
Conference Program and Abstracts of the 10th Annual Conference of the Special Interest Group in Neuropsychological Rehabilitation of the World Federation for NeuroRehabilitation (WFNR) 8-9 July, 2013, Maastricht, The Netherlands

Organising Committees

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Conference Program

Day 1: Monday 8th July

9.00-9.10 **Caroline van Heughten (Program Chair)**

Welcome and Introduction

9.10-9.40 **Talk 1: Professor Barbara Wilson – Opening Address, Chair: Prof Caroline van Heughten**

Rare and unusual syndromes you have probably never heard of but might encounter one day

Session 1a

9.40-10.40 **Effectiveness of Neuropsychological Rehabilitation, Chair: Prof Jennie Ponsford**

Talk 2: Tamara Ownsworth - Effectiveness of the Making Sense of Brain Tumour Program for improving psychological well-being after brain tumour: A randomised controlled trial

Talk 3: Dhamapurkar Samira - To investigate the effectiveness of positioning on level of awareness in patients in the vegetative state (VS) or the minimally conscious state (MCS)

Talk 4: Elizabeth Mitchell - Efficacy of leisure intervention groups and their impact on leisure satisfaction, self-esteem and QOL amongst people with an ABI

10.40-11.10 **Morning tea and posters**

Session 1b:

11.10-12.00 **Effectiveness of Neuropsychological Rehabilitation, Chair: Prof Jennie Ponsford**

Talk 5: Satu Baylan - Measuring the Effect of Brief Goal Management Training in Brain Imaging Environment

Talk 6: Igor Bombin - Can we improve functional independence and memory in amnesic MCI elderly subjects? Short and long-term results from a randomized clinical trial

Discussion

Session 2

12.00-12.40 **The influence of psychological factors (datablitz), Chair: Prof Rudolf Ponds**

Datablitz 1: Dawn Neumann - You did that on purpose!: Irritability and anger after traumatic brain injury may be related to cognitive attribution styles

Datablitz 2: Gisela Wolters Gregório - Influence of coping on psychosocial functioning in patients with brain injury who received intensive neurorehabilitation

Datablitz 3: Gisela Wolters Gregório - Changes in coping in the chronic phase in patients with psychiatric and behavioural problems due to acquired brain injury

Datablitz 4: Ieke Winkens - Coping, awareness of deficit and executive functioning after acquired brain injury

Datablitz 5: Jennie Ponsford - Sexuality following traumatic brain injury – A much ignored problem in neurorehabilitation

12.40-1.40: Lunch

Session 3

1.40-3.00 Assessment methods and methodology, Chair: Dr Michael Perdices

Talk 7: Caroline Van Heugten, Can We Forget The MMSE? Cognitive Screening In The (Sub)Acute Phase After Stroke

Talk 8: Michael Schoenberger - Validation of the German version of the Posttraumatic Growth Inventory in individuals with acquired brain injury

Talk 9: Robyn Tate - Revision of a scale to measure risk of bias in single-case reports: the RoBiN-T Scale

Talk 10: Nadina Lincoln - Validation of two cognitive batteries for assessing fitness to driver in people with multiple sclerosis

Session 4

3.00-4.10 Effectiveness of Neuropsychological Rehabilitation (datablitz), Chair: Prof Jim Malec

Datablitz 6: Nadina Lincoln - Rehabilitation of Memory in People with Multiple Sclerosis: a pilot randomised controlled trial

Datablitz 7: Catherine Tunnard - Comparison of neuropsychological rehabilitation techniques for unilateral neglect: A single-case experimental design

Datablitz 8: Angela Hinchcliffe - The Language of Music: Can modified melodic intonation therapy improve verbal output in severe dysphasia?

Datablitz 9: Matthew Jamieson - The efficacy of cognitive prosthetic technology for people with memory impairments; A systematic review and meta-analysis

Datablitz 10: Natalia Ojeda- Clinical symptoms and functional outcome improvement in chronic schizophrenia by a cognitive rehabilitation program: REHACOP

Datablitz 11: Skye McDonald - A brief intervention for improving recognition of emotional prosody following severe acquired brain injury

Datablitz 12: Birol Eredzhebov - Mirror Visual Feedback on Improving Hemineglect for Patients Stroke During the Chronic Stage of Recovery – A single case study

Datablitz 13: Sara Simblett - Beating the blues after a stroke: a pilot randomised controlled trial of computerised cognitive behavioural therapy

4.10-4.40 Afternoon tea

Session 5

4.40-6.00 The influence of anxiety and depression after brain injury, Chair: Prof Barbara Wilson

Talk 11: Kate Gould - Contribution of Cognitive Impairments to Anxiety Disorder Following Traumatic Brain Injury

Talk 12: Christian Salas - Emotion regulation and brain injury: searching for a common ground

Talk 13: Marieke Visser - The relative effect of coping style and depression on quality of life in chronic stroke patients

Talk 14: Maria van Mierlo - Psychological determinants of depression in stroke patients two months post-stroke: A prospective cohort study

6.30-11.00 Conference dinner at Castle Neercanne

POSTERS – MONDAY

Anna Adlam - Computerised working memory training in children who have survived a traumatic brain injury: A Phase II Randomised Controlled Trial Protocol

Mieko Aida - Art therapy for physical rehabilitation in a neuro- rehabilitation hospital in the UK

Shadi Akbari - Correlations among Impairment, Thinking Operations and Daily Activities after Stroke

Wafa Al Yazeedi - A Qatari perspective management of vegetative patients

Hisham AlHaidary - Rehabilitation goals from the perspective of Saudi clients with disabilities due to neurological disorders

Fiona Ashworth - Coping after brain injury: An exploration of responses of self-criticism and self-reassurance and their relationship with anxiety and depression

Awoniyi Folorunso Emmanuel - Variations in Aphasic Language Behaviour: A Case Study of Selected Bilinguals at the University College Hospital, Ibadan

Annette Baars-Elsinga - Development and evaluation of a protocol for cognitive strategy training in general hospitals

Emily Bennett - Developing a paediatric brain tumour parent/carer support and information group: A pilot study

Douwe Bergsma - Improvement of daily functioning after visual restorative function training in chronic stroke patients, using Goal Attainment Scaling

Dirk Bertens - Errorless learning in Goal Management Training: study protocol and case description

Tanesh Bhugobaun - From Wheelchair to Wheels

Tanesh Bhugobaun - A Pathway from Complex Neuropsychiatric Clinical Presentation to Independent Social Reintegration

Igor Bombín - Evidence-Based Neuro-Rehabilitation For Brain Injury: Best-Practices Guide And Benchmarking

Hileen Boosman - Cognitive characteristics associated with low learning potential in patients with acquired brain injury

Orla Brady - Evaluating and comparing the effectiveness of Sonas and Cognitive Stimulation Therapy (CST) on Cognition, Quality of life, Activities of Daily Living (ADL's), Communication, Neuropsychiatric symptoms and Occupational Performance within a group session in older adults with Dementia

Pamela Brown - Do scripted videos improve orientation and awareness of deficit?

Loredana Carrieri - Patterns of functioning and early difficulties at work in Multiple Sclerosis: implications for rehabilitation counselors

Melanie Cornell - An investigation into the effects of rhythmic auditory stimulation (RAS) on stride parameters in adults with acquired brain injury: An ABA design

Linda Crawford - Rehabilitation for Hypoxic brain injury: Focussing on meaningful roles maximises outcome

Gera De Haan - The effect of compensatory scanning training on mobility in hemianopia patients

Catherine Degiorgio - Realistic Observation in Game and Experience in Rehabilitation (R.O.G.E.R.): a prototype

Jacinta Douglas - Improving communication-specific coping after traumatic brain injury: Evaluation of a new treatment using single case experimental design

Ava Easton - Neuro-Narratives – A Beacon of Hope or Pandora's Box?

Birol Eredzhebov - Effects of Sulphur Footbath for Managing Spasticity After Brain Injury: A New Approach in Clinical Practice – A Pilot Study

Mairead Fitzgerald - "People Do not Recognise my Role as a Carer" –The Impact of Caring for someone with an Acquired Brain Injury in Ireland

Ekaterina Fufaeva - Patterns of neuropsychological outcomes in children with severe traumatic brain injury at the early stage of consciousness recovery

Jacqui Furlepa - Using music to improve executive function in a patient with acquired brain injury

Cathy Grant - Treatment of Neuropsychological Difficulties Associated with Dopa Responsive Dystonia

Alan M. Gray - Understanding expectations of, and satisfaction with, deep brain stimulation of the subthalamic nucleus in Parkinson's disease: patient and caregiver perspectives

Irene Huenges Wajer - Participation after aneurismal subarachnoid haemorrhage

Krista Huisman - Exploring near and far regions of space: Distance specific visuo-spatial neglect after stroke

Sinéad Hynes - Using video ratings to assess multitasking performance in a naturalistic paradigm

Bincy Joseph - Integrated approach to treatment of conversion disorder: A case study

Melanie Kleynen - Motor learning in clinical practice: a Delphi technique

Anneli Kolk - Rehabilitation programs versus real life: problems arose creating a novel computer-based attention rehabilitation for children

Wyske Kylstra - Treating persistent restlessness after stroke by TENS: A single-case experiment

Susan Lennie - Investigating the utility of the Addenbrooke's Cognitive Examination – revised (ACE-R) in predicting outcomes among adults undergoing in-patient neurorehabilitation

Tobias Loetscher - Using eye-tracking glasses to evaluate the effect of visual scanning training on everyday activities

Day 2: Tuesday 9th July

Session 6

8.30-9.30 **Challenging behaviour, Chair:** Dr Joke Spikman

Talk 15: Fabricia Quintão Loschiavo-Alvares - Neuropsychological Rehabilitation for Bipolar Disorder

Talk 16: Brian O'Neill - Challenging behaviour and sleep cycle disorder following brain injury and response to agomelatine

Session 7

9.30-10.10 **Caregiver burden after brain injury, Chair:** A/Prof Tamara Ownsworth

Talk 17: Alan M. Gray - The role of motor, psychiatric, and cognitive symptoms in predicting caregiver burden in Parkinson's disease: a review of the literature

Talk 18: Kessiah Hunt - Family-focused therapy following traumatic brain injury

Session 8

10.10-10.45 **Children with brain injury and Family burden (datablitz), Chair:** A/Prof Tamara Ownsworth

Datablitz 14: Maarten Milders - Cognitive stimulation by caregivers for people with dementia

Datablitz 15: Rene Stolwyk - A longitudinal comparison of patient and close other reports of neuropsychological change 1- to 5-years following traumatic brain injury

Datablitz 16: Teresa Maria Sgaramella - Future goals and concerns in young adults after brain injury: issues for assessment and intervention

Datablitz 17: Sophie Thomas - Cognitive outcomes in children diagnosed with infant non-accidental brain injury (NABI): A systematic review of the literature

10.45-11.15 Morning tea and posters

Session 9

11.15-12.15 Neuropsychological rehabilitation: models and services, Chair: Prof Robyn Tate

Talk 19: Fabricia Quintão Loschiavo-Alvares - A Proposal for the Extension of the Comprehensive Model of Cognitive Rehabilitation to include People with Neuropsychological and Neuropsychiatric Conditions

Talk 20: Tessa Hart - Treatment theory as an organizing framework for neuropsychological rehabilitation

Talk 21: Lingani Mbakile - The Experience of Traumatic Brain Injury in Botswana

12.15-1.15 Lunch and posters

Session 10

1.15-1.55 Cognitive neuroscience, Chair: Dr Ashok Jansari

Talk 22: Alan M. Gray - Deep brain stimulation as a treatment for neuropathic pain: neuropsychological outcomes from surgery

Talk 23: Catherine Haslam - The neurocognitive locus of errorless learning: A behavioural study investigating the contribution of executive processes to memory enhancement

Session 11

Assessment methods and methodology (datablitz), Chair: Prof Andrew Bateman

Datablitz 18: Fabricia Quintão Loschiavo-Alvares - Validation of DEX Revision Self-Rating Version for people with Bipolar Disorder type I and II

Datablitz 19: Ashok Jansari - Can a French adaptation of virtual reality assessment of executive functions (JEF©) work?

Datablitz 20: Anna Adlam - A systematic review of cognitive and behavioral assessments that measure executive functioning following brain injury

Datablitz 21: Antonia Ten Brink - Impact of neglect in daily life: the Catherine Bergego scale

Datablitz 22: Marie Villain - Ecological Assessment Battery for Numbers: Validation Study

Datablitz 23: Michael Perdices - Assessing Cognitive and Behavioural Change in the Individual: a Tale of Two Methods

Datablitz 24: Olga García Sánchez - Adaptation and validation of the Spanish language version of the QOLIBRI scale

Datablitz 25: Samira Dhamapurkar - Does position have an effect on JFK Coma Recovery Scale (CRS-R) scores for minimally conscious patients? An exploratory study

Datablitz 26: Annemarie Visser-Keizer - Presentation of the Dutch Multifactor Fatigue Scale (DMFS) for neurological patients

Datablitz 27: David Tulsky - Development of the TBI-QOL and SCI-QOL: Patient Reported Outcomes Measures for Individuals with Traumatic Brain Injury and Spinal Cord Injury

3.15-3.45 Afternoon tea and posters

Session 12

3.45-5.05 Domain-specific studies, Chair: Dr Fergus Gracey

Talk 24: Merel Braspenning - The prevalence of navigation impairments in chronic stroke patients: results of objective neuropsychological measures using virtual reality

Talk 25: Giles Yeates - Characterising Mentalising Impairments following Acquired Brain Injury and their Clinical Significance

Talk 26: Lucy Knox - "There's more to it than what you see on the CT scan": The experience of decision-making impairment after severe traumatic brain injury (TBI)

Talk 27: Joost Heutink - Car driving performance in patients with hemianopia after acquired brain damage

Session 13

Outcome of neuropsychological rehabilitation (datablitz), Chair: Prof Jon Evans

Datablitz 28: Jessica Barnes - Rehabilitation Case Management: A new model of service delivery supporting transition from hospital to home for people with traumatic brain injury

Datablitz 29: Véronique Moulart - Life after survival of a cardiac arrest: Cognitive functioning, societal participation and quality of life

Datablitz 30: Silvia Pizzighello - Efficiency managing of transprofessional rehabilitation for persons with acquired cerebrolesion

5.40-6.00 Conference close: Professor Barbara Wilson

6.00-6.30 Meeting of the WFNR NR-SIG

Fabricia Quintão Loschiavo-Alvares - Criterion and convergent validity between Impulsive Behavior Scale – Urgency, Lack of premeditation, Lack of Perseveration and Sensation Seeking (UPPS) and Barrat Impulsiviness Scale – BIS-11 in patients with bipolar disorder

Fabricia Quintão Loschiavo-Alvares - Comparison between performance on Impulsive Behavior Scale – Urgency, Lack of premeditation, Lack of Perseveration and Sensation Seeking (UPPS) of patients with depressive bipolar disorder and general population

James Malec - Irritability and aggression following brain injury: Toward the development of a cogent conceptual framework

Leona McManus - The impact of parental brain injury on teenage relatives: perspectives of teenagers and their non-injured parent

Tijana Mihaljcic - Developing a measure of self-awareness of falls risk and functional ability in the older population undergoing inpatient rehabilitation

Ann-Marie Morrissey - Benefitting Client, Family and Care Staff: Implementation of an Individualised Therapeutic Programme for a Long-Term Disorder of Consciousness Patient

Eva-Maria Müller - Entering the field of Sport Neuropsychology in Germany - a Pilot Project

Mary-Rose Mulry - Individualised Cognitive Therapy through stimulation and Individualised SIMS (Sonas Individual Multi-Sensory Session) with Long Stay Psychiatry of Later Life subjects who have cognitive impairment

Tanja Nijboer - Functional outcome after stroke: the influence of neglect on basic activities of daily living

Javier Peña - Is it possible for healthy older people to benefit from cognitive rehabilitation? A Pilot Study with REHACOP

Silvia Pizzighello - The Contribution Of Enb-2 Score For Subjective Syndrome

Dominik Poepll - The Contribution of Clinical Neuropsychologists in German Outpatient Neurorehabilitation

Sascha Rasquin - Increased participation level for people with aphasia in the chronic phase after stroke.

Gerard Riley - A Comparison of Implicit and Explicit Instructions when Using the Method of Vanishing Cues to Teach People with Acquired Brain Injury

Thiago River - Methodological steps to create a video game to rehabilitation ADHD Adolescents

Anita Rose - Improving orientation in individuals with an acquired brain injury: a series of single case studies

Anita Rose - Efficacy of a Multisensory Environment as a therapeutic intervention in Acquired Brain Injury: a series of single case studies

Rebecca Rous - The role of interdisciplinary neuropsychological formulation and intervention to maximise outcome for an individual with long-standing unilateral hemi-inattention

Rebecca Rous - Intensive rehabilitation at five years' post-injury can improve functional outcome and reduce support needs

Mohamed Sakel - Reducing length of stay in neurorehabilitation Unit- evidence based policy

Sharon Savage - Can word retraining programs provide meaningful benefits to patients with Semantic Dementia?

Lisa Sherman - The Outing Group: A Project based group within a neurorehabilitation setting

Sanne Smeets - Treatment of unawareness of deficits in patients with acquired brain injury: A systematic review

Miranda Smit - The feasibility and efficacy of computer-based prism adaptation to ameliorate neglect in sub-acute stroke patients submitted to a rehabilitation center

Jenny Svanberg - The impact of 'SenseCam', a wearable camera, on memory, identity and mood in Korsakoff's Syndrome: a single case experimental design study

Emily Talbot - A Paediatric Case of Dancing Eye Syndrome (Myoclonus Opsoclonus Syndrome)

Robyn Tate - A survey of school support for adolescents with acquired brain injury: Effective overall, but room for improvement in communication, transitions and planning

Sophie Thomas - Evaluation of a support and information group for parents of children with hydrocephalus

Sophie Thomas - An evaluation of parental experience of a paediatric neuropsychology service: Indicators for service quality and improvement

Nienke Tielemans - Proactive coping in stroke patients: Feasibility and psychometric properties of the Proactive Competence Inventory

Nienke Tielemans - "Plan ahead!": Treatment protocol of the Restore4Stroke self-management intervention based on proactive action-planning

Johanna Visser-Meily - Participation and psychosocial functioning of patients with Myotonic Dystrophy

Agnès Weill-Chounlamountry - Efficacy of a Multimodal Therapy of anomia due to a failure of access to the phonological lexicon

Barbara Wilson - When a kangaroo is a "baby camel": Teasing out visual problems from semantic impairment

Jill Winegardner - Explanation and feedback as a rehabilitation strategy: pairing emotional and cognitive approaches

Jill Winegardner - Perceived Changes in Executive Function following rehabilitation

Chi-Cheng Yang - Chang Gung University Brief Intervention on Post-Concussion Syndrome (CGU-BIPCS): An Early Intervention Program for Patients with Mild Traumatic Brain Injury

Abstracts

Opening Address**Rare and unusual syndromes you have probably never heard of but might encounter one day**Wilson, Barbara A.^{1,2}¹Oliver Zangwill Centre, Ely, UK²Raphael Medical Centre, Tonbridge, UK

Neuropsychologists are familiar with many conditions including traumatic brain injury, stroke, encephalitis, hypoxic brain damage and dementia to mention a few. Sometimes, however, we need to assess patients with unusual diagnoses that we have never come across before. This presentation describes five unusual and rare syndromes that most neuropsychologists have probably never seen but may be asked to assess one day. Five patients with 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 main characteristics of these syndromes are described and possible cognitive and behavioural deficits presented. *FFI* patients show impairment of attention, temporal ordering of events and working memory and a progressive dream-like state. As the name suggests the condition is incurable and leads to death. *Alexander's Disease* is a slowly progressing, neurodegenerative disease mostly involving the midbrain and cerebellum. It typically affects infants and children, causing developmental delay. *Evan's Syndrome* is a rare autoimmune disorder in which the body makes antibodies that destroy the red blood cells, platelets and white blood cells. There are regular flare-ups of the disorder. *Diogenes syndrome* is characterised by self-neglect, squalor, withdrawal, apathy and compulsive hoarding. It is associated with several conditions including frontal lobe dementia and learning disability. *Cerebral salt wasting disease* is a rare endocrine condition caused by inappropriate secretion of an antidiuretic hormone. All these conditions are associated with cognitive deficits. Suggestions for assessment are presented.

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Session 1a: Effectiveness of Neuropsychological Rehabilitation

Effectiveness of the *Making Sense of Brain Tumour Program* for improving psychological well-being after brain tumour: A randomised controlled trialOwnsworth, Tamara¹; Chambers, Suzanne^{1,2}; Stewart, Ea¹; Casey, L¹; Walker, David³; & Shum, David¹¹*Behavioural Basis of Health Program, Griffith Health Institute and School of Applied Psychology, Griffith University, Mt Gravatt, Australia*²*Cancer Council Queensland, Brisbane, Australia*³*NEWRO Foundation, Brisbane, Australia*

Background and aims: There is a paucity of research investigating the efficacy of psychological interventions for people with brain tumour and no controlled trials have been conducted to date. This randomised controlled trial aimed to evaluate the efficacy of the Making Sense of Brain Tumour (MSoBT) program, a home-based psychotherapy and rehabilitation intervention for people with a primary brain tumour and their family members.

Method: At present, 49 individuals with brain tumour (aged 21–82 years, 43% malignant) have been randomly allocated to an immediate treatment group ($n = 27$) or waitlist control group ($n = 22$). Participants were administered pre-intervention measures of mental health (Montgomery–Åsberg Depression Rating Scale, Depression, Anxiety and Stress Scales), existential well-being (McGill Quality of Life Questionnaire) and quality of life (Functional Assessment of Cancer Therapy-Brain). The immediate treatment group received the 10-session MSoBT program after the pre-intervention assessment. Waitlist controls received standard care for a 10 week period and were re-assessed before receiving the MSoBT program. A 6-month post-intervention follow-up was conducted.

Results: Mixed two-way ANOVAs indicated that the immediate treatment group demonstrated a greater reduction in depressive symptoms ($p < .01$) and greater improvement in functional well-being ($p < .001$) and quality of life ($p < .05$) between the pre- and post-intervention assessments than waitlist controls. Follow-up data concerning the long-term impact of the MSoBT program will be presented.

Conclusion: Preliminary findings support the efficacy of the MSoBT program as a psychological intervention for people with brain tumour. Future research will focus on the impact of the intervention for family members.

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To investigate the effectiveness of positioning on level of awareness in patients in the vegetative state (VS) or the minimally conscious state (MCS)

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Background and aims: In 2005 Elliott et al published a paper entitled “Effect of posture on levels of arousal and awareness in vegetative and minimally conscious patients: a preliminary investigation”. Patients were assessed with the Wessex Head Injury Matrix (WHIM) when prone and when upright in a tilt table. This present study aims to replicate and extend these findings by including a third position, sitting, in addition to lying and standing.

Method: We followed 22 patients with mixed aetiologies and compared the observed behaviours in different positions (lying, sitting and standing) using the WHIM.

Results: 8 patients were excluded due to missing data. The remaining 14 patients, received treatment as usual in the form of passive range of motion exercises and sensory stimulations prior to the WHIM assessment. For 11 patients, more behaviours were observed when patients were standing, compared to either sitting or lying. Also, the highest ranked behaviour (HRB) increased for three patients when they were standing. The HRB was less likely to change when patients were assessed in the lying position. Two patients scored the same HRB for sitting and standing; one patient showed the same scores across all positions.

Conclusion: Our findings are almost identical to those seen in the study reported by Elliott et al (2005). This suggests that positional changes can have an effect on level of awareness among patients in the VS and MCS. In particular, standing improves performance in 78% of patients, but there is no difference overall between lying and sitting.

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Efficacy of leisure intervention groups and their impact on leisure satisfaction, self-esteem and QOL amongst people with an ABI

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Background and aims: To determine whether participation in a leisure intervention program called “Pushing the Boundaries” targeted for individuals who have an Acquired Brain Injury (ABI) living in rural/regional NSW, improved the leisure satisfaction, self-esteem and quality of life of participants.

Method: Using a pre and post intervention design, participants completed the Leisure Satisfaction Scale, Rosenberg Self Esteem Scale and the World Health Organisation Quality of Life scale –brief, prior to each program, immediately following and at three months post program. Data were analysed using a paired Wilcoxin test. Individual leisure goals generated by participants during the program were also investigated.

Results: Participants were eight men and four women aged between 19–49 years who were recent clients of a rural Brain Injury Rehabilitation Service. The majority (7/12) had acquired their ABI more than two years previously and for most (10/12) the cause was trauma. Program participants showed clinically important and statistically significant improvements in leisure satisfaction ($p = 0.002$), self-esteem ($p = 0.03$) and quality of life ($p = 0.02$ to 0.008 for 4 domains of the WHO-QOL-Bref scale) three months post program.

Conclusions: The findings indicate that adults with an ABI participating in a “Pushing the Boundaries” program can experience improvements in leisure satisfaction, self-esteem and quality of life.

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Session 1b: Effectiveness of Neuropsychological Rehabilitation

Measuring the Effect of Brief Goal Management Training in Brain Imaging Environment

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Introduction: Difficulties in carrying out future intentions/goals (i.e. those requiring prospective memory, PM) are common following brain injury yet the evidence base for the effectiveness of interventions aimed at improving PM functioning remains limited. Both Goal Management Training (GMT) and Implementation Intentions have been developed to improve goal-directed behaviour. This study investigated whether brief Goal Management Training with Implementation Intentions (GMTii) can improve performance on a computerised PM task administered in the fMRI scanner.

Method: Thirty neurologically healthy young adults were randomly assigned to GMTii or control training. Participants completed an event based PM task pre- and post-training while undergoing an fMRI scan. Both groups also completed a modified version of the Hotel Test (Manly et al. 2002) during training

with the GMTii group instructed to use this to practice the newly learned strategies.

Results: Both groups showed similar performance to PM targets pre-training ($U = 67.5$, $z = -1.9$, $p = .06$). Following training, the GMTii group showed significantly greater improvement in performance than the control group compared to pre-training ($t = -3.4$ (24), $p < .05$; $r = .57$).

Discussion: The results indicate that brief GMTii can be effective in reducing the occurrence of PM slips on simple computerised tasks administered in the scanner environment, allowing the possibility of examining the neural effects of brief GMTii training.

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Can we Improve Functional Independence and Memory in Amnesic MCI elderly subjects? Short and Long-Term Results from a Randomized Clinical Trial

Bombín, Igor^{1,2}; Vega-González, Eva M^a¹; Cifuentes, Alicia¹; Caracuel, Alfonso³; Santiago-Ramajo, Sandra³; Pérez-García, Miguel³; & Bobes, Julio²

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Introduction: Mild Cognitive Impairment (MCI) in elderly subjects is characterized by significant functional impairments in higher-order ADL (activity/participation). We aimed to test the ability of two neuropsychological rehabilitation approaches to improve cognitive functioning and functional independence in a sample of amnesic MCI.

Methods: Double-blind randomized clinical trial, with a 12-month follow-up and two treatment arms: Restitution (R) and Compensation (C). A priori hypothesis was that C would be more effective than R in improving independent functioning. Outcome measures included comprehensive measures of attention, working memory, memory, and executive functions; functional independence (WHO-DAS II; CHART), quality of life (Q-LES-Q), subjective memory complaints (MFE), and anxiety/depression symptoms (GDS).

Results: Treatment groups showed no significant differences at baseline. After 12-month follow-up, R-group ($n = 33$) improved only in working memory ($p = 0.0018$; effect size Cohen's $d = 0.43$); whereas C-group ($n = 32$) improved in objective (HVLIT; $p = 0.022$; effect size Cohen's $d = 0.46$) and subjective (MFE; $p = 0.002$; Cohen's $d = 0.59$) memory measures, as well as in functional independence as measured with the CHART ($p = 0.048$; Cohen's $d = 0.43$). Despite these differential improvement profiles both groups did not statistically differ at 12-month follow-up.

Discussion: To our knowledge, this is the first study reporting Class I evidence (RCT) supporting the ability of neuropsychological rehabilitation to improve functional independence in MCI. Moreover, effect size of functional improvement was medium, but only when compensation/substitution and metacognition techniques were combined. Evidence of higher efficacy these approaches over restitution on cognitive functioning has been already reported (Jean et al, 2010; Stott & Spector, 2011).

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Session 2: The influence of psychological factors (datablitz)

You did that on purpose!: Irritability and anger after traumatic brain injury may be related to cognitive attribution stylesNeumann, Dawn^{1,2}; Malec, James F.^{1,2}; & Hammond, Flora^{1,2}¹*Department of Physical Medicine and Rehabilitation, Indiana University School of Medicine, Indianapolis, IN, USA*²*Rehabilitation Hospital of Indiana, Indianapolis, IN, USA*

Introduction: After a traumatic brain injury (TBI) problems with anger and aggression are common, difficult to treat, and often associated with poor psychosocial outcomes and life quality. In this preliminary study, we investigated the relationships of irritability and anger with attributions of intent, hostility, and blame.

Methods: Eighteen participants with moderate to severe TBI were presented with 21 written vignettes in which characters' actions hypothetically led to negative consequences for the participant. As validated in a former study, the vignettes described benign (1/3), ambiguous (1/3), and hostile behaviors (1/3) (unbeknownst to current participants). Participants rated how irritated and angry they would be in response to each vignette, as well as their perceived intent, hostility, and blame of the character. Trait aggression was also evaluated (Buss-Perry Aggression Questionnaire).

Results: Participants were an average of 48 years old (range: 24-67) and predominantly male (67%). Irritability and anger responses to vignettes were strongly correlated with perceived intent, hostility, and blame ratings of the character ($r = .762-.927$, $p < .01$). For all scenario types (benign, ambiguous, and hostile), trait aggression scores were moderately to strongly associated with intent, hostility, and blame ratings ($r = .476-.799$, $p < .05$).

Discussion: These preliminary findings suggest that irritability and anger after TBI are related to negative attributions. Moreover, participants with higher trait aggression appeared to have a bias for attributing more mal-intent and blame, even for benign and ambiguous behaviors, compared to participants with lower trait aggression. Findings should be replicated with larger studies. Clinical relevance to cognitive behavioral therapy will be discussed.

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Influence of coping on psychosocial functioning in patients with brain injury who received intensive neurorehabilitationWolters Gregório, Gisela¹; Holleman, Meike²; Vink, Martie²; & Van Heugten, Caroline^{1,3}¹*Department of Psychiatry and Neuropsychology, Maastricht University, Maastricht, The Netherlands*²*Neurorehabilitation Expert Center Amsterdam, Reade, Center for Rehabilitation and Rheumatology, Amsterdam, The Netherlands*³*Department of Neuropsychology and Psychopharmacology, Maastricht University, Maastricht, The Netherlands*

Background and aims: Coping style has been shown to be influential in psychosocial functioning after acquired brain injury. In this study, the influence of coping at the start of a comprehensive neuropsychological rehabilitation program (Intensive NeuroRehabilitation, INR) on changes in psychosocial functioning over the course of treatment is evaluated, as well as the influence of changes in coping on psychosocial functioning after treatment.

Method: Patients with acquired brain injury who were admitted to the INR treatment program were included in the study. The participants completed

questionnaires measuring coping (Utrecht Coping List), subjective complaints (Symptom-Checklist-90), emotional well-being (Hospital Anxiety and Depression Scale), and quality of life (Quality of Life in Brain Injury) at the start and end of the treatment. Linear regression analyses were used.

Results: In total, 70 patients participated. High use of passive coping predicted decreases in subjective complaints between the start and end of treatment. In addition, patients who decreased their passive coping over the course of treatment reported lower levels of depression, anxiety, and subjective complaints after the treatment. Patients who increased their active coping reported less anxiety after the treatment.

Conclusions: Coping at the start of treatment predicted changes in subjective complaints, but not in emotional well-being or quality of life. By showing that decreases in passive coping and increases in active coping were adaptive, the importance of stimulating active coping and decreasing passive coping during treatment is recommended.

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Changes in coping in the chronic phase in patients with psychiatric and behavioural problems due to acquired brain injury

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Background and aims: Coping style has been shown to be promising in influencing psychosocial functioning in patients who mainly suffer from cognitive difficulties due to brain injury. In this study, the influence of coping on long-term outcome is investigated, as well as the changes in coping after the start of treatment in patients whose behavioural or psychiatric difficulties are most prominent.

Method: Patients in the chronic phase after brain injury were recruited from consecutive admissions to 4 mental health centres. Patients completed questionnaires measuring coping (Utrecht Coping List), depression (Patient Health Questionnaire-9), and quality of life (Life Satisfaction Questionnaire 9) at the start of mental health care and at 6 months follow-up. Data were analysed with regression analyses.

Results: In total, 49 patients completed both assessments. Patients who reported more passive coping at the start of mental health care reported a lower quality of life and more depressive complaints at follow-up. On a group level, there were no significant changes in coping over time. On an individual level, most patients increased their passive and avoidance coping (41 and 55%, resp.) and decreased their active coping (49%). Patients who received more hours of psychological therapy showed significantly less increases in passive coping.

Conclusions: Passive coping at the start of mental health care was predictive of worse outcomes 6 months later. After the start, most patients report increases in passive and avoidance coping and decreases in active coping. By measuring coping at admission to mental health centres, patients can be identified who are at risk for worse functioning 6 months later.

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Coping, awareness of deficit and executive functioning after acquired brain injury

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Background and aims: Coping style and awareness of deficit are important predictors for rehabilitation outcome after acquired brain injury (ABI). It has been suggested that changes in coping style and awareness of deficit are consequences of executive dysfunction. Aim of this study was to examine the relationship between coping, awareness of deficit and executive functioning in individuals with ABI.

Method: Participants were patients with ABI that were referred to the Intensive Neuropsychological Rehabilitation Program of Reade, centre for rehabilitation and rheumatology (Amsterdam, The Netherlands). The program is a holistic outpatient rehabilitation service that aims to treat cognitive, emotional and behavioural changes after ABI. Participants completed the Utrecht Coping List, Patient Competency Rating Scale, Tower of London, Trail Making Test, Stroop Color Word Test and Dysexecutive Questionnaire of the Behavioural Assessment of the Dysexecutive Syndrome.

Results: 71 patients participated in this study. Objective executive functioning was not associated with coping or awareness of deficit. Self-reported executive dysfunction was significantly associated with coping: patients who reported more executive deficits showed greater reliance on passive coping styles ($r = .40$, $p = .00$), whereas patients who reported fewer executive deficits showed greater use of active coping styles ($r = -.31$, $p = .01$). In addition, patients with impaired awareness of deficit seemed to report less executive deficits than patients with good awareness and patients that underestimated their abilities. These findings were not significant statistically ($r = -.25$, $p = .07$).

Conclusion: Self-reported executive dysfunction predicts the use of passive and active coping styles.

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Sexuality following traumatic brain injury – A much ignored problem in neurorehabilitation

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Objective: Limited research or therapeutic interventions have focused on sexuality following Traumatic Brain Injury (TBI). This study aimed to examine self-reported changes in sexuality following TBI and explore the factors associated with these changes.

Method: Participants included 865 people with TBI (PTA days $M = 27.6$, $SD = 30.6$) and 142 healthy controls. Participants completed the recently validated Brain Injury Questionnaire of Sexuality (BIQS), Hospital and Anxiety and Depression Scale and Rosenberg Self Esteem Scale

Results: Relative to controls, participants with TBI reported significantly more negative changes in Sexual Function, Relationships and Self-Esteem and Mood on the BIQS, with more than half reporting a decline in these aspects of

sexuality post-injury. These sexual changes were attributed to various causes, most commonly fatigue, low confidence, pain, decreased mobility and feeling unattractive. Being depressed, older in age, at shorter time post-injury and less independent in ADL significantly predicted poorer overall BIQS Sexuality scores as well as the Sexual Functioning subscale score. Poorer Relationship Quality and Self Esteem scores on the BIQS were predicted by older age at injury and higher levels of depression. Lower Mood was associated with shorter PTA duration, younger age, and higher levels of depression. Self esteem was associated positively with sexuality outcome.

Conclusions: Therapeutic interventions for sexuality need to focus on depression and self-esteem, and address specific barriers to social participation and opportunities for sexual contact in individuals who are less independent in daily activities.

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Session 3: Assessment methods and methodology

Can We Forget The MMSE? Cognitive Screening In The (Sub)Acute Phase After Stroke

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Background and aims: Cognitive deficits are very common after stroke and early detection should be considered as standard clinical practice. The aim of this study was to review studies investigating the quality of multi-domain cognitive screening instruments in the first four weeks after stroke.

Methods: Systematic review (Pubmed, PsycINFO, CINAHL, Embase) to identify relevant literature to December 2011 concerning the assessment of cognitive functioning in stroke patients using multi-domain instruments, within 4 weeks post infarct or haemorrhage, lasting no longer than one hour. Convergent, criterion and predictive validity were examined. Prevalence of cognitive deficits could be established.

Results: 42 studies investigating 14 cognitive screening instruments were identified. None of the instruments covered all of the most affected cognitive domains. Prevalence ranges from 12 to 63%. Convergent validity was hardly studied. The Montreal Cognitive Assessment (MoCA) and Higher Cortical Function Deficit Test (HCFD) had good criterion validity. The Cognistat, MoCA, and Functional Independence Measure-cognitive (FIM-cog) showed good predictive validity.

Conclusions: None of the existing instruments fulfills all criteria. The Mini Mental State Examination (MMSE) is most widely used instrument, but shows insufficient criterion and predictive validity and should not be used for screening purposes. The MoCA is the best candidate, provided items measuring speed of information processing are added. Further studies investigating the optimal cut-offs are recommended.

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Validation of the German version of the Posttraumatic Growth Inventory in individuals with acquired brain injury

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Background & aims: Posttraumatic growth is defined as a positive psychological change based on the experience of a traumatic event. The aim of the current study was to determine the factorial and discriminant validity of the Posttraumatic Growth Inventory (PTGI) in a German sample of individuals with acquired brain injury.

Method: Participants in this cross-sectional study were 215 adult individuals (71% male; mean age 65 years) with acquired brain injury (88% stroke, 5% TBI, 7% other). At the end of their inpatient rehabilitation, subjects completed the German versions of the PTGI and the Hospital Anxiety and Depression Scale (HADS), as well as the Freiburg Questionnaire of Coping with Illness (FKV).

Results: In a confirmatory factor analysis of the PTGI, the five-factor structure was supported by two fit indices (CFI = 0.96, RMSEA = 0.079), but not by a χ^2 test ($\chi^2(179) = 418.6$ ($p < .01$)). No significant relationships ($p > .05$) between the PTGI factors and the HADS depression scale were observed once age was controlled for. However, regression analyses showed that the PTGI factors were moderately related ($p < .05$) to most FKV coping styles.

Conclusions: Overall, the model fit indices support the original factor structure claimed by the PTGI authors. The moderate or absent relationships of the PTGI with the HADS and FKV indicate that the PTGI is not merely measuring depression and coping styles. These findings are in support of the factorial and discriminant validity of the PTGI.

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Revision of a scale to measure risk of bias in single-case reports: the RoBiN-T Scale

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Background: Single-case designs are commonly reported in the intervention research literature and indeed are the most common methodological design on the PsycBITE database, comprising one-third of all records. They also readily lend themselves to an evidence-based approach in the clinical setting. Moreover, the randomised n-of-1 trial is now considered Level 1 evidence for treatment decision purposes. All these factors highlight the importance of

having well-conducted, single-case studies, but there is evidence of great variability in methodological rigor. We previously developed a scale to measure method quality of single-case reports. This paper describes our further work in improving the scale.

Method and Results: Changes made to the original scale resulted in a radically revised instrument, entitled the Risk of Bias in N-of-1 Trials (RoBiN-T) Scale. Item content was revised and increased to 15 items, two subscales were developed (Internal Validity and External Validity/Interpretation), and scoring was changed from a 2-point to 3-point scale to accommodate more rigorous standards. Construct validity and interrater reliability were examined in 20 randomly-selected, single-case reports. The scale discriminated between studies that did and did not have experimental control and interrater reliability was acceptable, both for experienced and novice raters.

Conclusions: The RoBiN-T Scale provides a comprehensive yet efficient examination of the important features of single-case methodology and has sound psychometric properties. It can also be used as a checklist against which to plan a rigorous, single-case intervention.

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Validation of two cognitive batteries for assessing fitness to drive in people with multiple sclerosis

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Background and Aims: Cognitive assessments are used to determine whether people with neurological conditions are safe to continue driving. The aim was to compare the Multiple Sclerosis Driver's Screening Assessment (MSDSA) and the Rookwood Driving Battery (RDB) for assessing fitness to drive in people with multiple sclerosis.

Method: Participants with multiple sclerosis were recruited from hospital and community clinics and were assessed on the MSDSA and RDB in randomised order. The classifications of safety to drive were compared.

Results: 29 drivers with multiple sclerosis were recruited (mean age = 49 years, $SD = 8.37$). MSDSA and RDB both classified twenty-four participants (83%) as safe to drive. There was moderate inter-rater agreement between MSDSA and RDB *pass/fail* classifications ($\kappa = 0.53, p < .001$). The MSDSA showed 100% sensitivity for *fail* classifications and 89% specificity when compared against the RDB. The MSDSA total score significantly correlated with the Road Sign Recognition ($p < .001$) and Information Processing ($p < .01$) MSDSA subtests, but only Road Sign Recognition was predictive of MSDSA outcome. Visual Es-Fs (attention and visual perception) and Comprehension (verbal and executive skills) subtests accounted for almost 60% of the variance in RDB total scores.

Conclusions: There was good agreement between MSDSA and RDB *pass* classifications. The MSDSA was better at identifying unsafe participants compared to the RDB. The Road Sign Recognition was more accurate in predicting MSDSA *pass* rather than *fail* classifications (92% sensitivity for *pass*, 40% specificity). MSDSA and RDB subtests assessing attention, visuospatial perception and executive function skills were related to driving ability in individuals with MS.

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Session 4: Effectiveness of Neuropsychological Rehabilitation (datablitz)

Rehabilitation of Memory in People with Multiple Sclerosis: a pilot randomised controlled trialCarr, Sara¹; das Nair, Roshan²; Schwartz, Annette¹; & Lincoln, Nadina²¹*The Poplars, Central Surrey Health, Epsom, UK*²*Institute of Work, Health and Organisations, University of Nottingham, Nottingham, UK*

Background and aims: Memory difficulties affect 40-65% of people with multiple sclerosis. The aim of this pilot randomised controlled trial was to assess the feasibility and effectiveness of a memory rehabilitation programme.

Method: Participants with multiple sclerosis who had memory difficulties were randomly allocated to an intervention group or a waiting list control group. Those in the intervention group were invited to ten treatment sessions in which restitution and compensation memory rehabilitation strategies were taught. Outcomes were assessed by post 4 and 8 months after randomisation.

Results: Forty-eight participants were recruited; 24 in each group. Participants in the intervention group attended an average of 7.9 sessions ($SD = 0.23$). There were no significant differences between the two groups on the Everyday Memory Questionnaire or Multiple Sclerosis Impact Scale ($p > 0.05$). However, the intervention group reported significantly better mood than controls on the General Health Questionnaire-28 at 8 months ($p = 0.03$).

Conclusions: Participants showed a benefit from the memory rehabilitation programme on a measure of mood but not in self reported memory problems. The study demonstrated it was feasible to deliver the memory rehabilitation programme in a group format on the basis of a manual and the intervention was well received, as indicated by high attendance rates and positive feedback at the end of the sessions. A randomised trial with more participants is warranted to assess the clinical and cost-effectiveness of this treatment.

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Comparison of neuropsychological rehabilitation techniques for unilateral neglect: A single-case experimental designTunnard, Catherine¹; Wilson, Barbara A.^{2,3}; & Florschutz, Gerhard¹¹*The Raphael Medical Centre, Tonbridge, Kent, UK*²*MRC Cognition & Brain Sciences Unit, Cambridge, UK*³*The Oliver Zangwill Centre for Neuropsychological Rehabilitation, Ely, Cambridgeshire, UK*

Background and aims: Unilateral neglect is a debilitating attentional disorder whereby patients fail to report, respond or orient to information presented on one side of space. Previous studies have demonstrated improvements in neglect symptoms using rehabilitation techniques, such as spatial cueing ('anchoring') or movement of the neglected limb ('limb activation'). The aim of the present study was to compare the effectiveness of different interventions in reducing the severe left sided neglect observed in a 51 year old male patient, F.P.

Method: A single-case ABACADAEACD design was used to investigate the effectiveness of the following interventions compared to baseline (A): musical stimulation (B), anchoring (C), vibratory stimulation (Motivaider)(D), limb activation (E), and anchoring and vibratory stimulation together (CD). Severity

of neglect was measured by F.P.'s performance on the star cancellation, line crossing and line bisection tests from the Behavioural Inattention Test (Wilson et al., 1987) across the five conditions.

Results: All interventions, except musical stimulation, resulted in improvements in F.P.'s left-sided neglect. Anchoring (C), vibratory stimulation (D) and the combination of these two techniques (CD) led to greatest improvements on all three tests of neglect compared to baseline. Musical stimulation was the least effective intervention.

Conclusions: Anchoring and vibratory stimulation were the most effective techniques for reducing symptoms of neglect for this patient. Further research is needed to investigate whether the observed gains can be: sustained on a longer-term basis; generalised to other tasks (e.g. self-care) and replicated in larger samples of patients experiencing unilateral neglect.

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The Language of Music: Can modified melodic intonation therapy improve verbal output in severe dysphasia?

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Background and aims: Difficulty in progressing beyond the point of being able to produce only automatic responses is not uncommon for people suffering from severe expressive dysphasia. Nor is it unusual for the same dysphasic individuals to have some preserved singing ability for familiar songs, with lyrics, since it is believed that music and language are processed by separate areas of the brain which are functionally autonomous. Working with one such dysphasic man, FY, who has a love of music and has some preserved singing in contrast to his more limited speech output, led us to consider the possibility of using music to encourage more functional verbal output.

Method: A multiple baseline single-case design was carried out to investigate the effects of a modified melodic intonation therapy (MMIT) programme on the verbal production of a 50 year old man with severe nonfluent aphasia. Fifteen functional phrases were introduced over a period of 12 weeks. Baseline measures were taken before treatment and an independent assessor rated FY's production of the phrases before, during and after MMIT intervention.

Results: Preliminary results from this study show increased success in production of phrases following the MMIT alongside some interesting additional benefits and developments for FY.

Conclusions: The results are encouraging and show some benefits of using this approach with FY. Further research is required to investigate the longer-term effects of MMIT, to introduce additional phrases and consider ways of improving functional carryover for FY and to replicate the work with other dysphasic individuals.

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The efficacy of cognitive prosthetic technology for people with memory impairments: a systematic review and meta-analysis

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Background and aims: Prosthetic technology can compensate for the negative impact which memory impairment can have on quality of life and independence. This paper aimed to review the literature by quantifying the efficacy of memory aid technology for people with memory difficulties and by assessing the methodology of selected studies using separate scales for single case and group studies.

Method: A systematic search was performed and all studies which investigated the impact of technology on the performance of memory tasks for adults with impaired memory resulting from ABI or a degenerative disease were included and rated.

Results: 31 single case experimental design (SCED) studies received a moderate mean rating of 5.87 on the SCED scale (Tate et al., 2008). The difference between first baseline and technology intervention phases for each participant in the SCED studies was re-calculated where possible using non-overlap of all pairs (Parker et al., 2009) giving a high mean score of 0.88 (16 studies, $n = 35$). Nine group studies received a low to moderate mean score of 4.33 on the PEDro-P scale (Maher et al., 2003) and a meta-analysis of the efficacy of technology vs. control condition in six studies gave a large effect size ($d = 1.46$) ($n = 101$).

Conclusions: There is good evidence that prosthetic technology can improve performance on everyday tasks requiring memory. Future research should look to perform group studies and studies with improved methodology and should investigate technology for those with degenerative diseases which lead to declining memory.

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Clinical symptoms and functional outcome improvement in chronic schizophrenia by a cognitive rehabilitation program: REHACOP

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Background and aims: Cognitive remediation improves cognition in schizophrenia, but its effectiveness on other relevant factors such as clinical symptoms and functional outcome has not been studied to the same degree. The aim of this study was to analyze the influence of the cognitive rehabilitation program REHACOP

Method: Eighty-four inpatients with chronic schizophrenia were recruited. All subjects underwent pre and post-treatment assessment including neuropsychology, clinical symptoms, insight, and functional outcome. Patients were

randomly assigned to either neuropsychological rehabilitation (REHACOP) or control group for 3 months in addition to treatment as usual. REHACOP is an integrative Spanish program that taps all basic cognitive functions.

Results: REHACOP group showed significantly greater improvements at 3 months in neurocognition, negative symptoms, disorganization and emotional distress measures compared to the control group (Cohen's effect size for these changes ranged from $d = 0.47$ for emotional distress to $d = 0.58$ for disorganization symptoms). REHACOP group also improved significantly in both GAF ($d = 0.61$) and DAS-WHO total score ($d = 0.57$). More specifically, they showed significant improvement in vocational outcome ($d = 0.47$), family contact ($d = 0.50$) and social competence ($d = 0.56$).

Conclusions: Neuropsychological rehabilitation may be useful for the reduction of some clinical symptoms and functional outcome. These findings support the feasibility of integrating neuropsychological rehabilitation into treatment as usual programs for patients with chronic schizophrenia.

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A brief intervention for improving recognition of emotional prosody following severe acquired brain injury

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Background and Aims: Acquired brain injuries, including traumatic brain injuries (TBI) can lead to significant impairment in the recognition of emotion in voice. This can occur independently to facial expression. Perception of emotional prosody is, therefore, an important target for remediation. No research to date has addressed this. The current study aimed to examine whether a short, 6 session treatment could improve the ability to recognise emotional prosody for people with acquired brain injury, mostly TBI.

Method: Treatment was evaluated using a randomised controlled trial. Ten participants were randomly allocated to treatment and 10 to waitlist. Treatment was based on a module taken from the "Reading a Smile" treatment manual (Bornhofen & McDonald, 2010). All participants remained involved for the duration of the study in the groups to which they were allocated.

Results: There were no significant treatment effects for group overall. Six of the treated participants, however, made demonstrable improvements on objective measures of prosody recognition. Improvements on objective measures of prosody perception did not generalise to relative reports of improvements in everyday communicative ability. Nor was there clear evidence of long term effects.

Conclusion: In conclusion, treatment of emotional prosody was effective in the short-term for half of the participants. Further research is required to determine what conditions are required to optimise generalisability and longer term gains.

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Mirror Visual Feedback on Improving Hemineglect for Patients with Stroke During the Chronic Stage of Recovery – A single case study

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Background and Aims: Patients with visual neglect demonstrate significant lack of awareness of the contralesional side of personal and external space limiting their perception during rehabilitation. This study reviews the potential use of mirrors in treating hemineglect in a stroke patient.

Method: A 50-year-old man with a left middle cerebral artery infarct was admitted for rehabilitation 6 months post injury with severe neglect of his right side. During the intervention the patient was seated on the plinth and a vertical mirror was placed in front of him. Activities were carried out with the physiotherapist standing behind the subject and physically assisting with the given tasks on the neglected side.

Results: Star cancellation test was used to determine the outcome of the treatments. Compared to the baseline measures, the final evaluation has displayed full ability to cancel all stars on the board, whereas initially the patient could not cross the midline.

Conclusion: Here we have investigated the effect of mirror therapy and focusing on visual feedback on treating visual hemineglect in a patient with stroke. The outcomes of the study show significant improvement on the neglect side. The results here suggest a further study with a larger sample is needed to generalize the effect of mirror therapy as well as to validate the findings.

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Beating the blues after a stroke: a pilot randomised controlled trial of computerised cognitive behavioural therapy

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Background and aims: A stroke can be an emotionally distressing experience. Symptoms of depression and anxiety disorders, particularly generalised anxiety disorder (GAD), are commonly reported. Despite this, psychological support has been highlighted as an area of unmet need. This study aimed to investigate whether a computerised psychotherapeutic intervention based on cognitive behavioural therapy (cCBT) could help to reduce distress.

Method: Twenty-nine people who had experienced a stroke and were reporting symptoms of depression and/or anxiety were recruited from neurorehabilitation services. Participants were randomly allocated to receive an eight-week course of cCBT or a comparator treatment (computerised cognitive training: cCogT). All were helped to access and complete these interventions within their local community, in small groups, where possible.

Results: An intention-to-treat analysis found that participants who had received cCBT experienced a significantly greater improvement in GAD

measured by the GAD-7 than those who received cCogT ($B = -3.77$, $t(22) = -2.33$, $p < 0.05$). There was an overall reduction in symptoms of depression measured by the BDI-II ($B = -1.17$, $t(25) = -2.42$, $p < 0.05$) but this improvement was not specific to either one of the interventions ($B = -0.16$, $t(25) = -0.27$, $p = 0.79$).

Conclusions: Community-based computerised interventions such as cCBT and cCogT have the potential to improve symptoms of depression and GAD following stroke. CCBT, specifically, may be effective for treating GAD. The mechanisms of these changes require further exploration and the role of spontaneous recovery cannot be ruled out at present. However, these results are promising and warrant further investigation.

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Session 5: The influence of anxiety and depression after brain injury

Contribution of Cognitive Impairments to Anxiety Disorder Following Traumatic Brain Injury

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Introduction: This study examined the association between cognitive impairment and clinically-diagnosed anxiety disorders following moderate to severe traumatic brain injury (TBI).

Method: Participants were recruited from consecutive admissions to a rehabilitation hospital. Data were obtained from 72 participants, who were predominantly young males with 12 years of education who sustained a moderate/severe TBI following traffic accidents. Participants completed the Structured Clinical Interview for the DSM-IV at one-year post-injury and a cognitive test battery to assess attention/working memory, information processing speed, memory, and executive functions.

Results: Prevalence of anxiety disorder at one-year post-injury was 27.8%. Compared to those without a diagnosis, participants with anxiety disorders were significantly slower on the Hayling Sentence Completion, Symbol Digit Modalities and Trail Making Tests, and performed significantly worse on Digit Span Backwards and BIRT List Learning tests. Logistic regression analyses revealed that all cognitive domains, except for the memory model, significantly predicted the presence of an anxiety disorder. However, relative to other cognitive domains, impaired processing speed was found to be most strongly associated with anxiety disorder.

Discussion: This is the first study to demonstrate a significant association between clinically diagnosed anxiety disorder and cognitive impairment in individuals with moderate to severe TBI. Specifically, slowed processing speed and poor working memory were shown to be strongly associated with the development of anxiety disorders. Conversely, anxiety disorders may also result in additional cognitive impairment through the distracting impact of intrusive and ruminative thoughts. Treatment implications for both aetiological pathways are discussed.

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Emotion regulation and brain injury: searching for a common ground

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Background and aims: The association between brain damage and emotion dysregulation has long been observed. However, little research has focused on how brain injury compromises the *mechanisms* that regulate emotion. Even though emotion regulation [ER] is a mature field today, its experimental paradigms have not been yet imported by brain injury research. The aim of this presentation is to report preliminary data from a group study on the use of ER strategies after brain injury.

Method: Participants with focal brain lesions (n = 20) and matched control subjects (n = 15) were compared in their ability to use two ER strategies. In the *reappraisal* task, subjects were asked to watch 'negative' pictures and generate positive reinterpretations. In the *response manipulation task*, participants watched emotionally inducing video clips and had to amplify or suppress their facial expression.

Results: In general patients were slower and produced less positive reinterpretations when compared to controls. Participants with left hemisphere lesions, and particularly subjects that exhibited marked concreteness presented the worst performance. In the response modulation task, patients in general were less able to voluntarily manipulate their facial expressions. Subjects with large right frontal lesions were especially impaired in their ability to suppress the expression of strong positive emotions.

Conclusions: The data is consistent with studies that associate reappraisal ability to left hemisphere functions (e.g. cognitive control), and suppression ability to right frontal functions (e.g. inhibition). These findings have important implications to comprehend the neuropsychological basis of ER and to inform neuropsychological rehabilitation practice.

Key words: emotion regulation, brain injury, emotion, emotion regulation strategies, reappraisal, suppression.

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The relative effect of coping style and depression on quality of life in chronic stroke patients

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Background and aims: Stroke patients rate their health-related quality of life (HR-QoL) lower than healthy individuals. Depression and coping style both have been suggested to contribute to HR-QoL after stroke, but the additional value of coping style is unknown. The aim was to examine the relative contribution of coping style and depression on HR-QoL in stroke patients.

Method: In a cross-sectional study, stroke patients (> 18 months post onset) were recruited from two rehabilitation centers in the Netherlands. Coping style was measured using the Assimilative-Accommodative Coping Scale, depression using the Center for Epidemiological Studies Depression Scale and HR-QoL using the WHOQOL-BREF. Univariable and multivariable regression analyses were performed, adjusted for patient characteristics.

Results: In total, 213 stroke patients were included. The mean age of the population was 59 years (SD 9.86), 56% were men and the mean time post stroke was 53 months (SD 37.8). Depression score was an independent predictor of all domains of HR-QoL (Physical Health (B = -.891; p = .000), Psychological Health (B = -.936; p = .000), Social Relationships (B = -.912; p = .000), Environment (B = -.706, p = .000)). The accommodative and assimilative coping style independently predicted Psychological Health, adjusted for depression and education (B = .276; p = .039 and B = .246; p = .060 respectively). In the other HR-QoL domains, coping style was not an independent predictor in addition to depression, which indicates that coping style and depression are inversely related.

Conclusions: This study shows that coping style and depression independently contribute to Psychological Health in chronic stroke patients. Preferable coping styles may be trained to improve both depression and HR-QoL in future research.

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Psychological determinants of depression in stroke patients two months post-stroke: A prospective cohort study

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Background and aims: Depression is a common and debilitating symptom in stroke patients. Demographic and stroke characteristics are only weakly related to post-stroke depressive symptoms (PSDS) and can not be altered. Therefore there is a growing interest in the influence of psychological variables on PSDS. Hence, the aim of this study was to identify psychological factors related to PSDS in patients two months post-stroke.

Methods: Prospective cohort study of 266 patients assessed at two months post-stroke. Depressive symptoms were determined by the Depression subscale of the Hospital Anxiety and Depression Scale (scores ≥ 8 experiencing depressive symptoms). Bivariate and multivariate logistic regression analyses were used to identify psychological factors related to PSDS. Age, gender, severity of stroke, independence in activities of daily living (ADL) post-stroke, and cognitive functioning (Montreal Cognitive Assessment) were used as control variables.

Results: Two months post-stroke, 24% of the patients experienced depressive symptoms.

Bivariate analysis showed that passive coping (OR 1.44), neuroticism (OR 1.31) and pessimism (OR 1.18) were positively associated with PSDS.

Proactive coping (OR 0.94), self-efficacy (OR 0.92), extraversion (OR 0.89), optimism (OR 0.72), ADL (OR 0.93), and cognitive functioning (OR 0.89) were negatively associated with PSDS. Multivariate logistic regression analysis showed that more passive coping (OR 1.4), less optimism (OR 0.83) and worse cognitive functioning (OR 0.92) were associated with PSDS (Nagelkerke R-Square 0.32).

Conclusions: This study shows the importance of psychological variables for the experience of depressive symptoms two months post-stroke. For clinicians it is important to become aware of these relationships.

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Session 6: Challenging behavior

Neuropsychological Rehabilitation for Bipolar Disorder

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Background and Aims: Cognitive deficits are commonly found in bipolar disorder (BD). The most impaired cognitive functions, by impact of multiple episodes of mood disorder, are memory, attention and executive functions which are intrinsically related to functional performance. This quasi experimental and prospective study aimed to investigate the effect of a protocol of neuropsychological rehabilitation (NR) in BD.

Methods: Control passive group n = 60 (CG- pharmacotherapy only) and intervention group n = 11 (NRG-pharmacotherapy+NR). NR protocol consisted of 14/weekly individual sessions, divided in three modules (mood monitoring, attention and memory, executive functions) of structured sessions and standardized techniques. Clinical application was tailored to patient's goal settings. Outcome measures: DEX-R (executive function), EMEP (coping), WHOQOL-BRIE (quality of life). Data pre, post-intervention and two-month follow-up were analyzed with the comparisons of the slope of scores from a NRG regression line with those from CG. Significant level set at $p < .05$.

Results: Significant difference ($p < .05$) was found between the predicted and obtained score in all comparisons. The point estimate of abnormality of that discrepancy was from 2.8% – 9.7%, and 95% confidence limits are from 0.29% – 9.18%. NRG¹ patients exhibited a large and statistically significant standardized difference between the obtained and predicted score from their baseline, which means that after the NR program this group demonstrated a significant improvement in the outcome measures.

Conclusion: Patients from NRG demonstrated an increase in their functional skills, with higher use of problem focus strategies and greater scores in quality of life measure. The results showed that individuals with BD can benefit from NR intervention as a tool to improve functional performance.

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Challenging behaviour and sleep cycle disorder following brain injury and response to agomelatine

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Background and Aims: Sleep disturbances are common after acquired brain injury. Sedatives can exacerbate behavioural disorders. Agomelatine is evidenced to improve sleep in addition to antidepressant effects.

Method: A male (61) presented challenging behaviour, sleep disturbance and severe cognitive impairment three years after severe brain injury (right subarachnoid haemorrhage and associated left middle and anterior cerebral artery occlusions). The Overt Aggression Scale Modified for Neuro-Rehabilitation (OASMNR) recorded challenge. Sleep and wakefulness were charted and sleep onset advanced one hour per day (as measured by sleep efficiency). Agomelatine was trialled in an AB design. Other psychoactive medications were constant. Data were available for 90 weeks after prescription.

Results: Typical hypnotics had no effect or ill effect. Agomelatine prescription led to significant OASMNR change; Nonoverlap All Pairs (NAP) = 0.38, $p=0.008$. Sleep efficiency change was highly significant; NAP = 0.80, $p<0.000$. Effects apparent at 1.5 years.

Conclusions: The clinically significant treatment effect of agomelatine on indices of challenging behaviour and sleep suggests further studies of this compound in the treatment of behavioural disorders after brain injury.

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Session 7: Caregiver burden after brain injury

The role of motor, psychiatric, and cognitive symptoms in predicting caregiver burden in Parkinson's disease: a review of the literature

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Background and aims: Parkinson's disease is characterised by not only motor impairment, but also cognitive and psychiatric disturbance. High levels of caregiver burden (CB) have been found in those providing informal support for sufferers, and researchers have examined the relationship between patient symptoms and severity of CB. The aim of this literature review was to examine the quality of this research and assess the impact of the different components of the Parkinsonian symptom profile on CB.

Method: A systematic search of databases (PsycINFO, Web of Science, OVID Medline, British Nursing Index, CINAHL) revealed 26 studies of relevance.

Results: Analysis of study findings indicated that whilst motor, psychiatric, and cognitive impairments were associated with CB, the extent to which these symptoms independently predicted CB after controlling for covariates was limited. In many cases, level of patient disability was found to be a better

predictor and often mediated the relationship between symptoms and CB. The comparison of results across studies is limited by heterogeneous use of conceptually varied measures of caregiver burden. Biases in sampling strategies may mean that results lack ecological validity.

Conclusions: Supporting individuals who care for patients with long-term neurological conditions is an increasingly emphasised healthcare goal. In this regard, enhancing patients' functional independence and offering practical support to caregivers is likely to benefit this population. Future research needs to examine the effectiveness of such interventions. More emphasis is needed on examining the social, health, and financial costs associated with providing informal support to people with Parkinson's disease.

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Family-focused therapy following traumatic brain injury

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Background and Aims: Traumatic brain injury (TBI) not only impacts the survivor, but also the family. While traditionally, services have focused on the rehabilitation of the individual, recently increased attention is being given to the impact of TBI on the entire family, viewing the family as a target for therapeutic intervention. The aim of this exploratory study was to evaluate a family-focused psychological intervention for survivors of TBI and their families; describing the issues raised and therapeutic outcomes.

Method: Five families were provided family-focused therapy. A range of intervention models were employed including narrative, behavioural and family therapy. Measures of anxiety and depression, caregiver burden, and family functioning were administered pre- and post-intervention and at 2-month follow-up. Transcripts were analysed to identify common themes in the description of impact of TBI on family members, outcomes of therapy and to identify effective therapeutic interventions.

Results: Analysis of standardized questionnaires revealed a pattern of improvement on measures following therapy, with some deterioration at follow-up. Common themes describing impact of TBI included difficulty managing survivor behaviours, marital relationship discord, parenting issues, lack of understanding from others, negative experiences with helping professions, survivor identity change, grief and loss.

Conclusions: Family-focused therapy can be a useful addition to the rehabilitation process following TBI. Family-focused therapists need to take a flexible approach given the wide variation in the impact of TBI and in family adjustment.

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Session 8: Children with brain injury and Family burden (databltz)

Cognitive stimulation by caregivers for people with dementia

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Background: Cognitive stimulation (CS) is a psychological intervention for people with dementia aimed at slowing down the rate of cognitive

deterioration through stimulating activities. CS is typically delivered by health care professionals, but CS by caregivers would allow long-term intervention without greatly increasing demands on health services. However, CS by caregivers raises questions concerning well-being and treatment integrity.

Method: The current study investigated the effect of CS by caregivers on well-being in caregivers and people with dementia, and whether caregivers were able to present the exercises as intended. Caregivers of home-living people with dementia were trained to engage their relative with dementia in stimulating activities, which were described in a workbook for caregivers.

Results: Twenty-one dyads completed the study. Caregiver and patient well-being showed no deterioration across three assessments at 2-month intervals. Recordings of intervention sessions and analysis of workbook entries indicated adequate treatment integrity. Most caregivers indicated that their relative with dementia had enjoyed the CS activities (20/21) and that they themselves had benefitted from the training (19/21). Eight dyads dropped out after the baseline assessment. In the dyads that dropped out, the person with dementia tended to be more cognitively and functionally impaired than in completing dyads.

Conclusion: CS by caregivers appeared acceptable to both caregivers and people with dementia, although poorer functioning in the person with dementia was a potential risk factor for drop-out. Caregivers were able to continue with the activities after supervision had stopped and to follow the training instructions.

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A longitudinal comparison of patient and close other reports of neuropsychological change 1- to 5-years following traumatic brain injury

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Introduction: Following Traumatic Brain Injury (TBI), a proportion of survivors disagree with clinicians and/or close others with regard to presence of neuropsychological dysfunction. Previous studies have demonstrated an association between this disagreement and poor patient/caregiver outcome. However, few studies have longitudinally investigated this phenomenon over an extended time period.

Aim: To investigate agreement levels between survivors of TBI and their close others, with regard to presence of neuropsychological dysfunction, at 1-year and 5-years post-injury.

Method: 53 survivors of TBI and their close others separately completed the Structured Outcome Questionnaire (SOQ), at 1-year and 5-years post-TBI, reporting whether the survivor of TBI was experiencing any cognitive, behavioural or emotional changes. Percentage of agreeing pairs within the sample were calculated for each SOQ item at both 1- and 5-year time points. Correlations between total number of disagreed SOQ items for each TBI-close other pair and a set demographic, injury and mood variables were also conducted.

Results: Across SOQ items and time points, percentage of agreeing pairs ranged from 45%–75%. Relatively lower agreement was noted on emotional items (45–62%) compared to cognitive (56–75%) and behavioural items (60–74%). Chi square analysis revealed no significant difference in pair agreement

across 1- and 5-year time points ($p > .05$). Correlational analyses revealed pair disagreement was not significantly associated with survivor age, gender, TBI severity, anxiety or depression ($p > .05$). However, pair disagreement was associated with close other anxiety and depression at 5-years post injury ($p < .05$).

Discussion: Implications of findings for both research and clinical practice will be discussed.

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Future goals and concerns in young adults after brain injury: issues for assessment and intervention

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Background and aims: Persons living in a condition of chronic illness and disability often exhibit a limited future time perspective (Martz & Livneh, 2003; Dipeolu et al., 2002; Sgaramella, 2011). Their future orientation is relevant insofar as it may influence the success of the rehabilitation program (Sivaraman and Wade, 2003).

The aim of this study was to examine future perspectives, aspirations and concerns, expected supports and barriers in a mild acquired brain injury sample.

Method: Thirty young adults, age range from 22 to 35 years, were involved in the study and compared with a matched control group. They were given the Interview About Future (Sorens, Nota, 2007).

Results: Non parametric statistics showed significant differences between the two groups. In particular, a more present oriented time perspective was evidenced; future goals referred to a shorter time interval; personal/work expectancies were reduced. Both internal and external supports were expected to influence realization of personal aspirations; in particular health and social context barriers were often mentioned.

Conclusions: Assessment of future time perspective should usually be included in pretreatment evaluation. Activities aimed at enhancing abilities to take on a positive time perspective should therefore be systematically organized to help develop a more unitary perception of past, present and future. Career guidance activities should, then, focus on abilities facilitating realization of advantageous work and life projects, such as self determination, problem solving and adaptability (Gysberg et al., 2003; Wehmeyer, et al., 2003; Sorens, Nota, Ferrari e Sgaramella, 2013; Szymanski & Parker, 2003).

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Cognitive outcomes in children diagnosed with infant non-accidental brain injury (NABI): A systematic review of the literature

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Background and Aims: Childhood abuse is believed to account for around 25% of traumatic brain injury (TBI) in children under two-years-old (Alexander, Levitt & Smith, 2001) and around 90–95% of severe TBI in those under 12-months (Billmire & Meyers, 1985). We systematically review the available evidence on the cognitive sequelae of infant NABI to inform rehabilitation planning protocols.

Method: An a-priori defined search strategy utilising Pubmed and Embase databases was conducted. References from primary study articles were sourced and those from book chapters and review articles scanned. Studies of NABI outcomes incorporating a standardised measure of cognition as a dependent variable were included. Methodological quality was assessed via an adapted version of the Newcastle-Ottawa Scale which is specifically designed for cohort studies.

Results: Eight observational studies were identified comprising: two without a comparison group; three employing an uninjured comparison group; and three utilising an accidental TBI comparison. A range of severity and type of cognitive deficits are described including impairments of attention, memory and reasoning alongside motor and behaviour disturbance. However, follow-up is limited to the pre-school period in the majority, the predictive validity of which is questionable. Studies attempting school age follow-up were significantly affected by attrition.

Conclusions: Whilst research into the impact of accidental TBI is rapidly expanding (Ewing-Cobbs et al, 2004) research into the long term cognitive sequelae of NABI remains sparse. This limits neuropsychological prognostic determination and subsequently rehabilitation planning. There is a need for a cohort study including school aged children.

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Session 9: Neuropsychological rehabilitation: models and services

A Proposal for the Extension of the Comprehensive Model of Cognitive Rehabilitation to include People with Neuropsychological and Neuropsychiatric Conditions

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Background and Aims: Cognitive rehabilitation (CR) is a broad field that requires a wide theoretical base which encompasses frameworks, theories, and models from considerably different areas. The comprehensive model of CR (CMCR) is the most complete reference for clinicians as it conceptualizes all the processes involved from assessment to treatment; however it was designed for people with acquired brain injuries. In the field of neuropsychiatric diseases, it has been recognized that cognitive deficits are common findings in this population and is related to impairment in productive, social as well as daily living skills. Therefore the clinical application of CR for these patients has been seen as an important treatment tool. The purpose of this study was to present a proposal for the extension of the model mentioned above.

Method: This model was based on the CMCR. To identify the main specific points which should be considered for the target population a systematic review was conducted. Points that have been included were related to specificities regarding both assessment and intervention in neuropsychiatric diseases.

Results: New information related to clinical history (age of onset, number of psychiatric hospitalisations), items to be considered during the assessment process (functional status, mood, anxiety and coping assessments), and during the treatment phase were added to the existing model.

Conclusion: this preliminary, theoretical proposal may extend the value of the CMCR: ongoing studies assessing the clinical issues related to clinical viability of this proposed model are being carried out.

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Treatment theory as an organizing framework for neuropsychological rehabilitation

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Background and aims: Rehabilitation is in need of a taxonomy for identifying and classifying its varied interventions. Treatment names that restate the problem or discipline (“Memory retraining;” “Adjustment counseling;” “Speech therapy”) do nothing to unpack the “black box” of rehabilitation. However, development of treatment theory—the specification of *how* and *why* treatments work—stands to aid in classifying rehabilitation treatments, as well as identifying their “active ingredients.” We present the interim results of an effort to develop a rehabilitation treatments taxonomy (RTT) based on treatment theory, with special emphasis on interventions based on volitional (effortful) learning, which have particular relevance to neuropsychological rehabilitation.

Method: We used literature review, consultation with a multi-disciplinary advisory committee, and extensive discussions during which classification models were tested against known and hypothetical interventions.

Results: We define treatment theory as having a tripartite structure in which *ingredients* (measurable clinician actions and decisions) are administered to effect changes in *objects* (measurable aspects of patient functioning) via *mechanisms of action* that are typically inferred rather than observed. We will discuss two broad learning-based treatment groupings termed *Skilled Performances* and *Cognitive/ Affective Representations*, both commonly used in neuropsychological rehabilitation, which differ in their characteristic objects, mechanisms, and active ingredients. These differences, their implications for research and practice, and how each grouping aligns with “real-world” treatments will be presented along with challenges and future directions for a classification scheme.

Conclusions: Rehabilitation needs a taxonomy, but the challenges of developing it are nowhere as pronounced as in the complex interventions of neuropsychological rehabilitation. We present our interim framework in hopes of encouraging discussion that will enable more progress.

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The Experience of Traumatic Brain Injury in Botswana

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Background and Aims: Whilst the consequences of traumatic brain injury (TBI) are understood in Western countries, it is not known how cultural background and beliefs affect response and outcome following TBI in

African countries, including Botswana, where health services and socioeconomic factors differ from industrialised nations. This study aimed to explore the experiences of TBI in individuals with TBI, caregivers and health care professionals.

Method: Participants, recruited through Princess Marina and Nyangabgwe Hospitals, included 21 individuals with moderate-severe TBI (68% males, mean age 35.2 years), 18 caregivers (90% female) and 25 healthcare workers (66% nurses), including 12% medical officers and 22% allied health staff. TBI cause was motor vehicle accident for 52% and assault for 48%. Qualitative semi-structured interviews were transcribed, translated and thematically coded.

Results: Thematic analysis indicated several themes: *Injury related changes, Attributions and beliefs about the cause of the injury, Family reactions, Communication and Service availability*. Participants described the common physical, cognitive, emotional and behavioural effects of TBI. Many participants attributed their injury to supernatural causes. Immediate family members to TBI expressed a sense of love and devotion towards the injured person, whereas distant friends and relatives tended to be judgemental. Communication was extremely problematic - characterized by inadequate information given to those injured and their caregivers. Provision of care was impeded by insufficient staff, limited supplies and lack of training of nurses.

Conclusions: This study will improve understanding of cultural responses and approaches to brain injuries in Botswana which may in turn inform improved practice.

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Session 10: Cognitive neuroscience

Deep brain stimulation as a treatment for neuropathic pain: neuropsychological outcomes from surgery

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Background and aims: Deep Brain Stimulation (DBS) of the periventricular / periaqueductal grey (PVG/PAG) area and sensory thalamus (ST) is a neurosurgical procedure that can reduce pain intensity in patients with neuropathic pain. However, little is known about its neuropsychological sequelae in terms of its impact on quality of life, emotional well-being, and cognition. The current study aimed to investigate this, and examine whether post-surgical neuropsychological change was associated with changes in pain severity.

Method: This study followed up 18 patients who had received DBS for neuropathic pain. Each participant had previously undergone a detailed psychometric evaluation of each of the above areas as part of a routine pre-surgical neuropsychological assessment. Commensurate measures were employed at a follow-up assessment at least 6 months post-surgery. Pain intensity pre- and post-surgery was also recorded, with changes in pain intensity compared against changes in neuropsychological variables.

Results: DBS significantly improved mood, anxiety, and aspects of quality of life. Improvements correlated with reduced pain severity. However, the sample continued to show impairments in most of these areas when compared against normative data published on non-clinical samples. There was little change in general cognitive functioning, aside from deterioration in spatial working memory. However, improvements in pain severity were associated with less improvement (and even deterioration) on measures of executive cognitive functioning.

Conclusions: DBS of the PVG/PAG and/or ST improves quality of life and emotional well-being in sufferers, although there is some indication of executive dysfunction particularly amongst those reporting greatest pain alleviation.

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The neurocognitive locus of errorless learning: a behavioural study investigating the contribution of executive processes to memory enhancement

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Introduction: Not everyone benefits from use of errorless learning principles and various explanations have been proposed to account for this variability. Recent behavioural research with healthy older adults (Anderson et al., 2012) raises questions about the relative importance of medial temporal over frontal functions to the errorless learning advantage. We examined this issue further in an acquired brain injury (ABI) sample, to determine whether executive dysfunction moderates the treatment benefit.

Methods: Twenty-five participants with ABI were recruited from Headway, and pre-experimentally assigned to either a high (n = 13) or low (n = 12) executive-attention dysfunction group based on their Working Memory Index (WMI) scores. Participants were then asked to learn word lists under three conditions: errorless learning (EL), errorless learning with self-generation (ELSG) and errorful learning (EF), from which an errorless treatment advantage (i.e., errorless conditions minus errorful) was calculated. We predicted that should executive function contribute to the EL advantage, then superior performance should be observed in the low attention group.

Results: Initial analysis revealed no difference between groups on demographic factors, premorbid ability, and memory, but significant differences on the WMI and other measures of executive function. Further analysis of the treatment advantage data revealed no effect of attentional group in either standard or self-generation forms of EL.

Discussion: Consistent with Anderson's findings, these data show that the neurocognitive locus of the errorless learning advantage is not in the frontal region. We extend these findings to clinical populations and discuss the implications for targeting EL principles in rehabilitation.

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Session 11: Assessment methods and methodology (datablitz)

Validation of DEX Revision Self-Rating Version for people with Bipolar Disorder type I and II

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Background and Aim: Bipolar disorder (BD) is characterized by variations in mood state and also persistent cognitive deficits, such as executive dysfunction, not only during mania and depression, but during remission of mood symptoms. Since impairment in both cognitive and psychosocial functioning are present in asymptomatic patients, current theorizing emphasizes the important role cognitive dysfunction may play in exacerbating psychosocial and functional disability. So, it is important to develop and validate instruments to investigate BD cognitive impairment profiles. This study investigated the properties of a revised self rating checklist of symptoms (DEX-R) in a sample of people with BD.

Method: 120 people with BD type I and II (BDG) and 300 healthy subjects (CG) completed the DEX-R, a 37 items questionnaire rated on a 5-point Likert scale.

Results: An exploratory factor analysis found 3 main factors that echoed previously identified subscales using Rasch Analysis. The total variance explained was 58.10% (KMO = 0.95, statistic Bartlett's test of sphericity = 8212.08; df = 666; p < 0.001). Significant differences (t = 15.63; df = 418; p < 0.01) between CG and the two BDG groups were found for all three domains. Notably, BDG Type I patients exhibited more impairments in items related to metacognitive functions.

Conclusion: Results were congruent with current theories of executive functions, and also with imaging studies in BDI that indicate altered orbitofrontal circuits, linked to metacognitive functions. EF is impaired in BD, and can be detected using a simple self-rating questionnaire approach. Results from DEX-R were consistent with imaging studies, which suggest that this questionnaire has good clinical potential for use in neuropsychiatry.

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Can a French adaptation of virtual reality assessment of executive functions (JEF[©]) work?

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Background and aims: JEF[©] (the Jansari assessment of Executive Functions) is a virtual reality assessment of executive functions (EF) which is ecologically-valid and proven useful in patients with brain damage. To explore its cross-cultural validity, it was translated into French and then validated in a brain-injury clinic in Belgium.

Methods: JEF[©] assesses eight cognitive constructs; planning, prioritisation, selection, creative-thinking, adaptive-thinking, action-based prospective

memory (PM), event-based PM and time-based PM and is run on a standard laptop with the participant playing the role of an office administrator. Twelve patients with Acquired Brain Injury (ABI) and 30 healthy controls took part in the study. All participants performed JEF[©], the Zoo Map and a variant of the multiple errands task.

Results: The ABI group were significantly impaired in JEF[©] relative to the controls ($t(40) = 7.45, p < .001$). At the individual level, only one of these patients showed a deficit in the standard tasks yet 11 out of 12 patients had a significantly lower JEF[©] score than their matched control group (all ps, ns). Finally, in the control group, there was a significant effect of educational level ($t(28) = 4.392, p < 0.001$), no effect of age, and no gender effects.

Discussion and Conclusions: The French version of JEF[©] has proven to be potentially at least as useful as existing tests of executive functions. The fact that a range of performance is seen both across patients and cognitive constructs demonstrates that the task is sensitive at a number of levels. Further research is needed to address the validity of the individual constructs against validated tests of specific functions.

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A systematic review of cognitive and behavioral assessments that measure executive functioning following brain injury

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Background and aims: Brain injury is a leading cause of disability often resulting in lifelong impairments in cognitive, behavioural and social function. Executive functions (EF) are often considered most vulnerable to damage. Therefore, it is essential that EF performance can be accurately and reliably assessed to inform rehabilitative practices.

Methods: This paper systematically reviewed literature reporting on the use of measures of EF in patients with acquired brain injury (ABI), to determine utility within this clinical population. Four electronic databases (Psychinfo, Cinahl, Embase and Medline) were searched up until December 2012 for peer reviewed articles focusing on the assessment of EF in those with brain injury. The quality of articles was evaluated using criteria such as: study design, sample characteristics, suitability of measures used, and significance of reported results.

Results: Database searches yielded a total of 2674 references of which 22 articles met the inclusion criteria for this review. The articles used both adults ($n = 11$) and children ($n = 11$) and focused on traditional measures, ecologically valid measures, questionnaire measures and mixed measures.

Conclusions: Overall, the number of EF measures identified was limited. The majority of measures were sensitive to EF impairment following moderate-severe ABI. Evaluating the utility of such measures, however, was problematic due to methodological weaknesses and limited psychometric information. More methodologically sound research is needed to investigate the underlying construct that EF tests assess. Further research is necessary, concerning the validity of EF measures in an ABI population, to reliably inform

development of rehabilitative interventions and add to theoretical understanding of EF development post-ABI.

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Impact of neglect in daily life: the Catherine Bergego scale

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Background and aims: Neglect is a prevalent disorder after a stroke resulting in a failure to report or respond to contralesional stimuli. Early detection is important as neglect is associated with poor motor recovery, higher disability, and poorer response to rehabilitation treatment. The Catherine Bergego scale (CBS) is a standardized checklist consisting of 10 items related to neglect in everyday life. Currently, the CBS is only available in English. We translated the CBS into Dutch and investigated its internal consistency, reliability and discriminant validity.

Method: 79 stroke patients (45 men, mean age 57, mean days post-stroke 40) admitted for inpatient rehabilitation were observed by their own nurse using the translated CBS. The star cancellation test was administered in the same week and the number of omissions was used to define neglect.

Results: Cronbach alpha was excellent (0.915). Items regarding auditory attention, collisions, dressing, knowledge of limbs and gaze orientation were most highly scored, in contrast to items regarding grooming, eating and finding personal belongings. CBS scores were higher for patients with neglect (9.15; SD = 7.74) compared to patients without neglect (4.18; SD = 7.13) (Mann-Whitney $U = 234$, $p = 0.001$). Items that best discriminated between neglect and non-neglect were gaze orientation, dressing and mouth cleaning. With these items, Nagelkerke R-square was 0.21.

Discussion: The translated CBS appears to be sensitive and reliable to detect neglect in ADL and is therefore recommended to use next to neuropsychological tests.

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Ecological Assessment Battery for Numbers: Validation Study

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Background and Aims: Number processing may be altered as a result of brain injury. The incidence of such disorders in daily life activities can be high. As clinicians, we have analytical tools for assessing acalculia: EC301 and TLC2 but the evaluation of the numerical skills on a day-to-day basis of brain-damaged patients is complicated by a lack of appropriate ecological norm-referenced assessment tools.

Method: Therefore we developed the Ecological Assessment Battery for Numbers that has been validated first with 82 control subjects and 22 patients with

brain injury. An initial validation study has highlighted some limitations, requiring a redesign of the battery, revision of rating criteria to improve the reliability and changing supports and instructions for more ecological validity.

Results: This final version, fully timed, has been standardized and validated with 126 control subjects and 10 patients with brain injury. In order to assess the psychometric qualities, patients were also assessed using a new analytical battery: the ECAN. The analysis of rank correlation (Kendall $w = 0.97$) indicates a good agreement between the results of analytical and ecological batteries, which indicates good validity of our tool. In addition, we calculated discrimination indices of modified items (differences between difficulty indices of extreme groups). Those analyses showed a sensitivity improvement. Items failed by most patients were mainly those involving transcoding. Three of the ten patients had an abnormally high execution time with a good total score.

Conclusions: Our new Ecological Assessment Battery for Numbers is standardized, valid and may be a useful clinical tool.

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Assessing Cognitive and Behavioural Change in the Individual: a Tale of Two Methods

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Background and Aims: Single Case Experimental Design Methodology (SCEDM) and the Reliable Change Index (RCI) provide two approaches for analysing performance change in individual patients with acquired brain injury. They have similar general objectives, but quite specific usefulness and applicability. These will be critically examined in this presentation.

Method: Theoretical underpinnings of SCEDM and the RCI are briefly discussed. Applicability of each method will be discussed in terms of the nature of the data that is being analysed. The strengths and limitations inherent in the formulation of each approach are also examined using clinical data.

Results: SCEDM is used to evaluate intervention effects and generally deal with data whose parametric properties are unknown. The main strengths of this method are its: i) flexibility; ii) capacity to demonstrate individual variability in the dependent variable, iii) direct interpretability of results; and iv) capacity to establish empirically validated treatments and evidence-based practices. The main weaknesses pertain to threats to internal/external validity, generalizability, and lack of consensus about appropriate methods for data analysis. The RCI is intended for analysis of parametric data, usually derived from standardised tests. Its clinical usefulness is primarily limited by lack of consensus about the preferred formula for its calculation, the unavailability of specific parameters required for these calculations and its insensitivity to small changes in the context of slow recovery/decline over prolonged time periods.

Conclusions: Both SCEDM and the RCI are valuable but not interchangeable empirical tools for determining the authenticity change in cognitive function or behaviour.

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Adaptation and validation of the Spanish language version of the QOLIBRI scale

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Background: Acquired brain injury (ABI) can significantly affect quality of life (QOL). The range of instruments to measure QOL in Spanish-speaking individuals with ABI is relatively restricted. The aim of this preliminary study is to validate a Spanish language version of the QOLIBRI Scale in a non-ABI sample.

Method: The QOLIBRI Scale was translated from English into Spanish, then back-translated into English to ensure accuracy of item content, and then administered to healthy controls. Each of the six QOLIBRI sub-sections, Total Score for Part 1 (cognitive, emotional, social satisfaction) Total Score for Part 2 (affective and physical dysfunction), and overall Total Score were correlated (Spearman rank) with SF-36 and WHOQOL Total Scores.

Results: The study sample consisted of 19 participants. There was a significant correlation between sub-section B and the SF-36 ($r = .48$, $p = 0.039$), as well as the WHOQOL ($r = .72$, $p < 0.0001$). There was also a significant correlation between sub-section D and the WHOQOL ($r = .51$, $p = 0.26$). The WHOQOL was also significantly correlated with the Total Scores for Part 1 ($r = .61$, $p = 0.006$) and Part 2 ($r = .57$, $p = 0.011$), but neither of these had significant correlations with the SF-36. Overall Total Score was not significantly correlated with either of the reference measures.

Discussion: Initial examination of the validity of the Spanish language version of the QOLIBRI suggests that it may be a potentially useful instrument to assess QOL in Spanish-speaking persons. We next intend to validate the scale in an ABI sample.

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Does position have an effect on JFK Coma Recovery Scale (CRS-R) scores for minimally conscious patients? An exploratory study

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Background and Aims: Assessment of patients with disorders of consciousness has always been challenging for health care professionals. Various tests are currently used to assess levels of consciousness, including the JFK Coma Recovery Scale (CRS-R). This test has excellent validity and reliability but no research has explored the effects of administering the test on patients in different positions. This study attempts to explore those effects.

Method: Following an initial pilot study, ten minimally conscious subjects with acquired brain injury were selected using convenience sampling. Three blind assessors were designated to assess each patient using the JFK (CSR-R) in supine, sitting and upright positions. The mean scores for each position were then analysed to compare scores across position.

Results: Results show that 6 subjects scored the highest core in upright position, 4 in sitting and 3 in lying. 2 subjects received the same score in upright and sitting and 1 subject scored the same in upright and supine. The most remarkable result was seen for one subject in upright position who scored a significantly higher score of 17 as compared to 7 and 12 in the other two positions.

Conclusions: The study reveals that there is no remarkable change on JFK (CRS-R) scores in each function scale. However, putting a patient in an upright position may increase their overall scores in comparison to supine and sitting position. Future studies could focus on a larger group of patients to test both effect of position, medication changes and testing time on assessment scores.

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Presentation of the Dutch Multifactor Fatigue Scale (DMFS) for neurological patients

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Background and aims: Fatigue is one of the most frequent and disabling complaints in the chronic phase after brain injury and is thought to be of a different nature than fatigue without neurological involvement. However, fatigue scales currently used in neurological populations, were mostly developed for non-neurological patients. The DMFS was developed based on interviews with stroke and traumatic brain injury patients in the chronic phase after injury.

Method: A concept scale containing 57 items was generated, a priori divided into six factors. Data were collected of 179 neurological patients in outpatient rehabilitation. Patients in the acute phase ($n = 20$), with progressive disease ($n = 12$), premorbid fatigue ($n = 5$) or missing data ($n = 4$) were excluded from analyses.

Results: The final DMFS consists of 38 items, items were excluded because of low factorloadings ($< .40$, $n = 9$), low item-total correlation ($< .50$, $n = 6$), double factorloadings ($n = 3$) or content ($n = 1$). PCA showed that a 5 factor model best fit the data, explaining 54.6% of variance. The 5 factors can be labeled Impact ($\alpha = .91$), Consequences ($\alpha = .83$), Mental fatigue ($\alpha = .86$), Physical fatigue ($\alpha = .77$) and Coping ($\alpha = .69$). The Impact and Physical subscales correlated most highly with another fatigue scale (CIS20R, $r = .73$ and $.71$, $p = .000$). Anxiety correlated highest with the Consequences subscale ($r = .51$, $p = .000$), while depression was most strongly related to the Physical subscale ($r = .46$, $p = .000$).

Conclusions: Fatigue in the chronic phase after brain injury has multiple factors. The DMFS has good psychometric properties and appears valuable for differentially assessing fatigue after brain injury, which is of utmost importance in neuropsychological rehabilitation.

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Development of the TBI-QOL and SCI-QOL: Patient Reported Outcomes Measures for Individuals with Traumatic Brain Injury and Spinal Cord Injury

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Background and Aims: The goal of this study was to develop and evaluate the validity of new patient reported outcomes (PRO) measures targeted to individuals with traumatic brain injury (TBI) and spinal cord injury (SCI). The scales cover a wide range of functioning including physical and emotional health, social participation, and cognitive functioning (TBI only) and were developed with advanced psychometric approaches including item response theory and computer adaptive testing (CAT).

Method: Qualitative development methods (e.g., focus groups, interviews) were used in conjunction with a large-scale quantitative field testing (e.g., TBI, n = 590, SCI, n = 855). Confirmatory factor analyses and 2-PL item response theory (IRT) were conducted. Local item dependence and differential item functioning were assessed. Problematic items were iteratively removed and were re-run until optimal scale indices were obtained. The resulting scales were developed as both CATs and short forms.

Results: 19 PRO item banks were developed for TBI (fatigue, headache pain, mobility, upper extremity, pain interference, depression, anxiety, grief/loss, anger, resilience, self evaluation, stigma, positive psychological functioning, ability to participate in social roles, satisfaction with participation, independence, cognition – executive functioning, cognition – general concerns, and communication. For SCI, 20 PRO item banks were developed (basic mobility, wheelchair mobility, ambulation, self care, fine motor, pain interference, bowel management difficulties, bladder management difficulties, skin/pressure ulcers, depression, anxiety, grief/loss, resilience, self evaluation, stigma, trauma, positive psychological functioning, ability to participate in social roles, satisfaction with participation, and independence).

Conclusions: CAT and short form versions of each bank are now available. Scales may be utilized in research studies to evaluate health, functioning, and quality of life across a wide range of domains. TBI-QOL and SCI-QOL have great potential to monitor symptoms and their consequences in clinical practice.

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Session 12: Domain-specific studies

The prevalence of navigation impairments in chronic stroke patients: results of objective neuropsychological measures using virtual reality

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Background and aims: It has recently been shown that almost one third of mild stroke patients report problems with navigation. These self-reported navigation problems co-occur with spatial anxiety and a reduced quality of life. Currently, there is no consensus about how to treat, or even assess navigation

problems. The aim of this study is to determine the frequency and nature of navigation impairment with a new battery of cognitive tasks. The results can be used to improve treatment for those with navigation impairment.

Methods: Navigation ability of 43 chronic stroke patients (aged 27–80) and 32 matched, healthy controls was measured with a test battery using a virtual environment. Performance was measured for ‘distance estimation’, ‘landmark recognition’ and ‘route order memory’. Furthermore, ‘route knowledge’ (making judgments about sequence of turns and spatial relations connecting landmarks), and ‘survey knowledge’ (knowledge about spatial relations integrated in a cognitive map) were measured.

Results: The three most prevalent problems (≤ 1.65 SD) in stroke patients were ‘route knowledge’ (16.28%), ‘distance estimation’ (14.29%), and ‘survey knowledge’ (11.90%). In all constructs, except for ‘route order memory’, proportionally more stroke patients scored below cut-off than controls.

Conclusions: Current neuropsychological assessment lacks specific and valid measures of navigation ability. This has led to negligence of navigation impairment whereas clinical practice shows that these impairments affect patients’ quality of life. Our results indicate that a considerable part of chronic stroke patients show impaired navigation ability. These findings stress the importance of including navigation assessment in treatment of stroke patients.

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Characterising Mentalising Impairments following Acquired Brain Injury and their Clinical Significance

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Background & Aims: Mentalising following acquired brain injury (ABI) is often assessed using story vignettes such as the Recognition of Faux Pas Test (RFPT, Stone et al, 1999). Total RFPT scores aggregate a range of different representations (e.g., 1st versus 2nd order; epistemic versus affective; intentionality). These aggregates may mask important subcomponent differences, reducing the sensitivity of these measures in detecting mentalising impairments. This study aimed to identify an alternative scoring system with increased sensitivity and specificity.

Method: 70 survivors of ABI and 40 matched controls completed the RFPT. Survivors additionally completed measures of executive functioning, attention, working memory, social cognition and mood. Responses on the RFPT were analysed for accuracy and emotional valency of intentionality representations for faux pas (FP) perpetrators (i.e., “why did they say it?”).

Results: Survivors were significantly worse than controls on both total scores and intentionality representations, with a greater effect size for the latter. Significant between-group differences were found for intentionality error type (no reference to the perpetrators’ intentions towards another or the FP committed intentionally for positive or negative reasons). Intentionality error type scores correlated with other neuropsychological and mood measures.

Discussion: These data support a clinical priority for assessing and working with survivors’ representations of others’ intentionality during social ambiguity or transgressions. The sensitivity of the RFPT and similar measures may be optimised through the quantification and categorisation of intentionality

representational error. Survivor psychological distress related to representations of others' intentionality should be targeted by psychotherapeutic and social cognition interventions.

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“There’s more to it than what you see on the CT scan”: The experience of decision-making impairment after severe traumatic brain injury (TBI)

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Background and Aims: It has been argued that human rights should be at the core of ethical rehabilitation practice. One fundamental right, emphasised by the United Nations Convention on the Rights of Persons with Disabilities, is the right of individuals to make decisions about their own lives. There is now a significant literature exploring the nature of decision-making impairment following severe TBI. However, there remains relatively little known about how this impairment is experienced by individuals with TBI and those who support them. This presentation will present a series of themes reflecting the experience of decision-making impairment and its consequences. **Method:** Data include 22 in-depth interviews with five individuals with severe TBI and their decision-making supporters. In line with constructivist grounded theory, data was analysed through a process of open and focussed coding, and identification of emergent categories.

Results: Several themes reflecting both the experiences of adults with severe TBI and their decision-making supporters will be highlighted. Themes coalesce around gaining a deeper understanding of decision-making impairment, and overcoming impairments by developing strategies in the context of their individual relationships.

Discussion: Through in-depth qualitative evidence, this study reveals the significant challenges faced by individuals with severe TBI and their supporters in the process of decision making. It provides insight into strategies used by individuals with TBI and their supporters to overcome decision-making impairments and maximise participation in decision making. Further, it emphasises the role that clinicians engaged in brain injury rehabilitation can play in supporting individuals to exercise their rights.

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Car driving performance in patients with hemianopia after acquired brain damage

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Background and Aims: The rehabilitation program *Auto-Mobility* aims to improve the opportunities for safe and independent motorised participation in traffic of visually impaired people in the Netherlands. This program is a partnership between Royal Dutch Visio, University of Groningen, The

Ministry of Traffic and the Netherlands Bureau of Driving Skills Certificates (CBR).

Method: We developed a saccadic scanning compensatory training for people with homonymous visual field defects (HVFDs), a loss of perception for half the visual field, affecting both eyes, due to acquired postchiasmatic brain injury (APBI). Twenty-seven patients with HVFDs performed an on-road driving test before the training, during which driving performance was evaluated by driving experts using a standardized scoring form.

Results: Fifteen patients were evaluated as safe to drive. Impaired visual scanning behaviour was the most important reason for failing the test ride, but performing operations in the car and making tactical choices were also rated significantly lower in the group that failed the test ride. Nine of the twelve patients that failed the first driving test passed a second test after finishing the compensatory scanning training.

Discussion: With the proper support, aids and training, people with HVFDs after APBI may gain sufficient practical fitness to drive a car in a European setting.

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Session 13: Outcome of neuropsychological rehabilitation (datablitz)

Chair: Prof Jon Evans

Rehabilitation Case Management: A new model of service delivery supporting transition from hospital to home for people with traumatic brain injury

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Background and aims: The Brain Injury Rehabilitation Service (BIRS) developed a Rehabilitation Case Management (RCM) model. The aims of the model were to:

- Streamline transition from inpatient to community services
- Enhance consistency of communication with the client and all stakeholders in the client's rehabilitation
- Enhance discharge planning and timing

This presentation describes its implementation and presents key evaluation findings. These findings may assist other services considering the utility of RCM in their setting or expanding an existing case management role.

Method: The evaluation framework employed a participatory evaluation approach. Semi-structured interviews were conducted with BIRS clinicians, RCMs, consumers and external stakeholders. Interviews were conducted at four time points across the 12 month evaluation period: implementation, four months, eight months and twelve months. A total of 84 interviews were conducted over the study period. The data were descriptively organised then coded and subjected to interpretative analysis to identify the key issues.

Results: Benefits of the new model included supporting continuity of care and providing a more coordinated and supported transition from inpatient rehabilitation into the community. The RCM model supported the treating team

with navigating procedural requirements and associated paperwork, thereby enabling them to focus more on providing therapy.

Conclusion: The RCM model is effective at meeting the teams' needs particularly those arising from complexities in funding issues and navigating systems. This in turn increased clinical focus and improved continuity of care.

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Life after survival of a cardiac arrest: Cognitive functioning, societal participation and quality of life

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Background and aims: A cardiac arrest can lead to hypoxic-ischemic brain damage and can affect different aspects of functioning. We investigated long-term functioning after survival of a cardiac arrest on the levels of cognition, daily activities, societal participation and quality of life.

Method: A prospective cohort study with measurements 2 weeks, 3 months and 1 year after the cardiac arrest. The primary outcome measures were societal participation (Community Integration Questionnaire; CIQ and Return to work) and quality of life (EuroQol VAS). Secondary outcome measures were daily functioning (Frenchay Activity Index; FAI) and cognitive impairments (Story Recall, Verbal Fluency, Trail Making Test; cut-off = mean -1½ SD).

Results: 141 survivors of cardiac arrest participated, mean age 60 years (± 11), 84% male. One year after the cardiac arrest the mean CIQ score was 14 (± 3), which is 9% lower than prior to the cardiac arrest. Of those still working at the moment of the cardiac arrest, after one year 40% worked as before, 32% worked less hours and 28% had stopped working. The mean score on the EuroQol was 73 (± 17). The mean FAI score was 25 (± 9), which is comparable to the scores prior to the cardiac arrest. Cognitive impairments were present in the domains of memory (19%), verbal fluency (19%) and executive functioning (20%).

Conclusions: One year after a cardiac arrest, cognitive impairments occur in several domains, and societal participation and quality of life are decreased.

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Efficiency managing of transprofessional rehabilitation for persons with acquired cerebrolesion

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Background and aims: The “Open Space” rehabilitation method is based on transprofessional interventions (cognitive rehabilitation, physical therapy, speech therapy, occupational therapy, educational intervention) in a shared environment. We present efficiency data comparing two organizational phases.

Method: In the control phase the different interventions were planned by the professionals: they were free to organize the daily patient activities sharing a general plan. In the subsequent experimental phase, we introduced a structured plan for each intervention, including overlapping of professionals managed by a clinical neuropsychologist on the basis of clinical needs and professionals indications. We compared inpatients who suffered from a brain injury requiring neurorehabilitation during the experimental phase ($N = 10$) with a paired sample of inpatients ($N = 10$) extracted from the control phase. The control group was paired for aetiology, age at the beginning of rehabilitation, initial level of Mini Mental State Examination, Disability Rating Scale, Functional Independence Measure, Level of Cognitive Functioning and Barthel Index.

Results: Both groups improved equally on the clinical and outcome measures completed at discharge, but the length of the rehabilitation time was almost halved in the experimental phase, reducing from a mean of 153.1 days to a mean of 85.5 ($t(18) = 2.13$, $p < .05$). Moreover, the number of treatments per participant was significantly increased in neuropsychological and occupational therapy (respectively: $t(18) = -3.29$, $p = .004$ and $t(18) = -5.5$, $p < .005$).

Conclusions: This result shows that the intensity, the global costs and the duration of rehabilitation improve when a neuropsychologist manages the complex planning of transprofessional interventions.

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Posters – Monday

Computerised working memory training in children who have survived a traumatic brain injury: A Phase II Randomised Controlled Trial Protocol

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Background and aims: Working memory (WM) impairments are frequently reported following paediatric traumatic brain injury (pTBI) and contribute to difficulties at home and school. Our collaborative group has shown that computerised training can improve WM in children with low working memory capacity, and with Attention Deficit Hyperactivity Disorder (ADHD). Training gains have been shown to transfer to other cognitive functions including mathematical ability. The efficacy of WM training in pTBI has yet to be investigated. This study, therefore, has five aims: i) to investigate whether WM capacity improves with training; iii) to investigate whether training effects transfer to other cognitive functions, everyday abilities, and reduce family burden; and iv) to evaluate whether training reduces health costs and improves quality of life.

Methods: Ninety children, aged 8–16 years, with moderate-to-severe TBI will be randomly allocated to either adaptive training (intervention) or non-adaptive training (control). Pre- and post-intervention assessments will include standardised measures of WM, executive function, attention, IQ, and academic attainment; experimental measures of WM and attentional control; and proxy ratings of everyday function, quality of life, and health resource utility. Assessments will be repeated 6-months post-intervention.

Results: A general linear model including the pre-intervention scores will be used to assess between-group differences at post-intervention and follow-up. Data will be analysed using both a per-protocol (PP) and an intention-to-treat (ITT) approaches.

Conclusions: Findings from this research will inform WM theory, enhance the evidence-base for interventions for pTBI, and provide foundations for future research aimed at developing and evaluating effective and targeted paediatric neuropsychological interventions.

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Art therapy for physical rehabilitation in a neuro- rehabilitation hospital in the UK

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Background and aims: Art therapy has been practiced as a psychological therapy since 1940s. Art therapy is defined as a form of psychotherapy that uses art media as its primary mode of communication. Art therapists encourage patients to express their feelings and emotions through art, such as painting, clay modelling, and drawing.

Currently, there are a very few Art Therapy services in neuro rehabilitation centres in the NHS or in private or voluntary sectors in the UK, and even fewer which focus on the use of art therapy as a part of physical rehabilitation programme. There is some literature about art therapy with patients with brain injury; this mainly reports changes in the emotional aspect of the patients described.

Method: Case studies. In our interdisciplinary team at the Raphael Medical Centre, in a neuro- rehabilitation hospital in the UK, art therapy is a part of the rehabilitation program and is offered to most of the patients, including those who are in a minimally conscious state. Art therapy provides help for cognitive, emotional, and physical Problems.

Results: This presentation, through a description of case studies, provides examples of how art therapy can facilitate the opportunities to develop fine movement of upper limbs with patients with brain injury. Aspects of facilitation of movement of hands, eye- hand coordination, spacious awareness, head-neck control are described.

Conclusions: Art therapy can be used for physical rehabilitation with patients with brain injury

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Correlations among Impairment, Thinking Operations and Daily Activities after Stroke

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Background: There is a great need to find valid, reliable measures of cognitive outcome after stroke. Measures of higher cortical function

developed for other disorders, are impractical for many stroke victims. On the other hand, there are tests of Activities of Daily Living (ADL) that require intact performance in categorization, sorting and reasoning. We tested the hypothesis that ADL tests dependent on cortical functions could be used to assess outcome in stroke patients.

Method: 27 right-handed stroke patients were evaluated on National Institute of Health Stroke Scale (NIHSS), Barthel Index (BI), Instrumental Activities of Daily Living (IADL) Scale and thinking process items of Lowenstein Occupational Therapy Cognitive Assessment (LOTCA).

Results: We found significant correlations between thinking process subtests of LOTCA and different items of NIHSS such as consciousness, arm movement, aphasia, ataxia and inattention. Spearman correlation of thinking process and BI tasks showed no relationship, although Structured Risca of thinking process evaluation was correlated to both self-care and mobility areas of the BI. Thinking process was strongly related to IADL total score ($p = 0.004$). The total NIHSS correlated significantly with BI and IADL total scores.

Conclusion: Higher-order functions, such as categorization, sorting and reasoning, are related to IADL performance which depends on complicated cognitive abilities. In contrast, the BI depends heavily on motoric function, and does not correlate with higher-order functions. Further confirmation is needed, but our data suggest that commonly used IADL tests could serve to as valid, reliable tests of cognitive impairment and recovery in stroke victims.

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A Qatari perspective management of vegetative patients

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Background and aims: Patients in chronic vegetative or minimally conscious states (VS or MCS) are medically categorized as untreatable after traumatic brain injury (TBI). Intervention in the management of VS is usually considered as hopeless but is an important issue for current and future rehabilitation facilities. Recently, research studies have found administration of medication showed positive results in cases of VS and MCS. We conducted three case studies, administering amantadine to three patients of VS, admitted to the Physical Medicine & Rehabilitation unit (PM&R), Doha, Qatar.

Method: We obtained permission from patient's blood relatives who gave consent as patients were in an unconscious state. We started amantadine 100 mg twice daily and increased according to response for a period of 10 weeks. The interdisciplinary rehabilitation team (Physiotherapy, Occupational therapy and PM&R physician) administered and monitored standard tools including the Disability Rating Scale (DRS), Coma Recovery Scale-Revised (CRS-R) and Coma Near Coma Scale (CNCS).

Results: During 10 weeks' treatment period we observed decreasing scores on the DRS & CNCS, indicating significant improvement. The CRS showed improvement in one patient, but the other two patients did not improve on the CRS although they improved in terms of arousal.

Conclusion: Amantadine 200–400 mg/day may safely improve arousal and cognition in patients with TBI. Early intervention of this type in the acute care setting is beneficial and may prevent musculoskeletal complications.

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Rehabilitation goals from the perspective of Saudi clients with disabilities due to neurological disorders

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Background and aims: Understanding what goals are important to the client is the first step in the goal setting process which is the focus of this study.

Method: A questionnaire addressing clients' perceived functional difficulties, importance and priority of rehabilitation goals was developed and validated through a four-step process that was then administered through structured interviews with clients admitted at King Fahad Medical City-Rehabilitation Hospital.

Results: Of the 130 participants, 35% had spinal cord disorder and 38% acquired brain dysfunction. The mean priority scores of rehabilitation goals, with 10 being the most important, were: functional mobility/locomotion 8.95; self care 6.98; religious or life philosophy 6.43; residential and domestic arrangements at home and community 6.27; medical, knowledge 5.92; productivity 5.16; relationships 4.13; emotions and feelings 3.78; communication and social cognition 3.88; leisure activities 3.58. Higher priority of self care, functional mobility and medical knowledge was reported by clients with brain dysfunction whereas higher priority of relationships, residential and domestic arrangements, productivity and religion was reported by spinal cord clients. Mobility and locomotion scored highest with priority and difficulty but some scores did not match. One such example is leisure that came last on the priority list despite of the high level of reported difficulty. Correlations and variation in priority scores according to patient demographics, diagnosis and onset date have been identified.

Conclusions: This study provided an understanding of what rehabilitation goals are important to Saudi clients with neurological disorders that could be used to facilitate their contribution to the goal setting process.

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Coping after brain injury: An exploration of responses of self-criticism and self-reassurance and their relationship with anxiety and depression

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Background and aims: The emotional impact of acquired brain injury (ABI) is well documented, including studies showing that coping style is amongst a range of predictors of poor emotional outcome. Recent integrated models of emotional adjustment highlight the importance of looking at specific emotional and behavioural responses to day-to-day problems (the experience of things 'going wrong'), as well as general styles. This paper will explore specific styles of responding to 'things going wrong' in every day life and the

relationship of such styles to anxiety and depression in people with ABI from a compassion theory perspective.

Method: 55 participants with ABI will complete two self-report questionnaires: the Forms of Self-Criticism and Self-Reassurance Scale (FSCSR) (Gilbert et al, 2004) and the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1993). The FSCSR is a measure focusing on self-criticism or self-reassurance as specific response styles to 'things going wrong'. The HADS measures symptoms and severity of anxiety and depression. We will test the hypothesis that more self-criticism and less self-reassurance would predict greater levels of anxiety and depression using multiple regression analysis.

Results: Results of quantitative data analysis will be presented and discussed with regards to response styles and symptoms of anxiety and depression.

Conclusion: The clinical implications of these findings will be discussed in relation to assessment and interventions including the response of self-criticism and its role in experiencing emotional difficulties as well as self-reassurance as a protective factor after ABI.

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Variations in Aphasic Language Behaviour: A Case Study of Selected Bilinguals at the University College Hospital, Ibadan

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Background and Aims: The major focus of this paper is to establish the relevance of Linguistics to the remediation of speech deficit in a typical multilingual country like Nigeria. I devote my attention to the discussion of the various language problems associated with brain damage, most especially aphasia or dysphasia, which is often present in people with speech disorder.

Methods: I focus specifically on aphasia as a major type of disorder as I look at some case studies focusing on the pronunciation and grammatical problems of some aphasics who use English as a second language at the University College Hospital Ibadan. Unstructured interview and spontaneous speech recording were used to obtain the speech samples from the patients. A normative test was also administered to the subjects. The data collected were analyzed to identify the peculiarities of the speech of these aphasics.

Results: The pronunciation of the bilingual Nigerian adult aphasics was characterised principally by substitution and deletion of segments and simplification of speech production. The work suggests a number of rehabilitation measures that speech therapists could adopt in helping aphasic patients, thereby establishing the relevance of linguistics to the remediation of the deficit.

Conclusions: My major argument in this paper is that the treatment of language disorder in Nigeria should not be approached from the medical perspective alone, since in many parts of the world today, it now involves an inter-disciplinary effort.

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Development and evaluation of a protocol for cognitive strategy training in general hospitals

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Background and aims: Cognitive impairments are a frequent consequence of acquired brain injury. In the Netherlands, evidence based protocols for cognitive strategy training in rehabilitation settings are available. These protocols were not applicable for cognitive rehabilitation in general hospitals, since the impairments in this patient population are less severe and the intensity of treatment is lower. Our aim was to develop and evaluate the feasibility of a new protocol for cognitive rehabilitation in general hospitals.

Method: Occupational therapists working in 7 rehabilitation units in general hospitals participated in this study. A total of 21 patients received training based on the new protocol. Evaluation took place via interviews with participating occupational therapists and patients and via goal attainment measurements.

Results: Both therapists and patients reported to assess the new protocol as relevant, useful and feasible. A total of 30 goals were set. The mean rating of functioning in terms of these goals improved significantly from 4.6 (range 2–7) before rehabilitation to 7.3 (range 5–9) after finishing the treatment program ($t = 11.00$, $df = 29$, $p < .001$). On an individual level, all patients showed improvements on all goals, ranging from 1 to 6 points.

Conclusion: The new protocol for cognitive rehabilitation is useful and effective in general hospitals. Formal effect evaluation should follow.

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Developing a paediatric brain tumour parent/carer support and information group: A pilot study

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Background and aims: The aim of the study was to explore the impact and utility of a newly-developed support and information group for parents/carers of children with brain tumours at a regional neuro-oncology centre. The literature demonstrates the range of neuropsychological consequences of childhood brain tumours, and the detrimental psychological effect this can have on parents/carers. Providing support and information can help to empower families in managing such difficulties.

Method: A group was developed for parents/carers of children with brain tumours. It aimed to provide parents/carers with opportunities for developing their understanding of key neuropsychological issues and to access additional peer support. Six evening sessions included presentations and discussions on psychological and neuropsychological issues associated with childhood brain

tumours (e.g., memory, emotions, behaviour). Parents/carers completed questionnaires on overall satisfaction, content and format of the group. They were also asked whether their expectations were met and if they would recommend the group to others.

Results: Session-by-session and overall satisfaction ratings indicated parents/carers found the group supportive, helpful and relevant. Parents/carers valued opportunities to discuss concerns with professionals and other parents/carers; all said they would recommend it to others. Many parents commented they would like additional or longer sessions including plenty of time for discussion. Some had already made changes in light of the information provided.

Conclusions: The pilot study demonstrated the value of a support and information group for parents/carers of children with brain tumours. Feedback from parents/carers was very positive and indicates the need for such support in paediatric neuro-oncology services.

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Improvement of daily functioning after visual restorative function training in chronic stroke patients, using Goal Attainment Scaling

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Background and aims: Stroke leads to homonymous visual field defects in about 30% of all incidences. These defects can have large consequences for daily life activities: reading, driving, navigation/orientation, recognition of faces and objects, watching TV or use a computer can all become problematic or impossible to perform. The size and depth of a cerebral visual field defect can be reduced by means of visual restorative function training (RFT). The aim of this study was to examine the functional improvement of patients, trained with RFT.

Method: Training-induced defect reduction was measured with Goldmann perimetry in 12 trained chronic stroke patients. The effects of defect reduction on daily functioning were evaluated by means of Goal Attainment Scaling (GAS) before and after training.

Results: Defect reduction was observed in all 12 patients, to a variable degree. GAS improvements were observed in 9 patients; 3 patients showed no change. The correlation between GAS and defect reduction was rather weak (Pearson's $r = 0.37$).

Conclusions: GAS is a valuable instrument to chart subjectively experienced improvement of daily functioning after intervention. The correlation between GAS and defect reduction should improve if all goals are set in accordance with the expected *location* of reduction.

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Errorless learning in Goal Management Training: study protocol and case description

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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. We designed an RCT to examine if an errorless learning approach contributes to the efficacy of GMT in the execution of complex daily tasks. We illustrate this treatment by describing a prototypical patient, JP.

Methods: JP, female, 45 years, has experienced executive problems since a right frontal brain contusion 28 years ago. During eight one-hour individual GMT sessions she was taught two self-chosen everyday-tasks using errorless learning techniques. The chosen tasks were 'cleaning my house' and 'processing my mail'. Primary outcome measure was task performance using a standardized scale evaluating correct, ineffective and missing task steps. Scores were adjusted to percentage scores; 100% indicating perfect performance. Secondary outcome measure was Goal Attainment Scaling.

Results: At baseline, both everyday-tasks were performed at 33% on the performance scale. Post-treatment scores were 56% for 'cleaning my house' and 98% for 'processing my mail'. GAS scores, rated by the participant, were 0 (goal achieved as expected) for 'cleaning my house' and 1 for 'processing my mail' (goal achieved better than expected). The trainer rated both goals 0 (goals achieved as expected).

Conclusions: The results of JP show that combining errorless learning and GMT improves the execution of complex daily life tasks in a brain-injured patient. The study might contribute to the optimization of the treatment of executive deficits.

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From Wheelchair to Wheels

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Background and aims: W.E. is a thirty-one year old female, married, degree in social work, previous orthopaedic surgery for pes-cavus correction (bilateral), asthma, episodes of hypoglycaemia, severely impaired mobility (wheelchair dependent at onset of rehabilitation), past emotional and physical abuse by mother and 'rejection' by family, neurological impression of central pain syndrome, anxiety with paroxysmal panic attacks and borderline personality traits. This chemically functionally disabled patient was admitted for inpatient treatment in various NHS Units but without improvement. She responded to a holistic rehabilitation programme.

Method: Integrative pre-admission assessment (patient and family) to establish basic needs, and to design a holistic person-centred rehabilitation programme. Pharmacotherapy reviewed by multidisciplinary team; physiotherapy; external application; art therapy; neuropsychiatric assessment; pain management; and inner-family therapy or “parts work”. The treatment was conducted in an intensive way with a daily programme, seven days per week, using the full potential of the therapeutic milieu to create trust. The treatment was reviewed weekly by the multidisciplinary team and with a therapeutic time-frame of eight to twelve weeks inpatient treatment.

Results: For all comparisons pre and post intervention an improvement was detected on all outcome measures (Quality of Life and Health of the Nation Outcome Scales), goal and functional achievements. Post discharge she did voluntary work and then had part-time employment as a social worker, with complete reintegration of her functional contexts.

Conclusions: Fully independent integration with family and employment was found in this case example. This case demonstrates that an important element to success in neurorehabilitation treatment is of the person as a whole, considering the multifaceted complexities of the case.

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A Pathway from Complex Neuropsychiatric Clinical Presentation to Independent Social Reintegration

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Background and Aims: MS was involved in road traffic accident when aged 24. He sustained numerous injuries, post trauma seizures, and psychotic symptoms of a paranoid delusional nature. From the ages of 3 to 9 years he was physically abused by his stepfather. Aim: to demonstrate the results of an efficient referral system from the acute stage to the most appropriate neurorehabilitation and neuropsychiatric services.

Method: An integrative preadmission assessment with the patient, family members and a multidisciplinary team established the patient’s needs and designed a rehabilitation programme. MS received neuropsychiatric assessment and pharmacotherapy for his psychotic delusional state plus physiotherapy, holistic rehabilitation and reality orientation therapy. 7 Seven day week intensive treatment was conducted with regular reviews. The treatment timeline was dictated by the length of the commissioning budget and outcome measures.

Results: MS showed a demonstrable improvement. Outcome measures included the Functional Independence Measure and the Functional Assessment Measure (scores of pre and post treatment), the Health of Nation Outcome Scale (scores pre and post), the Rehabilitation Complexity Scale and the Northwick Park Dependency Scale.

Conclusions: MS continued to progress until January 2013; his rehabilitation promotes independent living; he goes on weekend leave to his parents to gradually integrate him into his social environment; he has moved to a flat within the grounds of the Raphael Medical Centre. He has been interviewed with his employer for re-entry in his former job. The results represent efficient management of rehabilitation commissioning cost for a patient with complex neurorehabilitation and neuropsychiatric needs.

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Evidence-Based Neuro-Rehabilitation For Brain Injury: Best-Practices Guide And Benchmarking

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Background and Aims: Acknowledgment of the most effective multi-disciplinary neuro-rehabilitation techniques is crucial for brain-injury patients' prognosis. By reviewing the relevant literature we aimed to develop: (1) an evidence-based best-practice guide, and a (2) a benchmarking system to objectively assess (2.a) the degree a neuro-rehabilitation facility complies with, and (2.b) to which extent a particular patient is provided with such best-practices.

Methods: Twenty neuro-rehabilitation experts-practitioners reviewed a total of 4,225 abstracts applying the following inclusion criteria: article published from 1980 on; report of a neuropsychological, physical, communication, or functional neuro-rehabilitation technique efficacy study; sample of TBI or stroke patients (single-case studies were excluded); presence of a control-alternative treatment group. The methodological quality of the 761 selected reports was reviewed using the PEDro scale and divided in three levels of evidence.

Results: Experts summarized the main findings and methodological issues of the 761 reports. These findings were divided in six sections (General aspects; Sensory-Motor; Cognition, Emotion and Behavior; Complications' Management; Neuropharmacology; Social Integration) and 30 chapters. Summary evidence-based guide-lines and recommendations were obtained for each impairment/activity domain. The benchmarking was developed inspired in the EFQM Excellence Model, including a score system to assess the degree of compliance with the evidence-based recommendations, which were divided in three major Domains: Service Organization (150); Clinical Recommendations (450); Results (500).

Conclusions: The benchmarking system according to evidence-based recommendations will allow the assessment of neuro-rehabilitation; and may contribute to demonstrate the impact of coadjunctive evidence-based treatments on a single case.

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Cognitive characteristics associated with low learning potential in patients with acquired brain injury

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Background and aims: Cognitive impairments may hamper a patient's potential to learn during rehabilitation. The aim of this study was to explore the cognitive characteristics associated with low learning potential in patients with acquired brain injury (ABI).

Method: The dynamic Wisconsin Card Sorting Test (WCST) was administered in a one-session pre-test-training-post-test design to assess learning potential (LP). The pre-test and post-test followed standard WCST procedures and during the training additional instructions and feedback were given. Gain scores were calculated with the following formula: (post-test total correct–pre-test total correct)/(64–pre-test total correct). The maximum gain score is 1. A higher gain score indicates better learning potential. Patients were categorized into three categories: low LP (gain score < .33), moderate LP (gain score .33–.66), and high LP (gain score .67–1). Cognitive test scores were obtained from the patient's chart. We included the following tests: Rey Auditory Verbal Learning Test (RAVLT), Rey-Osterrieth Complex Figure, Trail Making Test–part A and B (TMT-A; TMT-B), WAIS-III Symbol Substitution, and D-KEFS Tower test.

Results: 54 patients with ABI were included. Of these, 14 patients had low LP, 13 patients moderate LP and 27 patients high LP. Patients with low LP showed significantly lower scores for verbal memory (RAVLT immediate recall) and executive functioning (TMT-B) than patients with high LP.

Conclusions: These results suggest that patients with low LP show poorer verbal memory and executive functioning than patients with high LP. More research is needed to determine whether LP is related to rehabilitation outcome.

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Evaluating and comparing the effectiveness of Sonas and Cognitive Stimulation Therapy (CST) on Cognition, Quality of life, Activities of Daily Living (ADL's), Communication, Neuropsychiatric symptoms and Occupational Performance within a group session in older adults with Dementia

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Background: This study describes a comparison of two interventions used with people with dementia. Sonas is a therapeutic communication activity where group sessions involve cognitive, sensory and social stimulation (Sonas

aPc 2011). Cognitive Stimulation Therapy (CST) is a non-invasive psychological intervention also for dementia; group sessions focus on the improvement and strengthening of cognitive resources as well as the maintenance of social and interaction skills.

Aims: To evaluate and compare the use of Sonas and CST in a Psychiatry of Later Life setting in patients with moderate level of cognitive impairment, secondary to dementia.

Methods: A single blind randomised controlled trial was carried out. Subjects were recruited from an inpatient psychiatric facility, a nursing home and the community. Groups within these categories were randomly allocated to one of two conditions: CST and Sonas. Outcome measures assess quality of life (QOL-ad), Cognition (SMMSE), Mood, Activities of Daily Living (ADL), Communication, Neuropsychiatric symptoms and Occupational Performance (OTTOS) within a group.

Results: The preliminary results indicate that there is a positive statistically significant difference change in both groups on the SMMSE, the OTTOS and the QOL-AD. The CST group only showed improvements on the Holden Communication Scale. No changes in ADL functioning were found.

Conclusion: Preliminary analysis suggests that change was demonstrated in both groups in the areas of Cognition, Occupational performance and QOL within a group demonstrating their effectiveness.

In terms of communication the CST group only demonstrated improvements; suggesting that CST may be a more effective intervention for this client group.

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Do scripted videos improve orientation and awareness of deficit?

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Background and aims: Impairments of orientation and awareness are common following severe acquired brain injury and may be related to rehabilitation outcomes (Fleming & Ownsworth, 2006). This study investigated the effect of daily iPad presented orientation videos on scores obtained on a modified version of the Galveston Orientation and Amnesia Test (GOAT) that included rationale for rehabilitation.

Method: All participants, with mixed aetiologies, experienced persisting difficulties in orientation and awareness of their rehabilitation needs.

In this series of 3 AB and ABA designs, participants watched a daily orientation video on an iPad showing their relatives reading an orientation script. The script was based on the preadmission assessment and included the date of injury; cause of injury; location of current treatment; date of admission and rationale for rehabilitation stay including the goal areas.

Results: Sample $n = 1$. In baseline (7 data points) TM had an average GOAT score of 38 (SD = 19). During the intervention this score increased to an average 61 (SD = 19). $NAP = 0.8182$; $p = 0.0265$.

Conclusions: Preliminary data indicate that orientation videos may improve awareness and orientation in individuals with acquired brain injury. This medium was enjoyed by service users and reassured relatives of their presence in the rehabilitation process. This will form part of a larger case-series.

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Patterns of functioning and early difficulties at work in Multiple Sclerosis: implications for rehabilitation counselors

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Background and aims: Multiple sclerosis often interferes with careers of working-aged individuals, more commonly with women's career. Frequently, in fact, they retire prematurely and experience significant consequences with respect to quality of life (Gronning, 1990; Ketelaer, 1993). Studies have shown that even mild impairments can significantly disrupt their ability to carry out activities of daily living (see for instance Amato et al., 2001; Beatty et al., 1995; Ruggieri et al., 2003)

The purpose of this study was to describe possible patterns of functioning and sources of difficulties in work life in four young women with a relapsing remitting Multiple Sclerosis (MS) and mild disability and to highlight possible specific implications for rehabilitation counselors.

Method: Standard cognitive assessment, self rated analysis of changes, problem solving appraisal and barriers experienced at work were analyzed in four women (age ranged from 26 to 41) and mild disability, as assessed with the EDSS.

Results: Four widely different profiles were described. Besides perceived and/or objective changes in cognitive functioning, behavioral changes and work barriers of different nature were reported, independently from duration of the disease and disability level.

Conclusions: Rehabilitation counselors should take into account several different dimensions of functioning during assessment, including the analysis of job participation and satisfaction. They must be prepared to organize preventive interventions in order to help these individuals not only in adapting to the environment but also in promoting self-management and problem solving skills before barriers threaten job satisfaction and, subsequently, job mastery and participation.

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An investigation into the effects of rhythmic auditory stimulation (RAS) on stride parameters in adults with acquired brain injury: An ABA design

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Background and aims: Previous studies have demonstrated that RAS can be effective in improving gait in stroke. This study aims to determine whether rhythmic auditory stimulation (RAS) could increase stride parameters (walking velocity, cadence and stride length) in adults with acquired brain injury, also to investigate the feasibility of recruiting and delivering RAS to inpatients with complex difficulties.

Method: Four patients with acquired brain injury participated in this study, 2 with traumatic brain injury and 2 with neurologic disorders. Gait training with RAS was performed 2/3 sessions per week over a period of 6 to 15 weeks. RAS was provided using a combination of a metronome beat and rhythmic cueing from a live guitar. Gait parameters were measured and blindly rated by an independent assessor pre, during and post-intervention using an ABA design.

Results: Measures of gait parameters showed that RAS increased cadence, walking velocity and stride length, with some patients sustaining gait improvements post-treatment. When recruiting patients for RAS, 6 out of 10 patients were deemed unsuitable for RAS at that stage in their rehabilitation. This was found to be due to various factors including requiring physical assistance, unable to follow instructions and difficulty engaging with treatment due to lack of understanding about the aims of RAS.

Conclusions: The results show positive effects of RAS for patients with acquired brain injury, in particular for those who showed understanding of the aims of the treatment. Further research is required to determine whether the effects can be sustained long term.

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Rehabilitation for hypoxic brain injury: Focussing on meaningful roles maximises outcome

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Background and aims: A main aim of rehabilitation following brain injury is to maximise patient engagement and independence in meaningful roles. Understanding how particular neurocognitive impairments impact on participation is therefore imperative for service planning and programme delivery. This study aimed to describe the patterns of participation for individuals with hypoxic brain injury (HBI), as compared to individuals with traumatic brain injury (TBI) and cerebral vascular aneurysm (CVA), and evaluate treatment approaches that maximise participation.

Method: Ten individuals with HBI admitted to a residential rehabilitation programme were supported to participate in clinical programmes that were devised weekly, with participation measured on a scale of attendance. Participation was compared to individuals with TBI ($n = 10$) and CVA ($n = 10$). Groups did not differ significantly in age or time since injury.

Results: Participation for individuals with HBI varied; however, it was significantly less overall than individuals with TBI and CVA. In particular, they spent less time in self-care activities and clinical sessions and needed more 1:1 support initially to participate. Individuals with HBI participated more when treatment was heavily focussed on personally-meaningful leisure activities rather than more structured clinical treatment sessions.

Conclusions: Focussing on treatment within the context of personally-meaningful roles was particularly important for improved participation of individuals with HBI.

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The effect of compensatory scanning training on mobility in hemianopia patients

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Background and aims: Homonymous hemianopia, the most common form of Homonymous Visual Field Defects (HVFD), refers to a loss of perception for half the visual field, affecting both eyes, due to acquired postchiasmatic brain injury. Because of a disorganized visual search strategy, patients with HVFD have particular difficulties with visual exploration and mobility. A new Compensatory Scanning Training protocol has been developed, which aims to improve awareness, scanning and mobility in daily life.

Method: The effect of this training has been examined in 57 hemianopia patients. A wide range of effect measurements has been applied, covering all levels of the ICF model. These measurements include visual search tasks including eye tracking, reading tasks, obstacle courses, rides in a driving simulator, and questionnaires to examine self-reported visual disabilities, mobility and quality of life. The examinations were done in the week before and the week after training and a subgroup of these patients, the so-called control group, was examined three months before the start of the training as well, resulting in a Randomized Controlled Trial.

Results: Data collection has recently been completed. The final results will be discussed in terms of within-subject effects (pre- vs. post-measurement, and associations between different parameters), and between-subject effects (comparison with the results of the control group).

Conclusion: Compensatory Scanning Training has a beneficial effect on scanning and mobility in hemianopia patients, but interesting inconsistencies have been found in the results of the different tests.

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Realistic Observation in Game and Experience in Rehabilitation (R.O.G.E.R.): a prototype

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Introduction: The past decade has witnessed growing interest in the use of virtual reality (VR) technology for assessment and rehabilitation of neurocognitive patients. VR presents an opportunity to create scenarios that incorporate naturalistic challenges and are highly relevant to real-world functioning (Rizzo, 2004). A number of Virtual Environments (VE) are well-correlated with performance in the real-world environment (Rose, 1998). VR technology allows experimental control of the task complexity and a customized patient experience. A critical feature of VR applications is the interaction with virtual objects. A number of different types of hardware and software may be used to create VE's with varying capabilities.

Methods: We describe the design process of a prototype, R.O.G.E.R. It was created in close collaboration with experimental videogame developers according to the specifications of clinical neuropsychologists. The environment is currently composed of three apartment rooms. The activity which drove the

creation of the task is packing a suitcase, an infrequent activity which enables assessment of planning processes. We decided to use the Kinect technology by which a camera recognizes the patient's movements. Moreover, this setting enables a permanent contact between the patient and the neuropsychologist during the task. In addition, this semi-immersion avoids the "cybersickness" frequently encountered with head-mounted displays (Kiryu, 2007).

Discussion: The way the patient assimilates the task instructions and the manner he/she gets familiar with the R.O.G.E.R. environment are naturalistic measures of his/her learning capacities. The implications of these findings will be investigated more in depth.

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Improving communication-specific coping after traumatic brain injury: Evaluation of a new treatment using single case experimental design

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Background and aims: People with TBI frequently experience communication breakdown. Typically, we use communication-specific coping strategies in situations characterised by communication breakdown. Productive strategies enhance message transfer; non-productive strategies do little to resolve problems and frequently result in negative social interaction. This research aimed to evaluate the effectiveness of a new intervention, Communication-specific Coping Intervention (CommCope-I), which specifically targets coping in the context of communication breakdown.

Method: Single case experimental design (baseline, treatment, withdrawal and follow-up at 1 and 3 months post-treatment) across two participants was used. Participants were RJA, a 30-year old woman who sustained severe TBI at 22 and ABR, a 34-year old man who sustained severe TBI at 29. CommCope-I is a 6-week program which targets personally-relevant productive coping strategies identified collaboratively with the client. Productive coping scripts are developed and practiced through a series of graded scenarios that are evaluated with the aid of video recording.

Results: Percentage of non-overlapping corrected data (PNCD) was used to analyse the data. PNCD involves a data-correction procedure to remove baseline trend from the data series prior to calculating the change produced as a result of intervention.¹ A large treatment effect was demonstrated in both participants (PNCD: end of treatment RJA = 100%, ABR = 100%, 3-month follow-up RJA = 92%, ABR = 100%). These results are consistent with highly effective treatment based Scruggs and Mastropieri's guideline.²

Conclusions: This study provides sound phase 1 evidence³ for the effectiveness of CommCope-I.

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³Beeson, P. M., & Robey, R. R (2006). Evaluating single-subject treatment research: lessons learned from the aphasia literature. *Neuropsychology Review*, 16, 161–139.

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Neuro-Narratives – A Beacon of Hope or Pandora’s Box?

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Background and Aims: This presentation explores the role of written narratives in the recovery of people following acquired brain injury caused by Encephalitis: their purpose and meaning for those who read and write them; the impact of these stories upon both authors and readers; and in what way (if any) these stories contribute to people’s recovery, and their relationships with professionals.

Methods: The findings are the result of a mixed methods study incorporating a literature review, quantitative findings from a self-report postal questionnaire (n = 406), and semi-structured qualitative interviews (n = 21).

Results: People’s experiences following acquired brain injury are, in many cases, life-changing and complex. Their narratives help them better understand the condition as well as make sense of their experiences, on both personal and collective levels. However for some narratives are not helpful. More generally their use was temporal and sensitive to context.

Conclusions: Narratives are an important tool in recovery, but not for all, including the relatives of people affected. Alternatives must be considered in the minority for whom narrative use is detrimental. Narratives can be used by professionals to better understand the experiences of their patients, reflect upon their practice, and to provide better patient-oriented services. More research needs to be done however, along with further exploration into the role of gender in narratives and the use of written narratives as a therapeutic tool.

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Effects of Sulphur Footbath for Managing Spasticity After Brain Injury: A New Approach in Clinical Practice – A Pilot Study

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Background and Aims: Footbaths and thermotherapy are considered to be a beneficial therapeutic way for managing musculoskeletal and orthopaedic disorders such as muscle pain, joint pain and bone deformities, but their anti-spastic effects for patients with neurological conditions have not been investigated yet. The present study aimed to evaluate the effects of footbath with 20% sulphur solution and physical exercises for managing lower limb spasticity involving 6 patients with brain injury during >1 year post trauma recovery.

Method: Subjects’ legs below the knee joint were immersed in warm water with 20% sulphur liquid solution for 30 minutes. Initial temperature of 37C has been gradually increased to 43C to overcome the skin-surface barrier and allow deeper penetration in the underlying tissues. The physical exercises were carried out immediately after the footbath for period of 45 min.

Results: To detect the changes after the treatments, goniometry and Modified Ashworth Scale (MAS) were used as main measurement tools. After the 2 weeks of treatment, all participants showed a significant improvement in their range of motion and level of spasticity compared to the baseline measures (p < .001).

Conclusion: These findings displayed that the use of sulphur footbath is an effective way of managing increased muscle tone and spasticity on patients with acquired brain injuries and potentially new method that might facilitate stroke rehabilitation.

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“People Do not Recognise my Role as a Carer” –The Impact of Caring for someone with an Acquired Brain Injury in Ireland

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Introduction: There is evidence that caring for someone with Acquired Brain Injury (ABI) can have a profound impact on the carer. With few support services available for carers of someone with ABI, carers may develop stress related symptoms. The current study investigates the impact of caring for someone with ABI in Ireland, with particular emphasis on identifying the services and supports needed by these carers.

Method: Participants (n = 19) were recruited through an ABI support group in the West of Ireland. A questionnaire was developed to measure (i) the impact of caring for someone with an ABI (ii) carers satisfaction with support services supporting those with ABI and (iii) to investigate the relationship between participant variables and the perceived overall impact of caring for someone with ABI. Descriptive and inferential statistics were used to analyse the data.

Results: Carers indicated feeling most negatively impacted by the lack of recognition for their role as a carer. Service provision supporting carers was significantly related to the overall impact of caring for someone with ABI. The quality of the information carers received about caring for someone with ABI and the time spent caring were also significantly related with the impact of caring for someone with ABI.

Discussion: The findings of this study suggest the need for increased service provision, information provision, recognition and support for carers of those with ABI. The findings also indicate that healthcare providers should acknowledge the vital role of the carer and to provide them with adequate information and support.

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Patterns of neuropsychological outcomes in children with severe traumatic brain injury at the early stage of consciousness recovery

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Background and aims: Despite the fact that paediatric patients are characterized by high plasticity of the developing brain and higher metabolism in the brain which promotes better compensatory abilities in childhood, many children remain with severe neuropsychological and behavioral problems after severe traumatic brain injury (Asikainen et al., 1996; Anderson V. et al., 2005). According to modern concepts of neurorehabilitation, early intervention can improve cognitive outcomes. The aim of this study was to follow up patterns of recovery in children (6–17 years) at the first four months after injury.

Methods: 17 children with sTBI ($GCS \leq 8$) were evaluated with Coma Recovery Scale-R (Giacino JT, 2004). Children were divided into three groups according to their consciousness recovery. Seven children regained their consciousness completely and were assessed by Luria Neuropsychological *Battery test*. Six children remained in the minimally conscious state (MCS) and were tested by the adapted procedure of neuropsychological assessment during the first four months. Four children have not recovered.

Results: Each group had different dynamics of consciousness recovery. Assessments of neuropsychological outcomes in the first group have shown that the most disabled functions at the early recovery period were the processing speed (neurodynamics of mental activity) and executive functions. Children in the second group had more severe executive dysfunctions comparing to the first group. They could follow simple commands but had difficulties with programming and planning their behavior and activity.

Conclusions: The factor of voluntary regulation plays a key role at the early stage in consciousness recovery.

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Using music to improve executive function in a patient with acquired brain injury

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Background and aims: The study illustrates the way music can be used to achieve functional goals. The aim was to move the patient on to the next stage of rehabilitation and enable him to function more independently. Currently, the patient could not live independently because of poor executive function skills. The aim for the therapy employed was for the patient to gain relevant skills and to realise that he was able to organise himself.

Method: A Neurologic Music Therapy technique called Musical Executive Function Training (MEFT) was employed with one patient. This includes improvisation and composition exercises to practice executive function skills such as organizing, problem solving, decision making and reasoning. Through the use of graphic scores, composition became accessible and recordable; this then allowed the patient to rehearse, conduct and perform his own music.

Results: By working through the process of composition, rehearsal and performance, the patient demonstrated many skills which are needed in everyday life. He had to plan and organise all areas of the composed music. In the next stage, he had to improve his communication skills and problem solve. This transferred to life outside the therapy room by improved overall executive function skills.

Conclusions: Using music to work in a very functional way has strong implications for the future of music therapy which traditionally has focused on emotional needs. This approach further integrates music therapists into the multidisciplinary team and allows us to reach to patients using a multifaceted approach.

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Treatment of Neuropsychological Difficulties Associated with Dopa Responsive Dystonia

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Background and aims: A young girl with Dopa Responsive Dystonia showed significant improvements in motor function after the introduction of Levodopa at 21 months of age, but had complaints of neuropsychological difficulties which became apparent as she reached school age.

Method: A neuropsychological evaluation was undertaken to understand the nature of her difficulties.

Results: Verbal and non-verbal reasoning was found to be age appropriate. Particular difficulties were identified with working memory, visual selective attention, dual attention and processing speed which were having a significant impact upon the child and her family. A trial of methylphenidate was undertaken which improved the child's performance on both neuropsychological measures and her everyday function.

Conclusions: The importance of a thorough neuropsychological evaluation is discussed in helping to plan with the family and school how best to support the child with this chronic but rare health condition.

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Understanding expectations of, and satisfaction with, deep brain stimulation of the subthalamic nucleus in Parkinson's disease: patient and caregiver perspectives

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Background and aims: Deep brain stimulation of the subthalamic nucleus (STN-DBS) is a neurosurgical procedure that can improve levodopa-responsive motor symptoms in Parkinson's disease (PD). However, its impact across the wider symptom profile is more variable. This study aimed to understand how service-users evaluate this intervention, whether issues considered important prior to surgery remain salient post-surgery, and whether STN-DBS recipients and their respective caregivers differ in their evaluations.

Method: Using a longitudinal qualitative design, a purposeful sample of 8 surgical candidates and 6 respective caregivers completed a semi-structured interview shortly before STN-DBS with a further interview 3-6 months post-surgery. Transcripts were analysed using a form of thematic analysis which adopted a *subtle realist* epistemological stance.

Results: Expectations of surgery centred on desired change in motor symptoms and quality of life. Subtle differences emerged between patients and caregivers in relation to quality of life expectations. Participants accepted that problems were likely to remain post-surgery, but minimised their significance. Perioperative complications were expected to result in dissatisfaction. Post-surgery, evaluations of DBS continued along similar themes. However, satisfaction was also influenced by fluctuations in symptom improvement, the occurrence

of new problems, and the manner in which health care interventions were delivered.

Conclusions: Neurosurgical services need to ensure that surgical candidates are fully informed as to the post-surgical demands of STN-DBS, such as fluctuating motor symptom improvements, stimulation-related side effects, and the practicalities of repeated hospital attendance. Satisfaction is improved where health professions are seen to be collaborative, supportive, and informative.

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Participation after aneurysmal subarachnoid hemorrhage

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Background and aims: Survivors of a Subarachnoid Hemorrhage (SAH), who have a relatively good functional outcome, report consistently to experience problems in (complex) daily life activities and in regaining their pre-morbid level of functioning. This study focuses on the level of participation problems after SAH and the influence of cognitive and emotional factors on perceived participation.

Methods: In 73 patients who visited our outpatient clinic 10 weeks after SAH, experienced participation and satisfaction with participation were assessed by the Restrictions scale and the Satisfaction scale of the Utrecht Scale for Evaluation of Rehabilitation Participation. The impact of cognitive functioning, cognitive- and emotional complaints, and symptoms of depression and anxiety on the level of participation were examined using linear regression analysis.

Results: Despite independent ADL, 48 patients (65.8%) reported participation restrictions and 45 patients (61.6%) were dissatisfied with their level of participation. Most common experienced restrictions concerned housekeeping, chores in and around the house and physical exercise. With respect to dissatisfaction outdoor activities, mobility, work/housekeeping and cognition were most frequently reported. The main predictor of the participation restrictions were cognitive complaints ($R^2 = .23$). In the prediction of satisfaction with participation, besides cognitive complaints also the level of anxiety played an important role (total $R^2 = .41$).

Conclusions: Rehabilitation of SAH patients is aimed at minimizing its consequences and to improve social participation. Participation is best predicted by cognitive complaints and anxiety symptoms. Focus on these (neuro-)psychological factors in rehabilitation of SAH patients can therefore be helpful to enhance outcome.

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Exploring near and far regions of space: Distance specific visuo-spatial neglect after stroke

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Background and Aims: Previous studies have shown that the severity of neglect can depend on the distance at which a task is performed. However, much is still unclear about neglect in different regions of space.

Method: A large group of stroke patients, admitted to a rehabilitation centre, were included in this study (N = 200). All patients were tested with the star cancellation test presented in near (at 30 cm) and far (at 120 cm) space. Patients were divided into one of 4 groups based on their performance on the test: no neglect, neglect in near space (N+), neglect in far space (F+), and neglect for both regions (NF+).

Results: Preliminary analyses showed that 30% of this sample was assessed as having neglect. Of this group, 46% suffered from N+, 46% suffered from F+, and 27% showed NF+. Most severe neglect (more omissions, higher score on center of cancellation) was found in the NF+ group.

Conclusions: This study is the first to systematically investigate neglect in different regions of space in a large group of stroke patients. It showed that near and far neglect also occur separately. Screening for neglect in several regions of space is therefore of great importance. As far space is often associated with orienting and navigation, detecting far space neglect will have important consequences for diagnostics and rehabilitation.

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Using video ratings to assess multitasking performance in a naturalistic paradigm

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Background and aims: Multitasking measures, in which a series of tasks must be completed within a naturalistic setting not fully under the experimenter's control, have been shown to be more sensitive than traditional measures in detecting organisational problems in people with subtle difficulties in executive functioning. Often, however, they can take a considerable time to administer and are demanding in terms of examiners noting and recording all relevant aspects of performance. They require sometimes subtle judgments (e.g. whether a rule has been infringed). This potentially leaves them more open to subtle bias due to examiner leniency, prior knowledge of the participant's status (e.g. patient vs. control), and experimental condition (e.g. post-rehabilitation vs. control). One method that could offset these limitations is to video record performance such that it can be accurately scored off-line by one or more raters who are naïve as to participant/condition status.

Method: The use of a video-ratings is investigated in this study with nineteen participants (mean age 69.04 years) who completed a Multiple Errands Task (MET) while wearing a body-worn camera. Their performance was scored “live” as well as by an independent rater who had only access to the combined video and audio footage of the task.

Results: Significant relationships were seen on all variables of the MET between the live and video ratings. The inter-rater reliability of the measure appears strong.

Conclusion: This study provides initial support for the use of a video rater for participants who have carried out a MET.

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Integrated approach to treatment of conversion disorder: A case study

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Background and Aim: Conversion disorder is a condition in which physical symptoms are present which cannot be explained by neurological or medical pathology, and is unconsciously caused by a stressful or traumatic event. Counselling, psychotherapy, pharmacotherapy, physiotherapy and occupational therapy are considered to be the usual choices of treatment. This study describes the successful management of a client with conversion disorder by an integrated therapeutic approach including conventional and anthroposophical medicine.

Method: JC suffered from different physical symptoms for one and a half years, following a road traffic accident. After admission to Raphael Medical Centre, JC was treated by a team that included a physician, nurses, counselling therapist, physiotherapist, occupational therapist and chiropractor, together with the anthroposophical medicines. These included oil dispersion baths, rhythmical massage, craniosacral therapy, eurythmy therapy, music therapy and art therapy. Progress has been monitored by validated assessment scales by each discipline (e.g. Manual Muscle Testing, Posture evaluation, gait analysis, quality of breathing, frequency of trunk twitches).

Results: JC was discharged within six months of successful treatment. JC fully recovered from the symptoms that she presented with on admission and was able to continue her job in her family business.

Conclusions: This case study explores the effect of interdisciplinary management in treating conversion disorder. The study suggests that a holistic integrated approach to rehabilitation combining anthroposophic and conventional medicine is effective from both physical and psychological points of view. Further studies are required to shed more light into this area of conversion disorder management.

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Motor learning in clinical practice: a Delphi technique

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Background and aims: Facilitating motor learning in patients during therapy is complex, especially in people with cognitive impairments. The translation of evidence from the different fields of motor learning for the use in therapy is problematic due to: 1) a lack of uniformity in concepts and taxonomy of terms related to motor learning and 2) the non-functional tasks which are often used in paradigms for research. The aim of this study was to develop a framework and identify tools to facilitate motor learning.

Method: A Delphi technique was used to address three major topics within three sequential rounds: 1) *Definitions, descriptions and taxonomy* 2) *Facilitation of motor learning* 3) *Choices within motor learning*. A questionnaire covering questions related to each topic was developed and distributed using an online survey programme. A heterogeneous sample of international experts with different backgrounds (e.g. researchers, lecturers, experienced therapists, coaches) working in the field of motor learning (e.g. children, adults, healthy, impaired) was invited to participate.

Results: Fifty-five experts agreed to participate. Consensus on definitions of implicit and explicit motor learning and descriptions of the best known motor learning strategies (e.g. analogy, observational learning) was achieved. Experts *classified* the strategy to different forms of learning (taxonomy). Less consensus was found on how to apply these strategies, but the same variables influencing decisions were consistently reported among the experts.

Conclusion: In this study the available knowledge and experiences on motor learning was structured and translated for use in practice. Unresolved aspects were discussed and should direct future research.

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Rehabilitation programs versus real life: problems arose creating a novel computer-based attention rehabilitation for children

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Background and aims: Few systematically controlled neurocognitive rehabilitation techniques for children exist. Two pediatric neurological disorders – mild traumatic brain injury (mTBI) and focal epilepsy (FE) – are

frequently accompanied by attention deficit. The aim of this study was to adapt the FORAMENRehab Attention software for children and design an intervention program to develop a new neurocognitive rehabilitation modality. **Method:** 8 patients (Mean age = 11.14 years; SD = 0.90) with attention deficit (3 with FE and 5 with mTBI) and 18 healthy controls (Mean age = 10.7 years, SD = 0.70) were included. FORAMENRehab is a neurorehabilitation software developed for adults by Sarajuuri et al. (2000). We divided the tasks into three difficulty levels. For baseline testing, which was also the starting point of training, 8 easy exercises were used. Patients received supervised computer-based training twice a week during the 5-week-period.

Results: The intervention created a significant improvement in sustained ($p = 0.014$) and complex attention ($p = 0.017$). The 100% compliance confirmed that the program was suitable for children. We discovered graphical and methodological problems (non-distinctive difficulty levels, ambiguous division of categories, inappropriate words) and deficiencies in the intervention design. **Conclusions:** FORAMENRehab appears to be an effective intervention for children with attention deficits due to mTBI and FE. Recommendations for improving the program include: (1) Baseline assessment tasks (used before and after training for evaluating children's progress) must be more complex and differ from rehabilitation starting tasks. (2) https://mail.google.com/mail/?shva=1-13c8b6408664fetc__msocom_1Upgrade to the next rehabilitation level follows after the performance on the current level is 100% correct once or 80–90% thrice. (3) Duration of training depends on the neurological pathology: children with FE need longer rehabilitation period (minimum 10 times). (4) Specific instructions to trainers.

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Treating persistent restlessness after stroke by TENS: A single-case experiment

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Background: In addition to its possible analgesic effect, Transcutaneous Electrical Nerve Stimulation (TENS) has been examined for its efficacy on non-pain related cognitive and behavioural functioning in children with ADHD (Jonsdottir, 2004), comatose people (Cooper, 1999), stroke patients (Scherder, 1997), and elderly with Mild Cognitive Impairment (MCI) or Alzheimer's Disease (Van Dijk, 2006; Luijpen, 2005; Scherder, 2003). Although the application of TENS has been investigated in post-stroke rehabilitation in order to enhance aspects of motor recovery (Laufer, 2011) and neglect (Van Dijk, 2002), few studies have been published on the effects of TENS on affective behaviour after stroke.

Aims: Reduction of persistent restlessness in a right hemispheric stroke patient.

Method: In this case study, TENS was administered as an experimental approach to a 55 year old male, suffering from a right hemispheric stroke. The influence of TENS was evaluated within a single-case experimental design, randomising the beginning of treatment and collecting an extensive number of repeated measures before, during and after treatment.

Results: The reported restlessness diminished significantly with the use of TENS, both statistically and clinically, and persisted after treatment.

Conclusion: The administration of TENS diminished daily restlessness after right-hemispheric stroke. Possible underlying mechanisms are discussed.

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Investigating the utility of the Addenbrooke's Cognitive Examination – revised (ACE-R) in predicting outcomes among adults undergoing in-patient neurorehabilitation

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Background and aims: Screening for cognitive impairment may help predict neurorehabilitation outcomes. We investigated (1) the use of the ACE-R in predicting functional gain during in-patient rehabilitation, and (2) whether ACE-R scores identified patients requiring additional therapy support during their admission.

Method: Prospective follow-up study of adults with physical disability admitted for rehabilitation. ACE-R and other clinical and demographic data were obtained soon after admission. Functional gain was measured using the Functional Independence Measure (FIM). The primary outcome measure was FIM change (FIM discharge minus FIM admission). Staff provided data on additional support/resources required by participants, over and above usual practice.

Results: Of 75 eligible patients approached, 65 consented and had baseline assessments. Complete follow-up datasets were available and analysed for $n = 60$ (mean age 49.84 years [SD = 12.01]; 62% female). No significant correlations were found between ACE-R scores and FIM change. There were no significant associations between FIM change and other baseline clinical and demographic data, except admission FIM score ($r = -0.27$, $p = 0.038$). There were significant differences in ACE-R Total ($U_z = -2.25$, $p = 0.014$), Memory ($U_z = -2.06$, $p = 0.039$) and Fluency ($U_z = -2.51$, $p = 0.012$) scores between those who did and did not require additional therapy support/resources. Only ACE-R Fluency score and gender survived a logistic regression analysis to predict additional resource needs.

Conclusions: Baseline ACE-R scores were not predictive of FIM change. ACE-R showed greater utility in identifying patients who required additional support/resources, with ACE-R Fluency score and gender appearing to be independent predictors of this.

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Using eye-tracking glasses to evaluate the effect of visual scanning training on everyday activities

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Background and aims: Visual field defects are commonly found among stroke survivors and have a profound impact on activities of daily living

(ADL). Current rehabilitation approaches aim to improve the ADLs by using compensatory scanning training to improve visual search. Little is known, however, about the transfer of these training effects to dynamic everyday situations such as running errands in a shopping mall.

Recent advances in technology have seen the development of eye tracking glasses. Worn like a normal pair of glasses, they allow eye movements in the 'real world' to be captured. This single-case study examined whether the glasses can be used to investigate the effects of compensatory scanning training in everyday situations.

Method: SMI Eye tracking glasses (SensoMotoric Instruments GmbH, Berlin, Germany) were evaluated on a 47-year old man suffering from a right-sided homonymous hemianopia receiving Neuro Vision Technology (NVT) scanning training. His eye movements were assessed during a computerized visual search task and in an uncontrolled walking task. The number of fixations and time spent looking to the left and right sides of space were determined.

Results: In both tasks, a marked asymmetry for exploring the right-side over the left-side of space was found.

Conclusions: The results indicate a typical over-compensation of eye movements towards the visual field defect. While this case report cannot determine whether the compensatory movements transferred from the computerized scanning training to the dynamic walking task, it introduces a promising tool for evaluating the effect of visual scanning training on everyday activities.

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Criterion and convergent validity between Impulsive Behavior Scale – Urgency, Lack of premeditation, Lack of Perseveration and Sensation Seeking (UPPS) and Barrat Impulsiveness Scale (BIS-11) in patients with bipolar disorder

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Background and Aim: Impulsivity is often associated with bipolar affective disorder, with serious behavioral consequences for these individuals and families. However, there is no consensus in the literature regarding the concept of "impulsiveness". This study aimed to investigate the association between components of impulsivity scales underlying the BIS-11 and UPPS-Impulsive Behavior Scale, in order to obtain evidence of both criterion and convergent validity.

Method: N=46 control group, mean age=48.42 (SD=14.33) years, 63%female and 82% with high school. N=41, clinical group (depressed bipolar patients), mean age=40.75 (SD=12.97) years, 78%female and 30% with high school or complete ongoing. The instruments used were BIS-11, UPPS Impulsive Behavior Scale and Beck Depression Inventory (BDI).

Results: Mean score on BDI in the clinical group was 21.9 points (SD=12.3) indicating moderate symptoms, and in the control group the average was 6.9 points (SD=5.4), absence of depressive symptoms. Cronbach's alpha ranged between 0.80–0.85, except at BIS-11 Lack of Planning component ($\alpha = 0.52$).

Significant associations ranging from weak to moderate between the scores of UPPS and BIS-11 were found, except at UPPS Sensation Seeking Correlation coefficients. Measure of inhibitory control of BIS-11 showed moderate associations with the three UPPS scores ranging between 0.44–0.57. Already a measure of lack of planning showed weak but significant associations with UPPS Urgency and UPPS Perseverance ($0.23 < r < 0.27, p < 0.05$) and a moderate association with UPPS Premeditation ($r = 0.40, p < 0.05$).

Discussion: Results demonstrated satisfactory criterion and convergent validity of UPPS. The non-significant results of UPPS Sensation Seeking Correlation coefficients could be explained considering the mood state of clinical group.

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Comparison between performance on Impulsive Behavior Scale – Urgency, Lack of premeditation, Lack of Perseveration and Sensation Seeking (UPPS) of patients with depressive bipolar disorder and general population

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Background and Aim: Impulsivity in Bipolar Disorder (BD) has been related to functional deficits, risk behaviors and activities with high potential for obtaining negative consequences, e.g. suicide attempts and drug abuse. The current lack of a common definition of impulsiveness can be one of the factors preventing progress toward the understanding of impulsive behavior. The aim was to evaluate the performance of patients with BD on the UPPS.

Method: A control group comprised of healthy volunteers, $n = 46$, mean age of 43.8 (SD = 11.8) years. The clinical group consisted of $n = 41$ bipolar patients, mean age of 41.8 (SD = 12.3) years. The Beck Depression Inventory (BDI), and the UPPS Impulsive Behavior Scale were used. UPPS is subdivided into four factors, namely: Lack of premeditation, lack of perseveration, sensation seeking and urgency.

Results: The mean score on BDI in the clinical group was 21.9 points (SD = 12.3), indicating moderate symptoms, and in the control group the mean score was 6.9 points (SD = 5.4), indicating the absence of depressive symptoms. Differences between groups were significant in all factors except the Sensation Seeking factor ($p = 0.42$).

Discussion: Results initially contribute to a better understanding of the construct of impulsivity in BD. The lack of difference between groups at Sensation Seeking factor can be explained, since the clinical group consisted of a sample with moderate depressive symptoms. However more studies are still needed in a sample of euthymic patients. In that way, they can carry out comparisons between impulsivity factors associated with mood states in BD and its outcomes.

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Irritability and aggression following brain injury: Toward the development of a cogent conceptual framework

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Background and aim: Irritability and aggression are prevalent following traumatic brain injury (TBI), affecting between 29–73% of persons with TBI. Despite their prevalence, irritability and aggression are understudied and not well understood. It is unclear, for instance, whether irritability and aggression are conceptually distinct or represent different degrees of emotional distress along a unified continuum. The aim of this study was to further elucidate the conceptual framework of irritability and aggression post-TBI.

Methods: Retrospective exploratory factor, item-response and item-level analyses were conducted of Neuropsychiatric Inventory (NPI) aggression and irritability subscale items rated by observers (e.g., caregivers) for 218 individuals with moderate-severe TBI on enrollment in 3 separate studies were used. The individuals with TBI were an average of 39.06 years old (SD = 13.26) and an average of 5.68 years post-injury (SD = 5.69). The sample was 53% female.

Results: The percentage of variance accounted for by both the first (Aggression) and second (Irritability) factors exceeded that accounted for by chance in statistically resampled data, suggesting two salient dimensions. However, the items loading most heavily on the Aggression factor exhibited high skewness and kurtosis, which can produce artifactual factors regardless of item content. Principal components analysis of Rasch item residuals suggested a unidimensional Rasch model. In the Rasch model, Aggression items indicated a more “difficult”, i.e., severe, level than Irritability items.

Discussion: Results suggest that post-TBI irritability and aggression have distinctive characteristics but are symptoms of the same underlying disorder. Aggression appears to be a more severe expression of this disorder.

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The impact of parental brain injury on teenage relatives: perspectives of teenagers and their non-injured parent

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Background and Aims: The numbers of adolescents growing up in families affected by brain injury is increasing due to improved survival. It has been recognised that these young people are at risk of behavioural and emotional problems but the impact of parental brain injury on social and educational function specifically is unclear. The current study seeks to respond to this gap by exploring the social and educational implications of living with a parent who has a brain injury. The study also seeks to identify the supports or professional input that parents and teenagers perceive to be beneficial for facilitating teenagers’ adjustment to changed family circumstances.

Method: This was a mixed-methods study comprising questionnaire and interviews with teenagers and their non-injured parents. A brief behaviour rating scale: the Strengths and Difficulties Questionnaire (SDQ) was used to objectify the psychosocial impact of parental brain injury while interview questions pertained to social participation, education, leisure and supports. Following interviews data will be analysed using descriptive statistics and content analysis.

Results and Conclusions: Data collection is underway and will be completed in March 2013 and results and conclusions will be presented.

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Developing a measure of self-awareness of falls risk and functional ability in the older population undergoing inpatient rehabilitation

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Background and aims: Research suggests that some older individuals may lack self-awareness of their falls risk; however, there is a lack of validated instruments that specifically measure this construct. The aim of this study was to develop a measure of intellectual, emergent and anticipatory self-awareness of falls risk in older people and evaluate its psychometric properties.

Method: Self-awareness was conceptualised as the discrepancy between patient-rated and physiotherapist-rated responses on the three-part scale. The intellectual, emergent and anticipatory awareness sections respectively measured knowledge of risk factors, accuracy of performance appraisal following a walking task, and ability to anticipate assistance required to complete an activity. Eighty participants aged over 60 years were recruited along with their treating physiotherapist and occupational therapist (OT). Inter-rater reliability between physiotherapists and OT, internal consistency, and convergent validity with another established measure of self-awareness (the modified Self-Regulation Skills Interview; (SRSI) were investigated.

Results: Inter-rater reliability between physiotherapist and OT for the intellectual, emergent and anticipatory section was acceptable (intraclass correlation coefficient = .74, .63, .81, respectively). Internal consistency for the three-part questionnaire was high (Cronbach's Alpha = .93). There was a significant Pearson correlation with the SRSI self-awareness index ($r = .47, p < .001$) and strategy generation index ($r = .53, p < .001$).

Conclusions: The results indicate adequate internal consistency, inter-rater reliability and convergent validity of the scale. The availability of a validated fall risk self-awareness measure will facilitate further research into the causes and consequences of poor self-awareness in this population, and the development of more effective prevention strategies.

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Benefitting Client, Family and Care Staff: Implementation of an Individualised Therapeutic Programme for a Long-Term Disorder of Consciousness Patient

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Background: More people are surviving severe brain injury with a disorder of consciousness (DoC) and long-term these clients are being cared for in

residential community settings. These settings can lack specialist intervention, skills and resources to care for a client with DoC. This study explored the benefit of implementing a comprehensive therapeutic programme for a 55 year old woman who was diagnosed as being in a persistent vegetative state nine years after her initial anoxic injury.

Aims: The study aims were: 1) To evaluate the benefit of providing an intensive therapeutic programme for the (a) client, (b) client's family, and (c) care staff in a residential community setting; and 2) To evaluate the benefits and difficulties in providing such a programme in a non-specialist setting.

Method: A single subject approach was chosen due to the heterogeneity of this client population. A therapeutic programme was then administered over a six month period.

Results: Benefits to the client, family and care staff were recorded. It was identified that the client was able to communicate yes/no responses reliably via a switch. This was nine years after her accident. Her care plan and daily treatment were altered as a result of this finding.

Conclusion: DoC clients may benefit from a specialist assessment and intervention long-term. This pilot study has highlighted the benefits to a participant, family and care staff from the provision of an individualised therapeutic programme.

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Entering the field of Sport Neuropsychology in Germany - a Pilot Project

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Background and aims: Sports is healthy as long as you don't get hurt. Concussions or mild traumatic brain injuries (MTBI) are common sports injuries. However, their prevalence and the risk of long term impairment is not known, underestimated or neglected by athletes, coaches and managers. There is an increasing international interest in this topic after long discussions and experiences in the USA. Programs have been developed to demonstrate risks and prevent athletes from further impairments after a MTBI. In Germany, this important field has not been addressed sufficiently to date.

Method: We have started a pilot project in our area (Würzburg, Germany) offering neuropsychological consulting for several sports teams (handball, basketball, soccer). We are providing professional training for managers, coaches and athletes to educate them about MTBI and its risks. Baseline testing of typical cognitive functions related to MTBI covers alertness, selective attention, divided attention, flexibility, working memory, short- and long-term verbal and visual-spatial memory. During the season, we are at the team's disposal as soon as someone suffers a MTBI and provide clinical assessment. We use these objective data to provide neuropsychological rationales to advise the athlete when and how to return to practice and play.

Result: Single case data so far indicates that the procedure which we have adapted to German standards is reasonable and accepted.

Conclusion: We think sport neuropsychology has not yet gained the significance it should have. Our goal is to encourage the general and sports public to pay more attention to MTBI's which should be taken more seriously, preventing athletes from further and even more severe brain damage.

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Individualised Cognitive Therapy through stimulation and Individualised SIMS (Sonas Individual Multi-Sensory Session) with Long Stay Psychiatry of Later Life subjects who have cognitive impairment

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Background: A recent randomised controlled trial on Cognitive Stimulation Therapy identified the need to evaluate its long-term benefits for people with cognitive impairment. Previous studies have aimed to evaluate its benefits in a group setting. This study aims to evaluate the benefit of and the sustainability of individual cognitive intervention on people with cognitive impairment.

Method: A mixed case analysis comparing two groups; Sonas Individual Multi-Sensory Session and Individualised Cognitive Therapy through stimulation. 10 participants were included and randomly assigned to an intervention group. The intervention comprised of 14 sessions. Assessment was carried out pre and post intervention with outcome measures used after each individual session. A 6-month follow up was conducted to explore sustainability.

Results: Individualised Cognitive Stimulation Therapy was found to be more effective than SIMS. However, both were identified to be of benefit cognitively as determined by scores on the Standardised Mini Mental State Examination (SMMSE) which had either been maintained or improved in all participants. Similarly other assessments and outcome measures used in the study maintained or improved their score with no cognitive decline detected.

Conclusion: The findings lend support that SIMS and Individualised Cognitive Therapy through stimulation have beneficial and sustainable effects as an individual intervention.

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Functional outcome after stroke: the influence of neglect on basic activities of daily living

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Background & Aims: One prominent deficit resulting from stroke is visuo-spatial neglect. Neglect has been associated with limitations in activities of daily living (ADL), but, so far, no neglect studies distinguished between ADL domains (e.g., locomotion, transfers, bowel management) in a repeated

measures design. The aim of the current study was to investigate the relationship between neglect and recovery in various ADL functions over time.

Method: 184 Stroke rehabilitation inpatients were included and assessed with a letter cancellation test and the Functional Independence Measure (FIM) in the first week of inpatient rehabilitation. The FIM was administered again at 6, 12, and 36 months post-stroke. The FIM consists of 18 items assessing 5 functions: Self-care, Sphincter control, Transfers, Locomotion and Cognition.

Results: Neglect and non-neglect patients obtained similar scores for Sphincter control and Cognition. Time-dependent recovery was also comparable. Contrarily, scores for Self-care, Transfers and Locomotion were significantly lower for neglect patients, although these differences became smaller with progress of time. Only for Self-care, differences between neglect and non-neglect patients were apparent at 3 years post-stroke.

Discussion: In the sub-acute phase, neglect has a negative influence on several, but not all ADL functions as measured with the FIM. With progress of time, independence improves for Transfers and Locomotion more than it does for Self-care. Detailed knowledge on the course of ADL independence and the relation with neglect is of practical use to rehabilitation health professionals; it would enable them to develop a more differentiated prognosis and rehabilitation programs.

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Is it possible for healthy older people to benefit from cognitive rehabilitation? A Pilot Study with REHACOP

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Background and aims: Cognitive decline associated with aging is a well established feature. REHACOP is a neuropsychological rehabilitation program initially designed for psychosis, but we adapted it for older people's characteristics. The aim of this study was to examine the efficacy of REHACOP among healthy older people.

Method: Twenty-one healthy participants were randomly allocated into experimental or control groups. The participants allocated on the experimental group (N = 9) received a cognitive rehabilitation (REHACOP). They attended 36 sessions of 90 minutes during three months. Patients under control condition (N = 7) performed occupational activities. Participants underwent neuropsychological pre- and post treatment assessments. Attention was assessed with Digit Forward and Digit Backward subtest from Wechsler Adult Intelligence Test- III (WAIS-III) and Verbal Learning and Memory with the Hopkins Verbal Learning Test.

Results: There were no significant differences between groups in age ($F = 0.12, p = 0.72$), sex ($\chi^2 = 0.90, p = 0.61$), years of education completed ($F = 0.01, p = 0.97$) or premorbid intelligence ($F = 2.13, p = 0.16$). Repeated measures MANOVA showed that the experimental group improved significantly in attention and memory, when compared to controls. Group x Time interactions were significant for Digit Span ($F = 21.91, p < 0.001$), verbal learning ($F = 4.61, p < 0.05$) and memory ($F = 4.59, p < 0.05$), showing that the experimental group improved significantly when compared to controls.

Conclusions: Our results suggest that REHACOP is an effective cognitive remediation program for improving attention and verbal learning and memory

among healthy older people. These findings support the implementation of neuropsychological rehabilitation in this population, which may be in turn a protective factor for dementia.

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The Contribution Of Enb-2 Score For Subjective Syndrome

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Background and aims: Post-concussion and subjective syndrome refer to a variety of persistent somatic, cognitive and behavioural/emotional symptoms (Carroll et al., 2004). These symptoms are also common in other types of cerebral lesions in the absence of TBI (Bazarian et al., 1999). Pre-existing or comorbid conditions, like personality or other stressful life events, can maintain or even worsen its effects (Greiffenstein and Baker, 2001). Psychological vulnerability does not facilitate the compensation of subclinical neuropsychological functioning and may exacerbate it leading to subjective syndrome. From the other side, part of a good recovery over time is probably due to behavioral adjustments to post-trauma conditions (Bernstein, 1999). We aim to explore if patients with good recovery, but needing psychological support for problems in behavioral adjustment, have lower scores in the neuropsychological functioning.

Method: Retrospective study. We selected all the 47 participants with best Level Cognitive Functioning score (8/8) from the population of 1331 patients with acquired brain lesions. We classified them into two groups: suggested (S, N = 20) vs not suggested (nS, N = 27) psychological support. We considered ENB-2 (neuropsychological battery) global scores and psychological counselling. T-tests and ROC curve analysis were computed.

Results: Group S performed worse than group nS in the ENB-2 ($t = -2.63$, $p < .05$). ROC curve analysis showed a cut off score (74.5) with a perfect sensitivity and a lower specificity in screening patients who will probably need a psychological support with normal performance in ENB-2.

Conclusions: Subclinical neuropsychological performance may reflect unsuccessful psychological adaptation in post-lesional good recovery

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The Contribution of Clinical Neuropsychologists in German Outpatient Neurorehabilitation

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Background and aims: Most German outpatient neurorehabilitation centres are organized in the German Federal Association of Outpatient Neurorehabilitation (BV ANR). We investigated how these centres achieve the objectives anchored in social legislation as defined by the International

Classification of Functioning, Disability and Health (ICF). With a focus on differences in structures and processes, we analyzed the standing of neuropsychology.

Method: Twenty-two outpatient neurorehabilitation centres participated in an online survey with 227 items using the Google tool “Docs” from September to December 2011. The survey is part of a long-term outcome study.

Results: All participants reported to implement ICF guidelines. However, frame conditions differed due to a variety of contract structures with different health and care insurance providers. All reported to employ neuropsychologists at a mean ratio of about one neuropsychologist per 20 patients. While almost all participants provide individual ($n=22$) and group therapy ($n=20$), only seven centres reported to implement interdisciplinary groups and only twelve collaborate with established outpatient neuropsychologists for after-treatment. Centres offering after-care for socio-professional reintegration and participation employed, in relation, the highest number of neuropsychologists.

Conclusions: Neuropsychology is well established in the field of German outpatient neurorehabilitation. Apparently, the significance of neuropsychological therapy increases towards the end of the medical rehabilitation process when goals of socio-professional reintegration are prominent. The amount of contribution to the overall rehabilitation outcome is still unknown. The ongoing long-term outcome study is intended to produce reliable data for German outpatient neurorehabilitation.

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Increased participation level for people with aphasia in the chronic phase after stroke

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Background and Aims: Aphasia, due to stroke interferes enormous with daily life. In the chronic phase very few interventions are available. We developed a new intervention, directed at increasing participation for patients with chronic aphasia.

Design: A prospective waiting-list control design.

Intervention: ‘Talking-Stick’: a group intervention, based on the communication-goals (based on optimizing participation) of the patients. Patient practice communication skills: within the intervention group and at home.

Outcome measures: Aken Aphasia Test (AAT) (only at baseline), Birckhoven Evaluation scale Treatment Goals Aphasia (BEBA), Community Integration Questionnaire (CIQ), Stroke Adapted Sickness Impact Profile (SA-SIP). Assessed before start intervention, directly after intervention, 6 months after end intervention.

Results: 45 patients (27 men-18 women; mean age 55.8, mean time since stroke 1.8 years; 5 in the waiting list group). Patients in the waiting list group did not change from baseline to 6 months later on any measures. Patients in the intervention group improved significant from baseline to the assessment directly after the intervention, on all goals set at baseline on the BEBA (the spoke more frequently, felt more confident, were more independent and were

happier with their lives compared to baseline), also they improved on the CIQ. These improvements remained at the 6 months follow-up.

Conclusions: It is possible to improve participation communication skills of patients with aphasia, in the chronic phase after stroke.

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A Comparison of Implicit and Explicit Instructions when Using the Method of Vanishing Cues to Teach People with Acquired Brain Injury

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Background and aims: This study compared two forms of the method of vanishing cues – one in which the learning trial instructions encouraged the use of explicit memory, and one in which they encouraged implicit memory.

Method: In a repeated measures design, 34 participants with acquired brain injury learned word lists in the two instructional conditions.

Results: As hypothesized, explicit instructions resulted in fewer errors during the learning trials and better performance on an immediate and a delayed retention test; and this advantage for explicit instructions was reduced for those with more severe memory and executive impairments.

Conclusions: Explicit instructions may be preferable for those with less severe memory and executive impairments, but the data suggested the need for further exploration of the possibility that those with more severe impairments may actually do worse under explicit instructions.

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Methodological steps to create a video game to rehabilitate ADHD Adolescents

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Background and aims: Many studies have demonstrated that the positive use of video game impacts a number of cognitive functions. From a therapeutic standpoint this cognitive enhancement provided by the games could be used in many types of psychiatric conditions. In this study we aimed to evaluate the different levels of usability and immersion of a video game built for ADHD adolescents' rehabilitation.

Methods: Usability and immersion data was collected through Mechanical Turk (<https://www.mturk.com/>), a mechanism for online data collection. Players were exposed to a game designed to train attentional inhibitory control and subsequently the usability of immersion constructs were evaluated.

Results: The initial study evaluated 13 subjects aged from 20 to 46 years ($M = 27.46$, $SD = 7.76$). On the usability scale ($M = 70.00$, $SD = 17.32$) subjects showed that the game had mild, but important problems. Immersion factors were assessed and showed that cognitive engagement ($M = 34.69$, $SD = 16.87$), emotional engagement ($M = 34.53$, $SD = 17.58$) and control ($M = 24.69$, $SD = 11.80$) were all in positive ranges, however dissociation

from the real world ($M = -3.9$, $SD = 3.7$) and challenge ($M = 15.07$, $SD = 9.15$) were not reached by the game.

Discussion: The results show that usability is an important factor to be considered when creating a game and contributed as a barrier to subject's immersion. With regard to immersion, the game features are highly engaging; however it is not immersive in the actual creation stage.

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Improving orientation in individuals with an acquired brain injury: a series of single case studies

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Introduction: Disorientation to time, place and situation, and on occasion, to person is a common sequela of an acquired brain injury (ABI). It has been proposed disorientation may be due to retrograde amnesia, failure in learning novel information or anterograde amnesia. The impact of disorientation on the person's daily life can present in negative behavioural response. In the following studies, the question of disorientation being caused by failure to learn new information was explored. Also the question of whether increased orientation helped decrease negative behaviour patterns was considered.

Method: In all three studies, treatment was carried out by presenting orientation questions orally coupled with visual stimuli. The orientation questions were based on the Galveston Orientation and Amnesia Test (GOAT; Levin et al., 1979) However, pertinent personal orientation questions were added.

Results: Results suggest that correct responses more frequently occurred when visual stimuli was coupled with oral questioning. All participants responded correctly to nearly 100% of all orientation questions within 14 days of initiating flashcards. At follow up (3, 6, 12 and 16 weeks) 80% retention was achieved. Qualitative report suggested that, as orientation increased, a decrease was noted in reassurance seeking behaviours.

Conclusions: These studies demonstrate the efficacy of improving orientation using a repeated multisensory approach. They also highlight increasing orientation can result in a decrease of negative behavioural sequelae such as repetitive reassurance seeking.

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Efficacy of a Multisensory Environment as a therapeutic intervention in Acquired Brain Injury: a series of single case studies

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Introduction: There has been significant argument over recent decades as to whether a multisensory environment has a benefit as a therapeutic intervention; where the overactive can be calmed, and the inactive become interested and stimulated. There has been little research to support the use of multisensory environments in brain injury, especially in adults. The efficacy of such an intervention was explored with a number of brain injured individuals resident in a rehabilitation unit.

Method: Five case studies are reported. Assessment was completed to ascertain individual need and this was matched to specific sensory equipment.

Results: Using a qualitative approach, obtained results suggest matching specific behaviours with specific sensory equipment, then monitoring and adapting the sensory intervention results in positive changes. These changes generalised outside of the multisensory environment.

Conclusions: These studies demonstrate the efficacy of the use of multisensory environments in adults with brain injury. Such an environment can be used to stimulate, relax, calm or energise and can be staged to provide a multisensory experience or a single sensory focus simply by adapting the lighting, atmosphere, sounds and textures to the specific needs of the resident at the time of use. Further research is needed in particular in using standardised assessment measures to measure outcome.

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The role of interdisciplinary neuropsychological formulation and intervention to maximise outcome for an individual with long-standing unilateral hemi-inattention

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Background and aims: Hemi-inattention is a common consequence of brain injury. For individuals that experience prolonged symptoms it is a significant barrier to independence, impacting across functional areas. Addressing hemi-inattention is therefore a primary focus for treating clinicians. Although the efficacy of interdisciplinary treatment is widely recognised, conceptualisation and integrated goal-planning can be difficult to achieve. An advantage of a neuropsychology led residential treatment programme is that it enables complex holistic formulation to guide interdisciplinary treatment goals. This study describes an example of interdisciplinary formulation for complex neurocognitive and physical impairment, including hemi-inattention.

Method: An individual with a traumatic brain injury, left upper-limb hemiplegia with complications of hypertonia and oedema, and additional right hemisphere vascular injury was admitted to a residential rehabilitation programme. Neuropsychological formulation guided interdisciplinary treatment planning, with a focus on impairment-based and functional intervention. Intervention included auditory and visual attention training, left upper-limb physical rehabilitation and functional task practice. Post-intervention functioning was compared to baseline measures.

Results: Intervention proved beneficial across neurocognitive, physical and functional measures when compared to baseline. This included improvements in hemi-inattention, use of left upper-limb, metacognitive awareness of impairments, and support need reduction.

Conclusions: Interdisciplinary treatment led by neuropsychological formulation was effective for an individual with complex physical and neurocognitive impairment.

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Intensive rehabilitation at five years post-injury can improve functional outcome and reduce support needs

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Background and aims: Severe acquired brain injury (ABI) results in long-term disability, with implications being far-reaching for areas including economic and social well-being. The efficacy of interdisciplinary treatment following ABI is well documented; however the benefits, sustainability and cost-effectiveness are less clear. This study highlights the functional gains made by an individual with a severe ABI at five years post-injury following intensive treatment.

Method: A 55 year-old male, five years post-injury, with a diagnosis of bilateral subdural haematomas, participated in a period of intensive residential rehabilitation. The individual had previously received initial post-acute inpatient treatment then residential care with limited outpatient rehabilitation. The individual's neurobehavioral profile on admission was characterised by severe neurocognitive impairments, dysexecutive syndrome and challenging behaviour. Interdisciplinary rehabilitation was guided by neuropsychological formulation. Interventions targeting physical, cognitive, and communication skills were conducted at impairment-based and functional levels. Enhancing family coping and behavioural management through education/training were further treatment aims.

Results: Significant progress was achieved between admission and discharge from the programme. The Mayo-Portland Adaptability Inventory (MPAI-4) demonstrated a reduction in physical, cognitive, emotional, behavioural, and social problems. Supervision and support needs also reduced.

Conclusions: Investment in a six-month period of intensive neurobehavioural rehabilitation had benefits including improved independence and family functioning, community re-integration, and cost-effective reductions in support needs for an individual five years post-injury. Results demonstrate the importance that interdisciplinary neuropsychological understanding can bring to the longer-term treatment outcome.

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Reducing length of stay in a neurorehabilitation unit- evidence based policy

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Background and aims: Length of stay (LOS) is a major performance marker for hospitals and individual departments in the UK. In 2013, as part of national service reconfiguration of NeuroRehabilitation, the UK Department of Health (DH) has put 1 of the 3 process related performance. The proposed tariff system provides financial incentives for specialist Units to discharge patient as soon as possible to reduce the LOS.

Method: Prospective data collection of all patients in a University hospital, UK for 2 years to ascertain reasons for Delayed Discharge (DD). After the action plan was implemented, 2 separate spot surveys were distributed by executive

director and commissioner. The commissioner and internal staff collected a 3rd prospective data in the last 6 months of 2012.

Results: From April 2009-March 2010 the mean LOS of the 149 patients admitted was 32.42 days (SD; 31.18) (Range: 1–193 days).

The DD resulted in a 441 days total bed lost for 12 patients costing £158760. (£360 / bed day cost in this Unit). The reasons were lack of social care facilities, poor social network and lack of capacity in the County Council.

The spot survey in April and June 2012 by the Executive Director & the lead Commissioner of the County showed that 9 out of 19 patients were awaiting discharge. During 6 months (August 2012 to 2013), 7 patients were DD totaling 54.5 weeks extra LOS which is equivalent to £114,660.

Conclusions: Despite the investment in the Unit and increased capacity in the private sector paid for by the NHS, the situation had hardly improved. Social determinants influence LOS even in the younger population (mean age 53yr) in a NeuroRehabilitation Unit.

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Can word retraining programs provide meaningful benefits to patients with Semantic Dementia?

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Background and aims: Semantic Dementia (SD) is an incurable neurodegenerative disease characterized by significant, progressive impairments to naming and comprehension. Recent studies, however, have shown that SD patients can re-learn words following training. How patients at different stages of the disease can maintain these words, and whether relearned words can be applied beyond the training task is not well understood and deserves investigation.

Method: Two patients (SD-mild and SD-severe) completed an intensive on-line word-training program involving daily repetitive practice of word-picture pairs of household items over a two-month period. A multiple-baseline-across behaviours (word lists) design was employed, with picture naming ability assessed before, during and at monthly intervals following training. Generalisation of learning to other contexts was evaluated using video scene description, word-picture-matching, and verbal comprehension tasks (completing actions around the house), pre- and post-intervention.

Results: Both patients showed substantial improvements in picture naming ($p < .001$), achieving 95% and 88% accuracy respectively. Within 2 months post-training, SD-severe required further weekly learning sessions to maintain words. In contrast, SD-mild showed some reduction over time but could independently maintain performance above 80% accuracy. Improvements extended across other tasks for SD-mild (video description: $p = .001$, accuracy 85%; verbal comprehension: $p = .031$, accuracy 89%), and to a lesser extent for SD-severe (video description: $p = .03$, accuracy 57%; word-picture-matching: $p = .039$, accuracy 75%).

Conclusions: Word training can deliver practical benefits, particularly in mild SD patients. With increased disease severity, ongoing practice may be required

to maintain words, with the ability to apply knowledge to other contexts lessened.

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The Outing Group: A Project based group within a neurorehabilitation setting

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B **background and aims:** Our study is based on work by Feeny and Capo (2012) and Ylvisaker (2007) who found that project based work fosters meaningful engagement, motivation, autonomy and skills of inquiry, all of which have positive effects in cognitive domains. This paper describes the development of a project designed to give individuals the opportunity to participate in activities of their choosing, enhance their cognitive functioning, and develop positive social relationships and meaningful roles within the context of the group.

Method: A project based group involving 6 adult participants with brain injury, was run by the speech and language and music therapist over 10 weeks within a residential setting. Each session was planned to develop and progress the project. An outcome measure designed by the therapists that measured areas of cognition, psychosocial and executive functioning was used to evaluate the group. Participants also set personal goals and were assigned a meaningful role that required an active contribution to the success of the outing. The participants worked collaboratively to create ideas, research, make choices, negotiate, plan and organise the outing which culminated in going on the outing.

Results: Gains were seen in the areas of attention, memory, initiation and drive, awareness and social skills. There were marked improvement in psychological wellbeing; however, less improvement was seen in organisation and sequencing and generative thinking.

Conclusion: The outing group was deemed a success by participants and according to our outcome measures. It demonstrated that when adults with brain injury are offered the opportunity to create and engage in activities of their choosing positive outcomes can be achieved.

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Treatment of unawareness of deficits in patients with acquired brain injury: a systematic review

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B **background and aims:** Unawareness of deficits is a well-known clinical problem following acquired brain injury (ABI). It is associated with

diminished treatment motivation, adherence and performance, and an unfavorable employment outcome. There are no well-established clinical guidelines for treating unawareness of deficits after ABI. Therefore the aim of this study was to review the available treatment methods for unawareness of deficits after ABI, and evaluate their effectiveness and methodological quality.

Method: Systematic literature search for treatment studies for unawareness of deficits after ABI. Information concerning study content and reported effectiveness was extracted. Quality of the study reports and methods were evaluated.

Results: 471 articles were identified: 25 met inclusion criteria; 16 were uncontrolled or single case studies. Nine were of higher quality: two randomized controlled trials; five single case experimental designs; one single case design with pre - and post-treatment measurement; and one quasi-experimental controlled design. Overall, interventions consisted of multiple components, including education and multi-modal feedback on performance. Five of the nine high quality studies reported a positive effect of the intervention on unawareness in patients with some knowledge of their impairments.

Conclusions: Patients with ABI may improve their knowledge of disabilities and possibly reach a level of awareness at which they personally experience problems when they occur. There is no convincing evidence that treatment improves awareness in patients with complete unawareness in the chronic phase of ABI. We recommended developing and evaluating theory-driven interventions specifically focused on disentangling the components of treatment that are successful in improving awareness. High quality studies are needed.

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The feasibility and efficacy of computer-based prism adaptation to ameliorate neglect in sub-acute stroke patients submitted to a rehabilitation center.

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Introduction: There is wide interest in transferring paper-and-pencil tests to a computer-based setting, resulting in more precise recording of performance. Here, we investigated the feasibility of computer-based prism adaptation (PA) to ameliorate neglect in sub-acute stroke patients submitted to a rehabilitation center.

Methods: 33 neglect patients were included. PA was performed with a pair of goggles to induce an ipsilesional optical shift of 10 degrees. A variety of neuropsychological tests were performed using a tablet immediately before and after PA.

Results: All 33 patients (mean age 60 (SD 13.30)), (mean days post-stroke 63.73 (SD 37.74)) were able to work with the tablet and to understand and perform the digitalized tests, indicating that there is feasibility of computer-based testing. However, some patients were not successfully adapted after PA and were excluded from analyses on efficacy of PA.

Preliminary analyses of the efficacy of PA, as assessed with digitalized neglect-tests, did not reveal significant changes in deviation from the actual center

on the line bisection nor in number of omissions on the cancellation tests. Additionally, no significant shift in the location of the omissions was found.

Discussion: The lack of general improvement is in line with the conclusion in a recent review (Schenk et al., 2012); a single session of PA does not ameliorate neglect in all patients. Our design was not fit, however, to fully evaluate effects of PA. Future randomized control trials, using computer-based tests and multiple PA procedures, are needed to investigate efficacy and generalizability of effects.

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The impact of 'SenseCam', a wearable camera, on memory, identity and mood in Korsakoff's Syndrome: a single case experimental design study

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Background and aims: To investigate the impact of using SenseCam, a wearable, automatic camera, on subjective mood and identity in a patient, Ms A, with severe memory impairment as a result of Korsakoff's Syndrome. It was hypothesised that SenseCam would improve Ms A's mood and identity through enhancing her recall of autobiographical memories of recent events, and therefore support a coherent sense of self; the lack of which was contributing to Ms A's mood deterioration.

Method: An ABA single case experimental design was implemented to investigate whether using SenseCam to record regular activities would impact on Ms A's mood and identity.

Results: Ms A experienced improved recall for events recorded using SenseCam, and showed some improvement on subjective ratings of identity. However, a corresponding improvement in mood was not seen. Qualitative information was gathered to explore Ms A's experience of the study, and investigate psychosocial factors that may have impacted on the use of SenseCam.

Conclusions: SenseCam may be of significant use as a compensatory memory aid for people with Korsakoff's Syndrome and other types of ARBD, but acceptance of memory impairment and consistent support may be amongst the factors required in order to support the use of such assistive technologies in a community setting.

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A Paediatric Case of Dancing Eye Syndrome (Myoclonus Opsoclonus Syndrome)

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Background & aims: Dancing Eye Syndrome (Opsoclonus–Myoclonus Syndrome) (DES/OMS) is a rare condition characterised by opsoclonus (rapid, involuntary, multidirectional eye movements), ataxia with myoclonus, irritability, sleep disturbance and mutism, sometimes associated with neuroblastoma. Literature suggests that age at onset is typically around 18 months old and the condition is no more prevalent in any specific ethnic group. The incidence rate of DES/OMS in children in the UK is 0.18 new cases per million total populations per year (Pang, de Sousa, Lang & Pike, 2010). The limited

research available regarding outcome indicates the possibility of intellectual impairment, speech, motor and behavioural difficulties.

Method: We introduce Chloe, a nine-year-old female diagnosed with DES/OMS without neuroblastoma at the age of two-years. We reveal the neuropsychological and psychological assessment battery compiled for this case assessing cognitive domains including memory (CMS), general intellectual abilities (WNV & WISC-IV) and emotion and behaviour (SDQ). The particular case we present is complicated by cultural and language issues and we discuss the challenges of differentiating these factors from condition specific deficits.

Results: At nine-years-old Chloe demonstrates significant difficulties in learning, memory, and behaviour. Complex cultural and language considerations were evident throughout the assessment, speaking three languages and having recently entered the UK education system.

Conclusion: We present a review of the literature on this condition, neuropsychological assessment findings and recommendations for rehabilitation. The importance of informing educational provision and community based support in this case is highlighted, particularly due to complex cultural and language concerns.

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A survey of school support for adolescents with acquired brain injury: Effective overall, but room for improvement in communication, transitions and planning

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Background: Adolescents with acquired brain injury (ABI) often have specific support needs related to school as a result of their impairments. Concerns have been raised regarding the implementation of support in the school setting. It is suggested that the process of knowledge transfer between clinicians and educators is one area where breakdown occurs. Clinicians know what to do from a health perspective and educators know what to do from an education perspective, but dovetailing this knowledge is problematic. This study aimed to survey current practice in the health and education sectors surrounding the return to school of students with ABI.

Method: A semi-structured interview was conducted with 148 participants regarding the experiences of 43 student referents. Participants comprised 32 students, 41 parents, 34 health respondents and 41 education respondents.

Results: The majority of students received support from professionals. A wide variety of supports across 33 different areas was provided to students at school. On average 9.6 supports were provided to each student and, as expected, students with high needs received more supports than students with low needs.

Conclusions: Overall, the results of the survey were positive. Areas of difficulty were examined in order to identify three areas for improvement: knowledge of brain injury and communication, transitions to be planned for in a timely manner and appropriate supports provided, and planning with joint input from health and education sectors.

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Evaluation of a support and information group for parents of children with hydrocephalus

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Background and Aims: Hydrocephalus is a condition associated with an abnormal accumulation of cerebrospinal fluid in the ventricles of the brain often leading to raised intracranial pressure. It has varied aetiologies and can occur congenitally or secondary to intracranial haemorrhage, infection or tumours (Kandasamy et al., 2011). It can be a lifelong condition and high levels of parental concern are common (Kulkarni et al., 2007). We present the findings of our evaluation of a pilot support group for parents of children with hydrocephalus.

Method: Six fortnightly sessions hosted by qualified psychologists and a charity representative were held at a regional neurosciences centre. Pre and post group evaluation measures included a Hydrocephalus Concerns Questionnaire for Parents (HCQ-P; Kulkarni, 2006); alongside Knowledge of Hydrocephalus, Hopes and Fears and Parental Satisfaction questionnaires.

Results: A Wilcoxon Signed Rank Test revealed a statistically significant increase in both parental understanding of paediatric hydrocephalus ($z = -3.41$, $p < .01$, $r = .62$) and also parental concern ($z = -2.43$, $p < .05$, $r = .57$). A large majority indicated that the group met all of their previously identified hopes and that they would recommend the group to others. Meeting other parents, sharing experiences and asking questions were highlighted as particularly helpful. Additional time for discussion and sharing views was requested.

Conclusions: We present positive findings. Parental understanding of hydrocephalus was increased as was parental concern, although this did not affect satisfaction. Parents particularly appreciated the opportunity for discussion with other parents and professionals. We present considerations and lessons learned for further parent groups.

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An evaluation of parental experience of a paediatric neuropsychology service: Indicators for service quality and improvement

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Background and Aims: Assessing the quality of services from the perspective of the service user has become increasingly important. It is of interest to service users, clinicians, healthcare managers, public policy analysts, and service commissioners and it is essential for informing service quality improvements. Two prior North American studies have employed questionnaire measures of satisfaction (Farmer and Brazeal, 1998; Bodin et al., 2007). We aim to augment these studies through conducting a mixed-methodology study, investigating parental experience of the service and of their child's paediatric neuropsychology assessment.

Method: The study was undertaken in the paediatric neuropsychology service of a regional neurosciences centre. Postal surveys and semi-structured interviews were conducted. A critical realist perspective to thematic analysis was used for transcript analysis.

Results: Responses from 18 families (43% response rate) were received of which 8 were interviewed. A high level of satisfaction was identified. Themes presented relate to service delivery variables, contextual factors and the role of the service in facilitating understanding and informing rehabilitation. Sub-themes included the following factors: therapeutic engagement; trauma and grief; the psychologist as an advocate for the child; practical rehabilitation strategies; developing insight into cognitive deficits; pre-assessment anxiety; and issues relating to the written reporting of findings.

Conclusions: We present findings of a high level of satisfaction with this service. The specific aspects of service delivery, service value and systemic context that were identified as important to families are presented alongside indicators for service improvement.

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Proactive coping in stroke patients: Feasibility and psychometric properties of the Proactive Competence Inventory

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Background and aims: Proactive coping entails anticipating on potential negative consequences of stroke in advance to deal with these as effectively as possible. In this study, the feasibility and psychometric properties of the Proactive Competence Inventory (PCI) were explored. Furthermore, the relationship of proactive coping with health-related quality of life (HRQoL) was examined.

Methods: A total of 55 stroke patients (≥ 18 years) completed the PCI to assess proactive coping competencies, the Utrecht Coping List (UCL) to assess different coping styles and the short Stroke Specific Quality of Life Scale (SSQoL-12) to assess HRQoL.

Results: The PCI showed excellent reliability (Cronbach's $\alpha = .95$) and acceptable score distribution. Construct validity was shown by moderate, positive relations with UCL active problem solving ($r = .36$), and moderate, negative relations with UCL passive reactions ($-.49$), UCL avoidance ($-.38$) and UCL expression of emotions ($-.39$). No significant relations ($p > .05$) were found between PCI and UCL palliative reactions, UCL seeking social support and UCL reassuring thoughts.

Correlations between PCI and HRQoL domains were moderate to strong (.48-.61), and were higher than correlations between UCL scales and HRQoL domains.

Conclusions: The PCI showed to be a reliable, feasible and valid measure in stroke patients. This study was the first to indicate potential benefits of proactive coping strategies in stroke. Future research is recommended to confirm our results and to explore ways to enhance proactive coping in stroke patients.

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“Plan ahead!”: Treatment protocol of the Restore4Stroke self-management intervention based on proactive action-planning

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Background and aim: Stroke patients and their partners are often restricted in their daily lives by the consequences of stroke. A new self-management intervention has been developed to teach stroke patients and their partners to cope proactively with these consequences, in order to improve their participation. We aim to provide a description of the rationale behind and content of this intervention.

Description of the intervention: “Plan ahead!” is a group self-management intervention specially developed for stroke patients living at home (stroke ≥ 2 months ago) and their partners. Characteristics of this intervention are (1) proactive action planning as the main constituent, (2) stroke-specific elements, and (3) considering partners as full participants. The intervention lasts ten weeks, with six two-hour sessions in the first six weeks and a two-hour booster session in the tenth week. Groups consist of four stroke patients and, if possible, their cohabiting partners. It is provided by two healthcare professionals with at least a Higher Professional Education degree in healthcare and experience of group counselling and working with patients with brain injury.

Discussion: This intervention is expected to increase the use of proactive action planning and thus reduce the impact of stroke on the daily lives of stroke patients and their partners. It is based on the proactive coping theory and innovative in its aim to change behaviour patterns of participants directly, teaching participants a general action planning strategy and considering partners as full participants with their own goals and opportunities.

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Participation and psychosocial functioning of patients with Myotonic Dystrophy

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Background and aims: Myotonic Dystrophy type 1 (MD) can be seen as a multisystemic disease. Besides the muscular system, the brain is also

involved. When the central nervous system is affected there are neuropsychological complaints (cognition, behavior, mood and fatigue) and participation is subsequently affected negatively. The aim of the study is to investigate the level of neuropsychological functioning, and to determine factors related to participation of MD-patients.

Method: Cross sectional survey (n = 66). Participation was evaluated using the Utrecht Scale of Evaluation of Rehabilitation-Participation. Determinants were physical characteristics (Muscular Impairment Rating Scale, Fatigue Severity Scale, Epworth Sleepiness Scale), neuropsychological characteristics (Cognitive Failure Questionnaire, Apathy Evaluation Scale, Hospital Anxiety and Depression Scale), and social support (Social support List). Statistics included assessing score distributions and Spearman correlations.

Results: 68% had mild paralysis, 76% reported severe fatigue, 28% excessive daytime sleepiness, 13% cognitive complaints, 52% apathy, 31% anxiety, 13% depression. Age (Spearman's coefficient, -0.54), sleepiness (0.26), fatigue (-0.32), apathy (-0.30) and emotional complaints (-0.30) were significantly associated with more restrictions of participation, particularly in activities outside their home environment. If patients were more fatigued (-0.39) and had increased emotional complaints (-0.51), they were less satisfied with their participation level. The frequency of participation was lower with increasing age (-0.39) and increased levels of apathy (-0.33).

Conclusions: MD is a complex disease with physical and internal impairments. A considerably number of MD-patients have neuropsychological impairments. Risk factors for lower participation are age, sleepiness, fatigue, apathy and emotional symptoms. More attention should be paid to the neuropsychological disturbances.

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Efficacy of a Multimodal Therapy of anomia due to a failure of access to the phonological lexicon

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Introduction: Efficacy of phonological therapies to improve naming disorders is still controversial, especially for generalisation to untrained words. We created a phonological multimodal computerised therapy involving both oral and written tasks, using an error reduction learning method (AFDM). Two specific treatments were developed for fluent and for non fluent aphasia. We previously demonstrated efficacy of the therapy for fluent aphasia in a single case study, including generalisation to untrained words, maintenance and transfer in daily life¹.

Objectives: To assess the efficacy of the treatment dedicated to non fluent aphasia.

Methods: A single case experimental design therapy was used in a 62 year-old man with chronic severe non-fluent aphasia consecutive to cerebral infarction. He exhibited word finding disorder due to a failure of access to the phonological lexicon. We used the word finding therapy with phonological facilitations and multimodal procedure to address access to the output phonological lexicon

from AFDM. Effects for trained words, generalisation to untrained words and maintenance were tested.

Results: After therapy, verbal naming of both trained and untrained words improved significantly ($p < 0,001$). The improvement was maintained after six weeks without therapy.

Discussion: This study demonstrates the effect of a therapy of word finding disorder due to a failure of access to the phonological lexicon. This result reinforces the hypothesis that the multimodal therapy was critical for making the naming therapy efficient.

Reference: ¹Weill-Chounlamounry, A., Capelle, N., Tessier, C., pradat-diehl, P. (2013) Multimodal Therapy of word retrieval disorder due to phonological encoding dysfunction. *Brain Injury* (In press)

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When a kangaroo is a “baby camel”: Teasing out visual problems from semantic impairment

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Background and Aims: Our patient E.E. sustained a traumatic brain injury, resulting in both visual and semantic deficits. The most striking aspect of his performance was a disadvantage in identifying living or natural things relative to inanimate objects. As natural objects are more visually confusable with one another than inanimate objects, our aim was to determine whether EE’s category-specific pattern of performance was due to the nature of his semantic impairment or to his visual deficit or both.

Method: In addition to the tests involving object pictures on which EE had higher scores for the manmade objects, we administered three tests to evaluate the contribution of the visual impairment to the category-specific finding. First was the Camel and Cactus test of semantic association using words rather than pictures. Second was a naming test where living things are divided into ones with higher vs. lower visual overlap with other members of their category. The third tested recognition of sounds of objects.

Results: On the Camel and Cactus words, EE still had a higher score for manmade than for living things. On the naming test, EE maintained something of an advantage for manmade things, though it was reduced. On the sound identification test, which EE found very difficult, there was no category effect.

Conclusion: EE’s semantic pattern cannot be explained solely by his visual impairment but appears to result from an intriguing interaction between the visual deficit and a genuine category-specific aspect of his semantic knowledge.

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Explanation and feedback as a rehabilitation strategy: pairing emotional and cognitive approaches

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Background and aims: An apparently mild TBI left Jack, an intelligent design engineer, with cognitive and emotional problems severe enough for him to consider suicide and to prevent him from returning to work. We aim to show that rehabilitation in a therapeutic milieu which focussed on helping Jack to both understand and emotionally tolerate his problems produced a successful outcome

Method: Jack attended an 18-week holistic rehabilitation programme. He joined a group on understanding brain injury, learning about the brain and about his own reduced pituitary function. He learned strategies to manage both his emotional reactions and his cognitive difficulties.

Results: Jack's symptoms caused confusion, puzzlement and fear; his emotional reactions then shut down his thinking ability. He benefited greatly from learning how the brain, including his own brain, works and to put his changes in this perspective. Tests verified that he truly had a brain injury; this comforted him and helped him understand and accept his symptoms. He learned compassion-based strategies that freed his mind to focus on cognitive strategies to solve everyday problems. He successfully returned to work and showed great improvement on mood measures.

Conclusions: A main message from Jack's story is that a seemingly trivial injury can cause major problems which are not always recognised by the medical profession or neuropsychologists who can miss the genuine difficulties faced by people in what appear to be superficial accidents. The holistic approach is shown to be effective in dealing with interrelated cognitive and emotional consequences of "mild" TBI.

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Perceived Changes in Executive Function following rehabilitation

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Background and Aims: The Dex-R is a revised version of an earlier questionnaire. It is subdivided into four domains (activation, emotion regulation, executive cognition & metacognition) after Stuss' (2007) recent model. Did people with Acquired Brain Injury (ABI), attending a rehabilitation programme for 6 weeks, perceive themselves as changing over that period? Did their relatives perceive change? Which, if any, of the four domains were most likely to show change?

Method: We administered the DEX-R to 18 clients attending the programme and 10 of their relatives. All participants completed the ratings before and after the programme.

Results: Overall there was a significant difference between the clients' scores before and after the programme ($p = 0.05$). There was no difference in scores between clients and relatives before the programme ($p > 0.05$) or after the programme ($p > 0.05$). There was no significant correlation between the changes

perceived by the clients and their relatives after the programme ($p > 0.05$). The greatest difficulties perceived at the start of the programme for both clients and relatives were in the executive cognition domain. After 6 weeks, both patients and relatives agreed that executive cognitive functions domain was no longer the most impaired ($p > 0.05$). For relatives the Behavioural-Emotional Self Regulation domain was considered to be the most impaired domain after the programme (92.1%, $p = 0.000$), while patients highlighted the Activation Regulating functions (91.1%, $p = 0.000$)

Conclusion: People with ABI perceived a change in functioning after the programme but their relatives did not perceive such change overall. There were differences between clients and relatives as to which domain was most problematic.

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Chang Gung University Brief Intervention on Post-Concussion Syndrome (CGU-BIPCS): An Early Intervention Program for Patients with Mild Traumatic Brain Injury

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Introduction: Post-concussion syndrome (PCS) is not uncommon in patients with mild traumatic brain injury (mTBI). Although recovery from PCS usually occurs within three months post-injury, few patients still continued to suffer from those symptoms for several months. In fact, intervention programs for PCS have been developed in many western studies, while no comprehensive intervention methods were established in the eastern ones. This study thus aims to develop a culturally-appropriate and structuralized brief intervention program for the PCS.

Methods: A total of 50 mTBI patients, which included 25 patients with a regular outpatient clinical intervention for PCS and 25 patients with the Chang Gung University Brief Intervention on Post-Concussion Syndrome (CGU-BIPCS), were recruited. The CGU-BIPCS mainly consisted of six domains: (1) information of the PCS; (2) intervention for physical symptoms; (3) intervention for cognitive symptoms; (4) intervention for emotional symptoms; (5) intervention for sleep problems; and (6) stress and coping strategies. All patients' PCS was evaluated by the modified Checklist of the Post-Concussion Symptoms (mCPCS) at 2 weeks and 2 months post-injury.

Results: The results showed both at 2 weeks and 2 months after injury, PCS in patients who received the CGU-BIPCS was significantly lower than PCS in ones who received regular interventions.

Discussions: The CGU-BIPCS might be the first structuralized early intervention programme for PCS in mTBI patients in eastern societies. The results not only revealed that the efficacy of the CGU-BIPCS, but also that an early intervention program might be needed to prevent persistent PCS.

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