Abstracts of the 6th Symposium on Neuropsychological Rehabilitation August 3–4, 2009, Tallinn, Estonia

Organising Committee

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

CONVENOR'S ADDRESS

Balint's Syndrome: What is it, How to Assess it and Can it be Treated?

B.A. Wilson

MRC Cognition & Brain Sciences Unit, Cambridge and The Oliver Zangwill Centre, Ely, United Kingdom

What is it? In 1909 Balint described a syndrome with three components: these were psychic paralysis of gaze or optic apraxia, which is an inability to look voluntarily into the peripheral field; optic ataxia, which is an inability to localise in space or manually point to visually presented objects; and simultanagnosia where, despite adequate visual acuity, it is impossible to process more than one visually presented object at a time. The syndrome is associated with large bilateral parietal lesions usually resulting from anoxic brain damage. *How to assess it?* Because of the particular manifestations of the condition, it is difficult to assess Balint's syndrome with standard neuropsychological measures. Although some verbal tests can be administered in the usual way, reading will be difficult because of the simultanagnosia and most visuo–spatial and visuo–perceptual tests will be impossible for individuals with this syndrome to perform because of problems localising objects in space. Assessment should include measurement of the ability to localise in space, whether or not the patient has simultanagnosia, body awareness and topographical orientation. It is necessary to exclude poor eyesight, poor motor functioning and poor comprehension as explanations for any problems. Suggestions are made as to how to measure the component cognitive functions of people with Balint's Syndrome. *Can it be treated?* A review of the rather sparse literature on this rare condition suggests that in some cases natural recovery can occur over time. For those patients who remain with the syndrome, a few studies suggest that some limited improvement can occur with intensive rehabilitation. It may be more fruitful to focus on compensatory strategies (Wilson 2009). A summary of recovery and treatment is provided.

SESSION 1: TRIALS AND TRIBULATIONS OF NEUROPSYCHOLOGICAL REHABILITATION

How is Effective Cognitive Rehabilitation Organised? A Systematic Review Into Clinically Relevant Treatment Issues

C. Van Heugten and G. Wolters-Gregorio

Department of Psychiatry and Neuropsychology, School for Mental Health and Neuroscience, Maastricht University, the Netherlands

Introduction: From previous review studies we know that there is substantial evidence to support the effectiveness of cognitive rehabilitation. These reviews however do not offer the clinician information for evidence-based practice. Clinically relevant information (is my patient comparable to the study population? Can I offer this intervention in my own setting?) is lacking. The current review tries to bridge this gap. *Method:* A systematic literature search was performed in Pubmed and Psychinfo (1980-2008) using keywords for brain damage, cognition and rehabilitation. Only RCT's evaluating the effectiveness of cognitive rehabilitation were included. A total of 90 RCTs could be included of which the following information is extracted: cognitive domain, patient and injury characteristics (i.e., type of injury, time

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

since injury), treatment characteristics (setting, duration, frequency, discipline involved, individual/group, face to face/contextual). *Results:* A total of 4438 patients were treated in 90 studies (mean age 51 years, stroke patients in 50% of the studies). Most studies were performed on treatment of visuospatial, memory and language functioning. Half of the treatments were offered in the first 6 months after injury, 30% was offered in the chronic phase (> 1 year postinjury). The mean duration of treatment was 48.8 hours, with a mean of 4.4 hours per week. Many treatments were offered in hospital or a rehabilitation setting, none in nursing homes. Most interventions (72) are offered individually. The expertise needed to offer the treatment is often not specified, but the psychologist was mentioned in only 4 studies. Caregivers are hardly ever involved in treatment (n = 7). In 65 studies the experimental treatment was more effective than the control treatment. *Conclusions:* Recommendations can be given on the organization of effective cognitive rehabilitation in clinical practice.

Ethical and Evidence-Based Practice in Brain Injury Rehabilitation

J F. Malec

Rehabilitation Hospital of Indiana, Indianapolis, United States of America

The proposed presentation will examine ethical implications of evidence-based medicine (EBM) within current practice of brain injury rehabilitation. The randomised controlled trial (RCT) has come to be considered the gold standard for EBM methodology. Strengths as well as risks and weaknesses of RCT-focused EBM will be reviewed. The ultimate goal of EBM is to develop a scientific basis for choosing interventions that will benefit individuals with defined characteristics under specified conditions. By referencing practice recommendations to the strength of the scientific evidence gleaned from systematic reviews, EBM avoids the influence of professional biases. EBM is linked to the medical model in which the target of the intervention is a disorder within the individual patient. Some interventions in brain injury rehabilitation may be more appropriately studied within a social model of disability in which the target of intervention is the individual's environment or social system. While the pursuit of a scientific basis for practice is clearly an ethical mandate, defining ethical practice in the absence of strong evidence and in the presence of competing methodologies is elusive. Balancing these considerations, the case will be presented that ethical practice of brain injury rehabilitation requires awareness not only of the scientific evidence for an intervention but also of current best practices recommended by professional traditions and consensus, the practice situation, and the individual's current and evolving situation, needs and preferences.

Active Ingredients and Treatment Components in a Telephone-Based Goal Self-Management Intervention

T. Hart,[1] J.A.Brockway,[2] K.Bell[2] and J.Whyte[1]

[1] *Moss Rehabilitation Research Institute, Elkins Park, Philadelphia, United States of America*

[2] *Department of Rehabilitation Medicine, University of Washington, Seattle, United States of America*

Background and Aims: To improve its evidence base, neuropsychological rehabilitation must develop hypotheses about its active ingredients, and more precise ways to measure them. This is challenging since most rehabilitation involves multiple ingredients and dynamic processes, such as learn-

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

ing and interpersonal interaction. This presentation describes a 3-step process by which active ingredients of complex interventions may be hypothesised, operationalised, and measured in vivo. The process is illustrated with a study examining the active ingredients of the Scheduled Telephone Intervention (STI; Bell et al., 2005), a treatment in which outreach telephone calls address the multiple, evolving needs of community-dwelling people with moderate/ severe traumatic brain injury (TBI) and their families. *Method*: To define a complex treatment, one must (1) hypothesise its active ingredients (mechanisms of change); (2) translate ingredients into critical therapist/ patient behaviors; (3) create and test usable materials (manuals, scoring systems) by which critical behaviors may be delivered or recorded. We created measurement tools for 8 hypothesised active ingredients of the STI, including the *common elements* of therapist empathy, therapeutic alliance, and degree of structure in session, and *specific elements* linked to theories of goal self-management: problem/goal clarification, action planning, and self-efficacy. TBI education and therapist directiveness are also measured as potentially important mediators of STI outcome. *Results*: Using an iterative process with reliability testing among coders of taped STI calls, a detailed manual and score sheet have been developed to code each of the 8 treatment elements on a 0–2 scale. The presentation will include behaviors aligned with each theoretically derived treatment element, and will discuss challenges associated with achieving coding reliability. *Discussion*: This presentation illustrates the process of defining a complex intervention using theoretical constructs, a first step in measuring treatment ingredients so as to link them with the outcomes they affect.

Examining Efficacy, Maintenance and Community Integration of a Cognitive Behaviour Therapy (CBT) Protocol Adapted for People With Brain Injury

A. Arundine,[1,2] C. Bradbury[1] and R. Green[1, 2]

[1] *Toronto Rehabilitation Institute, Toronto, Canada*
[2] *University of Toronto, Canada*

Background and Aims: We have previously demonstrated the efficacy of a cognitive behaviour therapy (CBT) protocol that was adapted to address the unique cognitive and emotional needs of ABI survivors, and which additionally includes a telehealth delivery modality (Bradbury et al., 2008). However, the maintenance of CBT treatment effects in ABI has yet to be investigated. The primary aim of the current study was to demonstrate that patients maintain benefits (reduction in psychological distress) after cessation of treatment over a 6-month duration in both conventional (group, face to face) and telephone administration modalities. *Methods*: Seventeen people with moderate to severe ABI (> 1-year postinjury) with elevated psychological distress were recruited. Participants received eleven sessions of CBT administered in either a face-to-face group format (G-CBT) or individually over the telephone (T-CBT). Post-treatment and follow-up performance on the Symptom Checklist-90-Revised (SCL-90-R), the Depression, Anxiety Stress Scales (DASS), the Community Integration Questionnaire (CIQ) and the Ways of Coping Questionnaire — Revised (WOC-R) was examined. *Results*: Psychological distress was significantly reduced from pre- to post-treatment and sustained at the 6-month follow-up period on both the DASS, $t(15)=4.19$, $P < .01$, and SCL-90-R, $t(15) = 6.32$, $P < .001$, measures. Subgroup analyses revealed that both G-CBT and T-CBT modalities were similarly effective on the SCL-90-R. However, the G-CBT group

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

showed greater symptom reduction than T-CBT when measured by the DASS. *Discussion*: CBT treatment effects were robust, and demonstrated maintenance of benefits 6 months postcessation of treatment. Findings regarding CBT treatment, coping and community integration are also discussed. To our knowledge, this is the first adapted psychological intervention demonstrating long-term efficacy for people with ABI.

SESSION 2: SYMPOSIUM ON ASSISTIVE TECHNOLOGY

Framework for Conceptualisation of Assistive Technology for Cognition

B. O'Neill[1] and A. Gillespie[2]

[1] *Central Scotland Brain Injury Rehabilitation Centre, Bonkle, United Kingdom*
[2] *University of Stirling, United Kingdom*

Background: The social and economic cost of social care for people with cognitive deficits is significant. Assistive technology for cognition (ATC), which enables independent action, has the potential to revolutionise care provision. ATC can be variously grouped; low-tech or high-tech specification, monitoring versus enabling, interactive or noninteractive, visual or verbal interface, running remotely or locally. A neuropsychological framework would allow both streamlined prescription of devices and identify areas for future development. *Methodology*: The present paper is a systematic review of existing ATC (after LoPresti et al. 2004). The following domains of cognitive function provide structure for the review: Visual Identification (people, objects, object uses); Memory (episodic, semantic, visual domain, verbal domain); Procedural Memory (performance scaffolding); Executive Function (prospective memory, problem solving); Attention (emotional arousal, sustained attention, visuospatial attention); Working Memory (visuospatial, auditory); Praxis (performance scaffolding); Spatial orientation. *Results*: Papers were identified demonstrating support for spatial orientation, performance scaffolding, prospective memory, autobiographical memory and attention (sustained, visuospatial). Areas where there are deficiencies include visual identification, verbal working memory, sustained attention and problem solving. *Discussion*: A framework is proposed that maps out the relation between psychological function on the one hand and current and future ATC on the other. The proposed framework is useful at a theoretical level for clarifying the psychological benefits provided by a given ATC. The framework could be clinically useful by guiding the prescription of ATC based on a given neuropsychological profile. Finally, the framework is useful for identifying lacunae for the future development of ATC.

SMS Text Messaging as a Means of Increasing Recall of Therapy Goals in Brain Injury Rehabilitation

C. Culley and J.J. Evans

Section of Psychological Medicine, Faculty of Medicine, University of Glasgow, United Kingdom

Background and aims: A single-blind within-subjects trial was used to test the efficacy of sending SMS text messages to patients with a traumatic brain injury as a means of improving their recall of rehabilitation goals. *Method*: Eleven participants were recruited from two community based rehabilitation centres and were sent text messages relating to three randomly selected goals from a selection of six current goals three times per day for 14 days. Participants' recall of their rehabilitation goals was assessed at

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

baseline, seven days, and fourteen days via free recall and cued recall procedures. *Results and Discussion*: Results showed that goals in the 'text condition' were recalled better than goals in the 'no text' condition. Practical applications and extensions are discussed.

The efficacy of SMS Text Messages Used to Compensate for the Effects of Cognitive Impairments in Schizophrenia

M. Pijnenborg,[1] F.K. Withaar, [2,3] M.E. Timmerman,[2] W.H. Brouwer,[2,3,4] R.J. van den Bosch[4,5] and J.J. Evans[6]

[1] *Dept. of Psychotic Disorders, GGZ-Drenthe, Assen, the Netherlands*
[2] *Dept. of Psychology, University of Groningen, Groningen, the Netherlands*
[3] *Dept. of Neurology, University Medical Center, Groningen, the Netherlands*
[4] *School for Behavioural and Cognitive Neurosciences (BCN), University Medical Centre, Groningen, the Netherlands*
[5] *Dept. of Psychiatry, University Medical Center, Groningen, the Netherlands*
[6] *Section of Psychological Medicine, Faculty of Medicine, University of Glasgow, Glasgow, United Kingdom.*

Background and aims Many people with schizophrenia have severe cognitive impairments that hamper their everyday activities. The effect of pharmacological and behavioural interventions on cognitive functioning has been demonstrated, but even after successful intervention considerable impairments can remain. Therefore, we sought for alternative ways to help patients cope with the effects of their cognitive impairments. In the present study, we have evaluated the efficacy of SMS-text messages used to compensate for the effects of cognitive impairments in schizophrenia in daily life. *Design:* A waiting list controlled trial. was conducted: patients were quasi-randomly assigned to an A-B-A (baseline-intervention-follow-up) condition or an A-A-B-A condition that included an additional 7-week waiting list. The waiting list was included to control for the effect of time on relevant outcome. *Method:* Sixty-two people with schizophrenia or related psychotic disorders were included in the study. All patients showed impaired goal-directed behaviour in daily life situations. Patients were prompted with SMS-text messages to improve their every day functioning. The primary outcome measure was the percentage of goals achieved. Secondary outcome measures were social functioning, psychiatric symptoms and self-esteem. *Results* The overall percentage of goals achieved increased with prompting, while performance dropped to baseline level after withdrawing the prompts. Keeping appointments with mental health workers and carrying out leisure activities increased with prompting, while medication adherence and attendance at training sessions remained unchanged. A majority of the patients enjoyed receiving the SMS-text messages. *Discussion:* Prompting can significantly improve achievement of a number of relevant goals. For other goals, combining prompting with interventions that enhance motivation seems indicated.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Supports in Everyday Activities With a Home-Based Electronic Memory Aid for Persons With Memory Impairments

I-L Boman,[1] A.Bartfai,[1] L, Borell,[2] K.Tham[2] and H. Hemmingsson[2]

[1] *Department of Rehabilitation Medicine and Department of Clinical Sciences, Danderyd Hospital, Stockholm, Sweden*

[2] *Department of Neurobiology, Care Sciences and Society, Karolinska Institutet, Huddinge, Sweden*

Background and aim: In previous studies we have found that a set of electronic memory aids in a training apartment in a hospital and in two prototype apartments could help persons with memory impairments after acquired brain injury to carry out everyday activities. In this study we have examined the possibilities of a newly developed electronic memory aid with a wireless design and individually spoken reminders as support to carry out everyday activities in the participant's own home. *Method:* This was a single-subject study with a multiple baseline AB design. Five participants identified three activities each that they usually forget to carry out. There were automatic computer registrations of completed activities during the intervention of 12 weeks. Assessments of functioning and quality of life were conducted before and after the intervention and at follow-up after 2 months. *Results:* Four participants improved in completing most of the self-chosen activities when the electronic memory aid was used. Performance and satisfaction with performance and quality of life improved, but there was no memory function improvement. There were technical problems with the electronic memory aid during the intervention, which had a negative effect for users. *Discussion:* The results indicated that the electronic memory aid could give support to improve performance. The participants perceived that the aid was useful and they wanted to keep the electronic memory aids after the intervention even if there were problems with the technology. The result indicates that it is important to put high demands on technical reliability of electronic memory aids.

Theory and Efficacy of a Voice Mediated Assistive Technology to Support Performance of Complex Sequences: A Series of Eight Single-n Studies

B. O'Neill[1] and A. Gillespie[2]

[1] *Central Scotland Brain Injury Rehabilitation Centre, Bonkle, United Kingdom*

[2] *University of Stirling, United Kingdom*

Background: Cognitive impairment reduces a person's ability to carry out activities of daily living (ADL). Complex behavioural sequences require memory storage and retrieval of the steps in the sequence, timely initiation of the substep action, self-monitoring of the goal state (and sub-goal) achievement and error correction. These abilities thus comprise both memory and executive function abilities. Omissions of substeps, failure to identify and correct errors and intrusion of behaviours unrelated to the goal are common. This study investigated whether an interactive auditory–verbal prompting system augments performance of a rehabilitation relevant sequence (donning a prosthetic limb). *Method*: Eight participants (mean age 64.25 years) were recruited from a service offering rehabilitation after amputation due to having difficulty donning their prostheses. Neuropsychological assessment of participants was carried out using RBANS, Hayling and Brixton, and ACE-R measures. Mean RBANS total score was 61.9, the mean ACE-R score was 72.9, placing the sample in the impaired range of cognitive function on both measures. An auditory–verbal

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

prompting system (Guide) was used in an alternating phase design. Statistical significance was assessed using exact probability randomisation tests (Todman and Dugard 2001). *Results*: Six of the eight single n studies showed a significant reduction in the number of omissions of sub-steps and thereby reduction in errors overall. Learning effects were observed in trials where Guide was not used. *Discussion*: Our results are discussed in terms of social and psychological processes underpinning sequence performance. Further work in supporting activities of daily living in proposed.

SESSION 3: DATABLITZ — SPECIFIC COGNITIVE DOMAINS

Impairment of Actual Tool-Use in Apraxia: A New Method for Detecting Deficits in Grasp Selection

A. Sunderland

School of Psychology, University of Nottingham, United Kingdom

Background and aims: Ideomotor apraxia is common after left hemisphere stroke and can be a barrier to rehabilitation. Traditional assessment involves gesture imitation or pantomime of tool-use but the everyday functional implications are unclear. Measurement of actual tool use is difficult because of the great variability in normal tool-use actions. A simpler approach may be to observe rotation of the wrist during reaches towards upright or inverted tools. *Method:* Participants reached rapidly for the handle of a tool which was upright or inverted. This was compared on interleaved trials with reaching for a rod or bar where inversion of the hand was determined by a physical barrier. Performance was videoed and accelerometers were worn on the wrist. Five left hemisphere apraxic patients were compared with 5 right hemisphere cases and age-matched healthy controls. *Results:* Rotation of the wrist was unimpaired when reaching for a rod or bar but apraxic patients showed more frequent failure to invert the hand when reaching for inverted tools than normal controls or right hemisphere cases ($p <$ .01). However, there was no correlation between gesture imitation scores and frequency of rotation errors. In addition accelerometer data indicated late rotation when reaching for non-tools by some apraxic patients. *Discussion:* Failure to invert the hand when reaching rapidly for an inverted tool appears common in apraxia and can be observed even without special equipment. However the relationship to severity of apraxia on traditional measures is unclear. Additional left hemisphere cases with and without apraxia are being recruited to study this issue.

A Randomised Controlled Trial of a Neuropsychologically Informed Dressing Therapy: A Report of Progress on the DRESS Trial

M. Walker,[1] A. Sunderland,[2] J. Edmans,[1] P.Logan,[1] A.Drummond,[1] J. Fletcher-Smith,[1] K.Garvey[1] and J. Taylor[2]

[1] *Division of Rehabilitation and Ageing, University of Nottingham, United Kingdom*
[2] *School of Psychology, University of Nottingham, United Kingdom*

Background and aims: Relearning to dress independently is a major challenge faced by patients recovering from a stroke. Previous single case experiments have suggested that neglect, apraxia and other neuropsychological deficits impede this relearning, and that dressing therapy may be more effective if designed to take account of individual profiles of cognitive impair-

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

ment. The generality of these findings is being explored in the Dressing Rehabilitation Evaluation Stroke Study. *Method:* A randomised trial comparing 35 patients receiving neuropsychologically informed therapy (the Cognitive Approach) with 35 receiving conventional U.K. dressing therapy (the Functional Approach). Patients are selected from consecutive admissions to a stroke service, screened to identify those with cognitive impairment and persistent dressing difficulties after 2 weeks. After randomization, the Cognitive or Functional approach is followed for 3 dressing sessions per week for 6 weeks. Outcome is blind assessed 2 months later. The Cognitive approach starts with cognitive testing and standardised observation of dressing behaviour to identify patterns of error related to different cognitive impairments. Individually tailored treatment is then given based on effective interventions for neglect, apraxia, attentional deficits and spatial confusion identified from a search of the neuropsychological literature. *Results and Discussion:* We have successfully compiled two comprehensive treatment manuals to guide the interventions in this trial. By January 2009, 41 patients had been randomised into the trial. The treating therapists have successfully applied the predetermined strategies from the manual to the patients dressing difficulties and only one patient has dropped out of the trial due to relocation.

Rehabilitation of Dyscalculia Using an Errorless Learning Approach Five Years Following Open Head Injury: A Single Case Study

F. Gracey,[1] J. Cope[2] and S. Connell[3]

[1] *Oliver Zangwill Centre for Neuropsychological Rehabilitation, Princess of Wales Hospital, Ely, Cambridgeshire, United Kingdom*

[2] *Cambridgeshire and Peterborough Foundation Trust, Newtown Centre, Huntingdon, Cambridgeshire, United Kingdom*

[3] *Camden Primary Care Trust, London, United Kingdom*

Dyscalculia is an impairment of numerical and mathematical ability. Cognitive models of dyscalculia describe number comprehension, production and calculation systems, dealing with different types of representations of number, numerical facts and operations (add, subtract, multiply and divide). Clinical cases consistent with cognitive accounts have been presented in the literature. There are a limited number of cases systematically describing and evaluating rehabilitation of dyscalculia. To address the question of the effectiveness of rehabilitation of dyscalculia we present our work with Lorna, a 32 year old woman who suffered left hemisphere damage from a gun shot wound 5 years prior to rehabilitation. Assessment followed an adaptation of Levin's (1979) guidelines in order to provide an account of Lorna's dyscalculia in accordance with a cognitive model. This highlighted impairments in verbalising numbers greater than 8 (consistent with her expressive dysphasia), fraction knowledge and simple division. Performance on addition, multiplication and subtraction was relatively spared. Due to functional difficulties with fractions (e.g., when cooking), rehabilitation focused on learning fractions using an errorless learning approach. Following rehabilitation, Lorna was reassessed. Improvements in fraction knowledge were clearly evident. Learning generalised so that her performance on basic division was significantly improved, suggesting a common arithmetic fact representation underpinning division and fraction knowledge. Implications for Lorna's performance on functional tasks are briefly considered. It is concluded that this case demonstrates the effectiveness of a specific errorless learning approach for rehabilitation of fraction knowledge and division many years postinjury.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Improving Assessment of Working Memory in Aphasia

M. Ivanova, and B.Hallowell

School of Hearing, Speech and Language Sciences, Ohio University, Athens, Ohio, United States of America

Aims: Deficits in working memory (WM) are an important subset of non-linguistic deficits in aphasia (Murray, Ramage, & Hooper, 2001; Wright & Shisler, 2005). Unfortunately, the study of WM in aphasia is fraught with methodological limitations, thus reducing validity and generalisation of findings. A novel WM task was developed with the aim of circumventing confounds associated with existing WM tasks and measures in aphasia. *Method*: The sentence-picture matching task, used for the processing part of the task, is more natural in terms of everyday language use and relies less on intact metalinguistic skills in contrast to true/false judgments. In contrast to random comprehension questions it provides a more accurate and detailed index of performance on the processing component of the WM task. Use of sentences of varying length and complexity allowed investigation of the differential impact of these factors on performance. Additionally, the task was constructed so that participants could respond either with simple gestures or verbally, to both processing and recall components. Participants with (n = 27) and without aphasia (n = 33) participated in the study. *Results and Discussion*: Performance on the WM task was significantly different for participants with aphasia compared to those without aphasia in terms of both storage and processing scores. At the same time, different patterns of performance across conditions of the task were observed within each group. In sum, the feasibility of using a novel task to assess WM in individuals with and without aphasia has been empirically demonstrated. Implications of current findings for assessment of WM in aphasia are discussed.

What Can We Learn About Personal Relevance From a Naming Treatment in Mild Semantic Dementia?

G. Robinson

Department of Neuropsychology, National Hospital for Neurology and Neurosurgery, London, United Kingdom

Background and Aims: Semantic dementia (SD) patients have been observed to use a range of vocabulary relevant to daily lives when performance on formal tests is poor. Snowden *et al.* (1996) proposed that autobiographical experience has a role in influencing preservation of semantic information. This study was designed to examine the influence of personal relevance and recency on relearning of names in a patient with mild SD. *Method*: A cross-over treatment design was adopted with a mild SD patient (CTI). Two tasks were employed (picture naming = 165 items; naming or description from verbal description = 120 items) that varied along the following dimensions (personal relevance, recency, semantic category). Two matched sets of stimuli were created for these treatments, which each lasted 4 weeks. The daily intervention contained an orthographic and phonological component and CTI's performance was measured 14 and 10 times during the treatment and post-treatment phases, respectively. *Results*: CTI's performance reached ceiling rapidly during treatment. Post-treatment monitoring indicated almost full retention for a significant period of time (> 6 months). The pattern of information loss differed between dimensions with greater loss of less personally relevant items. *Discussion*: The results provide evi-

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

dence that naming treatments in mild SD can be rapid and effective, regardless of stimuli type, strengthening and maintaining semantic memory for a considerable period of time. The pattern of information loss supports the notion that personal relevance has a role in the preservation of semantic information.

Rehabilitation of Executive Problems in the Chronic Stage after Frontal Haemorrhage: The Case of M.H.

L. Fasotti[1,2] and D.H.E.Boelen[1]

[1] *Sint Maartenskliniek Research, Development & Education, Nijmegen, the Netherlands.*
[2] *Donders Institute for Brain, Cognition and Behaviour, Radboud University Nijmegen, Nijmegen, the Netherlands.*

M.H. is a young male (39 years) who has suffered a subarachnoidal haemorrhage resulting in bilateral frontal haematomas. Almost two years later, after a period of clinical rehabilitation and a sojourn at home, he is admitted in the Day Hospital for Brain Injury in Nijmegen. Before starting rehabilitation he is tested, and both this assessment and neuropsychological testing in the earlier clinical period show severe problems in executive and memory functioning. No significant differences between both assessments are found, showing that M.H.'s impairments have remained stable for more than a year. After testing, M.H. enters a multifaceted training for executive functioning with the objective of improving his daily executive functioning. The training comprises 3 stages: information and awareness, goal setting and planning, and initiation, execution and regulation. It is aimed at several aspects of the dysexecutive syndrome and executive improvement is fostered by teaching a comprehensive cognitive strategy, which allows M.H. to tackle the 3 most important difficulties of his daily executive functioning in a systematic and structured way. In 24 therapy sessions, M.H. learns how to formulate his intentions and actions explicitly in terms of goals and sub-goals (planning), how to effectively execute these plans and goals, and how to monitor his behavior during execution. The results show that, even in the chronic stage, M.H. is able to attain his personal goals and partially resume his former roles. Also, he performs better in a series of ecologically valid executive tests. However, in a complex secretarial executive test his performance remains impaired. In this task, without memory aids, he remains unable to retain a number of goals and sub-goals that exceeds his limited working memory capacity, and therefore loses the overall picture required to accomplish this complex task successfully.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

SESSION 4: NEW DEVELOPMENTS IN CLASSIFICATION AND ASSESSMENT TOOLS FOR RESEARCH AND CLINICAL PRACTICE

Facilitating Use of the World Health Organization (WHO) International Classification of Functioning, Disability and Health (ICF) in Rehabilitation Research and Clinical Practice

R.L. Tate[1,2] and M. Perdices[3,4]

[1] *Rehabilitation Studies Unit, Northern Clinical School, Faculty of Medicine, University of Sydney, Australia*
[2] *Royal Rehabilitation Centre Sydney, Australia*
[3] *Department of Neurology, Royal North Shore Hospital, Sydney, Australia*
[4] *Division of Psychological Medicine, Northern Clinical School, Faculty of Medicine, University of Sydney, Australia*

Background: There is little evidence to suggest that the ICF (WHO, 2001) is routinely used in clinical practice and rehabilitation research. Part of the problem is its overwhelming detail and complexity, containing almost 1,500 alphanumeric codes. Although many health practitioners understand the ICF structure at the Component and Domain levels, detailed knowledge at the Category level is much more tenuous. Yet, it is this level of knowledge that is required to apply the ICF. *Aims and outcomes:* This paper describes three strategies that have been developed to facilitate an understanding and use of the ICF. First, "ICF trees" (Tate & Perdices, 2008) are graphical representations of the ICF, depicting the detailed nomenclature to the 2nd level Category. They provide, at a single glance, both the overview and detail of the ICF, thereby serving as a useful supplement to the 300-page Manual. Second, the ICF Checklist (http://www.who.int) contains a selection of 128 Domains and Categories which can be rated for severity, thus operationalising the ICF framework in a useable format. More specific measures with psychometric facilities, such as the WHO-DAS II and the WHO-QOL, are also available. Finally, ICF Core Sets are currently being developed for a range of health conditions. They comprise the minimum number of Categories that are necessary yet sufficient to describe a health condition. The methodology of developing Core Sets is described and the example of stroke (Geyh et al., 2004) is provided. *Conclusions:* Taken together, these types of initiatives have the potential to make the ICF much more readily accessible and thence applied to research and clinical practice.

The Self-Perceptions in Rehabilitation Questionnaire: A New Measure of Therapy Progress in Brain Injury Rehabilitation

T. Ownsworth,[1] J. Fleming,[2] E. Stewart[1] and J. Griffin[3]

[1] *School of Psychology, Griffith University, Brisbane, Australia*
[2] *Occupational Therapy Department, University of Queensland and Princess Alexandra Hospital, Brisbane, Australia*
[3] *Occupational Therapy Department, Princess Alexandra Hospital, Brisbane, Australia*

Background & Aims: Many existing assessment tools effectively capture pre- versus post-treatment changes in brain injury rehabilitation. The Self-Perceptions in Rehabilitation Questionnaire (SPIRQ) is a new 19-item self-report measure developed to monitor the emergence of self-awareness, perceptions of rehabilitation and emotional reactions throughout rehabilitation. Unlike other awareness measures the SPIRQ does not rely on collateral ratings for interpretation. This study aims to describe the development and

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

preliminary psychometric evaluation of the SPIRQ and its four scales (Current Self, Future Self, Self in Rehabilitation and Emotional reactions). *Methods*: 50 individuals attending outpatient brain injury rehabilitation completed the SPIRQ during sessions with their occupational therapist. A subset ($n = 25$) completed the SPIRQ on three occasions to examine test–retest reliability and the effect of administration timing (start versus end of session). In an ongoing study, a further participant sample ($n = 25$) will complete other standardised measures of self-awareness, motivation in rehabilitation and emotional status in order to determine convergent validity of the SPIRQ. *Results*: Based on current data collection, internal consistency and test–retest reliability of the SPIRQ were sound ($\alpha > .70$, $r > .70$) and there was no significant effect of administration timing ($p > .05$). The pattern of correlations between the scales of the SPIRQ was theoretically consistent. Importantly, SPIRQ ratings were not correlated with level of functional impairment. The findings of other validity analyses will be reported. *Conclusion*: Preliminary findings support the psychometric merit of the SPIRQ. Potential clinical applications and future empirical evaluation of the SPIRQ will be discussed.

The Assessment of Prospective Memory: Correspondence between Short-Scale and Naturalistic Assessment Procedures, and Everyday Performance

J. Fish,[1] T. Manly,[1] J.J. Evans,[2] B.A. Wilson[1,3]

[1] *Medical Research Council Cognition & Brain Sciences Unit, Cambridge, United Kingdom*
[2] *Section of Psychological Medicine, Faculty of Medicine, University of Glasgow, United Kingdom*
[3] *The Oliver Zangwill Centre, The Princess of Wales Hospital, Ely, United Kingdom*

Here we present findings from three related studies examining the concordance between various measures of cognitive function all considered to incorporate prospective memory demands. These include questionnaires measures, laboratory tests, measures taking place over extended time periods, and diary measures of 'real-life' goal attainment. Study one examined the relationships between two questionnaire measures of cognitive complaints and a computer test in a group of neurologically healthy participants. Performance on the computer task was significantly associated with ratings from one questionnaire but not the other, potential reasons for which are discussed. Study two examined the relationships between standard tests frequently used in neuropsychological assessment and a prospective memory task carried out over a week-long period, in participants with Acquired Brain Injury (ABI). We found that tests of immediate verbal memory and sustained attention were most strongly associated with PM performance. Study three looked again at neuropsychological test performance in people with ABI, but this time in relation to completion of 'real-life' PM tasks. Everyday task attainment was significantly associated with clinical measures of everyday memory and, to a lesser extent, executive function. The results from all three studies suggest that in order to gain a useful estimate of likely everyday prospective memory functioning, one needs to consider evidence from a variety of tests. The implications for clinical assessment and prospective memory research are discussed.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

The Use of the SASBA in the Assessment of Inappropriate Sexual Behaviour in Neurological Impairment

C. Knight, N.Alderman, L.Birkett-Swan

St Andrew's Healthcare, Northampton, United Kingdom

Background and aims: Inappropriate sexual behaviour (ISB) as sequelae of neurological impairment is overlooked in comparison to other challenging behaviour such as aggression, yet the impact on patients and carers is equally significant and pervasive. Additionally, there can be a reluctance to discuss ISB. Inconsistencies in terminology and lack of measurement tools for ISB limit the degree to which such behaviour can be identified, reported and managed. The St Andrew's Sexual Behaviour Assessment (SASBA; Knight et al., 2008), based on the Overt Aggression Scale — Modified for Neurorehabilitation (OAS-MNR: Alderman et al.,1997), was conceived to increase knowledge and understanding about ISB, provide clinical information to inform treatment, and make available a means of enabling appropriate, open discussion about the subject. *Method:* The validity and reliability of the SASBA for use with people who have both progressive neurological conditions and acquired brain injury admitted to inpatient services is explored. This scale allows continuous observations of four categories of ISB, each with four levels of severity, that were developed with reference to relevant literature (Johnson, Knight & Alderman, 2006). Statistical properties of the scale were obtained using written descriptions and video enactments of ISB generated by clinicians. *Results:* Results indicate strong construct and content validity, and good inter-rater and test-retest reliability. *Discussion:* Field data using SASBA has led to further insight about the nature of ISB. Clinical uses of the scale and benefits/limitations are outlined. Information captured using SASBA can meaningfully contribute to a formulation about ISB, the design of an appropriate intervention, and to measure outcome.

SESSION 5: PAEDIATRIC NEUROPSYCHOLOGICAL REHABILITATION

Efficacy for a Family-Centred Intervention for Parents of Children With an Acquired Brain Injury (ABI)

D. Woods,[1,2,3] C. Catroppa,[1,2,3] V. Anderson,[1,2,3] J. Matthews,[4] R. Giallo,[4] and P. Barnett[2]

[1] *Australian Centre for Child Neuropsychological Studies, Murdoch Children's Research Institute, Melbourne Australia,*

[2] *Royal Children's Hospital, Melbourne, Australia,*

[3] *University of Melbourne, Victoria, Australia*

[4] *Parenting Research Centre, Victoria, Australia*

Background: Children with ABI are at significant risk of developing serious behavioural problems which are a source of distress for parents. Parental distress compromises parenting abilities, with adverse effects for the child with ABI. Limited evaluation of the effectiveness of interventions to improve parents' ability to manage behavioural sequelae following ABI has been conducted. This project involves investigating the applicability of Signposts for Building Better Behaviour intervention program, originally developed for children with an intellectual disability, in assisting parents and families to reduce distress, and better manage difficult behaviours of children with an ABI. *Method*: Participants were 48 parents and families of children with mild, moderate or severe ABI. Parents completed 8-modules of the

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Signposts program over 4 months via group or telephone delivery. *Results*: Parents reported significant reductions on the Depression Anxiety Stress Scale (DASS), significant reductions in child behaviour problems as measured by the Child Behaviour Checklist (CBCL), and families reported a significant decrease on the Family Burden of Injury (FBI) scale. Parents agreed that parenting skills taught were appropriate and useful for an ABI cohort. *Discussion*: Preliminary efficacy for the Signposts program has been established and is now being evaluated in a larger randomised-control trial. Family-centred interventions after paediatric ABI are ensuring the continued evolution of best practices and policies in the rehabilitative process.

Recent Advances in a Neuropsychological Research and Rehabilitation Program for Children with Traumatic Brain Injury

L. Schrieff, C. Corbett and K. Thomas

ACSENT Laboratory, Department of Psychology, University of Cape Town, South Africa

Background and aims: Pediatric traumatic brain injury (pTBI) as an important public health concern, but neuropsychological rehabilitation is not yet standard practice following such acquired brain injuries. The need for such services is acute in both developing countries and developed countries, and so the lack of such services in a relatively resource-poor country such as South Africa is of major concern. This paper describes recent progress in our efforts to establish a neuropsychological rehabilitation service at Red Cross War Memorial Children's Hospital (RXH) in Cape Town, South Africa. *Method*: We conducted pilot evaluations of two neuropsychological interventions (Attention Process Training (APT) and Goal Management Training (GMT)) aimed at improving attentional and executive functioning, respectively, following pTBI. Both the APT program and the GMT program were evaluated through case-studies ($N = 3$). The interventions were implemented over 8- and 5-week periods, respectively. Outcome measures included neuropsychological test performance, intervention-specific exercises and real-world tasks. *Results*: Both interventions proved effective, but did not generalise across all outcome domains. Importantly, preliminary results suggest that familial and school involvement and support are critical to the success of these interventions. *Discussion*: Our findings shed light on the efficacy of these interventions in the South African pTBI population and also provide valuable insight into factors that either promote or hinder the implementation of neuropsychological rehabilitation. Of particular interest is the contrast between those factors unique to our local context and those that might affect neuropsychological rehabilitation in general.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

SESSION 6: PSYCHOSOCIAL ISSUES IN CHILDREN, ADOLESCENTS AND ADULTS

A Comprehensive Model of Care for Rehabilitation of Children with Acquired Brain Injuries

M. Chevignard,[1,2] H. Toure,[1] D. Brugel,[1] J. Poirier[1] and A. Laurent-Vannier

[1] *Physical Medicine and Rehabilitation Department for children with acquired neurological injuries, Hôpital National de Saint Maurice, Saint Maurice, France.*
[2] *Université Pierre et Marie Curie, Paris, France*

Background: Acquired brain injury (ABI) is a leading cause of lifelong disability in children. Deficits may only become fully apparent when developmental demands increase and once cognitive processes are expected to be fully developed. It is therefore necessary to provide organised long-term follow-up for children post-ABI. Despite these recommendations, it has been shown that only a small proportion of children received specialised rehabilitation and adequate follow-up after ABI. The aims of this study were to describe a comprehensive model of care devoted to children with ABI and to analyse outcomes for children treated over one year. *Methods:* The program features an in- and out-patient rehabilitation facility, where multi-disciplinary rehabilitation and specialised schooling are provided. An outreach program has also been created to deal with the complex delayed psychosocial issues arising in late adolescence–early adulthood. The ultimate goal of the program is to promote each child's successful reintegration in school and in the community. Clinical data was collected for all children treated over the year 2006, such as ABI type and severity, the type/amount of services provided. The Glasgow Outcome Scale (GOS) adapted for children was used to assess overall outcome upon admission and at discharge. Discharge modalities were analysed. *Results:* Overall outcome, as measured by the GOS, improved dramatically between admission (3.3 ($SD = 0.45$) and discharge (2.15; $SD = 0.74$). Most of the children were discharged home with an adequate personalised plan for ongoing rehabilitation and school adaptations. *Conclusion:* Given the specificities of childhood ABI, long-term specific care must be organised and coordinated.

Psychosocial Adjustment as a Function of Behavioural, Executive and Emotional Outcome Following Childhood Acquired Brain Injury

C. Soo,[1,2] R. Tate,[1,3] and N. Brookes[4]

[1] *Rehabilitation Studies Unit, The University of Sydney, Australia*
[2] *Australian Centre for Child Neuropsychology Studies, Murdoch Children's Research Institute, Australia*
[3] *Brain Injury Rehabilitation Unit, Royal Rehabilitation Centre Sydney, Australia*
[4] *Brain Injury Rehabilitation Program, Sydney Children's Hospital, Australia*

Background: It is well established that acquired brain injury (ABI) often results in psychosocial difficulties affecting participation. These difficulties arise from a combination of cognitive, behavioural, motor and emotional sequelae. This study examined psychosocial outcome following childhood ABI in terms of behavioural, executive and emotional variables. *Method*: Participants ($n = 35$; aged 7–17 years) with ABI were recruited from the Brain Injury Rehabilitation Program, Sydney Children's Hospital, Australia. Psychosocial functioning was assessed using the Sydney Psychosocial Reintegration Scale for Children (SPRS-C). Executive (e.g., cognitive flexibility, verbal fluency), emotional (anxiety, depression, anger,

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

self-concept) and behavioural (internalising, externalising) variables were examined using both self and parent-report measures. *Results*: Thirty-four per cent of the sample was rated as having good psychosocial functioning on the SPRS-C, with 60% classified as limited and 6% as poor. The sample was stratified on psychosocial functioning comparing good versus limited/poor groups. Participants classified as good had higher functioning on internalising and externalising variables ($p < .01$) and cognitive flexibility ($p < .05$) compared to the limited/poor group. No group differences were found on any emotional variable; indeed only 9–21% of the group had elevated levels on emotional outcome measures. This was, however, dependent on age, with up to 44% of the older sample (15–17 years) reporting elevated levels on at least one emotional variable compared to 4–16% of the younger sample (7–14 years). *Discussion*: The pattern of results highlight the importance of behavioural functioning in psychosocial outcome post-childhood ABI. Findings also emphasise the need to take into account age when examining behavioural, emotional and executive variables and their relationship with psychosocial adjustment.

Empathy in Adolescents With Early Brain Injury

K. Brownfield,[1,2] L. Gonzalez,[1,2,3] W. Crouch,[1] P. Anderson[2,4] and V. Anderson[2,3,4]

[1] *Monash University, Melbourne, Australia*
[2] *Murdoch Childrens Research Institute, Melbourne, Australia*
[3] *Royal Children's Hospital, Melbourne, Australia*
[4] *University of Melbourne, Melbourne, Australia*

Aims: Injuries to the developing brain often lead to later social and emotional difficulties. A fundamental aspect of social and emotional wellbeing is the ability to empathise; therefore deficits in empathy may have potentially wide-ranging consequences. However, to date there is an absence of research investigating empathic ability following early brain injury. The current research explored the following questions: (a) Do adolescents with early brain injury display empathic deficits compared with a normative sample? (b) How is the timing of the injury related to empathic ability? (c) Are adolescents with early brain injury more likely to experience social or emotional difficulties? *Method*: Seventy-three adolescent participants were recruited through an existing study at the Murdoch Children's Research Institute in Melbourne, Australia. All had MRI-documented brain injury which occurred at least two years prior to their participation. Inclusion criteria ensured English fluency, an IQ of at least 70 and sufficient reading ability. Participants completed measures of empathy (Davis' Interpersonal Reactivity Index) and depression (Reynolds Adolescent Depression Scale), along with a battery of social functioning scales. *Results and Discussion*: Overall, participants demonstrated significant empathic deficits. Deficits in cognitive but not affective empathy were most pronounced when the injury had occurred during infancy and early childhood, as opposed to congenital/perinatal or later childhood injuries, $F(1,66) = 6.02$, $p < .01$. Although participants displayed a range of social difficulties ($p < .01$); their total depression levels did not differ significantly from the adolescent normative sample. These findings may assist in predicting socio-emotional outcomes in those who experience early brain injury.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Psychiatric Disorders Following Traumatic Brain Injury

K. Gould,[1] J. Ponsford,[1] L. Johnston,[2] and M. Schönberger[2]

[1] *Department of Psychology, Monash University, Austalia*
[2] *Monash-Epworth Rehabilitation Research Centre, Epworth Hospital, Richmond, Australia*

Background and Aims Previous studies of psychiatric disorders following traumatic brain injury (TBI) have used differing methodology, resulting in variable reported frequency of disorders. There is also limited understanding of their causes. There have been few prospective studies. The present study aimed to examine the frequency and association between psychiatric disorders prior to and following TBI. *Method* To date, 160 participants with TBI have been assessed for pre-injury disorders as well as disorders current at the time of the injury. These participants are being prospectively and longitudinally assessed over 5 years. At this stage, 80 participants have completed twelve month assessments. Average age at injury was 33.5 years (range 16–77) and 77% were male. Measures included the Structured Clinical Interview for DSM-IV-TR, Hospital Anxiety and Depression Scale, Alcohol Use Disorders Identification Test, Drug Abuse Screening Test, Glasgow Outcome Scale–Extended, Sydney Psychosocial Reintegration Scale and Quality of Life Inventory. *Results* More than half of all participants had a lifetime history of psychiatric disorders pre-injury (51.9%), the most frequent of which were anxiety (18.6%), substance use (18%), depression (15.4%), and alcohol use (14.8%) disorders. Comorbidity was high. At the time of injury, 23.1% of participants had a psychiatric disorder. However, by one year post-TBI, psychiatric disorders increased significantly in frequency (45%), with rates of depressive (32.1%) and anxiety (22.6%) disorders highest. Findings regarding predictors of psychiatric disorders and impact on outcome post-TBI will be presented. *Discussion* Findings highlight the importance of identifying those at risk and implementing strategies to address psychiatric disorders post-TBI.

Social Cognition, So What?: (1) A Preliminary Exploration of Inter-subjective Experiences of Intimacy in Couples following Acquired Brain Injury (ABI)

G. Yeates

Community Head Injury Service, Aylesbury, and The Oliver Zangwill Centre for Neuropsychological Rehabilitation, Ely, United Kingdom

Background & Aims: The existing literature on social cognition impairments following ABI is operationalising more specific impairment constructs. However only a few studies have explored the relationship between these and psychosocial outcomes, in particular romantic couple's experiences of intimacy, closeness and connection. This study is part of a larger investigation into these associations using mixed methodologies and theoretical foundations, with the aim of generating rich and varied data to facilitate theory building and guide appropriate couples interventions. *Method*: Participants are adult romantic couples including survivors of varying forms of ABI. Survivors have been assessed to exhibit one or more socio-emotional communication impairments (mentalising and social inference, emotion recognition, social judgment making, emotion-based decision making). 20-30 Couples will be interviewed by the study's completion. Data from the first of these interviews are reported here. Interviews are in both couples and individual formats and are semi-structured. Questions from adult/couples attachment interviews are used as index queries and these are followed up in

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

a flexible, responsive manner. This data is analysed using psycho-discursive qualitative methodology. This qualitative information is triangulated with neuropsychological assessment and psychosocial questionnaire data where relevant. *Results*: This early data is highlighting a complex interplay of neuropsychological impairment, interpersonal process and wider contextual influence. Key processes and factors are emphasised. *Discussion*: The interpersonal and inter-subjective processes arising from the interplay of neuropsychological and social contextual factors are considered and the means of validating these conjectures through the subsequent phases of this research study are outlined.

Brain-injured Survivors' Experience of Neurorehabilitation in the Wider Context of Adaptation to Brain Injury: An Interpretative Phenomenological Analysis

A. Moses,[1] J. Dickson,[1] and R. Aguiar[2]

[1] *Division of Clinical Psychology, University of Liverpool, Liverpool, United Kingdom*
[2] *Brain Injury Rehabilitation Centre, Mersey Care NHS Trust, Mossley Hill Hospital, Liverpool, United Kingdom*

Aims: Although there is much research examining specific neurorehabilitation outcomes, few studies focused on the phenomenological experiences of brain-injured survivors undergoing neurorehabilitation. This study aimed to obtain a rich and detailed understanding of such experiences in the wider context of brain injury adaptation. *Method*: Fifteen brain-injured individuals undergoing neurorehabilitation took part in semi-structured interviews. Their narratives underwent systematic analysis using Interpretative Phenomenological Analysis (IPA; Smith, 1996). Seven superordinate themes emerged relating to: (1) the impact of ABI, (2) self-identity changes, (3) social changes, (4) generating coping strategies, (5) taking a proactive stance, (6) searching for meaning, and (7) the impact of neurorehabilitation. *Results*: The results are viewed through the lens of positive psychology. The findings suggest that brain-injured survivors see themselves as active agents in the adjustment process, and use active coping and problem-solving strategies. It was also found that participants viewed their experience of neurorehabilitation as adjunctive to the wider process of adaptation to brain injury. *Discussion*: The study identified the main needs experienced by brain-injured individuals, which were expressed as a preoccupation with the unresolved aspects of their adjustment, mainly relating to the emotional processing of their experiences. Other needs related to information provision, and lack of social opportunities. Suggestions were made regarding: (a) improved access to neuropsychotherapeutic services as part of holistic rehabilitation programmes, (b) improving provision of clear information about ABI sequelae, and (c) greater role for peer-support groups. Further consideration to the individual needs to be given in the context of personhood alongside that of the brain injury.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

SESSION 7: NEUROSCIENCE AND NEUROPSYCHOLOGICAL REHABILITATION

Subacute Cognitive and Neurological Decline after Traumatic Brain Injury, and Treatments to Minimise Decline and Improve Recovery

R.Green

Cognitive Neurorehabilitation Sciences Lab, Toronto Rehabilitation Institute, Toronto, and University of Toronto, Toronto, Canada

Background and Aims: Moderate and severe traumatic brain injuries can cause significant impairments to cognitive functioning. In the early months following injury, there is typically a great deal of improvement in these impaired functions. By six months to a year, recovery typically reaches an asymptote, with little overt recovery observed thereafter. The prevailing clinical and scientific assumption is that the level of functioning attained up to this point is maintained into the long-term. We investigated this assumption. *Methods*: 30+ patients with moderate to severe TBI underwent comprehensive neuropsychological testing at 1.5, 4.5, 12 and 24 months post-injury. Quantitative MRI including diffusion tensor imaging was carried out at 4.5 and 24+ months post-injury. *Results*: Following a normal early recovery, declines in cognitive functioning were observed using the reliable change index. Sub-acute neurological decline was also observed as measured by increased cerebrospinal fluid, hippocampal volume loss and progression of white matter lesions. Hippocampal volume loss was associated with diminished memory recovery. *Discussion*: While such findings sound discouraging, it is important to note that recovery is taking place despite them. Therefore, an understanding of the mechanisms of these deleterious changes will open the door to new avenues for treatment. Behavioural interventions that can offset sub-acute atrophy, thereby offering the potential to augment cognitive recovery, are discussed.

Plastic Cognitive and Neural Changes Induced by Music Listening after Middle Cerebral Artery Stroke

T. Särkämö and M. Tervaniemi

Cognitive Brain Research Unit, Department of Psychology, University of Helsinki, Finland and Finnish Centre of Excellence in Interdisciplinary Music Research, Department of Music, University of Jyväskylä, Finland

Music listening plays an important role in regulating our mood, attention, and self-identity. Neurally, music listening engages a complex network of temporal, frontal, parietal, and subcortical areas involved not just in auditory perception but also in attention, working memory, semantic and syntactic processing, and emotions. In neurological rehabilitation, active music therapy has previously been used to aid emotional, motor, and speech recovery, but little is known about the potential therapeutic effects of normal music listening. Our aim was to determine whether everyday music listening could improve cognitive recovery and mood and enhance basic auditory encoding in neurological patients. Sixty patients with a middle cerebral artery (MCA) stroke were randomised to music listening, audio book listening and control groups (n = 20 in each) at the acute post-stroke stage and were followed for six months using neuropsychological assessments and magnetoencephalography (MEG) measurements. Behavioural results showed that music listening improved verbal memory and focused attention recovery significantly more than audio book listening or nonlistening. In

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

addition, music listeners also experienced less depressed and confused mood after the stroke than nonlisteners. MEG results showed that both music and audio book listening increased the amplitude of the MMNm more than nonlistening. This implies improved neural discrimination of changes in basic sound attributes. Moreover, recovery of the MMNm correlated with memory and attention recovery, suggesting that plastic changes in basic sound processing may partly underlie the enhanced cognitive recovery induced by music. Clinically, these findings encourage the use of music listening in neurological rehabilitation.

The Effects of Cognitive Training on Brain Activity in Patients With Frontal Lobe Lesions

E.C. Miotto,[1] C.R. Savage,[2] J.J. Evans,[3] B.A. Wilson,[4] M.G. Martins,[5] M. Scaff[1] and E. Amaro Junior[5]

1 Department of Neurology and Division of Psychology, Hospital das Clinicas, University of São Paulo Medical School, Brazil.
2 Hoglund Brain Imaging Center, Kansas University Medical Center, United States of America
3 Section of Psychological Medicine, University of Glasgow, United Kingdom
4 MRC Cognition and Brain Sciences Unit, Cambridge, England
5 Department of Radiology, University of São Paulo, Medical School, Brazil.

Background and Aims: It is well established that the prefrontal cortex (PFC) has been implicated in the ability to apply semantic organizational strategies during verbal encoding and episodic learning. However, there has been no direct evidence demonstrating which specific areas in the PFC are engaged after cognitive training using semantic organizational strategies in patients with frontal lesions. The aim of the present study was to investigate the effects of semantic strategic training on brain activity and changes in behavioral performance, after cognitive training, using fMRI in patients with lesions in the PFC. *Method*: 25 patients (14 with left frontal lobe and 11 with bilateral orbital frontal lesions) were scanned before and after a 30-minute cognitive training during encoding of word lists. Free recall was obtained off-scan. *Results*: There was a significant activation in bilateral dorsolateral prefrontal (DLPF) and orbitofrontal (OFC) areas after cognitive training associated with improved performance on the number of words retrieved and strategy application. *Discussion*: These results demonstrate the engagement of bilateral DLPF and OFC cortex during strategic memory processes especially when effort of effective use of strategies are required. The different areas engaged may shed light on some of the processes underlying recovery with cognitive rehabilitation in PFC patients.

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

J. Ponsford and C. Willmott

School of Psychology, Psychiatry and Psychological Medicine, Monash University, Monash-Epworth Rehabilitation Research Centre and National Trauma Research, Monash University, Australia

Background and Aims: Most previous studies evaluating use of methylphenidate following traumatic brain injury (TBI) have been conducted many years post-injury. This study aimed to evaluate the efficacy of methylphenidate in facilitating attention in TBI individuals during inpatient rehabilitation. *Methods*: 40 participants with moderate-severe TBI (Mean =

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

68 days post-injury) were recruited into a randomised, crossover, double-blind, placebo controlled trial. Methylphenidate was administered at a dose of 0.3mg/kg bd. Lactose in identical capsules served as placebo. Methylphenidate and placebo administration was randomised in a crossover design across six sessions over two weeks. Primary outcome measures were neuropsychological tests of attention. *Results*: No participants were withdrawn due to side-effects or adverse events. Methylphenidate significantly increased speed of information processing on the Symbol Digit Modalities Test (95% CI .30 to 2.95, Cohen's d = .39, p = .02), Ruff 2 & 7 Test – Automatic Condition (95% CI 1.38 to 6.12, Cohen's d = .51, p = .003), Simple Selective Attention Task (95% CI -58.35 to –17.43, Cohen's d = .59, p = .001) and Dissimilar Compatible (95% CI –70.13 to –15.38, Cohen's d = .51, p = .003) and Similar Compatible (95% CI -74.82 to –19.06, Cohen's d = .55, p = .002) conditions of the Four Choice Reaction Time Task. Those with more severe injuries and slower baseline information processing speed demonstrated a greater drug response. *Discussion*: Methylphenidate enhances information processing speed in the inpatient rehabilitation phase following TBI.

SESSION 8: DATABLITZ – NEUROPSYCHOLOGICAL REHABILITATION OUTCOMES

Changes in Emotional and Executive Functioning after Holistic Neuropsychological Rehabilitation

M. Vink,[1] M. Holleman,[1] R. Horst,[1] K. Molleman,[1] M. Luijpen[1] and A. Bouma[2]

[1] *Rehabilitation Centre Amsterdam, Overtoom 283, 1054 HW Amsterdam, the Netherlands*
[2] *Department of Clinical and Developmental Psychology, University of Groningen, the Netherlands*

Background and aims: In the long-term consequences of acquired brain injury, emotional functioning is thought to interact with cognitive functioning. Holistic neuropsychological rehabilitation aims to integrate emotional and cognitive interventions. The study explores the changes in emotional and executive functioning after holistic neuropsychological rehabilitation. *Method:* Participants are a group of patients (N = 69) with chronic brain injury who participated in a 16-week intensive holistic group program. Patients were assessed before participation and after completing the program. Follow-up assessments took place 1 and 3 years later. Assessment consisted of questionnaires regarding emotional and executive functioning and neuropsychological testing. *Results:* Paired samples t tests were used to compare pre- and post-treatment scores and follow-up scores. The SPSS-PC program was used for statistical analysis. Significant changes were found on depression and anxiety scores, as well as on perceived cognitive and socio-emotional aspects of executive functioning. There were no significant changes in the scores of neuropsychological testing before and after the program. *Conclusions:* After participation in a holistic neuropsychological rehabilitation program, patients with chronic brain injury seem to experience positive changes in emotional and executive functioning. An integrated treatment approach might be beneficial. The interaction of the different components requires further investigation.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Effectiveness of a Post-acute Outpatient Community Re-entry Cognitive Rehabilitation Programme for Patients with Acquired Brain Injury

S. Rasquin,[1] S. Bouwens,[2] B. Dijks,[3] I. Winkens,[3] W. Bakx,[1] and C. Van Heugten[2]

[1] *Rehabilitation Foundation Limburg, Hoensbroek, the Netherlands*
[2] *School for Mental Health and Neuroscience, Department of Psychiatry and Neuropsychology, Maastricht University, Maastricht, the Netherlands*
[3] *Vlans, Utrecht, the Netherlands*

Objective: To examine the effectiveness of a post-acute outpatient community re-entry cognitive rehabilitation programme for patients with acquired brain injury and their relatives. *Participants:* Twenty-seven patients with acquired brain injury (30% stroke; 52% male) with a mean age of 49.5 (*SD* 9.2) years. Mean time since injury was 1.9 years (*SD* 2.0). And 25 relatives with a mean age of 48.8 (*SD* 8.8) years. *Intervention:* A group programme with seven participants per group, 15 weekly sessions of 2.5 hours and a booster session 6 weeks after the last session. Group sessions consisted of cognitive strategy training, social skills training, and psycho-education. Patients also received homework. Relatives were invited twice. *Methods:* Repeated measurements: prior to treatment (baseline, T0); directly after treatment (T1, 21 weeks); and at follow-up (T2, 45 weeks). Primary outcome measures: cognitive failures (CFQ); quality of life (SA-SIP); and individualised goals (GAS). *Results*: There were no significant differences in CFQ; the SA-SIP physical functioning deteriorated significantly at first (T1), but returned to baseline level at follow-up (T1-T2). At T2 the level of social activities improved and patients reported less fatigue ($p < .05$). Patients did improve significantly on individual goals ($p < .05$) between T0 and T1. The level of attainment did not change between T1 and T2. Goals were mostly set in the cognitive and behavioural domains. *Conclusions:* The programme had a positive effect on the individual goals set by the patients. This effect did not result in better participation by or a better quality of life for either the patients or their relatives.

Efficacy of Two Therapeutic Procedures to Increase Community Participation after Traumatic Brain Injury: A Randomised Controlled Trial

R.L. Tate,[1,2] S. McDonald,[3] G.K. Simpson,[4] A.T. Lane-Brown,[1] R. Schultz,[1] R. Dunne,[4] and B.A. Wilson[5,6]

[1] *Rehabilitation Studies Unit, Northern Clinical School, Faculty of Medicine, University of Sydney, Sydney, Australia*
[2] *Royal Rehabilitation Centre Sydney, Australia*
[3] *School of Psychology, University of New South Wales, Sydney, Australia*
[4] *Brain Injury Rehabilitation Unit, Liverpool Hospital, Sydney, Australia*
[5] *MRC Cognition and Brain Sciences Unit, Cambridge, United Kingdom*
[6] *Oliver Zangwill Centre, Ely, United Kingdom*

Background: For many people with traumatic brain injury (TBI) the severity of residual disabilities is such that return to work is not possible. This subgroup presents a challenge for rehabilitation professionals, particularly in terms of the provision of strategies to facilitate engagement in meaningful occupational activity. This study developed a neuropsychologically-based therapy program for this subgroup aimed at improving skills in developing new activities and compared it with (a) a standardised leisure education program and (b) a wait-list control group. *Method*: Forty-eight people with TBI who were not able to work ($M = 75.3$ months post-trauma) were randomly

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

allocated to one of the above groups. Allocation was concealed and all participants remained in the group to which they were allocated. The primary outcome measures were the Nottingham Leisure Questionnaire (NLQ) and the Community Integration Measure (CIM). Groups were similar at baseline for selected demographic and prognostic variables, but differences were found for age and the outcome variables; accordingly these were controlled in statistical analyses. In cases where there were missing data values, pre-treatment scores were used as post-treatment scores. *Results*: Between-group ANCOVAs showed a trend to significance on the NLQ ($F_{(3,44)} = 2.8$, $p = .05$), but not the CIM ($F_{(3,43)} = 2.1$, $p > .05$). For the NLQ, the neuropsychological therapy group showed a larger increase in scores at post-treatment than the other two groups, with a medium effect size ($d = .46$), although mean group differences using post-hoc t tests were not statistically significant. *Conclusions*: Evidence for a treatment effect using the global outcome scales was limited and challenges in conducting therapy and research in this area are discussed.

Community Rehabilitation for Social Role Participation: Outcomes of a Three Year Follow-up Study

S. Sloan[1] and J. Mackey[2]

[1]*Osborn Sloan and Associates, Kew, Australia*
[2]*Applied Communication Skills, Kew, Australia*

Community based rehabilitation for people with acquired brain injury aims to address the paucity of role participation and subsequent social isolation that are reported in long-term outcome studies. This is an emerging area of intervention however and one where there are few studies to guide clinicians. This paper will present the results of a three year intervention study that focussed on maximising life role participation for 44 individuals with severe acquired brain injury. Subjects received individually tailored, community based rehabilitation programs based on the six key principles of the Community Approach to Participation (CAP). Results on a range of broad measures will be presented showing the outcomes in terms of participation in community activities and meaningful social roles, as well as hours of weekly support. Based on the evidence that life role participation can be increased, the nature of the therapy intervention that leads to positive change will be explored. As an illustration, the paper will focus on a key aspect of therapy, namely building social communication skills. It will be seen that, participation in life roles, and the social interaction that it provides, may require relationships to be re-framed and specific skills developed to effectively manage these interactions. A case study will be used to provide concrete examples of the pragmatic communication skills that need to be taught in order to support participation in activities.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

SESSION 9 SYMPOSIUM: THE SOCIAL DIMENSION OF ACQUIRED BRAIN INJURY REHABILITATION

PAPER 1: Overview

A. Haslam and W.H. Williams

School of Psychology, University of Exeter, United Kingdom

There is growing awareness that a range of social psychological factors typically unaccounted for in neurorehabilitation have a major influence over the outcomes of survivors of acquired brain injury (ABI). In this symposia research is presented that explores the role of such factors and which indicates that they may well be crucial in determining whether survivors can regain optimal social role adjustment post-trauma. O'Neill reports on the attitudes of members of the public towards survivors of ABI — with the public having more negative views on survivors of those with brain injury compared to students. Redpath et al. investigate the role that the attitudes of healthcare professionals towards individuals with ABI relationship plays in shaping intended healthcare behaviour. Both strands of research show how negative perceptions may influence helping behaviour subsequent to initial contact within an Emergency Department. Linden et al. explore how the general public perceives people with ABI and how that may influence their their desire to socialise with, employ, house and include people with ABI in their lives. Boylan et al., in a related study, identify similar, but specific issues, in relation to children and adolescents with ABI. They offer suggestions for managing such challenging transitions for those at risk. These studies illustrate the importance of mapping the social dimensions of ABI in neurorehabilitation and identify potential barriers to social reintegrating for survivors of brain injury within their communities. Potential solutions to these problems also need to be identified and tested.

PAPER 2: 'They Call Me Scar-head': Experiencing and Coping with Stigma following Childhood Acquired Brain Injury (ABI).

A-M. Boylan, M. Linden, and F. Alderdice

Nursing and Midwifery Research Unit, Queen's University Belfast, United Kingdom

Background and Aims: Previous research on the social outcomes of ABI has shown that post-injury, children can experience loneliness and lowered self-esteem. However, there is a dearth of knowledge about the social impact of ABI in childhood and adolescence. Awareness of this is vital for successful rehabilitation and community reintegration of survivors. The aim of this paper is to explore and discuss findings on stigmatisation following ABI, and to uncover coping mechanisms employed by members of this population. *Method:* Semi-structured interviews were conducted with nine children with ABI which were audio-recorded, transcribed verbatim and analysed using Interpretative Phenomenological Analysis (IPA; Smith, 1998). Questions explored the child's experiences of school, community involvement, and relationships. *Results:* The main themes that emerged included: persistent negative stigmatisation, best interests versus worst interests, and coping. Incidents of stigmatisation were not discussed by every participant. However, several individuals reported persistent negative stigmatisation by their peers, including bullying and name-calling. Teachers and siblings were also identified as blameworthy. Participants discussed the coping mechanisms used to deal with

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

negative stigmatisation including relying on peer support, and talking to teachers and parents. However, some participants felt that at times their complaints were not taken seriously. *Discussion*: This study shows that survivors of childhood ABI can endure frequent stigmatisation. The difficulty lies in assessing who should be targeted in an attempt to improve their quality of life in this respect.

PAPER 3: Exploring Public Views on Survivors of Brain Injury

J. O'Neill,[1] M. Linden[1] and I. Crothers[2]

[1] *Nursing and Midwifery Research Unit, Queen's University Belfast, United Kingdom*
[2] *Area Brain Injury Team, Craigavon and Banbridge Community Health and Social Services Trust, United Kingdom*

Background and Aims The purpose of this study was to investigate public perceptions of survivors of brain injury. *Method*: 323 participants took part in this study (169 psychology students and 154 members of the public). A list of 20 statements which could potentially describe survivors of brain injury was presented to participants who rated their level of agreement with each statement. Responses were made using a 5-point Likert scale. *Results*: The effects of group (student and public), gender and socioeconomic status (low, moderate and high) on responses to the statements were assessed. Multivariate analysis of variance showed a statistically significant difference between the two groups with students reporting more positive perceptions of brain injury survivors on 15 of the 20 statements. No effects of gender or socioeconomic status were found. *Discussion*: The research suggests that in comparison to students, members of the public hold more negative views on survivors of brain injury in relation to intellectual competency, ability to care and trustworthiness.

PAPER 4: 'Still be a Working Member of Society': A Qualitative Exploration of Public Perceptions on Survivors of Brain Injury

M. Linden and A-M. Boylan

[1] *Nursing and Midwifery Research Unit, Queen's University Belfast, United Kingdom*

Background and Aims: How members of the public perceive survivors of brain injury has the potential to influence their desire to socialise with, employ, house and include them in their lives. The present study sought to employ a qualitative methodology to determine the views held by the general public in Northern Ireland towards survivors of brain injury. *Method*: Semi-structured interviews were conducted with sixteen members of the general public. Ten questions addressed issues such as the role of survivors of brain injury in society, the challenges they face, and the characteristics ascribed to them. Interview data was transcribed verbatim and was subjected to thematic analysis. *Results*: When asked to describe someone with a brain injury participants typically used negative labels and identified the most common problems as relating to physical, cognitive, emotional and social functioning. There was a general failure to recognise that brain injury was a 'hidden' disability, with most participants expecting some outward manifestation. *Discussion*: Few previous studies have employed a qualitative approach to explore how the public perceives survivors of brain injury. This study showed that members of the public had an increasing awareness of the challenges faced by this group. In spite of this, perceptions of aggressiveness, dependency and unhappiness were still evident suggesting potential problems in reintegrating survivors of brain injury with their communities.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

PAPER 5: Attitudes of Health Care Staff to Brain Injured Individuals: How Blame May Influence Helping Behaviour

S. Redpath,[1] H. Williams,[2] P. Yates[3] and A. Harris[3]

[1] *Abertawe & Bro Morgannwg NHS University Trust, Cymru/Wales, United Kingdom*
[2] *School of Psychology, University of Exeter, United Kingdom*
[3] *Royal Devon and Exeter Hospital, Exeter, United Kingdom*

Primary Objective: To investigate the attitudes of healthcare professionals towards individuals with traumatic brain injury (TBI), their relationship to intended healthcare behaviour, and to consider the implications of these on neuropsychological formulation and rehabilitation. *Research Design*: An independent groups design used four independent variables; aetiology, group, blame and gender to explore attitudes towards survivors of brain injury. The dependent variables were measured using the Prejudicial Evaluation and Social Interaction Scale (PESIS) and Helping Behaviour Scale (HBS). *Methods and Procedures*: A hypothetical vignette based methodology was used; 463 participants (131 trainee nurses, 94 qualified nurses, 174 trainee doctors, 61 qualified doctors) were randomly allocated to one of six possible conditions. *Main Outcomes and Results*: Regardless of aetiology, if an individual is to blame for their injury, qualified healthcare professionals have more prejudicial attitudes than those entering the profession. There is a significant negative relationship between prejudice and helping behaviour for qualified healthcare professionals. *Conclusions*: Increased prejudicial attitudes of qualified staff are related to a decrease in intended helping behaviour, which has the potential to impact negatively on an individual's recovery post-injury. An individual's experience of the healthcare system needs to be considered for neuropsychological formulation when they present to services with postinjury difficulties.

PAPER 6: 'It's a Beautiful Day' — The Role of Peer Support and the Voluntary Sector in Recovery From Acquired Brain Injury

A. Easton

The Encephalitis Society, Malton, United Kingdom

Background and Aims: Along with more medical models of rehabilitation there is also an opportunity for therapeutic outcomes involving one's peers and acquired brain injury support organisations. People's need for understanding, acceptance and support continues long after they have left hospital/rehabilitation and despite attempts to realise this through transitional rehabilitation, it can be difficult to achieve. This presentation therefore attempts to offer for consideration examples of successful peer support provided through the voluntary sector. *Methods*: This presentation is based on recorded and observational case history data (video and written, from membership surveys and qualitative interviews) from the users of one national UK voluntary sector provider, along with evidence from the empirical literature to illustrate the type of opportunities that can be accessed among one's peers, via voluntary sector services. *Results*: The presentation will present the largely positive outcomes of peer and voluntary sector support however it will also consider the temporal nature of such support and the notion that the appropriateness of such opportunities are contingent, existing in time and space. *Discussion*: There is a role for peer and voluntary organisations in improving the outcome for people who have sustained a brain injury, and they can have a significant and positive impact on their recovery/rehabilitation. We need innovatory solutions to longstanding and com-

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

plex problems, such as ongoing support for brain injured populations when they return to their communities — a greater partnership between statutory and voluntary sectors may be one way to address this.

SESSION 10: DATABLITZ — COGNITION, EMOTION, BEHAVIOUR AND MOTOR FUNCTIONING IN ACQUIRED BRAIN INJURY — THEORY, ASSESSMENT AND TREATMENT

Prevention of Depression, Enhancing Cognitive Recovery, and Improving Community Participation in Traumatic Brain Injury (TBI) with Duloxetine — Preliminary Results

L.E. Trexler

Department of Neuropsychology, Rehabilitation Hospital of Indiana, Indianapolis, United States of America

Objectives: To determine if duloxetine prevents depression and improves cognitive recovery and community participation following TBI. *Methods:* Double-blind, randomised, placebo-controlled study in an acute rehabilitation hospital. Participants were randomly assigned to duloxetine (n = 4) and placebo (n = 3) groups. Participants randomised to the duloxetine group received 30mg qd of duloxetine for one week and then 60mg qd for nine months. Main Outcome Measures were the Hamilton Depression Scale (HAM-D); Hopkins Verbal Learning Test (HVLT); the Community Integration Questionnaire (CIQ). *Results:* HAM-D scores for all participants were notably low. At the nine month follow-up, duloxetine participants demonstrated consistently better performance on the HVLT Total Recall subtest (two-tailed t test, p = .02), as well as on a measure of phonemic fluency (two-tailed t test, p = .05). Duloxetine participants were also found to rate themselves consistently better on the CIQ Productivity scale at 6 months (two-tailed t-test, p = .005) and 9 months (two-tailed t test, p = .02). *Discussion:* While preliminary, these data suggest that duloxetine may be effective in improving community participation and return to work or school following in TBI. Results also suggest improved cognitive recovery, particularly with respect to rate of verbal learning capacity and verbal fluency. No long-term advantage for the duloxetine group was found for preventing depression, but both groups had remarkably low levels of depression.

Cognitive and Motor Performance in Physically Well-Recovered Men With Traumatic Brain Injury

J. Sarajuuri,[1] M. Pasanen,[2] M. Vartiainen,[1] M. Rinne,[2] T. Lehto,[1] and H. Alaranta[1]

[1] *Käpylä Rehabilitation Centre, Helsinki, Finland*

[2] *UKK-instituutti, Tampere, Finland*

Background and Goals: The primary and secondary effects of traumatic brain injury (TBI) often result in combined physical and neuropsychological sequelae that greatly challenge the affected person's autonomy. Motor performance and cognition have most often been studied in isolation. The purpose of this paper was to investigate the relationship between cognitive and motor performance in physically well-recovered men with significant TBIs. *Methods*: Thirty-four voluntary consecutively attended male patients with TBI. The inclusion criteria were: (1) age 19–55 years; (2) body mass index less than 35; (3) passed Mini Mental State Examination (normal

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

>24/30); and they were (4) able to maintain initial test positions; (5) to perform a 2 km Walk Test; and (6) to run a short distance. More than 1 year should have passed since the injury. The motor performance tests were for static and dynamic balance, running for agility and a rhythm co-ordination. The neuropsychometric measures were: CERAD; Trail Making Tests; Digit Symbol sub-test from the WAIS-R; and the motor functions and acoustico-motor organisation sub-tests from the Luria's Neuropsychological Investigation. *Results*: The patients reported having experienced defects in balance, clumsiness in arm movements, difficulties in running and fatigue. 80% reported that they have had to change their sport or physical activities after injury and 12% had totally quitted their former sport activities. Findings showed high, statistically significant correlations of the speed of the complex information processing and attention to the performance time in agility. The results indicated also that the patients with normal performance in the measures of executive functioning had statistically significantly faster mean performance time in dynamic balance and/or agility compared to the patients with pathological results. *Conclusions:* The results showed that measures of information processing, attention and executive functioning may be associated to motor performance. The findings gave support to the previous notion that there is interaction between motor performance and cognition. Investigating the relationship between cognition and motor performance could promote the creation of cognitive treatment that may improve motor performance after brain injury and vice versa.

Neurocognitive Correlates of Aggressive and Sexually Disinhibited Behaviour Following Acquired Brain Injury

A. James[1] and A. Young[2]

[1] *Brain Injury Rehabilitation Trust, Ely, United Kingdom*
[2] *University of York, United Kingdom*

Aggression and sexual disinhibition are socially disabling consequences of acquired brain injury. In the current study, the relationships between aggression (both verbal and physical), sexual disinhibition and neurocognitive status were investigated in a sample of 46 participants with acquired brain injury during a nine week period in a residential neurobehavioural rehabilitation programme. A measure of noncompliance was also included in the analysis. Behavioural recordings were made systematically in real time. Consistent with previous research, it was found that there was a modest relationship between these behavioural problems and neurocognitive status. No relationships between self-reported emotional status and behavioural disturbance were evident. Verbal aggression, physical aggression and sexual disinhibition were related to greater neurocognitive impairment. Verbal aggression was particularly linked with greater impairment on intellectual and memory measures, while physical aggression was linked most strongly with poorer verbal skills. Sexual disinhibition produced the largest number of relationships, particularly with measures of memory and executive function. Non-compliance, however, showed a different pattern with better performances on a number of measures of executive function associated with higher levels of behavioural disturbance. There was evidence that these relationships were specific, rather than representing a more generic behavioural syndrome.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Determinants of Quality of Life in Survivors of Out-of-Hospital Cardiac Arrest

V. Moulaert,[1] E. Wachelder,[1] J. Verbunt,[1, 2] C. van Heugten[3] and D. Wade[2,4]

[1] *Rehabilitation Foundation Limburg, Hoensbroek, the Netherlands*
[2] *Care and Public Health Research Institute, Maastricht University, Maastricht, the Netherlands*
[3] *School for Mental Health and Neuroscience, Maastricht University, Maastricht, the Netherlands*
[4] *Oxford Centre of Enablement, Oxford, United Kingdom*

Background and Aims: Cardiac arrest can lead to hypoxic brain injury and decrease quality of life. We studied factors related to quality of life in survivors of out-of-hospital cardiac arrest. *Methods*: A retrospective cohort study on 88 survivors of out-of-hospital cardiac arrest, admitted to a Dutch academic hospital between 2001 and 2006. Patients received questionnaires at home. The primary measure was quality of life (SF-36). Secondary measures were experienced cognitive functioning, emotional functioning (depression/anxiety and posttraumatic stress), fatigue, daily functioning and participation in society. Quality of life scores were considered low when < 1SD of population average. Multiple linear regression analyses were performed in which quality of life was the dependent variable. *Results*: 63 patients (72%) returned the questionnaire. Mean time since cardiac arrest was 36 months (range 5–73 months). Physical and mental quality of life was low in 17 and 24% of the responders, respectively. Backward regression analyses showed that physical quality of life was significantly ($p < .001$, adjusted $R^2 = 0.531$) explained by experienced cognitive problems ($\beta = –0.378$), daily activities ($\beta = 0.262$), posttraumatic stress ($\beta = –0.246$) and fatigue ($\beta = –0.226$). Mental quality of life was significantly ($p < .001$, adjusted $R^2 = 0.664$) explained by anxiety/depression ($\beta = –0.609$), fatigue ($\beta = –0.177$) and experienced cognitive problems ($\beta = –.175$). *Discussion*: Several years after out-of-hospital cardiac arrest a quarter of the survivors reported a reduced quality of life. Quality of life is related to cognitive problems, fatigue, anxiety/depression, posttraumatic stress and difficulties in daily activities. Rehabilitation programs for this group should specifically address these topics.

Cross-Cultural Differential Item Functioning in Assessment of Symptoms of Brain Injury

A. Bateman, A. Caracuel and T. Teasdale

Oliver Zangwill Centre for Neuropsychological Rehabilitation, Ely, United Kingdom

Introduction: The European Brain Injury Questionnaire is a checklist of symptoms used not just as an assessment of subjective symptoms but to evaluate the outcomes of the rehabilitation programmes of several European centres (e.g., Williams, Evans and Wilson, 1999; Boman, Lindstedt, Hemmingsson and Bartfai, 2004; Dewar and Wilson, 2005; Schönberger, Humle, Zeeman, and Teasdale, 2006). However, data collected from different countries using this tool have not been compared using Rasch techniques. *Method and Results:* This preliminary analysis using RUMM2020software presents a re-analysis of responses to the questionnaire by 335 patients from Spain, France and the United Kingdom. Item Characteristic Curves were plotted, illustrating the varying discrimination and difficulties of items within the questionnaire. The discovery of cross-cultural uniform differential item functioning was found in 8/63 items (e.g., 'experienced crying easily', 'having temper outbursts'), significant after Bonferroni adjustment ($p < .0001$). The development of a

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

"theory of DIF" is required for each of these items (Wilson, 2005). *Discussion and Conclusion*: When test items have the same construct validity for all examinees in a population, examinees of comparable disability should have the same probability of endorsing an item. Examination of test item bias is an important stage in establishing test validity, especially if the tool is to be used with different subgroups, where it should be established items behave identically across the groups. These observations underline the need for caution before pooling questionnaire data in international studies. This differential item function method is hence endorsed as an appropriate way to approach multicentre data.

SESSION 11: PSYCHOSOCIAL ISSUES: IMPLICATIONS AND INTERVENTIONS

Social Identity and Offending in Adolesence: The Role of Head Injury on Gang and Group Membership

G. Cordan,[1] W.H. Williams,[1] C. Haslam,[1] J. Jetten[2] and A. Haslam[1]

[1] *School of Psychology, University of Exeter, United Kingdom*
[2] *University of Queensland, Brisbane, Australia*

Prevalence estimates of Head Injury (HI) within a forensic context tend to be elevated compared to the general population. The adolescent population is at particular risk of HI and of offending. Their offending is uniquely characterised by high group violation rates, particularly in relation to crimes of violence, substance misuse, and joyriding. Furthermore, adolescence is a period where there is tendency for conformity to peer group — particularly in terms of encouragement of anti-social behaviour. Research has shown how peer influence via gang membership mediates poly drug use, joyriding, and violence. However the influence of HI has been overlooked. This study examines the role of social identity and social group membership in terms of adjustment and clinical well-being to critical life transitions. Evidence of the detrimental impact of HI on socio-emotional functioning within adolescence has been found. HI within adolescence is likely to represent an additional transition during a particularly challenging period of life. A random sample of 129 male young offenders, aged between 14–18, were recruited from both community and prison populations. 24% of the sample (n = 31) were randomly recruited from a local city Youth Offending Team, serving various community orders. 76% (n = 98) were randomly recruited from a Young Offender Institute, and were deposed to varying lengths of sentence for a range of offences. A relatively elevated level of HI was reported compared to the general population — particularly for being knocked out with loss of consciousness of between 10 minutes to 6 hours. The role of HI and its effects on social identity are described. A biopsychosocial framework, mapping the consequences of HI on peer relationships in relation to adolescent involvement in drug misuse, joyriding and violence, is presented. The role of socially focussed rehabilitation of offenders with HI in childhood and adolescence is explored.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Coping With Communication Breakdown Following Traumatic Brain Injury: Preliminary Findings of a Randomised Controlled Trial Evaluating a New Treatment

J. Douglas,[1] M. Drummond,[2] and J. Cox[2]

[1] *School of Human Communication Sciences, La Trobe University, Australia*
[2] *Speech Pathology Department, Epworth Hospital, Victoria, Australia*

Background and Aims: The majority of adults who sustain moderate or severe traumatic brain injury (TBI) experience difficulties communicating effectively. These communication problems are a source of ongoing stress and have a negative impact on social participation. Currently, a novel approach to functional communication intervention is being evaluated in a randomised controlled trial. The intervention was developed to facilitate the use of productive and reduce the use of non-productive communication-specific coping strategies in everyday situations. *Method:* Participants are adults with TBI who are living in the community between 1 and 8 years after injury and are continuing to experience communication difficulties. A case control procedure has been used to assign participants to treatment versus waitlist conditions. The structured treatment program incorporates the procedures and principles of cognitive behavioural therapy and context-sensitive social communication therapy. Outcome measures include the La Trobe Communication Questionnaire, the Communication Coping Questionnaire, Clinical Discourse Analysis, the CHART-SF, the Depression Anxiety and Stress Scales, and a semi-structured qualitative interview with participants and family members. *Results:* Preliminary results contrasting the performance of the first 10–15 treatment–waitlist pairs on pre-treatment and post-treatment measures will be presented. Our anticipated results are consistent with a significant interaction effect on a 2×2 mixed ANOVA. *Discussion:* Communication deficits after TBI place substantial ongoing demands on therapy resources. However, to date there have been few controlled studies of communication interventions. The results of this study will provide some much needed evidence in the area.

Holistic Group Treatment — A Shortcut to Awareness?

A. Bartfai, C. Nilsson and M. Löfgren

Karolinska Institute, Department of Clinical Sciences, Danderyd Hospital, Division of Rehabilitation Medicine, Stockholm, Sweden.

Objective: A holistic group-treatment program for mild acquired brain injury (mABI) aims to facilitate daily life by offering knowledge concerning brain injury, strategies for daily life and coping discussions (Bartfai, etal 2000). No structured follow-up has been done from *the patients'* perspective. A qualitative approach, grounded theory was selected as the research method of choice because it is suitable for studying human actions and processes. *Participants and Methods*: Nine patients (4/5 M/F, 33–59 yrs) were recruited by purposive sampling after completing the group treatment program. The interviews lasted approximately 1 hour. The transcribed interviews were analysed by the Grounded Theory Method of constant comparison. Data were collected, coded, and analysed simultaneously in a 'zigzag process'. An emergent design was used to develop hypotheses. Codes were compared repeatedly within and between each other until the basic properties of the categories were defined. Data gathering was stopped when the categories were considered saturated. Theoretical concepts were developed during the analyses. Trustworthiness was ensured by triangulation in

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

researchers. *Results:* This group treatment can be considered as a shortcut to change and increased awareness by speeding up adaptation. Participants needed support for *how* to deal with changes and *what* are life's new priorities? Continued struggle with everyday challenges after treatment was rather a sign of incomplete adjustment after mTBI. *Conclusion:* The study emphasizes the importance of group treatment for the integration of knowledge, strategies and self-image leading to changes in how to handle problems or prioritise in major life choices.

Using a Compassionate Mind Approach After a Traumatic Brain Injury: A Case Study

F. Ashworth and F. Gracey

Oliver Zangwill Centre for Neuropsychological Rehabilitation, Princess of Wales Hospital, Ely, Cambridgeshire, United Kingdom

Emotional problems are prevalent following traumatic brain injury (TBI), however, the evidence base on interventions is limited. Gilbert's compassionate mind (CM) model draws on affective neuroscience to understand affective systems. CM is integrated into the cognitive behavioural therapy (CBT) model and so may be helpful in understanding emotional changes after brain injury and for guiding intervention. Clinical cases using CM following TBI are not evident in the literature. In order to consider the potential effectiveness of CM in TBI, we present the case of Penelope, a 23-year-old woman who suffered a TBI 3 years prior to rehabilitation. Penelope presented with low self-esteem, depression and disordered eating. Neuropsychological assessment revealed executive problems. She entered a holistic neuropsychological rehabilitation program aimed at improving her complex interacting difficulties and received CBT-based interventions as part of this program. Formulation of Penelope's difficulties is presented based on the CM model. The CM intervention technique employed is described, which aimed to facilitate an emotional shift with Penelope by upregulating positive affect mediated by a 'soothing' affective system in order to downregulate the 'threat' affective system. Adaptations to the approach in the context of Penelope's TBI are discussed. Outcome evaluation using self-report measures of mental health and self-esteem indicated positive changes, implicating the usefulness of CM in this case. Implications for broader use of CM in the context of impaired affect regulation systems are considered. In conclusion, Gilbert's CM model may be useful in conceptualising emotional and behavioural responses and for developing intervention in rehabilitation following TBI.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

SESSION 12: MEMORY, PTA AND ERRORLESS LEARNING

Head Injury Attenders at the Emergency Room

T.M. McMillan,[1] P. McKenzie,[1] I.J. Swann,[2] C.J. Weir[3] and A. McAviney[2]

[1] *Psychological Medicine, Faculty of Medicine, University of Glasgow, Gartnavel Royal Hospital, Glasgow, United Kingdom*
[2] *Emergency Medicine Department, Glasgow Royal Infirmary, Glasgow, United Kingdom*
[3] *Robertson Centre for Biostatistics, University of Glasgow, Glasgow, United Kingdom*

Background and Aims: Large numbers of people with a head injury attend emergency departments (EDs), are assessed, given an information sheet and return to home without inpatient admission. There is relatively little research on this group, and we know little about users perspectives on the usefulness of such advice, whether it is remembered or adhered to. We also know little about whether there is an identifiable sub-group that requires follow-up. This study explores these two issues. *Methods and Procedure:* A single group prospective follow-up design. Information obtained by ED staff during hospital attendance, and telephone follow-up information about user satisfaction, memory for advice and symptom persistence at early follow-up was compared in 200 ED attenders with head injury who were not admitted to hospital as inpatients. The follow-up comprised a structured interview and the Post Concussional Symptoms Checklist. *Results:* Almost all participants reported high levels of satisfaction with advice, despite a minority remembering the advice given (alcohol/drugs 44%; medication 38%; rest/sleep 56%; work 36%; sport 36%). At follow-up, symptom persistence was not predicted by information obtained in the ED; however, attenders with retrospectively estimated post-traumatic amnesia of more than 5 minutes, had greater symptom persistence and poorer memory for advice at follow-up. *Discussion:* Although satisfaction with advice was high, memory for advice was relatively poor and this was associated with longer durations of PTA. The usefulness of PTA in triage for follow-up is discussed.

Are Two Methods Better Than One? Evaluating the Effectiveness of Combining Errorless Learning with Vanishing Cues

C. Haslam,[1] Z. Moss[1] and K. Hodder[2]

[1] *School of Psychology, University of Exeter, United Kingdom*
[2] *Medicess Limited, Basingstoke, United Kingdom*

Background and Aims: A growing trend in memory rehabilitation is to combine techniques to enhance treatment effects. While this makes intuitive sense, little is known about the added value of incorporating each technique. To investigate this issue we conducted two studies, comparing the effectiveness of combining errorless learning (EL) with vanishing cues (VC) relative to each method in isolation. *Method:* Healthy controls ($N = 60$) and patients with probable Alzheimer's Disease ($N = 22$) took part in Studies 1 and 2, respectively. For controls, dual task methodology was included to render their performance more comparable with that of patients. In each study, participants were asked to learn item-name associations under four conditions — EL, VC, EL+VC and trial and error — over four learning trials. Memory was tested after interference and brief delay. *Results:* For healthy controls, EL alone and EL +VC produced the best memory performances, but there was no difference between these conditions. In Study 2, all

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

treatment conditions (EL, VC, EL+VC) were significantly better than trial-and-error and, in this case, we found that the combined method was significantly better than each method in isolation. In practical terms, the data show that patients recalled an average of one more association under combined treatment conditions. *Discussion*: In line with recent recommendations, there was evidence of enhanced memory performance with combined methods for the patient group. While statistically significant, the magnitude of the improvement was relatively small which raises questions about the additional effort involved in combining methods relative to the actual gain.

SESSION 13: DATABLITZ – MEMORY REHABILITATION

Exploring the Limits of Memory Rehabilitation Using Errorless Learning and Spaced Retrieval in Dense Amnesia

A. Jansari,[1] T. McGibbon,[1] C. Haslam[2] and S. Anderson[3]

[1] *School of Psychology, University of East London, United Kingdom*
[2] *School of Psychology, University of Exeter, United Kingdom*
[3] *Sussex Rehabilitation Centre, Haywards Heath, United Kingdom*

Background: Various techniques have been developed to treat memory impairment and among the more successful are errorless learning (EL) and spaced retrieval (SR). While each has received considerable support, it remains unclear whether these methods are equally beneficial for clients with profound memory impairment. *Method:* We report findings from a study comparing the effectiveness of EL and SR in a case series involving three densely amnesic patients with differing aetiologies (anoxia, herpes simplex encephalitis and sub-arachnoid haemorrhage). Using these techniques participants were asked to learn visual and verbal associations over five trials. Following a short period of interference, memory was tested immediately and then also after a number of longer delays. *Results:* Both methods were found to facilitate memory performance in these patients relative to trial-and-error learning but there appeared to be differences between patients in their response to the different techniques. *Discussion*: The complex interaction between treatment methods and client response to the intervention are discussed in terms of the practical utility of different rehabilitation strategies.

Errorless Learning is Superior to Trial and Error When Learning a Practical Skill

C.L. Donaghey,[1] T.M. McMillan[1] and B. O'Neill[2]

[1] *Psychological Medicine, Faculty of Medicine, University of Glasgow, United Kingdom*
[2] *WestMARC Disability Service, Southern General Hospital, Glasgow, United Kingdom*

Background and Aims: Errorless learning has been demonstrated to be an effective strategy for the cognitive rehabilitation of people with memory impairment. This study aimed to determine whether errorless learning is an effective strategy for teaching a complex procedure. Cognitive impairment has been tentatively linked with poorer outcome of rehabilitation for lower limb amputation. Addressing this issue may improve outcome. The aim of this study is to determine whether an errorless learning approach is of benefit to amputees who are learning to fit a prosthetic limb. *Method:* Thirty adults from a limb-fitting clinic were randomly assigned to an errorless learning intervention (n = 15) or treatment as usual control group (n = 15).

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Neuropsychological characteristics were assessed using the Addenbrookes Cognitive Examination — Revised (ACE-R) and the list learning test of the Adult Memory and Information Processing Battery (AMIPB). *Results:* After only five learning trials, the errorless learning group learned to fit their limb more efficiently. They remembered more correct steps (Mann-Whitney U = 28; $p = .000$) and made fewer errors during the fitting sequence than the control group (Mann-Whitney U = 39; $p = .002$). *Discussion:* These findings suggest that errorless learning is beneficial to individuals who are learning to fit a prosthetic limb and can be effective for a procedural memory task.

How Do Number of Errors, Memory Load and Distractors Affect Errorless and Error Exposed Learning?

J.E. Nordvik,[1] N.I. Landroe[1] and A.K. Schanke[2]

[1] *Centre for the study of human cognition, Department of Psychology, University of Oslo, Norway*
[2] *Sunnaas Rehabilitation Hospital, Nesoddtangen, Norway*

Background and Aims: Clare and Jones show in a review from 2008 that whether errorless learning is beneficial or not depends on how the principle of errorless learning is operationalised and who the participants are (e.g., healthy controls, patients diagnosed with brain injury, dementia, or schizophrenia). The review indicates a need for better understanding of the possible favourable aspects of errorless learning. The aim of this study is (1) to investigate the role of memory load and capacity on errorless and error exposed learning, (2) examine the effect of the number of errors the participants are exposed to, and (3) contrast the effect of error exposure and distractors on the learning outcome. *Method*: 40 students (healthy controls) and 15 patients with acquired brain injury (ABI) are recruited to an errorless vs. error exposed learning experiment. The effect of the number of errors (0, 1 and 3 errors) and distractors (congruent vs. congruent) are contrasted. The participants are tested on: Digit span, Letter–number sequencing and PASAT. *Results*: Preliminary analyses indicate that both healthy controls and ABI-patients show decreased learning in the error exposed learning condition when working memory load is high. Second, three errors do not seem to significantly decrease learning more than one error and, finally, incongruent distractors in combinations with error exposure affect learning more negatively than congruent distractors. *Discussion*: The disadvantages of errors in learning might be related to working memory load and capacity.

Effects of Immediate Feedback and Errorless Learning on Recognition Memory Processing in Young and Older Adults

L. DaSilva and A. Sunderland

School of Psychology, University of Nottingham, Nottingham, United Kingdom

Age impairs certain aspects of recognition memory (i.e., recollection), while leaves others preserved (i.e., familiarity). The aim of this intervention was to assess if elderly people could be helped in making better use of familiarity, which is considered less reliable and more prone to error, when compared to recollection. Measures of sensitivity and response bias were derived from the performance on a continuous recognition memory task for faces. Two conditions were manipulated — immediate feedback on response accuracy and errorless learning (by avoiding guess responses). Forty participants were recruited — 20 were under 30, the other half was over 60. In each age group subjects

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

were allocated to either a control or intervention condition. Results showed that although the elderly group tended to show a more liberal response criterion at the start, the intervention group was able to invert this expected tendency and after the program was less prone to make false positives. Generalisation of this advantage to other memory tasks was nevertheless limited. These results are analysed in the light of current research in the area of memory intervention and the potential use of this training approach for age-related memory impairments is discussed. In particular, the need for the development of new methods to tackle issues of generalisation, as well as more effective ways to increase sensitivity (and not only false alarm indexes). Future studies could also assess the separate contributions of feedback and errorless learning conditions.

Preliminary Results From a Memory Aids Clinic for the Management of Everyday Memory Problems

B-K. Dewar,[1] N. Kapur[2] and M. Kopelman[1]

[1] *Institute of Psychiatry, Kings College London, London, United Kingdom*
[2] *Addenbrookes Hospital, Cambridge, United Kingdom*

There is growing evidence that compensatory memory aids are effective in the rehabilitation of memory impairment secondary to acquired brain injury. We report on the preliminary findings from an outpatient Memory Aids Clinic (MAC), a structured approach to training the use of memory aids. It was hypothesised that training would improve everyday memory function as measured by attainment of everyday memory goals. Goal attainment was assessed at baseline, the end of training and at follow-up. 24 subjects were referred following complaints of everyday memory problems secondary to a variety of neurological conditions. Treatment in the MAC consisted of a baseline session (clinical interview, neuropsychological assessment, and questionnaires), three training sessions over a 6-week period and follow-up (including reassessment) after 3 months. The initial training session introduced specific aids to match the subject's functional goals. The application and generalisation of these aids to everyday life was then facilitated in subsequent sessions. Training also incorporated errorless learning principles and homework was conducted between sessions, including assessment of compliance. Goal attainment was significantly higher following treatment. This positive treatment effect was maintained over time as goal attainment did not significantly change at follow-up. These preliminary results suggest that the provision of memory aids within a structured training program can have a positive effect on achievement of everyday memory goals. Results will be discussed in terms of factors predictive of a positive outcome and specific elements of the training program.

Computerised Memory Rehabilitation Following Acquired Brain Injury: A Systematic Review

C. Culley and J.J. Evans

Section of Psychological Medicine, Faculty of Medicine, University of Glasgow, United Kingdom

Background and Aims: Clinicians in the field of cognitive rehabilitation have long sought to discover if the computer may provide the key to the successful rehabilitation of memory deficits following acquired brain injury. *Method:* A systematic review of the literature revealed 13 studies that were analysed to address questions of the effectiveness, maintenance, and gener-

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

alisability of computerised memory rehabilitation. *Results and Discussion:* It is concluded that there is some limited evidence that computerised memory rehabilitation produces small improvements in memory as measured by neuropsychological tests. There is no evidence to suggest that improvements generalise beyond neuropsychological test measures to daily activities or that any changes in memory function endure over time without sustained and intensive input.

Predicting Better Outcomes From Group-Based Memory Training: Lessons From Patients With Stable Neurological Disorders

K. Richardson,[1] S. Lah,[1] Z. Thayer[2] and L. Miller[2]

[1] *School of Psychology, The University of Sydney, Sydney, Australia*
[2] *Neuropsychology Unit, Royal Prince Alfred Hospital, Camperdown, Australia*

Background and aims: We have found that patients with everyday memory complaints as a result of stable neurological conditions can benefit from group-based memory training (Richardson, Lah, Say, Thayer & Miller, 2009). A better understanding of the factors associated with differential patient responses to training was the aim of this study. *Method*: Fifty-six neurology outpatients (aged 21–70 years) completed a memory-training program consisting of six weekly, two-hour, group-based sessions that provided education and memory strategy practice. Their aetiologies included epilepsy (55%), stroke (32%), nonmalignant tumour removal (9%) and infection (4%). None had signs of dementia. Outcome measures included alternate forms of the Rey Auditory Verbal Learning Test (RAVLT) and a prospective memory (PM) test, as well as questionnaires assessing everyday memory. We used regression analysis to determine the impact of age, gender and aetiology, as well as baseline scores on measures of mood, attention, memory, and self-awareness of memory (i.e., concordance between self- and other-ratings of everyday memory). *Results:* RAVLT improvement was associated with self-awareness of memory at baseline and a history of epilepsy (compared to other aetiologies combined). Changes in self-reported everyday memory were greatest in younger patients and those with poorer PM and attention at baseline. There were no significant effects of mood or gender. *Discussion:* Several factors predicted individual memory training effects, but these differed depending on the outcome measure. Understanding such relationships should help to tailor memory interventions more effectively in the future.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

POSTERS – DAY 1

Demands on Modern Therapy Software – From Early Rehabilitation to Reintegration

F. Schulze

RehaCom, HASOMED GmbH, Magdeburg, Germany

In Germany, software in support of cognitive rehabilitation has been used for 20 years. Which preconditions does such software have to meet to also meet the modern claims of cognitive therapy? Using the example of the very widespread therapy software 'RehaCom', it will be shown how a modular design, a guided computer–patient interaction, an adaptive performance adjustment, and an offer of a variety of therapy equipment become an appealing system for patients and therapists. Special attention will be turned to the demonstration of the individual phases of rehabilitation in that software. In early rehabilitation, tasks are needed which already stimulate the patient in the first days of the disturbance. Editors, easy to handle, enable the integration of patient specific material into the process. With increasing performance ability more complex tasks are necessary. A varied, interesting training has to be supported by high variety (texts, images, tones). After hospital stay a cost-saving supervision model is needed. A home training, supervised by a therapist, has to be enabled to meet the long-lasting therapy demand. Modern Internet technology enables the data communication between the patient and the therapist for controlling and monitoring the home training. After a successful rehabilitation the affected person has to get prepared for work life. For this purpose there has to be close-to-reality tasks. Besides these professional preconditions the system has to make up the grade of the globalisation. A localisation of the therapy software into 15 languages and the worldwide sales show the success of a modern concept.

The Relation Between Physical Functioning and Perceived Self-Efficacy in Stroke Patients in a Neurorehabilitation Setting

L. Monaci[1] and J.J. Evans[2]

[1] *Wolfson Neurorehabilitation Centre, London, United Kingdom*

[2] *Section of Psychological Medicine, Faculty of Medicine, University of Glasgow, United Kingdom*

Background and Aims: The potential value of the Stroke Self Efficacy Scale (Jones 2008) was examined in a small sample stroke patients undergoing neurorehabilitation The relationship between physical independence and perceived self-efficacy, as well as change in clinical outcome measures after a period of inpatient neurorehabilitation were examined. *Method:* Functional Independence Measure (FIM) and Stroke Self-Efficacy Scale scores were collected from 14 stroke patients as part of routine clinical practice on admission and at discharge. Participants had been admitted from acute hospitals for a variable number of days of inpatient rehabilitation. *Results:* Participants' FIM and self-efficacy scores had significantly improved by discharge. There was a significant correlation between FIM and self-efficacy scores, which may indicate that these two measures usually assess a similar domain. However, some of the patients' self-efficacy scores had considerably increased at discharge, although their FIM score had not. *Discussion:* Further research should address whether a combination of measures of physical functioning, such as the FIM, and measures of perceived self-efficacy may be useful in identifying patients with a lack of insight and those whose lack of confidence in their ability to cope is disproportionate to actual disability.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Evaluation of a Single-Session Group Intervention for the Management of Executive Dysfunction

A. Champion, F. Laver and A. Thomsen

Health Psychology Department, Gloucestershire Royal Hospital, Gloucester, United Kingdom

Background and Aims: Data presented previously suggests that a single-session 'memory group' intervention is associated with increased use of memory strategies, and hence has a role in settings where resources may not permit lengthier input. A similar model was piloted for executive dysfunction, with more limited expectations as interventions in this domain typically require more functionally grounded input for success. *Method:* The intervention consisted of one 2-hour session incorporating information provision about executive function difficulties, suggestions for their management and SMART goal setting. Attendees represented a range of aetiologies. Family members/carers were encouraged to attend. Strategy use pre- and post- intervention was assessed using a questionnaire based on the session's content. *Results:* At the time of abstract submission, there had been 20 attendees over 4 groups, with outcome measures completed by 7 attendees. Wilcoxon signed rank tests indicated that there was no statistically significant increase in the number of strategies used at one month follow-up, but there was a statistically significant increase in the number of strategies being used at least once a day ($p < .05$). This represented a mean increase of one strategy per day. *Discussion:* Attendance at the group was associated not with adoption of new management strategies but with more consistent use of existing strategies. This finding would fit intuitively with such a time-limited intervention, in that it might serve to reinforce the importance of consistency and routine in application of strategies rather than markedly change approaches to management.

Memory Group: Report of a Therapeutic Environment for Amnesic Patients in Brazil

F.A. Monteiro, S. Bolognani, and O.F.A. Bueno

Centro Paulista de Neuropsicologia – AFIP, Departamento de Psicobiologia, Universidade Federal de São Paulo, Brazil

Background and Aims: Cognitive rehabilitation for amnesic patients focuses primarily on self awareness and compensatory strategies to alleviate memory deficits in real life. Our patients have an individual rehabilitation program, but they also participate in collective sessions — the Memory Group (MG) — based on the concept of 'therapeutic milieu'. The goal is to provide a protected environment and real life challenges for the patients. Our aim is to describe the experience of the MG in our rehabilitation center. *Method:* Four patients presenting moderate to severe anterograde amnesia participate on weekly meetings for one and a half hours. They practice using compensatory strategies, problem solving, planning, decision making and social skills, not only inside the group, but also going out in the city and organising parties for other patients and families. *Results:* Family members, individual therapists and patients themselves identify the following benefits from the MG: improvement in self perception and more effective use of memory aids, general improvement in mood, reported sense of belonging for meeting people with the same problems, more initiative at home and more interest in seeking either activities related to the group or general social

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

activities, reported improvement in self confidence to deal with social situations and to solve problems in real world. *Discussion:* The MG is an ally to the individually designed rehabilitation program, providing gains that are reflected in the patients' daily life, reducing the handicap brought by the cognitive deficits, and improving sense of autonomy, quality of life and participation in the community.

Motor Performance Characteristics in 5-Year-Old Preschool Children With Developmental Speech and Language Disorders

I. Müürsepp, J. Ereline, H.Gapeyeva and M. Pääsuke

Institute of Exercise Biology and Physiotherapy, University of Tartu, Estonia

Background and aims: Speech disorders are the most common complaint in preschool-aged children. Usual treatment for them is mere speech therapy. The aim of the study was to evaluate motor performance in 5-year-old children with minor to moderate developmental speech and language disorders (DSLD) in comparison of age-matched healthy children. *Method:* Thirty-two DSLD children and 45 control group (CG) children participated in this study. Vertical jumping was tested on the force platform. Bilateral and unilateral maximal isometric strength of the leg extensors was measured by electromechanical dynamometer. Isometric hand-grip strength was determined by mechanical hand dynamometer. The dexterity skills were measured by Complete Minnesota Manual Dexterity Test. Raven's Coloured Progressive Matrices was used for the measurement of children's intelligence. *Results:* Dexterity skills and intelligence did not differ significantly ($p > .05$) in the measured groups. DSLD children demonstrated lower ($p < .01$) jumping height as compared to CG children. DSLD girls had lower ($p < .05$) maximal strength of the leg extensors compared to all other groups. The hand-grip strength was greater ($p < .05$) in CG boys compared to all other measured groups, but no significant differences were observed between CG girls and DSLD children. *Conclusions:* In children with minor to moderate DSLD the lag of voluntary muscle strength and especially muscle coordination is clearly evident, but these children do not differ from CG children in dexterity skills and in common intelligence. DSLD girls tended to have more affected gross-motor skills compared to DSLD boys. It would be appropriate to provide to DSLD children more multifarious therapy.

Virtual Reality and Children With TBI: Pilot and Possibilities

J. Galvin,[1] V. Anderson,[1] R. McDonald[2] and C. Catroppa[1]

[1] *Royal Children's Hospital, Murdoch Children's Research Institute, Melbourne, Australia*
[2] *Monash University, Melbourne, Australia*

Background: Children who sustain traumatic brain injuries (TBI) often have difficulty with hand and arm function. Children rely on hand skills for writing, playing and developing independence in self care tasks. Rehabilitation of hand function, based on motor learning principles, involves repetition and practice of skills. However, traditional therapies tend to be repetitive and fail to maintain children's attention and motivation over long periods of recovery and rehabilitation. Virtual Reality (VR) therapy provides an engaging opportunity for practice and repetition of motor tasks, with evidence that it improves motor function in adults following stroke and children with cerebral palsy. Its usefulness for rehabilitation of children with TBI has

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

not yet been determined. This presentation aims to: (a) critically review literature and current practice regarding the use of VR in paediatric rehabilitation; (b) outline a research protocol for implementing a VR program for improving upper limb skills in children following a TBI; and (c) report results of a pilot study with typically developing children. *Method:* 20 children aged 5–15 years were assessed using the BOT 2. Movement parameters within VR were adjusted to accommodate individual skill levels. *Results:* Age related differences were found in skill and engagement on different games within the VR system. *Conclusions:* Children of all ages were motivated and able to engage with the games and tasks in the VR system. VR allows for movement parameters to be adjusted based on the individual needs of each child and is promising for use in paediatric rehabilitation.

Two New Measures for Assessing Advocacy Activities and Perceived Control after Acquired Brain Injury

J.F. Malec,[1] A.W. Brown[2] and A.M. Moessner[2]

[1] *Rehabilitation Hospital of Indiana, Indianapolis, United States of America*
[2] *Mayo Clinic College of Medicine, Rochester, United States of America*

Purpose: To develop and evaluate measures of advocacy activity and perceived control specific to individuals with acquired brain injury. *Method:* Initial forms of the Advocacy Activities Scale (AAS) and Perceived Control Scale for Brain Injury (PCS-BI), as well as the Craig Hospital Inventory of Environmental Factors (CHIEF), Satisfaction with Life Scale (SWLS) and SF-12, were mailed through three state Brain Injury Associations in the upper midwestern U.S. 322 (21.8%) complete response sets of 1550 possible were obtained. The AAS and PCS-BI were analyzed and refined using Rasch analysis. Concurrent validity was examined through simple correlations and Principal Components Analysis (PCA). *Results:* After modification based on Rasch analyses, the AAS showed satisfactory internal consistency (Person Reliability = .78; Item Reliability = .97) as did the PCS-BI (Person Reliability = .78; Item Reliability = .99). Pearson correlations revealed that greater advocacy activity (AAS) was associated with greater perceived control (PCS-BI) but also with a heightened perception of barriers (CHIEF). Greater perceived control (PCS-BI) was also associated with greater physical and mental wellbeing (SF-12) and satisfaction with life (SWLS), and lowered perception of barriers (CHIEF). PCA identified six factors representing complex relationships among measures. Although more complex than predicted, relationships with other measures supported the concurrent validity of the AAS and PCS-BI. *Conclusions:* The AAS and PCS-BI are reliable and valid measures of advocacy activity and an associated sense of perceived control among those affected by brain injury for use in survey research and assessing the effectiveness of interventions to increase advocacy activity.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Developing Computer-administered Cognitive Rehabilitation in the Context of Holistic Neurorehabilitation: A Challenge for 15 Years

J. Sarajuuri and S. Koskinen

Käpylä Rehabilitation Centre, Helsinki, Finland

Cognitive rehabilitation is traditionally considered an important part of rehabilitation of brain-injured patients. It is defined as a systematic, functionally oriented service of therapeutic activities that is based on assessment and understanding of the patient's brain-behavioral deficits. According to the recommendations of evidence-based studies, computer-based interventions that include active therapist involvement to foster insight into cognitive strengths and weaknesses, to develop compensatory strategies, and to facilitate the transfer of skills into real-life situations, may be used as part of a multi-modal intervention for cognitive deficits. However, there seems to be an obvious lack of theoretically and clinically based rehabilitation software. This observation was the reason for us to start our development project in the early 1990's. FORAMENRehab® — cognitive software is a tool for cognitive rehabilitation to be used as a part of a holistic neuropsychological rehabilitation approach. The programs are based on the models of and theories of brain functioning and recovery. Four separate modules form the FORAMENRehab® — cognitive software: attention, memory, visual perception and visuospatial functions, and executive functions and reasoning. The software provides an easy to handle and efficient graphical user interface operating in Windows environment. Each program has a clear written instruction on the screen as well as a model animation. The parameters of each program can be modified to adjust to a particular user. After 15 years of creative neuropsychological thinking, clinical practice, and co-operation with a committed multimedia expert, the Finnish version of FORAMENRehab® is completed and widely used in Finland. The next step will be to localise it to different languages.

Inability to Empathise Following Traumatic Brain Injury

R.L.I. Wood[1] and C. Williams[1]

[1] *Department of Psychology, Swansea University, Singleton Park, Swansea, SA2 8PP, United Kingdom*

Aims: This study examined: a) the impact of traumatic brain injury (TBI) on emotional empathy; b) the relationship between emotional empathy and neuropsychological ability, and c) the influence of low emotional empathy on measures of affect. *Method:* 89 patients completed the Balanced Emotional Empathy Scale (BEES), a number of neuropsychological tests, some of which were ecologically valid tests of executive ability, plus two measures of affect, the Beck Anxiety Inventory (BAI) and Beck Depression Inventory (BDI). Results: The TBI cohort showed a high frequency (60.7%) of low emotional empathy scores compared to the control group (31%). There was no relationship between injury severity and the ability to empathise, or between emotional empathy and neuropsychological performance. There was no evidence to suggest that low scores on affective measures influenced emotional empathy scores. *Conclusions:* A high proportion of TBI patients lack the ability to empathise but the deficit does not appear related to any specific cognitive impairment and cannot be predicted by measures of affect.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Executive Dysfunction in Chronic Brain-injured Patients: Assessment in Outpatient Rehabilitation

D.H.E. Boelen,[1] J.M. Spikman,[2] A.C.M. Rietveld[1,3] and L.Fasotti[1,4]

[1] *Sint Maartenskliniek Research, Development & Education, Nijmegen, the Netherlands*
[2] *Department of Neurology – Neuropsychology Unit, University Medical Centre Groningen, Groningen, the Netherlands*
[3] *Department of Linguistics, Radboud University Nijmegen, Nijmegen, the Netherlands*
[4] *Donders Institute for Brain, Cognition and Behaviour, Radboud University Nijmegen, Nijmegen, the Netherlands*

We studied 81 chronic brain-injured patients referred for outpatient rehabilitation, who complained of executive impairments in daily life situations and were observed by proxies and therapists to have such problems. The patients were assessed using various tests and questionnaires of executive functioning, such as the BADS and the DEX Questionnaire. Despite the fact that executive problems are frequently seen in this rehabilitation population, relatively little is known about the severity of these deficits and the best way to measure them. The main purpose was to examine the sensitivity of these instruments in this particular group of patients. The tests and the DEX were also administered to healthy controls to investigate which of the instruments discriminate optimally between patients and healthy controls. The results indicate that the tests as well as the questionnaires were sensitive to the executive problems of the patients. There were no significant differences between DEX ratings of patients, proxies and therapists. This suggests that patients who were eligible for outpatient rehabilitation showed relative intact awareness into their executive problems. A specific combination of three 'open-ended' tests and the DEX contributed significantly to the prediction of group membership.

Normative Data for the Original Boston Naming Test and an Adapted Version in the Brazilian Population

E.C. Miotto,[1] J. Sato, João,[2] M.C. Souza de Lucia,[1] C.H.P. Camargo,[3] M. Scaff[4]

[1] *Division of Psychology, Central Institute, Hospital das Clinicas, University of Sao Paulo, Brazil*
[2] *Center of Mathematics, Computation and Cognition – Federal University ABC – Santo André, Brazil*
[3] *Psychology Sector, Institute of Psychiatry, Hospital das Clinicas, University of Sao Paulo, Brazil*
[4] *Department of Neurology, Hospital das Clinicas, University of Sao Paulo, Brazil*

Background and aims: A number of normative data for the Boston Naming Test (BNT) has been published in various languages and countries in order to account for cultural and linguistic differences in relation to the original English version. However, there has been no published normative version of the BNT for Portuguese-speaking Brazilian children, adult and elderly subjects. The current study aimed to present the normative data for the Boston Naming Test (BNT) in the Brazilian population and an adapted version. *Method:* The original 60-item BNT and an adapted version which replaced 20-items from the original BNT were administered to 840 healthy Brazilian subjects aged between 6 and 77 years old and 0 to 17 years of education. The 20-altered items were included due to linguistic and cultural differences between Brazilian and English speakers. *Results:* The coefficients of General Linear Model estimation suggested that both age and education were statistically significant to predict the total scores. In addition, the variances of the scores explained by these predictors in the original BNT were 41.20% against 25.84% in adapted BNT. These results suggested that

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

the scores in the original BNT were more dependent on age and education than the adapted BNT. *Conclusion:* These findings demonstrated the importance of gathering normative data for the BNT at different language and culture populations than the original North-American population and provided clinically useful norms of the original and adapted BNT versions to be used in children, adults and elderly Brazilian subjects.

Cognitive Rehabilitation in Brazil: A Review of the Scientific Literature

J. Abrisqueta-Gomez,[1] C.S. Calandria Ponce,[2] S. Bolognani[1] and O.F.A. Bueno[1]

[1] *"Centro Paulista de Neuropsicologia – AFIP, Departamento de Psicobiologia – Universidade Federal de São Paulo, Brazil*

[2] *Brain Checkup – Consulting and Research in Cognitive Neurosciences, São Paulo, Brazil*

Background: Cognitive Rehabilitation (CR) aims to reduce the impact of cognitive and emotional problems of patients who have suffered brain impairment. The intervention efficacy must be demonstrated in daily living tasks and real life activities. In Brazil there are few institutions and professionals working in this field. Thus, our objective is to identify the national scientific literature on this matter. *Method:* The search was conducted through Medline, Lilacs and Cochrane database with the following terms: cognitive rehabilitation, neuropsychological rehabilitation, cognitive training, attention, memory, language, perception, executive functions and psychotherapy. We included all papers published up to 2008 by Brazilian groups. *Results:* Forty-six articles were found, with 24 ?related to cognitive training, 7 to cognitive or neuropsychological rehabilitation, 7 to functional training, 4 to psychotherapy (all on cognitive behavioral approach), and 4 were reviews or descriptive reports. The most common deficits being treated were language (18%) and memory (15%). The main population studied in rehabilitation programs was elderly individuals with neurodegenerative diseases. *Discussion:* This first review gives us a preliminary overview of the ongoing national literature on CR. More extensive studies are needed for analysing the methodologies and variables used, as well as classifying the evidence level of the published studies. This will contribute to future consensus and recommendations for the clinical practice of CR in Brazil.

The Role of Narratives in the Reconstruction of the Self Following Encephalitis

A. Easton[1] and K. Atkin[2]

[1] *The Encephalitis Society, Malton, United Kingdom*

[2] *The University of York, United Kingdom*

Background and Aims: Brain injury is often described as a hidden disability and people seek ways of validating and making sense of their experience. One way is through writing their own stories and reading those of others, perhaps in an attempt to regain some control and maintain a positive self-identity. We know little about why people read and write stories and their impact on readers and authors. *Methods:* This mixed methods study includes a questionnaire and in-depth interviews. This paper focuses on the quantitative aspects of the study: the completion of a self-report postal questionnaire, distributed to a database of people affected by encephalitis in the United Kingdom ($n = 790$). *Results:* Our findings show that significant numbers of people affected and their family members are reading stories by or about people who have been affected by encephalitis. We found statistically significant associations in gender, and are also able to present data detailing

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

the reasons people ascribe to why they read and write stories and the impact this has upon them. We will also present EBIQ scores for this population and contrast their levels of dis/ability when compared to other brain injured populations. *Discussion:* The data will explore how reading and writing stories about a shared experience may help some people make sense of what is happening to them and identify the kinds of people for whom reading and writing stories are important. This may help practitioners to provide better support for this population, by facilitating opportunities for people to recount their stories.

Cross-Cultural Perspectives of Quality of Life Between Kuwaitis and Americans With Spinal Cord Injuries

F. Manee,[1] D Rintala,[2] G. Hersch,[3] J. Chan[3] and K. Reed[3]

[1] *Occupational Therapy Department, Health Sciences Center, Kuwait University, Kuwait.*
[2] *Physical Medicine and Rehabilitation, Baylor College of Medicine, Houston, United States of America*
[3] *Occupational Therapy Department, Texas Woman's University, United States of America*

Background and Aims: A spinal cord injury (SCI) is an unexpected injury that can happen to almost anyone regardless of social class, gender, or race. The annual incidence of SCI worldwide has been reported to be between 11.5 and 57.8 cases per million population (Ackery et al., 2004). In the United States, it was estimated that the incidence rate of SCI is approximately 11,000 new cases per year (National Spinal Cord Injury Statistical Center — NSCISC, 2006). Although SCI can affect persons of all ages, it statistically affects young adult males the most. In 2006, 79.6% of SCI cases reported to the national database of NSCISC occurred among males with the average age at injury being 37.6 years of age (NSCISC, 2006). The aim of this study was to compare quality of life (QOL) scores between adult Kuwaitis and Americans with spinal cord injuries (SCI). *Method:* This study was quantitative in design. The health-related quality of life (HRQOL) of adult Kuwaitis with SCI living in the community as measured by the 36-item Short Form Health Survey (SF-36) were compared to American general population norms and the results from American survivors with SCI reported in the Forchheimer et al. study (2004) using the means and standard deviation scores. *Results: t* test analysis showed a significant decrease in QOL scores of the Kuwaitis compared with Americans on three scales of the SF-36: social functioning, role emotional, and mental health as well as the mental component summary measure (MCS). *Discussion:* This study showed that Kuwaitis with SCI were less impaired. Adult Kuwaitis with SCI had a significantly lower HRQOL compared with that of American general population norms on all eight subscales and the two composite summaries of the SF-36. Furthermore, the Kuwaiti sample had lower HRQOL than a sample of American's with SCI on three mental and emotional subscales and the MCS. In addition, both Kuwaiti and American individuals with SCI reported low QOL in the physical functioning (PF), bodily pain (BP), and general health (GH) subscales of the SF-36.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Enabling Cients With a Severe Brain Injury to Set their Own Rehabilitation Goals

C.M. Ramsden

Brain Injury Rehabilitation Trust, Aylesbury, United Kingdom

The literature reports that involving individuals with cognitive impairments in setting goals for rehabilitation increases attainment and maintenance of goals. Individuals with severe brain injuries in long-term rehabilitation settings may require support to set goals due to their ongoing rehabilitation and the severity of their cognitive impairments, including poor self-awareness, insight, memory and communication skills. The current study explores the ability of people with severe brain injuries to set goals in a long-term residential rehabilitation setting, using a semi-structured interview administered by care staff familiar to the participants. The interview set out simple questions that the staff member asks within a routine setting that provide specific cues in a number of categories, allowing goals to be set in for living situation, level of supervision, vocation and recreation. The interview was administered at three time periods over 14 months. Despite high levels of disability and need for supervision, most participants were able to set at least one specific and one achievable goal. More than half of the participants were able to set at least one specific goal for each category. More than half set achievable goals for supervision and recreation, but not for living and vocation, suggesting that the ability to set specific, achievable rehabilitation goals may vary depending on the area of life under discussion. These findings show that people with severe cognitive impairments can be engaged in setting goals for their rehabilitation, using a simple tool that can be administered by care staff.

Post-Traumatic Amnesia and Outcome In Patients With Traumatic Brain Injury, Alcohol Abuse and Intoxication at Time of Injury: An Early Rehabilitation Study

E. de Guise,[1] J. Lelanc,[1] J.Dagher,[1] J. Lamoureux,[2] A. Al Jishi,[1] J. Marcoux,[1] M.Maleki[1] and M. Feyz[1]

[1] *McGill University Health Center, Montreal General Hospital, Montreal, Canada*
[2] *University of Montreal, Montreal, Canada*

Aims: To investigate the relationship between history of alcohol abuse and intoxication at time of injury on duration of post traumatic amnesia (PTA) as well as functional and neurobehavioral outcomes in persons with traumatic brain injury (TBI) admitted in an early rehabilitation setting. *Method:* Sixty persons with mild, moderate and severe TBI participated in this study. Each patient was part of a patient-centred program using the concept of reality orientation therapy in a unified bedside protocol that stimulates orientation and encourages appropriate interaction with the environment. The outcomes measured were duration of PTA, length of stay (LOS), Extended Glasgow Outcome Scale (GOS-E) score, the FIM™ score as well as early neuropsychological outcome measured by the Neurobehavioral Rating Scale Revised (NBRS-R). *Results:* PTA was significantly longer (36.1 days vs. 20.9 days) in the group with a history of alcohol abuse ($t_{(58)} = 2.995$, $p = .004$) and so was LOS in the acute rehabilitation setting (45.1 days vs. 31.25 days, $t_{(58)} = 2.433$, $p = .018$), regardless of whether the patients were intoxicated or not at the time of injury. No difference was shown on the FIM™ scores, the GOS-E or the NBRS-R ($p > .05$). *Discussion:* The impact of alcohol abuse in patients with TBI is significant during their acute rehabilitation stay. However, no significant difference in

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

functional or neurobehavioral outcomes was obtained at discharge from the early rehabilitation setting. Acute rehabilitation protocols for assessment and treatment should be developed for patients with TBI who have a history of alcohol abuse.

The Use of Kinetic Cues in a Multi-Modal Approach to the Rehabilitation of Memory in a 40-Year-Old Woman With Bipolar Disorder and Multiple Substance Abuse

R. Poz

Department of Psychology & Neuropsychology, West Suffolk Hospital, Bury St. Edmunds, United Kingdom

Background: A 40-year-old woman with bipolar disorder, fibromyalgia and a history of child abuse, referred with memory problems and frontal lobe impairment following years of multiple substance abuse, including alcohol. Assessment identified patchy memory abilities dipping into the borderline range (WMS-IIIUK), that the woman was applying her best effort (TOMM) and minimal levels of daily activity and apathy. *Aims:* to improve her use of internal memory skills identified as being strengths, increase her use of external memory strategies and be relevant to her daily life. Her personal aims were to improve her recall of appointments and important tasks and to increase her involvement in their farm. *Method:* The partner was involved throughout the programme and psychoeducation provided. A 'traffic light' system was introduced to promote differentiation between important and unimportant tasks. A multimodal approach was used to teach her the names of her stock, and the farm layout. This included a novel approach of pairing sign language-type movements with verbal names. *Results:* The outcome both immediately and at 3-month follow-up indicated improvement in her ability to recall relevant names, an improvement by one standard deviation on list learning (WMS-IIIUK), greater elaboration of detail in her visual memory of their farm, greater involvement in the working of the farm, and a reduction in her use of medication. *Discussion:* Standard interventions of psychoeducation and the introduction of external daily structure resulted in reduced apathy and increased activity. The atypical multi-modal approach used to teach her names may have been effective through its novelty for the woman and tapping multiple memory systems and both hemispheres.

Neuropsychological Rehabilitation for ADHD

M. Miranda,[1] S. Rizzuti,[1] M. Muszkat,[1] E.C. Macedo,[2] M.D. Feitosa[3] and O.F.A. Bueno[1]

[1] *Centro Paulista de Neuropsicologia – AFIP; Universidade Federal de São Paulo, Brasil*
[2] *Universidade Presbiteriana Mackenzie – R da Consolação, Brasil*
[3] *Faculdade de Tecnologia de São Paulo – Praça Fernando Prestes, Brasil*

Background and aims: To describe the implementation of a rehabilitation program for ADHD children, presenting the theoretical and clinical grounds for the efficacy of neuropsychological rehabilitation activities (including behavioral-cognitive therapy, cognitive training and family intervention), combined with pharmacological intervention; also to discuss current cognitive training techniques for attention and operational memory. *Method:* Patient groups medicated with methylphenidate and neuropsychological rehabilitation at the neuropsychological center. Twenty ADHD-diagnosed children aged 8–14 were divided into 4 groups to be subjected to the following procedures: group 1 — medication alone; group 2 — medication and neuropsychological rehabilitation (cognitive training and behavioural–cognitive therapy); group 3

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

—cognitive training alone; group 4 behavioural–cognitive therapy alone. *Results:* outcomes in terms of efficacy of the programs are being analysed in relation to performance on neuropsychological tests and behavioural scales before and after intervention, which will enable us to objectively analyze the efficacy for both cognitive and behavioral symptoms. *Discussion:* The results of this study and discussion of these aspects will help acquire new knowledge of techniques and instruments for rehabilitating ADHD children.

The Rorschach Test as a Tool for Quantitative Assessment of Personality and Behaviour Changes in TBI: Case Report

P. Rzezak,[1,2] D. Landucci,[1] G. Petri,[2] S. Bolognani[1]and O. Bueno[3]

[1] *Centro Paulista de Neuropsicologia – AFIP, São Paulo, Brasil*
[2] *Sociedade de Rorschach de São Paulo, São Paulo, Brasil*
[3] *Departamento de Psicobiologia – UNIFESP, São Paulo, Brasil*

Background and Aims: TBI patients suffer behavior and identity alterations, and there is a lack of instrumental to assess these kinds of impairments. We propose the use of Rorschach's plates to evaluate such changes and to measure functional improvements after neuropsychological rehabilitation. *Methods:* A 30-year-old female speech therapist who sustained a TBI after a car accident 1 year before, referred for neuropsychological treatment, underwent evaluation with the Rorschach Test before and after the 12-month rehabilitation program. The professional responsible for both Rorschach's testing was not involved in the treatment process. *Results:* At the first testing, she showed impairments in mental imagery integration and context evaluation, concentration and visual perception, thought communication and social-affective retraction. She presented enhanced self-criticism, irritability, self-image distortion, impulsivity, lack of consistency and difficulties to maintain her goals. At the second testing, after a rehabilitation program, she improved in visual gestalt formation, imagery integration, self-identity adaptation, affection recognition, self-image and spontaneity in social environment. Nevertheless, she still showed insecurity, low self-confidence, anxiety feelings, and low tolerance to frustration. *Conclusions:* Important information regarding behavioral and identity changes related to TBI was obtained through Rorschach Test. Moreover, functional improvements in such abilities could be demonstrated after rehabilitation program. The Rorschach Test might be a valuable instrument to assess the personality changes related to TBI, and also to identify possible changes prior and after neuropsychological rehabilitation.

Emotional Memory and Attention in Closed Head Injury

G. Farrell,[1] A. Bajo[2] and M. Evansgeli[3]

[1] *Department of Neuropsychology, 4th Floor, University Hospital Coventry and Warwickshire, Coventry, United Kingdom.*
[2] *The Brain Injury Rehabilitation Unit, Edgware Community Hospital, Edgware, United Kingdom.*
[3] *Department of Psychology, Royal Holloway, University of London, Egham, United Kingdom*

Background and Aims: Previous research has shown the enhancing effects of emotional arousal on memory. Visually salient stimuli are used to induce emotional arousal resulting in superior recall for these stimuli. Central visual detail in scenes containing emotional stimulus is enhanced at the expense of peripheral visual detail. Attentional narrowing is hypothesised to account for this effect. The aim of this study was to investigate the

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

effects of attention and executive functioning on recall for emotional stimuli in a sample of individuals with closed head injury. This population is of interest because, firstly, relatively little research on the effects of emotional arousal on memory has been conducted with this group, and, secondly, memory deficits in this population are frequently mediated by attentional and executive difficulties. *Method:* Participants (N = 22), who had previously sustained closed head injuries, were randomly allocated to two groups. Both groups saw a presentation that included a shocking visually arousing stimulus. The accompanying narrative was either neutral or emotionally arousing. Memory, attention, and executive functioning were then assessed. Immediate and next day delayed recall were measured. *Results:* The results indicated that memory for the emotional stimulus was better irrespective of accompanying narrative and memory for central detail was enhanced. Performance on the Lottery Subtest of the Test of Everyday Attention was the only measure associated with recall and then only with phases of the presentation that did not include the arousing visual stimulus. *Discussion:* It was concluded that visually salient emotionally arousing stimuli enhanced recall. The implications for the assessment of emotional memory in brain injury and the design of rehabilitation materials are discussed.

Computer-Based Cognitive Training: A 16-Month Longitudinal Single Case Study

J.E. Nordvik,[1] N.I. Landroe[1] and A.K. Schanke[2]

[1] *Centre for the study of human cognition, Department of Psychology, University of Oslo, Norway*
[2] *Sunnaas Rehabilitation Hospital, Nesoddtangen, Norway*

Background and Aims: During the last decade an increasing number of studies have been exploring the effect of computerised cognitive training in diagnostic groups like ADHD and schizophrenia. Recently, a study by Westerberg and colleagues reported significant improvement of working memory and attention following computer-based training for stroke patients. As a whole the results are diverging in studies on patients with acquired brain injury. However, several of the early studies on computerised cognitive training and ABI, suffered from significant methodologically shortages. Further, little research has been conducted on newly developed cognitive training software. Previous studies have focused on the effect of training in the post acute rehabilitation phase. The aim of this study is to explore the role of computerised cognitive training in earlier stages of the rehabilitation. *Method:* N = 1-design. The participant is a 62-year-old man suffering a stroke 5 months before inclusion in this study. The participant underwent neuropsychological testing and sMRI before and after each study phase, all in all, 6 sessions of neuropsychological testing and sMRI scanning were performed. *Results:* Analysis of the neuropsychological results, suggests an effect of training particularly on working memory and attention. Preliminary results of the sMRI data will also be presented. *Discussion:* In this single case study, computerised cognitive training involving tasks designed to stimulate executive functions/problem solving, memory, attention and visuospatial skills, primarily seems to improve working memory and attention. Possible explanations for this result are discussed.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

The Effects of Transcranial Direct Current Stimulation on Cortico Spinal Projections to Muscles in the Upper Limb

J. O'Neill, R. Carson, J. Ennis, C. Haridas, N. Kennedy and B. Nelson
Queen's University Belfast, Belfast, United Kingdom

Background and Aims: Research on the manipulation of neural plasticity has largely focused on distal muscles in the upper limb. This may not be entirely appropriate for rehabilitation as it does not allow for the improvement of gross motor function. This study aims to address this issue by investigating whether techniques which have been demonstrated to induce plasticity in distal muscles of the upper limb can do so in more proximal muscles. *Method:* Transcranial direct current stimulation (tDCS) was used to induce neural plasticity. Changes in MEPs were measured using a combination of transcranial magnetic stimulation (TMS) and electromyography (EMG). Data was recorded from the first dorsal interosseous (FDI), flexor carpi radialis (FCR), extensor carpi radialis (ECR) and biceps brachii (BB) muscles. Three durations of tDCS (10, 15 and 20 mins) were administered to participants in separate testing sessions. Changes in MEP amplitude before and after tDCS indicated the induction of neural plasticity. *Results:* Statistically significant changes in MEP amplitude were seen in FCR and BB recordings, $F(1,36) = 4.195$; $p = 0.048$, and $F(1,24) = 6.015$; $p = .022$, respectively. Changes in FCR were not in the expected direction which may be explained in light of certain methodological issues. *Discussion:* Given the complex design of the study it is possible that over stimulation of motor pathways had a confounding impact on MEP's. tDCS has previously been shown to produce consistent changes in neural plasticity and has the potential to increase recovery time following damage to corticospinal pathways involved with movement of the upper limbs.

A Two-Way Approach to Child Neurorehabilitation

J. Sjöblom, L. Fjeldborg and K.V. From
Children's Rehabilitation Centre, Virum, Denmark

Children's Rehabilitation Centre (BCfR) is a specialised Danish neurorehabilitation clinic, focusing on children and adolescents with brain injury, acquired between the age of 1 and 18. The centre has a neuropsychologically based multidisciplinary approach. BCfR offers a unique two-way approach to neurorehabilitation. The rehabilitation either takes place daily at the centre for a concentrated period of time (e.g., 6–12 months) or in the child's local setting, for instance at the child's day care, school and/or at home. There is an ongoing cooperation between the two programs, in order to optimise the effects of the neurorehabilitation. Both programs include the child's network through counselling and psychoeducation. The involvement of the child's network in the process is a crucial part of the rehabilitation. The neurorehabilitation program is planned according to the individual needs of the child and is based upon an examination done by a child neuropsychologist, a speech therapist, a special education teacher, a pedagogue, an occupational therapist and a physiotherapist. BCfR stays in contact with the children, until they are 18 years old, with regular follow-up examinations. The child is, as a minimum and according to its individual needs, offered re-examination annually until the age of 7, around puberty (age 12) and before adulthood (age 17). The follow-ups secure the child's development by identifying and reacting to

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

possible newly emerged problems. The purpose of the rehabilitation is to enable the best possible return to daily living and to maximise the child's independence and the family's quality of life.

Supporting the Family Following Acquired Brain Injury

K.V. From, L. Fjeldborg and J. Sjöblom

Children's Rehabilitation Centre, Virum, Denmark

Children's Rehabilitation Centre (BCfR) has for more than a decade been offering neuropsychologically based multidisciplinary neurorehabilitation to children and adolescents with acquired brain injury. The programme offers intensive specialised rehabilitation at the Centre as well as rehabilitation based in a local setting depending on the specific need of the child. When a child acquires a brain injury, the relatives may have to cope with considerable changes of personality and behaviour, changes that can be awkward and even embarrassing to all members of the family. Anxiety and depression is evident in a lot of close relatives and most report some degree of emotional distress regardless of age and relation to the child. BCfR finds it important for all members of the family as well as for the closest friends of both children and parents to understand the nature of a brain injury. This is why we recognise a need for family support that exceeds the traditional definition of relatives. In relation to this we offer individual as well as group counselling services not only to parents and siblings, but to grandparents, friends, and others as well. The group counselling addresses the distressing changes following acquired brain injury including a variety of cognitive and emotional issues. The aims of these groups are to prevent isolation and present a better understanding, finally leading to better adjustment and more realistic personal expectations for the whole family as well as for the closest friends.

POSTERS — DAY 2

Children's Drawing and Neuropsychological Profile of Children with Attention Deficit Hyperactivity Disorder

S.S.A.O Sa, L.F. Coelho-Scaramuzza, D.D.A. Gouvêa, E.G. Sinnes, S. Rizzutti, S.M. Palma, J.V.H. Gonçalves, R. Stuque, D.A. Dias, M. Muszkat, M.C. Miranda and O.F.A. Bueno.

Centro Paulista de Neuropsicologia — AFIP; Departamento de Psicobiologia, Universidade Federal de São Paulo, Brasil

Background and Aims: The aim of this study was to evaluate if the drawings of children with Attention Deficit Hyperactivity Disorder (ADHD) would have peculiar graphic elements related to specific neuropsycological profile. *Method:* The assessment involved drawings of 105 children by qualitative and semi-quantitative methods, according to the criteria proposed by Buck and Hammer. The ADHD group was composed by 56 children (32 of combined subtype and 24 inattentive subtype according to the DSM-IV criteria) and the control group by 49 children, both groups with age ranging from 7 to 11 years *Results:* A predominant expressive characteristic was seen in the combined type with prevalence of irregularity in size, move and hard pressure on the trace, no sense of direction or preference of sheet quadrant. Such characteristics suggest that impulsiveness and excitability pattern are expressed in the projective drawings in a strong way. In the inattentive

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

subtype we found abnormalities related to the number of distinctive elements such as size of the lines, poor details and predomination of distortion. There were more perseveration in inattentive type (62.5%) compared to the combined type (46.88%) and controls (6%). *Conclusion:* Children´s drawings analysis can provide additional elements to delimitate of the clinical profile in children with ADHD.

Validating an Irish Language Version of the Rivermead Behavioural Memory Test II

S. Hynes and A. Shiel

Occupational Therapy Department, Árus Moyola, N.U.I., Galway, Ireland

Background and aims This pilot study attempts to develop an Irish language version of the Rivermead Behavioural Memory Test II (RBMT II; Wilson, B., Cockburn, J. & Baddeley, A., 2003), a screening test for memory impairment in adults. It aims to facilitate the delivery of services through the Irish language to brain injured patients who may have difficulty communicating in their second language. *Method:* All versions of the RBMT II were translated to Irish and administered to a convenience sample of 21 participants aged 21–64 years. Equivalent translation of the RBMT II was achieved using multiple translations and back-translations of the instrument and field testing with both bilingual and monolingual participants. *Results:* Strong evidence of concurrent validity is clear from the results. Test–retest reliability of the measure proves to be low. In general the 4 parallel versions seem to be of equal difficulty. Certain within-group differences exist. The Irish version of the RBMT II is found to be no more difficult than the English version. *Discussion:* The results support an Irish RBMT II as a valid test of everyday memory and overall the reliability of the tool is acceptable and relatively resistant to differences within the group studied.

Lateralised and Nonlateralised Attentional Processes in Subacute Stroke Patients With and Without Neglect

M.E. Van Kessel,[1] I.J.W. Van Nes,[1] W.H. Brower,[2] A.C.H. Geurts,[3] and L. Fasotti[1,4]

[1] *Sint Maartenskliniek Research, Development and Education, Nijmegen, the Netherlands*
[2] *University Medical Centre Groningen, Groningen, the Netherlands*
[3] *Radboud University Medical Centre, Nijmegen, the Netherlands*
[4] *Donders Institute for Brain, Cognition and Behaviour, Radboud University Nijmegen, Nijmegen, the Netherlands.*

Asymmetry in performance levels on the contralesional as compared to the ipsilesional side is the most distinctive feature in neglect. Furthermore, non-spatial attentional difficulties may modulate lateralised neglect symptoms. According to some authors, exogenous attention for the contralesional side is impaired in neglect, whereas endogenous attentional processes seem to be relatively preserved. Therefore, patients could be able to compensate for neglect by employing endogenous attention. Reaction time (RT) patterns were investigated in 20 healthy controls as well as 24 right hemisphere (RH) and 21 left hemisphere (LH) stroke patients. A computerised simple visual reaction time task (CVRT) with stimuli presented either left, central or right on a large projection screen, was administered. Asymmetry scores were computed and ipsilesional RT's were chosen as a measure of general, nonlateralised attention. CVRT scores were compared to patients' performances on two BIT subtests. It turned out that by classifying

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

patients using RT asymmetry scores, more patients fell into the neglect category than by using the BIT subtests. No differences were present between ipsilesional RT's in both patient groups and lateral RT's in the healthy subjects. However, of the RH patients with defective asymmetry scores, patients with BIT scores above cut-off showed longer ipsilesional RT's than patients with normal BIT scores, whilst there were no differences in asymmetry scores between both groups. These results suggest that some patients might compensate for their lateralised deficit thanks to intact general attention, at least in paper-and-pencil tasks. These patients might however show visuospatial attention deficits in complex situations.

Factor Structure of the Hospital Anxiety and Depression Scale in Individuals with Traumatic Brain Injury

M. Schönberger[1] and J. Ponsford[1,2]

[1] *School of Psychology, Psychiatry and Psychological Medicine, Monash University, Melbourne, Australia*
[2] *Monash-Epworth Rehabilitation Research Centre, Epworth Hospital, Melbourne, Austalia*

Background: Emotional problems are a frequent consequence of traumatic brain injury (TBI) and reliable and valid assessment of these is important for clinical practice. However, there is a paucity of measures of emotional sequelae that have been validated for the use in TBI population. *Purpose:* To examine the factor structure of the Hospital Anxiety and Depression Scale (HADS). *Method:* 294 individuals with TBI (72.1% male; mean age 37.1 years, *SD* 17.5, median PTA duration 17 days) completed the HADS 1 year post-injury. A series of Confirmatory Factor Analyses (CFA) was conducted to examine the fit of a 1-, 2- and 3-factor solution, the latter being based on the tripartite model of anxiety and depression. These CFA were conducted with and without controlling for item-wording effects (multi-trait multi-method approach). *Results:* Neither the 1- nor the 2-factor model fit the data. However, when controlling for item wording, the fit of both models became satisfactory. The 3-factor solution fitted the data without controlling for item wording effects. *Conclusion:* The results show the importance of controlling for method effects when evaluating the factor structure of a questionnaire and indicate the reliability of the original anxiety and depression subscales of the HADS. The results would also justify the use of the HADS as a single scale of emotional distress. However, even though the 3-factor solution fit the data, alternative scales should be used if the purpose of the assessment is to measure stress symptoms separately from anxiety and depression.

Neuropsychological Rehabilitation in a Case of Dense Memory and Executive Deficits: Empowering the Family of a Severely Impaired Patient

S.A.P. Bolognani, D. Landucci-Moreira, T.S. Rivero, S.M.D. Brucki and O.F.A. Bueno

Centro Paulista de Neuropsicologia – AFIP, Departamento de Psicobiologia, Universidade Federal de São Paulo, Brazil

Background and Aims: Brain injury to the frontal lobes may cause severe cognitive impairments and personality changes, which affect the patient's ability to carry on an independent life. Our aim is to describe a family-focused intervention and to report the behavioral and neuropsychological outcomes in a case of anterior communicating artery aneurysm rupture. *Method:* The patient was a 55-year-old male Business graduate who sustained very severe

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

memory and executive dysfunctions, becoming totally dependent for even the most basic self-care tasks. Neuropsychological and functional assessments were completed before and after the intervention. The rehabilitation program addressed real life needs and was carried out mostly by orientation sessions with the patient's wife and the professional caregivers, to provide theory based explanations for daily problems, select and test strategies, set realistic goals, provide environmental changes and generalisation at home. *Results:* The functional assessment showed that the patient had important improvements in behavior and daily living performance after the intervention. Even though higher numbers on tests were not our main goal, the mild improvement seen at the neuropsychological assessment showed signs of an overall improvement on the patient's cognitive functioning. *Discussion:* An intervention based on family empowerment is effective for patients with severe impairments. In most cases, the patient's progress is not as successful as a comeback to the premorbid activities. Still, it remains a large space to work with these patients and families, if the expected improvements are functional gains, emotional adjustment and quality of life.

Insertion of External Support in the Routine of Patients with Alzheimer's Disease

V.L.D. Vieira, S.M.D. Brucki, A.L.C.M. Martins, F. Canali, L.G. Vasconcelos, M.O. Oliveira, B.G.S. Bittencurt, J. Abrisqueta-Gomez, P.H. Bertolucci and O.F.A. Bueno

Centro Paulista de Neuropsicologia (CPN) - Departamento de Psicobiologia Universidade Federal de São Paulo, Brasil

Background: Longitudinal studies of aging are useful to identify mild cognitive impairments and facilitate use of early non-pharmacological interventions that may enable intact functions to be stimulated and preserved for a longer time. *Methods:* 12 mild Alzheimer´s disease patients (6 women), (mean age 75.4 (6.2) years mean schooling 9.6 (5.6) years) participated in a rehabilitation program lasting 8 months and were evaluated at entry and at conclusion (T1 and T2 respectively). All patients were taking anticholinesterase medication. They performed two comprehensive cognitive and functional evaluations: MMSE, ADAS-Cog, orientation and information subtests of Wechsler Memory Scale, personal data (PD) — address and phone number, and temporal orientation (TO). Caregivers completed the Neuropsychiatry Inventory (NPI) and the Functional Activities Questionnaire (FAQ) at the same time points. The rehabilitation program was composed of 2 weekly sessions and familiar orientation each 15 days. Techniques utilised were reorganisation and substitution, by errorless learning. Patients were oriented to give their PD and TO daily. *Results:* No statistical difference was seen between T1 and T2 measures suggesting relative stability on cognitive and functional scores. *Discussion:* Patients maintained relative stability over 8 months of cognitive rehabilitation plus pharmacological treatment. These results are very promising in maintaining better functioning over a longer period of time in patients with mild dementia.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

'A World Without Barriers for Those Who Do Not Remember': External Compensation for Memory Disorders in the Chronic Phase After Brain Damage

O. García Sánchez and C. González Agudo

Polibea, Centre for Rehabilitation of Acquired Brain Injury, Madrid, Spain

Background: This study is based on behavioural theories of compensation or functional adaptation, focusing on improving the ability of patients with memory impairment to carry out activities of daily living. Through the use of technical and non-technical compensatory strategies, the general aim of the intervention was not to change impaired cognitive abilities, but to facilitate the development of everyday behaviours that normally depend on the affected cognitive functions. Taking a holistic approach, we focused on psychosocial adjustment, social integration and personal independence. Memory impairments are common after brain injury and, once chronic, the most effective way to tackle these problems is through the use of: external aids (alarms); development of habits or routines (learned and automated repetitive behaviours); reducing the likelihood of error or omission (errorless learning); and environmental changes to reduce the demands made upon memory. We hypothesised that a combination of environmental changes and external aids may improve everyday functioning even in those with severe memory impairment. *Methodology:* Five subjects with acquired brain injury (chronic phase, with an average of 5 years) participated. They received a group session once per week for 3 years, where they were trained in the use of external aids. *Results:* Use of external aids to compensate for memory impairment made it possible to carry out activities with a functional purpose. It also facilitated the acquisition of new information (names and learning paths) and increased independence in participants' daily activities at the centre. *Discussion:* Memory compensation techniques improve the acquisition of everyday routines and facilitate the development of self-initiated actions. However, they do not necessarily have an impact on the ability to manage novel situations.

Optimisation of the Methods of Neuropsychological Rehabilitation

M. Khrakovskaya

Institute of the Human Brain Russian Academy of Sciences, St. Petersburg, Russia

This paper outlines the principles of an approach to the rehabilitation of visual agnosia and illustrates the method with a clinical case involving successful rehabilitation of a patient with prosopagnosia. It is known that patients with agnosia suffer from disturbance in their optic-motor activity, one of the important components of visual perception. At the beginning of the rehabilitation course, the technique includes tasks intended to produce recovery in patients' eye movement functioning based on automated adult reading processes, that is, reading line by line from left to right, and from top to bottom. During the subsequent stages, both the volume of visual information and the task complexity are gradually increased step by step. This normalises the optic-motor activity and enhances the patient's readiness for perception. Later, tasks requiring other perceptual skills including identification and classification of various object parts are added. Our experience suggests that the earlier this treatment starts, the more effective the treatment. This method reflects an idea that rehabilitation techniques may be optimised by the application of techniques based on the processes involved

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

in normal cognition which are automated in healthy adults. Thus, the activation of sintagmatic and paradigmatic relationships between words, including the word-changing and word-building rules of the given language system, produces successful oral and written speech recovery in patients with aphasia. Acalculia remediation is based on automated number sequences in the calculation system. All of these methods use the same treatment approach: using automated operations at the least damaged levels of the recovering functions. The paper presents a clinical case and technique of successful treatment of a patient with prosopagnosia through application of the method described.

Components of Neuropsychological Rehabilitation of Patients With Brain Injuries

V. Daminov, N. Varako and I. Kulikova

National Medical-Surgery Pirogov Centre, Moscow, Russia

Introduction: It is hypothesised that rehabilitation is most effective when it involves a complex psychological approach, aimed at both the cognitive and emotional state of a patient, including work with the patient's family. *Aims:* To investigate outcomes of a complex neuropsychological rehabilitation intervention. *Methods and Patients:* 74 patients (21–76 years old) with cognitive and emotional difficulties caused by stroke, TBI or hypoxia. Diagnostics methods included the Luria neuropsychological battery, clinical conversation and in cases of severe damage, neurological scales for conscious state estimation. Neuropsychological rehabilitation included three components: *Overcoming cognitive deficits*, which aimed for restoration of disturbed links of functional systems and identification of compensatory strategies. *Work with emotional problems* aimed at emotional adaptation of the patient to the situation of his illness. It was necessary to explain to the patient the peculiarities of his new state and help him/her to accept it, to find new life aims and meanings. Specific work with psychological trauma was carried out, when necessary. *Work with family* involved gathering information about the patient's premorbid characteristics and changes following his/her illness. Educational input was provided and the family was involved actively in the rehabilitation process. *Results:* The rehabilitation programme outlined was shown to be effective. The cognitive indices improved and particular compensation strategies were identified. Positive changes in emotional state were observed. The relatives became more aware of the patients' state and made vital contribution to rehabilitation process. *Discussion:* Neuropsychological rehabilitation is maximally effective when it combines interventions addressing cognitive deficits, emotional problems and involves the family.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Cognitive Impairments in Survivors of Out-of-Hospital Cardiac Arrest: A Systematic Review

V. Moulaert,[1] J. Verbunt,[1, 2] C. van Heugten,[3] and D. Wade[2,4]

[1] *Rehabilitation Foundation Limburg, Hoensbroek, the Netherlands*
[2] *Care and Public Health Research Institute, Maastricht University, Maastricht, the Netherlands*
[3] *School for Mental Health and Neuroscience, Maastricht University, Maastricht, the Netherlands*
[4] *Oxford Centre of Enablement, Oxford, United Kingdom*

Objective: To describe the current evidence on the frequency and nature of cognitive impairments in survivors of out-of-hospital cardiac arrest. *Design:* Systematic review. *Data Sources:* Pubmed, Embase, PsychInfo and Cinahl (1980–2006). No language restriction was imposed. *Review Methods:* The following inclusion criteria were used: participants had to be survivors of out-of-hospital cardiac arrest, 18 years or older, and there had to be least one cognitive outcome measure with a follow-up of three months or more. Case-reports and qualitative studies were excluded. The articles were screened on title, abstract and full-text by two reviewers. All selected articles were reviewed and assessed by two reviewers independently using a quality criteria list. *Results:* Out of the 286 articles initially identified, 28 were selected for final evaluation. There was a high heterogeneity between the studies with regard to study design, number of participants, outcome measures and duration of follow-up. In general the quality of the articles appeared low, with a few positive exceptions. The reported frequency of cognitive impairments in survivors of out-of-hospital cardiac arrest ranged from 6% to 100%. Memory problems were the most common cognitive impairment, followed by impairments in attention and executive functioning. Three high-quality prospective studies found that cognitive problems occured in about half of the survivors of out-of-hospital cardiac arrest. *Conclusion:* There are few good studies on the frequency of cognitive impairments after out-of-hospital cardiac arrest. However, cognitive problems, in particular memory problems, seem common in survivors of out-of-hospital cardiac arrest.

A Holistic Traumatic Brain Injury Rehabilitation Program in Astangu Vocational Rehabilitation Centre

K. Traks and E. Kohtla

Rehabilitation Department, Astangu Vocational Rehabilitation Centre, Tallinn, Estonia

Background and aims: Neuropsychological deficits are common after traumatic brain injury (TBI) affecting person's life long after the injury. Persons with TBI need psychological, cognitive, social and medical support to recover from the injury and get integrated back to the community. In Estonia there are some short-term public rehabilitation services available after the active treatment period, but these focus mostly on physiotherapy. Astangu Vocational Rehabilitation Centre is the only centre that offers a holistic rehabilitation program for persons with TBI, where all the necessary services are included to the program. *Method:* The TBI rehabilitation program lasts for 9 months. The participants should be at least 18 years old, finished the acute rehabilitation and have complaints about long-term cognitive dysfunction followed by traumatic brain injury. The methods used in the program are group and individual interventions including social, neuropsychological, physiological, occupational, music and art therapies. During the program the neuropsychological changes will be evaluated to compare the neuropsychological status of the participants in the beginning and at the end

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

of the program, in addition the current activity rate of the participants who took part of the program in previous years will be evaluated. *Results:* The program has been developed in 2005 and now been running for 4 years. Currently the main outcomes are the participants' improvement of social skills, better awareness of one's abilities and future opportunities and more active socialising to the community. *Discussion:* The program plays an important role in the development of holistic rehabilitation programs in Estonia. Follow-up studies are being planned.

Prospective Program Evaluation of a New Residential Community Reintegration Program for Severe Chronic Brain Injury

G.J. Geurtsen and J.D. Martina

Rehabilitation Centre Groot Klimmendaal, Department for Acquired Brain Injury, Arnhem, the Netherlands

Introduction: Many brain injury patients succeed in gaining reintegration but some of them have multiple problems which hamper community functioning. Besides the direct consequences of the brain injury patients develop secondary problems such as psychiatric complaints and behavioural problems. Moreover some develop alcohol and drugs dependency. Through the compilation of huge problems patients get stuck in life. They do not succeed in living and working independently. This poses a great personal and societal challenge, which needs intervention to prevent further accumulation of problems and to prevent admission to a neuropsychiatry department. The Brain Integration Program (BIP) aims towards reintegration in the areas of living, day spending and social contacts with this complex patient group. *Methods:* To determine the effectiveness of the BIP, in study 1, 24 patients were prospectively assessed at start and end of treatment and at 1-year follow-up (Geurtsen et al., Brain Injury 2008, 22 (7–8): 545–554). In the ongoing study 2, 70 patients were prospectively assessed 3 months before start of treatment, at start and end of treatment and at 1-year follow-up. A 3-year follow-up will be undertaken. *Results:* In the waiting list period there are no significant changes. Both the emotional wellbeing increases and community integration increases too. After treatment more than 70% of the patients live on their own instead of living with their parents. The number of patients working increases and the hours work increases. Results show clinical and statistical significant improvements after treatment and no significant deterioration between the assessment after treatment and follow-up. *Discussion:* The improvements after treatment indicate that the BIP is effective in resolving the needs of this complex patient group. BIP leads to a sustained reduction in problems experienced by chronic brain injury patients.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Vygotsky-Luria's Neuropsychological Approach to Overcoming Learning Difficulties

T.V. Akhutina

Laboratory of Neuropsychology, Department of Psychology, Lomonosov Moscow State University, Moscow, Russia

Our presentation discusses the programs of neuropsychological treatment of children with learning disabilities. Three characteristic features of our approach (Akhutina, Pylaeva, 2008) follow three principles of child development elaborated by Vygotsky and Luria: (a) the programs focus on the transition from joint child–adult co-actions with external tools to the child's individual action with inner tools; (b) psychologists aim their help at the weak component of the child's functional systems: they start by taking on the role of the weak component and then hand it over to the child. The interactive scaffolding is gradually withdrawn; (c) the psychologist tries to organise the optimal level of activation in order to have optimal functional system for fulfilling the action — emotional involvement of the child in the interaction is one of necessary conditions for such functioning. To demonstrate this approach the results of a 2-year experiment will be presented. 16 children with learning disabilities of 1–2 grades participated in the study. 8 boys were in the experimental group, mean age 7.2, and 8 boys were in the control group, mean age 7.3. At the beginning of the remedial program the children of the two groups did not differ statistically by all indices. At the end of the first year the children of experimental group showed significant progress in executive functions, and encoding of audio–verbal and visual information (left hemisphere functions). During the second year the left hemisphere posterior functions and the right hemisphere functions showed significant development. There were no significant changes in the control group after the first year. During the second year the executive functions showed significant development. Only these functions reached the normal level for first graders in the control group, all others did not. In the experimental group all indices exceeded this level.

Uneven Development of Visual-Spatial Information Processing Strategies in 5- to 9-Year-Old Children With and Without Learning Disabilities

Z. Melikyan and T. Akhutina

Laboratory of Neuropsychology, The Lomonosov Moscow State University, Russia

Introduction: Unevenness of cognitive development (i.e., when in an individual some cognitive functions are developed better then others) may lead to learning disabilities (LD) when better developed functions can not make up for weaker ones. To provide individualised instruction and effective remediation for LD children it is important to assess strong and weak components of cognitive functions. The present study analyses strong and weak components of visuo–spatial information processing (essential for academic success) in children with and without LD. *Method:* 50 children with good academic performance (21 boys and 29 girls), age 5–8 year-old and 51 LD children (29 boys, 22 girls), age 5–9 year-old participated in the study. The Luria neuropsychological battery (24 tests) modified for 5–9-year-old children was used. A set of visual-spatial tests included both Luria (e.g., copying 3-D drawing) and other visual-spatial tests (e.g. RCFT, JLO, and so on). *Results:*

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Quantitative analysis of data revealed two subgroups of children — with predominant weakness (compensated for in control group and not compensated for in LD group) of RH and LH strategy of information processing. Children from LH group (17 controls, 18 LD children) demonstrated difficulties in the analysis of the details of the images, omissions of the details and simplifications of their drawings, pictured 3-D images according to their knowledge not the actual perception of the object. Children from RH group (16 controls, 16 LD children) had difficulties in preserving the entire image and structure of the depicted object and made significant spatial distortions of the depicted objects that contradict common knowledge of geometry. *Conclusions:* Differences in visuo-spatial information processing strategies between children with typical development and LD were mostly quantitative, constituting a continuum.

Return to School in Children With Acquired Brain Injury: The Role of the Neuropsychologist in a Multidisciplinary, Child-Centred Approach

R. Stargatt

Psychology Department, La Trobe University, Bundoora, Australia

Returning to school following an acquired brain injury can be a major challenge for many children and their families. Neuropsychological assessment will often identify an array of cognitive deficits that will impact on the child's ability to participate in the school environment. The neuropsychologist can play a key role in the rehabilitation of the child into the class room by also understanding how the brain injury impacts on behaviour and emotion. Successful return to the school environment will require analyses of the environmental context the child is returning to, collaboration with rehabilitation specialists, communication with parents and teachers and a detailed knowledge of the child. Intervention needs to take account of the needs of the child and the neuropsychological data as well as the school curriculum and environment. The neuropsychologist is well positioned to set up the systems to support intervention and to review progress and change with a view to best possible outcomes. The needs of the child, the process of school re-entry, the problems caused by cognitive, behavioural and emotional deregulation and broad strategies and requirements for intervention at individual and systemic levels will be presented.

Client Education Group for People in Postacute Stage of Rehabilitation for Acquired Brain Injury

E. Lavelle and M. Miller

ABI Rehabilitation Services, Ranui, Auckland, New Zealand

Background and Aims: A client education group was created in March 2008 in coordination with clients to address the lack of consistent education after a brain injury given to clients and their families during the postacute stage of rehabilitation. This paper will discuss the development and rationale of the Brain Interest Group, an education group for people who have recently sustained a brain injury, along with the results of a satisfaction survey. The Brain Interest Group was set up with the aim of providing clients with the information that they wished to learn about, in terms of learning to live with a brain injury. Over time and with changes to the rehabilitation organisation which resulted in clients being admitted more acutely and having a shorter length of stay, the group was formalised into an 8-session

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

format. The group format uses principles of adult education, which encourages participation from all members and draws on group members knowledge, as well as providing some didactic teaching and handouts that members can refer to with their families. The topics covered in the group are the effects of brain injury on Memory, Fatigue, Drug and Alcohol use, Emotions, Relationships and Neuroanatomy. Clients enter the group as soon as they determined to be out of Post Traumatic Amnesia (PTA). Many clients leave the residential stage of their rehabilitation prior to completing the 8-session cycle and then travel to the residential site in order to complete the group programme. The aim of the survey was to look at client satisfaction after receiving formal education and how this related to their overall reintegration back to their community. Although many rehabilitation organisations offer support and education groups there is an overall lack of outcomes in the literature that explore its effects on clients' recovery and reintegration. *Method:* Satisfaction surveys combining qualitative and quantitative data were sent to all participants who have attended the group between March 2008 and March 2009. The satisfaction survey looked at how awareness and strategies for each topic related to the clients ability to participate in daily activities more effectively. It also reviewed satisfaction of the group and learning in an environment with other clients of similar injury diagnosis. *Results:* The results from the satisfaction surveys are currently being compiled for further analysis. From the anecdotal feedback received so far it would seem that group satisfaction is very high. We have been surprised by the high number of participants who have chosen to continue to attend the group despite, for some, living outside the Auckland area. Group members have commented on the importance of being with others who are going through the same experience and the usefulness of having information in advance of experiencing difficulties in the community. Links are now also being made with other community organisations in order to continue to improve the education materials.

All Hope Abandoned …! Amnestic Syndromes Following Nontraumatic Brain – Anecdotes of Late Recovery

J. Tierney

Brain Disorders Program, Austin Health, Kew, Australia

It is generally considered that a chronic amnestic syndrome is a permanent condition. Many people with an ongoing amnestic syndrome secondary to severe acquired brain injury of nontraumatic aetiology, have loss of autobiographical memory for extensive periods of life prior to the brain injury, as well as the loss of carry over memory for ongoing life events. Procedural memory generally remains intact. Ongoing disorientation to who they are, where they are, and what happened to them can be devastating and associated with severe challenging behaviours and associated management issues. Case studies will be presented of long-term follow-up of patients with amnestic disorders where autobiographical memory began to return more than 10 years post injury. This was associated with improved carry-over memory for significant day to day events. These improvements contributed to the eventual re-establishment of a meaningful life narrative and participation in more meaningful life roles.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

Peer-Relationship Difficulties in Children With Brain Injuries: Comparisons With Children in Mental Health Services and Mainstream Schools

J. Tonks, W.H. Williams, I. Frampton, P. Yates and A. Slater

School of Psychology, University of Exeter, Exeter, United Kingdom

As children with traumatic brain injury (TBI) become adolescents, they struggle to keep up with rapidly developing same age peers. They are less adept at recognising and responding to expressions, more sophisticated social situations may become too challenging and complex, and there may be considerable differential development in reaching cognitive/intellectual milestones. Difficulties typically increase over time, and children with TBI are at increased risk of later-life clinically significant difficulties. *Aims:* In this study we wanted to explore the prevalence of peer difficulties in TBI children compared to those reported by a matched, non-injured clinical sample of children accessing mental health services and a non-injured, non-clinical sample. *Methods:* 28 TBI children, 57 children using the Child and Adolescent Mental Health Service (CAMHS) and 67 children in mainstream schools participated in the study. Parents, teachers and children were asked to complete a measure of peer-relationship difficulties. *Results:* CAMHS children and TBI children experienced significantly more peer-relationship difficulties than controls. There was no significant difference between CAMHS children and TBI children in terms of the level of peer-relationship difficulties reported. *Conclusions*: TBI children are as disadvantaged as children with mental health difficulties in relationships with peers, yet appropriate intervention services are not commonly available after TBI. Improved provision for TBI children with peer-relationship difficulties may result in more positive outcomes for such children in adulthood.

Rorschach Method in Children With Attention Deficit Hyperactivity Disorder (ADHD)

R. Fígaro, L.F.C. Scaramuzza, D.L.F. Barbosa, Denise D. A. Gouvêa, Elaine G. Sinnes, S. Rizzutti, S.M. Palma, J.V.H. Gonçalves, R. Stuque, D.A. Dias, M. Muszkat, M.C. Miranda and O.F.A. Bueno

Centro Paulista de Neuropsicologia – AFIP, Departamento de Psicobiologia, Universidade Federal de São Paulo, Brasil

Background and Aims: Although Rorschach is a test of personality, its specific findings may also be related to neuropsychological profile such as observed in children with neurodevelopmental disorders. The aim of this study was to analyse relationships between Rorschach measures and the neuropsychological profile including behavioral, psychological and executive functions in children with ADHD. *Methods*: Five male children aged 8 to 9 diagnosed with ADHD were submitted to neuropsychological assessment: WISC III, Rey complex figure, working memory (digit span and Corsi), attentional performance (CPT), phonological fluency test, neurological evaluation (ENE) and Rorschach test. We selected for correlation the average percentile of the copy of the Rey figure, percentile of commissions, the reaction time and CPT perseveration indices. Rorschach test was evaluated according to Exner comprehensive system: experiential style (EB), experience-based (eb) and positive constellations. *Results:* Correlations between indices of impulsivity and perseveration on CPT were found in 80% of the cases and extratensive experiential style discharges was related to

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press

emotional lability and less inhibitory control. Children with ADHD showed a mixed profile related to the more aggressive extratensive style and more expressive, motor and emotional features. *Conclusions:* Detecting emotional and personality factors through the Rorschach test can provide a better approach to rehabilitation program in children with ADHD.

https://doi.org/10.1375/brim.10.2.206 Published online by Cambridge University Press