
Proceedings of SRR

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Quality of life as perceived by users of environmental control systems

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Background: Rehabilitation professionals have often claimed in the literature that provision of environmental control systems (ECSs) improves quality of life (QoL). However this literature has mainly concentrated on equipment descriptions, service efficiency or functional changes in users, with assumptions of enhanced QoL as an inevitable consequence of users' functional gains. Concerns about theoretical negative potential of ECSs, about the individualized nature of QoL, and the limited research into the users' own perspectives regarding QoL, make the validity of these assumptions uncertain.

Method: In-depth qualitative interviews were audio-taped with participants, all provided with ECSs through Health Authorities in South Hampshire. Fifteen out of 20 transcripts were analysed by inductively coding the data with descriptive categories and forming relationships between categories.

Results: Eleven general categories emerged as significant in participants' lives. ECSs contributed to those concerned with social interactions, coping ability, self-esteem, independence, environment and occupation. Service provision, health and disabilities, emotions, personal character, and care received appeared to affect the way in which ECSs were used. Thirteen participants were able to readily identify the most important

areas specifically affecting their QoL, with only one participant prioritizing factors directly attributable to his ECS.

Discussion: ECSs are only one of many factors that contribute to QoL in ECS users, with perception of factors' significance varying between individual users.

Conclusion: Future validation of the Schedule for Evaluation of Individual QoL is recommended as a combined qualitative and quantitative measure. This could potentially assess overall QoL and ECS impact on specific factors contributing to QoL, as perceived by the users.

The sensitivity and specificity of the Middlesex Elderly Assessment of Mental State for detecting cognitive impairment after stroke

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Background: The aim of this study was to assess the sensitivity and specificity of a screening battery, the Middlesex Elderly Assessment of Mental State (MEAMS), for detecting cognitive impairment after stroke.

Method: Stroke patients admitted to hospital received both a cognitive screening assessment with the MEAMS and a detailed cognitive assessment. The information obtained from testing was summarized in detailed structured written reports. From the conclusions in these reports, patients were classified as 'impaired' or 'not

impaired' in perception, memory, executive function and language. The sensitivity and specificity of the MEAMS subtests and overall number of tests passed were determined in relation to the presence of impairment, as given in the overall conclusion of the written reports.

Results: There were 30 stroke patients aged 58 to 92 (mean 75.80, SD 7.94) years. Of these, 17 were men and 13 were women. The MEAMS subtests and the total number passed were cross-tabulated with the overall conclusions of the written reports. The sensitivity and specificity of each subtest and the overall MEAMS were calculated. The sensitivity of the MEAMS subtests ranged from 11% to 100% and the specificity ranged from 69% to 100%. The sensitivity of the overall MEAMS score was 51% and the specificity was 100%.

Discussion: The MEAMS was not a sensitive screen for overall cognitive impairment or for memory, perceptual, language and executive function problems after stroke, but it was specific.

Conclusions: The MEAMS is not recommended as a measure for screening for cognitive problems after stroke.

The effect of mood on rehabilitation outcome post stroke: are simple measures better?

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Background: When designing randomized controlled trials (RCTs) of any rehabilitation interventions, groups require balancing by confounding factors a priori (or results adjusted post hoc). Age, sex and stroke severity are commonly used. The affect of mood on rehabilitation

outcome is rarely considered. We aimed to determine whether mood variables, available early post stroke, were predictive of three-month outcome.

Method: A cohort of stroke patients admitted to hospital were included. Data were recorded at two weeks (age, sex, Barthel, presence (single item self-report rating, YALE) and level (6-item observational tool, Signs of Depression Scale, SODS; 20-item clinical interview, Montgomery Asberg Depression Rating Scale, MADRS)), discharge (destination and Barthel) and three months (status). Logistic regression was used to identify two-week variables predictive of outcome (good = alive, home at three months, discharge Barthel >17).

Results: Consenting patients ($N = 122$, median age 74 (IQR 68–79), 54 (44%) female, median day 7 Barthel 8 (IQR 4–10)) surviving to week 2 were included. Seventy-seven (63%) had a bad outcome. Logistic regression using age, sex and day 7 Barthel correctly predicted outcome for 71%. Age and sex were removed as nonsignificant. We found that Barthel alone predicted outcome for 71%. The YALE, SODS and MADRS, added individually with the Barthel, correctly predicted outcome for 82%, 73% and 77% respectively.

Discussion: The single-item YALE (no training necessary), when combined with Barthel, provides a better prediction of outcome than SODS (basic training) or MADRS (specialist training).

Conclusion: RCTs of rehabilitation interventions should balance groups by: day 7 Barthel and week 2 YALE. This model should be tested on an independent dataset.

Developing outcome measures for neglect

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Background: Unilateral spatial neglect commonly occurs after stroke. The person affected may fail to look, listen or move in certain parts of space. We aimed to develop outcome measures that are psychometrically sound, quick to apply, and based on everyday tasks. Six measures were developed from domestic and personal daily tasks. Initial results on validity and reliability are available on two tasks designed as peripersonal neglect measures: the kitchen cupboard and the key rack tasks.

Method: Forty-two right-handed in-patients (25:17 male: female, median age 72) with right hemisphere stroke were recruited. Participants were asked to remove nine keys from a key rack, and to identify 14 grocery items from a photograph of the contents of a cupboard. The validity of each measure was determined by examining agreement with a standardized screening assessment. Test-retest reliability was determined using weighted kappa statistics.

Results: Sensitivity was low for the keys (47%) and cupboard (53%) measures whereas specificity was high for both (keys 96%, cupboard 100%). Test-retest reliability was good, with 79% (keys) and 81% (cupboard) agreement between first and second performance of the task. Weighted kappas were 0.64 and 0.80 respectively.

Discussion: Analyses of these two new measures show promise with high specificity and good reliability. However, further development is required to increase the sensitivity to an acceptable level. Increasing task difficulty may be a way forward.

Conclusion: These preliminary results justify a longitudinal study of their use as outcome measures.

Motor-improvement following shaping-training in low-functioning chronic hemiparesis: an exploratory study on a CI therapy-derived intervention

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Background: Controlled clinical trials strongly suggest that constraint-induced movement (CI) therapy is the most effective intervention for chronic hemiparesis, but this technique has proven difficult to transfer into clinical practice. Here, we explored the clinical benefits of a CI therapy-derived intervention, which would be both practical in the clinical environment and extend the applicability to persons with low residual movement abilities.

Method: Thirteen brain-damaged patients, aged 17–21, with chronic upper-limb hemiparesis and limited movement recovery (lower functioning). A repeated measures AB design was employed. Affected arm movements were trained for 90 minutes per day over three weeks, using the principle of shaping. A three-week baseline interval in which standard physical therapy was given for 90 minutes per day was used as the control condition. Follow-up data were collected after one month. Outcome parameters were extracted from the Wolf-Motor Function Test (WMFT), the Frenchay Arm Test (FAT) and the Motor Activity Log (MAL).

Results: Substantial improvements of movement abilities together with the everyday use of the affected arm were found in each individual following the intervention (MAL/AUO: $F(3,36) = 29.8$; $p < 0.01$; MAL/QOM: $F(3,36) = 23.5$; $p < 0.01$; FAT: $F(3,36) = 3.12$; $p < 0.05$; WMFT: $F(3,36) = 18.5$; $p < 0.01$), but not during baseline. The clinical benefits were maintained in the follow-up period.

Conclusion: The shaping protocol is a 'practical compromise' for the clinical environment that allows for substantial improvement of affected arm movements in chronic patients.

Normal paediatric gait kinematic data using the CODA mpx30 motion analysis system

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Background: In order to assess the gait of subjects with walking problems, it is imperative to understand normal kinematics. Each motion analysis system uses its own marker set, therefore requiring its own database of normative values for clinical analysis. This project provides previously unpublished normative data for the CODA mpx30 motion analysis system.

Method: Written informed consent was gained from each parent and child. Twenty-seven children aged 4–16 years (13 male: 14 female) fulfilling inclusion criteria were recruited. Subjects walked along a 10-m walkway with active CODA markers attached to predetermined anatomical landmarks in accordance with the system's gait protocol. Three sets of kinematic data from both legs of each subject (providing 162 data files in total) were collected.

Results: The mean ± 1 SD for the whole group was plotted for pelvis, hip, knee and ankle in all three planes of motion for one gait cycle, as per standard gait analysis protocol. Figure 1 represents the mean (± 1 SD) kinematic findings from the whole group for hip, knee and ankle in the sagittal plane. They illustrate the movements that occur at each joint, during one gait cycle, from initial contact (IC), to terminal swing (TSw).

Discussion: The results provide a normative database using CODA mpx30 motion analysis system.

Clinically motion analysis is used to assess children with walking difficulties who attend this laboratory (predominantly with cerebral palsy) for gait analysis before and after intervention.

Conclusion: This study provides system-relevant normal values for comparison, to optimize the analytical interpretation of results, thus improving clinical accuracy.

Ventilatory dysfunction: its influence on fatigue and function after stroke

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Background: Ventilatory dysfunction after stroke may contribute to post-stroke fatigue and limit function. This study aimed to identify the contribution of ventilatory impairments to fatigue and function after stroke.

Method: Patients were recruited two weeks after stroke. Static mouth pressures (MIP/MEP), spirometry, oxygen saturation (S_{aO_2}), haemoglobin (Hb), smoking pack years, Modified Barthel Index (MBI), Wimbledon self-report scale (WSRS), Bamford classification and fatigue (Chronic Respiratory Diseases Questionnaire sections 7,10,14 and 16) were measured.

Results: Fifty-seven patients (37 males), mean age 70 (SD 9.8), were recruited. Median (IQR) were MBI 71 (48.5–95), WSRS 5 (2–14) and fatigue 14 (8.5–19). Median mouth pressures were analysed as some patients registered aberrantly high values. Backward multiple regression with fatigue and MBI as outcome variables was performed. The final model for fatigue found

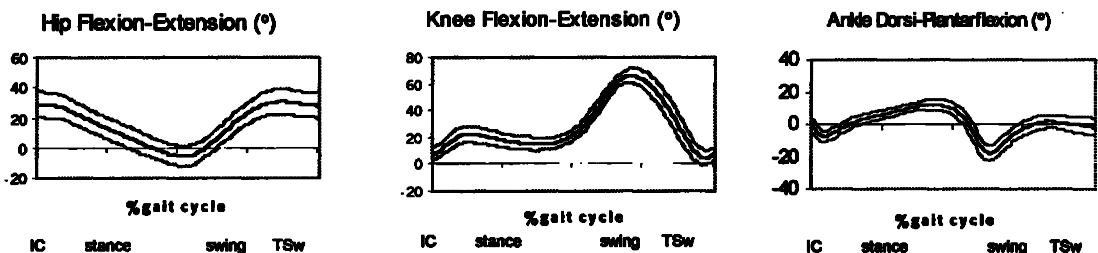


Figure 1 Recorded gait kinematics in the sagittal plane.

17% of the variability explained by WSRS, forced vital capacity percent of predicted (FVC%) and pack years combined, Adjusted $R^2 = 0.205$, $p = 0.002$. The final model for MBI found 43% of variability explained by MIP%, SaO_2 , FVC%, WSRS, and Bamford classification combined, adjusted $R^2 = 0.442$, $p < 0.0001$.

Discussion: Mood and FVC% contributed significantly to fatigue and function. The final model for fatigue only explained a small proportion of the variability, whereas the model for function explained 43%. Other factors, which may explain fatigue (e.g., nutrition), should be considered. Fatigue did not explain function but ventilatory capacity measures did. Improving respiratory muscle strength and ventilation may improve function.

Conclusion: Future work should address this.

Describing current hands-on therapy for the hemiplegic upper limb

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Background: Detailed descriptions of hands-on therapy for stroke are lacking, but considered necessary for evaluative and comparative effectiveness studies. We sought to describe the detailed content of current hands-on therapy applied to the hemiplegic arm and develop a means of recording specific therapy.

Method: A modified nominal-group technique was undertaken, involving seven senior neurophysiotherapists. Audiotaped face-to-face interviews were transcribed verbatim. Treatment categories were generated using thematic content analysis and validated by investigator triangulation. Subsequent group work allowed participant confirmation of the results. Participants refined technique descriptors, piloted the resultant treatment schedule and validated its content in clinical practice.

Results: The treatment schedule reflected a flexible therapeutic process, ranging from realigning

joints/limb segments to functional use of the arm. Treatment aims identified included increasing soft-tissue extensibility, postural awareness/sensitivity, and motor performance in the limb. Actions to achieve these aims included passive anatomical movements, massage, stretch, isolated joint movement, sensory input, and functional movement. All participants agreed this schedule reflected therapy accurately.

Discussion: The schedule can be used to record specific content of individual treatment sessions. However, skilful amalgamation of different actions is not always clearly recognisable and individual actions cannot be separated out without detracting from the complexity of the whole. Nevertheless, the schedule can be used in exploratory and evaluative studies to record the detailed content of each treatment session.

Conclusion: The content of one treatment module for stroke has been comprehensively described and the schedule will enable further exploratory, evaluative and comparative studies to be undertaken and replicated.

Memory difficulties following right hemisphere stroke (RHS): a systematic review

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Background: Post-stroke memory impairment adversely affects rehabilitation outcome. However, little is known about the nature and prevalence of these impairments. We aimed to determine whether: (1) RHS patients experience more nonverbal memory difficulties than non-stroke controls (NSCs) and left-hemisphere stroke (LHS) patients; (2) RHS patients experience more verbal memory difficulties than NSCs, but less than LHS patients.

Method: We carried out a systematic review of the electronic databases MEDLINE (1966–2000), PSYCHINFO (1974–2000) and CINAHL (1982–2000). Included were English language

published studies, reporting standardized long-term (episodic) memory ability, of human participants with clinical symptoms of stroke occurring in the cerebral hemispheres of the brain.

Results: Thirty-seven of the 276 studies considered were eligible for inclusion. Their mean age ranged from 43 to 78.5 years. There was strong evidence of RHS deficits on nonverbal memory tests, relative to NSCs but not to LHS patients. RHS patients appeared worse than NSCs on verbal memory tests. There was equivocal evidence of fewer verbal memory problems in RHS than LHS patients, which may be due to inadequate statistical power.

Discussion: This review confirms that RHS patients have difficulty remembering nonverbal information and, somewhat surprisingly, that they also struggle with verbal information. Despite considerable research effort in this area (37 published studies) existing studies are inadequate to determine differences between the RHS and LHS patients. Two methodological issues were identified: methods of assessment and sampling.

Conclusion: RHS patients experience considerable memory difficulties, which must be addressed when planning rehabilitation.

The incidence and outcome of traumatic brain injury (TBI) in the British Armed Forces

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Background: The incidence and outcome of TBI has not previously been studied in the British Armed Forces.

Method: Eleven military primary care centres across all three Forces were purposively sampled (sample size 33 250). An audit of all medical records for 2001 was undertaken, searching for TBIs that occurred in that year. A TBI was defined as any alteration in consciousness at the time of injury. Anonymized details were recorded in a database.

Results: The incidence of TBI in the Armed Forces for 2001 was 1420/100 000 (CI 1298–1552). Ninety per cent were male, 93% were under the age of 30. Assault was the principle cause of TBI (36%), Total loss of consciousness was 32.4% of which 32.71% were 20 years and under and the remainder 12–30 years. Forty-nine per cent of subjects reported ongoing attributable symptoms at one week post injury, 20% of subjects reported symptoms one month post injury. These symptoms included headache, fatigue, irritability and poor sleep.

Discussion: This is a high incidence of TBI, principally amongst young men which reflects one of the groups in the civilian population who tend to sustain TBI. TBIs recorded in this study were mostly mild in severity. The high proportion of individuals suffering ongoing attributable symptoms demonstrates that sequelae from mild TBI is problematic and may be a significant cause of morbidity.

Conclusion: The incidence and outcome of TBI is significant in the British Armed Forces. These results are of use to the field of mild TBI in the general population.