

## SRR Abstracts Summer 2007

### SRR Summer Meeting, Weetwood Hall, Leeds 3<sup>rd</sup> and 4<sup>th</sup> July 2007

#### INVESTIGATING VISUAL ATTENTION IN AUTISM

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##### **Background:**

One way of exploring visual attention is by using what is known as the gap effect, where reaction times (RT) to respond to peripheral targets are faster when the initial fixation target is removed. Prior research has shown that children with autism respond differently than controls to this task, providing clues to their underlying difficulties.

##### **Method**

In five experiments participants fixated a central fixation cross and manually responded to a left or right target under two conditions ('overlap', where the central cross remains visible, and 'gap' where it disappears). We tested adults on a series of RT experiments to establish the task characteristics then used our paradigm on children with autism to measure their visual attention.

##### **Results**

In the experiment comparing children with and without autism, there was a main effect trial type [ $F(1, 94) = 9.4, p < .05$ ] and group [ $F(4, 94) = 11.2, p < .01$ ], but no interaction ( $p > .05$ ) which showed a) all groups showed the gap effect and b) while there was a clear developmental trend to get faster overall, the children with autism were much slower, most like the youngest control age group. The children with autism were differentially slowed, suggesting that these children have difficulty shifting their visual attention.

##### **Discussion**

We discuss the implications of these results as a potential tool for aiding in the assessment and identification of children with autism.

##### **Conclusion**

The gap effect is a useful way of measuring visual attention in children with autism and may provide clues about their underlying deficits.

#### A QUALITATIVE STUDY EXPLORING PARTICIPANTS' VIEWS OF THE VALUE OF A TRANSITIONAL COMMUNITY STROKE SCHEME

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##### **Background:**

A community scheme for stroke survivors was developed to help with integration into their communities. The scheme was held twice a week for eight weeks, each session comprising of one hour exercise and one hour interactive education, which included outside speakers. The aim of this study was to gain insight into participants' perceptions of this scheme.

##### **Method**

Twelve participants were purposively selected and interviewed. Transcripts of the interviews were analysed using Interpretative Phenomenological Analysis. The researchers adopted a critically reflective approach. Two researchers analysed the data. Analysed data were compared with exit questionnaires completed by all scheme participants.

##### **Results**

Themes identified included the needs of stroke survivors, labelled as: formal services, support networks (friends and family), community inclusion, and personal issues. The role of the scheme was perceived by participants as helping to re-establish physical and social confidence. Increase in confidence was seen as vital in helping them meet their needs. Gains in confidence were sometimes short-lived due to the scheme ending after eight weeks.

## **Discussion**

### **Conclusion**

It is recommended that future schemes continue to focus on exercise and place more emphasis on group working rather than on the use of outside speakers. This will best facilitate increase in confidence. Future schemes could also adopt a phased approach for participants leaving the scheme, with continuing support and encouragement of the group in accessing other community activities.

The findings from a parallel RCT were presented at SRR Summer 2006.

## **EVALUATING THE CONSTRUCT VALIDITY OF THE TRUNK IMPAIRMENT SCALE: A RASCH ANALYSIS OF ITS SUBSCALES**

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### **Background:**

The Trunk Impairment Scale (TIS) evaluates static, dynamic sitting balance and trunk coordination in people after stroke. This study aimed to evaluate the construct validity of the subscales of the TIS.

### **Method**

A total of 162 participants (mean age 67, SD=11), in all stages after stroke, were included in the study. Rasch analysis (Partial Credit Model) was used (RUMM2020 software).

### **Results**

There were no disordered thresholds on any of the polytomous items. The static sitting balance subscale (SSB) did not fit the Rasch model (Chi-square=15.68; p=0.0004). We were unable to examine DIF due to a large number of extreme cases in the dataset. The dynamic sitting balance subscale (DSB) fitted the Rasch model (Bonferroni adjusted p-value=0.005) after splitting item 2 by Barthel categories to adjust for uniform DIF (Chi-square=42.65; p=0.0052). The coordination subscale (COO) fitted the Rasch model and did not display uniform or non-uniform DIF (Chi-square=7.87; p=0.446). In DSB and COO fewer than 5% of the independent t-tests performed on person estimated locations were significant, further supporting unidimensionality of these subscales. Graphical exploration of thresholds for DSB and COO confirmed a hierarchy of dependent items. Person and items were well distributed across the continuum of balance impairment.

### **Discussion**

We were unable to examine SSB in full and further work with patients with very severe static sitting balance impairments is needed. Item 2 of DSB needs to be given detailed attention before assessing people after stroke.

### **Conclusion**

Construct validity of two subscales was confirmed using Rasch analysis. Further work is needed to examine SSB.

## **EXERCISING ATTENTION IN THE CLASSROOM**

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### **Background:**

Increasing diagnosis of attention-deficit hyperactivity disorder (ADHD) in recent years has been accompanied by concerns about children's attentional abilities within the classroom. Concurrently, school curricula allocate decreasing time to physical education.

### **Method**

We explored whether a classroom exercise program could improve attention. Children (n=1224, aged 8 to 11 years) participated in a two-week, cross-over, randomised trial. They received classroom exercise in the early afternoon during one week and no programme in the other week (order counterbalanced across groups).

### **Results**

Cognitive measures at the end of the school day showed better attention levels in the

week of the exercise [ $F(1,1220) = 10.56, p < 0.001$ ]. Performance improved by 1.68% across age groups (95% CI = 0.64 to 2.69) and by 3.74% each year (95% CI for P5 vs P4 = 4.29 to 10.05; P6 vs P5 = 1.57 to 7.48; P7 vs P6 = 2.7 to 3.57). This improvement is equivalent to an increased maturity of approximately six months.

#### **Discussion**

These findings provide the first empirical support that even a short period of physical exercise benefits classroom performance. Exercise is well known to be associated with release of endogenous opiate peptides, which might have beneficial effects on cognitive function via improved dopaminergic regulation of executive function. Thus, exercise might benefit classroom performance through a similar mechanism to the action of methylphenidate.

#### **Conclusion**

Physical exertion may help children 'stay on task', and this may be an important tool when considering how to maximise the effects of therapeutic intervention in rehabilitation medicine.

### **A RANDOMISED CONTROLLED TRIAL OF ORTHOTICS AND PHYSIOTHERAPY AMONGST THOSE TREATED WITH BOTULINUM TOXIN (BT-A) FOR UPPER LIMB SPASTICITY IN STROKE.**

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#### **Background:**

BtxA is an effective treatment for spasticity following stroke, while evidence is poor for upper limb splinting, either alone or with physiotherapy.

#### **Method**

A randomised, single blind trial where the intervention group received 12 x 20 minute twice weekly physiotherapy plus a customised resting orthosis (splint). All participants received (BtxA 1000u dysport).

Primary outcomes were protractor goniometry for measurement range of passive movement at the shoulder, elbow, wrist and fingers (in degrees of movement). Spasticity was also recorded using the modified Ashworth scale.

#### **Results**

Of 64 patients entered into the study 62.5% were male and mean age was 65.3 years (SD 11.5). Mean duration since stroke was 61.7 months (SD 80.1). Site-specific dosage of BtxA was equal across intervention and control groups. Results at 7 weeks showed a significant group effect, ( $p < 0.002$ ), and greater improvement in wrist extension and finger flexion ( $< 0.0125$ ) in the intervention group. Spasticity improved similarly in both groups. A significant between group effect for finger flexion was sustained to 12 weeks ( $p < 0.002$ ), with positive trends in other measurements. A significant group effect for finger flexion was also observed at 20 weeks ( $p < 0.004$ ), and strong trends were also observed for shoulder and wrist ( $p = < 0.03$ ).

#### **Discussion**

#### **Conclusion**

The addition of splinting and physiotherapy to botulinum toxin improves the magnitude of and duration of wrist extension and reduces finger flexion, which is sustained beyond the pharmacological effect of the drug. The differential effect on wrist and fingers implies an improvement attributable to splinting.

### **A RANDOMISED PILOT-STUDY OF PRE-DISCHARGE OCCUPATIONAL THERAPY HOME VISITS: FEASIBILITY AND RESULTS**

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**Background:**

Pre-discharge home visits aim to maximise independence by assessing a person at home, providing equipment, adapting the home environment and/or providing education. The aim of this study was to investigate the feasibility of a randomised trial in a clinical setting, and the effect of pre-discharge home visits on the functional performance of older people.

**Method**

Ten participants were randomly allocated to receive either the home visit (experimental) or in-hospital interview (control) group. Patients were assessed at 0, 2, 4, 8 and 12 weeks by a blinded assessor. Outcomes were: performance of daily activities, reintegration to community living, quality of life, readmission and fall rates.

**Results**

Recruitment was slow and took 3 months. There were two dropouts. The home visit intervention took an average of 1.5 hours including travel time. Difference in functional performance, as recorded by the Nottingham Extended Activities of Daily Living (NEADL) was 16.1 points at 2 weeks (95% CI, 4.9 to 27.1),  $p=.012$ , and 23.0 points at 8 weeks (95% CI, 12.2 to 33.8),  $p=.003$  but with wide confidence intervals. There were no other significant differences between groups.

**Discussion**

A randomised trial to evaluate pre-discharge home visits is feasible. A multicentre trial is now indicated, using dedicated recruiters who screen admission lists for eligible patients. Clinically important differences on the NEADL suggest benefits for older people of a pre-discharge home visit, but this finding needs to be confirmed with a larger, sufficiently powered study.

**Conclusion**

Evaluation of pre-discharge home visits in a rehabilitation setting is feasible.

**DIFFERENTIAL FUNCTIONING OF ITEMS: CAN THE FIM STAND UP TO BEING MEASURED?**

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**Background:**

The Functional Independence Measure (FIM) is a widely used measure of activity in sub-acute rehabilitation settings. This study aims to evaluate the scaling properties of the FIM using Rasch analysis in a large sample of patients participating in multidisciplinary inpatient neurological rehabilitation.

**Method**

Patients' ability was measured on admission and discharge using the FIM by consensus of the multidisciplinary rehabilitation team. The FIM was examined for unidimensionality using RUMM 2020 software. Age, sex and diagnosis were used to examine for Differential Item Functioning (DIF).

**Results**

Over 10 years, 1495 patients had a median (IQR) age of 48 (36–58) years and a median length of stay of 18 (18–39) days. Initial analysis revealed poor fit of the FIM motor scale ( $\chi^2 < 0.000$ ). Both motor and cognitive scales had large ceiling effects with poor targeting in the upper scores. Ten items had disordered thresholds and 14 items displayed DIF.

**Discussion**

It is not legitimate to derive summated scores from the FIM motor or cognitive scales. It is possible to construct unidimensional scales of patients' motor and cognitive ability from FIM raw data, but this indicates redundancy in the data our teams collect and introduces extra layers of complexity.

**Conclusion**

It would be advantageous to develop a new item bank for rehabilitation based on qualitative interviewing of patients, with an interval scale developed iteratively using Rasch analysis, and administered using computer adaptive testing. This would produce an outcome measure fit for purpose for the future.

## **MEASURING FUNCTIONAL COMMUNICATION: THE RELIABILITY OF TOM ACTIVITY RATINGS OF A CONVERSATION SAMPLE FROM PEOPLE WITH COMMUNICATION PROBLEMS AFTER STROKE**

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### **Background:**

The assessment of people with communication problems must include consideration of functional and social activities. Conversation is an integral part of social interaction; however, it is difficult to measure efficiently and reliably. We investigate the reliability of the Therapy Outcome Measure (TOM) Activity scale when completed by an unfamiliar rater watching a short conversational sample, and consider whether clinically acceptable levels of agreement (rather than high correlations) are achieved.

### **Method**

102 participants with communication difficulties after stroke were videoed talking to an unfamiliar partner. Conversations were rated twice by two disinterested SLTs using the 11-point TOM Activity scale. SLTs were not trained on use of the TOM. We made rating by rating comparisons to show the true level of agreement within/between therapists.

### **Results**

Intra-rater agreement was high: 54% of ratings identical and 93% within 1 point of each other on the 11 point scale. Inter-rater agreement was slightly lower: 40% identical and 77% within one point.

### **Discussion**

The very high level of intra-rater agreement shows that therapists can judge consistently, making their rating of conversation a reliable measure. While inter-rater reliability is still high, a disparity of at least 2 points on 23% of occasions may not be clinically acceptable. Our findings confirm the need for training across judges which has been shown to raise TOMs reliability to a high level.

### **Conclusion**

Use of the TOM Activity scale by independent judges rating short conversations can be a valid, reliable and efficient measure of functional outcome for people with communication difficulties after stroke.

## **THE EFFECT OF ASSISTIVE DEVICES ON GAIT IN NON-AMBULANT PEOPLE AFTER STROKE**

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### **Background:**

The restoration of walking after stroke is a priority for patients and professionals alike. Assistive devices are thought to be beneficial, but research to-date has been limited to people with chronic stroke who are already able to walk (albeit in a limited capacity). The aim of this study was to assess the effects of three assistive devices; a walking stick, an ankle foot orthosis and a slider shoe in a new group: non-ambulant people with stroke who are under-going rehabilitation to restore walking

### **Method**

Design: A same-subject randomised cross-over design was used in which participants walked with no aid (the control condition) and the assistive devices in a randomised order.

Outcome measures: gait speed and affected step length (10m walk test), walking disability (Functional Ambulation Category), and participant satisfaction (questionnaire) in a one-off session.

Participants were 20 people with stroke who were under-going rehabilitation; unable to walk in every-day life but able to 5m with stand-by assistance.

Analysis: Wilcoxon Signed Rank Tests

### **Results**

There was a significant improvement in walking disability when using the devices ( $p=0.000$ ). Participants were positive about them; 40-55% felt their gait improved and 95% would use them more often. However the devices had no significant effect on gait impairments

#### **Discussion**

n/a

#### **Conclusion**

Assistive devices had a beneficial effect on walking disability but not gait impairments in non-ambulant people with stroke and patients felt positive about using them.

### **QUALITY OF LIFE AFTER A STROKE. THE DEVELOPMENT OF A NEEDS BASED QUALITY OF LIFE SCALE, THE STROKE-QOL.**

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#### **Background:**

While many scales can measure health status following stroke, there is no disease specific scale for Quality of Life. Needs-based quality of life scales measure how a disease impacts upon the ability of the person to meet their needs. This study set out to develop such a scale for Stroke.

#### **Method**

Initially, qualitative interviews were undertaken with 48 patients based upon a theoretical sampling frame accounting for spasticity, gender, duration of stroke and employment status. Themes were identified from the taped interviews which reflected the impact upon meeting needs. Statements using the subjects own words were chosen as a basis of a self-completed questionnaire. After cognitive debriefing by 16 subjects, it was mailed to patients on a stroke data base. Following refinement using the Rasch measurement model, a further sample was taken for test-retest.

#### **Results**

Physical and mental health; limitation of function; the consequences of loss of income; depression; and the perceived reactions of others emerged as important themes. Responses to the draft questionnaire from 188 people were analysed and items removed because of bias and misfit to the Rasch model. A test retest questionnaire was returned by a further 97 patients, leading to a 30 items scale which satisfied all Rasch requirements ( $X^2 = 0.73$ ), strict unidimensionality and test retest reliability (0.26).

#### **Discussion**

#### **Conclusion**

A 30 item scale, affirmed as true or not true for QoL in stroke, has been constructed according to the needs based model. It satisfies the most rigorous psychometric standards for scale development

### **PSYCHOMETRIC PROPERTIES OF THE WEEFIM INSTRUMENT IN CHILDREN WITH CEREBRAL PALSY IN TURKEY**

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#### **Background:**

The WeeFIM™ has recently been adapted and validated for non-disabled children in Turkey. This study set out to validate the scale in children with cerebral palsy.

#### **Method**

134 Turkish children with cerebral palsy (mean age  $54.6 \pm 46.0$  months, % 52% female) were assessed. Reliability was tested by internal consistency and inter-rater reliability; internal construct validity by Rasch analysis, and external construct validity by correlation with Denver II Development Test.

#### **Results**

Internal consistency and inter-rater reliability was good (Cronbach's alpha 0.93, 0.98;

Spearman  $r$  0.93, 0.94 for motor and cognitive WeeFIM™, respectively). In the Rasch analysis some collapsing of response categories was necessary. Sets of items, reflecting the clinical groupings such as sphincter control showed local dependency, suggesting measurement redundancy. Nevertheless both the motor and cognitive subscales showed adequate fit to the model (Chi-square < .05, Bonferroni adjusted). There was no substantive differential item functioning in the data and strict unidimensionality was shown by analysis of the residuals. External construct validity was supported by expected correlations with developmental ages determined by social, fine motor function, language and gross motor function domains of the Denver II Development Test.

#### **Discussion**

Internal construct validity of the motor and cognitive scales of the WeeFIM™ was confirmed by fit to the Rasch model. Some redundancy of items was observed but deletion may not be appropriate in a clinical setting. Larger samples are needed to confirm these findings.

#### **Conclusion**

WeeFIM™ is a reliable and valid instrument to evaluate functional status of Turkish children with cerebral palsy.

### **THE COHERENCE SUBSCALE OF THE ILLNESS PERCEPTION QUESTIONNAIRE ADAPTED FOR LOW BACK PAIN – A RASCH ANALYSIS.**

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**Background:** This study aims to assess the Coherence subscale of the

Illness Perception Questionnaire (IPQ) adapted for low back pain (LBP) using the Rasch measurement model. The IPQ assesses patient perceptions of their health condition and its rehabilitation. The Coherence scale, examines the degree to which patients' beliefs about their condition and its rehabilitation are congruent, or make common sense. It comprises five items using 1 - 5 Likert scales; the lowest score (5) represents high coherence; the maximum score (25) indicates a poor match between patient's belief about their LBP and their rehabilitation potentially undermining engagement with rehabilitation.

**Method:** Coherence scale data from 139 patients prior to commencing physiotherapy were analysed using the Rasch model to evaluate internal construct validity, response category ordering (thresholds) and Differential Item Functioning (DIF).

**Results:** The scale showed good initial fit to the Rasch model (Chi-Square Interaction 11.86;  $p= 0.29$ ; Person reliability 0.91). Response category structure was correctly ordered and there was no DIF by gender or age. The patients median raw score was 12.00 (IQR 10.00 16.00).

**Discussion:** The Coherence scale within the IPQ-LBP satisfied the requirements of the Rasch model, providing a robust scale for evaluating beliefs about rehabilitation for LBP. A transformation to interval scaling can be achieved to facilitate inclusion in complex models to investigate the role of such beliefs in rehabilitation efficacy.

**Conclusion:** The scale could be a useful tool for evaluating interventions designed to facilitate patient engagement in rehabilitation of LBP.

## **THE DEVELOPMENT OF THE OFFICE WORK SCREEN: A VALIDATED HEALTH SURVEILLANCE QUESTIONNAIRE FOR OFFICE WORKERS**

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### **Background:**

The prevalence and costs to both employers and individuals of musculoskeletal disorders and associated psychosocial factors are well documented. There is increasing evidence that early identification is the key to the prevention of chronicity and sickness absence. The study aim was to develop and validate a unidimensional screening questionnaire, capturing relevant psychosocial issues and musculoskeletal symptoms, to measure Work Instability in office workers.

### **Method**

The staged methodology was based upon Rasch analysis and included item banking from existing Work Instability scales and analysis of new data from postal surveys. The criterion validity of the emerging scale was examined using a Gold Standard of full vocational assessment by Occupational Physiotherapists.

### **Results**

A 62 item questionnaire was returned by 153 employees from two different settings. The data were fitted to the Rasch model and 26 items were found to fit model expectations (chi-square  $p=0.07$ ), satisfy strict requirements for unidimensionality and discriminate across expert defined levels of Work Instability. Reliability was 0.9, indicating suitability for use at the individual level. Absence of item bias was shown for age, gender and if the individual had been off sick from work in the past 3 months suggesting the scale is robust to variations in workforce composition and sickness absence rates.

### **Discussion**

The Office Work Screen is a short, psychometrically robust, questionnaire, incorporating both musculoskeletal symptoms and relevant psychosocial factors in one dimension.

### **Conclusion**

This new questionnaire offers the prospect of proactive management (for example ergonomics/Vocational Rehabilitation interventions) to prevent or minimise sickness absence in office workers.

## **THE TIMING OF CORRECTIONS IN CHILDREN WITH AND WITHOUT DEVELOPMENTAL COORDINATION DISORDER (DCD)**

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### **Background:**

Developmental Coordination Disorder (DCD) occurs in a significant proportion of children, who present with impaired body/eye co-ordination and show poor acquisition of motor skills. DCD is defined as a specific problem with coordinative tasks despite normal IQ and no evidence of neurological, biochemical or physical abnormalities. Simple aiming movements are well studied and understood and therefore are a useful tool for studying children with DCD.

### **Method**

A step-perturbation paradigm explored on-line corrections in adults ( $n = 10$ , 20-25 yrs), control children ( $n = 40$ , 4-13 yrs) and children with DCD ( $n = 22$ , 7-13 yrs).

### **Results**

Control children found the task straightforward and their ability to make on-line corrections improved with age. Children with DCD found the task difficult and the apparatus was modified accordingly. ANOVA of movement time (MT) revealed a significant main effect of Group ( $F(5, 56) = 5.5$ ,  $p < .01$ ) which was due to longer MT in the



DCD group compared to the other groups. A significant main effect of Condition ( $F(3.6, 202.46) = 15.2, p < .01$ ) was observed but no interaction.

### **Discussion**

The DCD population showed poorer performance in both the perturbation and non-perturbation condition. Nevertheless, there was no interaction between group and condition suggesting the difficulties with implementing 'on-the-fly' corrections is related to a fundamental problem in programming basic movements rather than a specific deficit with on-line correction per se.

### **Conclusion**

The current data shed light on the fundamental difficulties faced by children with DCD and also suggest that these measures have the potential to identify children requiring further intervention.

## **WITHIN-DAY AND DAY-TO-DAY INTRA-RATER RELIABILITY OF DIAGNOSTIC ULTRASOUND IN THE MEASUREMENT OF ACROMIO-HUMERAL DISTANCE IN HEALTHY INDIVIDUALS.**

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### **Background:**

Shoulder subluxation is reported to affect up to 81% of stroke patients. Clinically, subluxation is regarded as a palpable increase in the gap between the inferior margin of the acromion and the head of the humerus (acromio-humeral distance (AHD)). The prevention and treatment of shoulder subluxation is hampered by the insensitivity of current clinical measurements. The aim of this study was to assess the intra-rater reliability of the portable diagnostic ultrasound in the measurement of AHD in healthy individuals prior to testing its application on stroke patients.

### **Method**

Thirty-two healthy participants (13 male, 19 female) aged 51-85 years (mean  $64.21 \pm 10.05$ ) were recruited into the study. Seated participants were scanned using ultrasound by a single assessor who was blind to all measurements. Four measurements were recorded on day one, and then four on the same day one week later. Reliability was assessed by intra-class correlation coefficients (ICC) and standard error of measurement (SEM). Analysis of variance (ANOVA) was used to evaluate any measurement differences.

### **Results**

The mean AHD was  $1.67 \text{cm} \pm 0.41$  (range 0.92-2.52cm) and  $1.77 \text{cm} \pm 0.40$  (range 0.93-2.70cm) for the left and right shoulders respectively. Within-day intra-rater reliability coefficients were 0.982 and 0.983 for the left and right shoulders respectively. Corresponding values for day-to-day reliability were 0.964 and 0.971. The SEM showed low values. ANOVA showed no significant differences in measurements either within ( $p = 0.524$ ) or between days ( $p = 0.497$ ).

### **Discussion**

Portable diagnostic ultrasound is a quick and reliable method of assessing AHD in healthy individuals when measured by the same examiner.

### **Conclusion**

Future study is needed to assess the inter-rater reliability of the portable ultrasound technique on healthy individuals and also to assess its reliability on stroke patients

## **A SYSTEMATIC REVIEW OF PHYSIOTHERAPY EXERCISE PROGRAMMES FOLLOWING DISCHARGE FROM HOSPITAL AFTER TOTAL KNEE ARTHROPLASTY.**

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**Background:**

Although Knee joint arthroplasty is a common orthopaedic procedure, there are surprisingly few published evidence-based rehabilitation guidelines/programmes available for use in clinical practice. The purpose of this research was to inform the development of evidence-based physiotherapy interventions for these patients.

**Method**

A systematic review determining the extent to which post discharge physiotherapy exercise is effective, in terms of improving function, mobility, range of motion, quality of life and strength, for osteoarthritic patients following elective primary total knee arthroplasty. Trials were included if they compared a physiotherapy intervention versus usual/standard care or compared two types of relevant physiotherapy.

Outcomes: self report measures of function, walking, muscle strength, quality of life and range of joint motion.

Narrative and Meta-Analyses: using fixed effect models, weighted mean differences, standardised effect sizes, and tests for heterogeneity.

**Results**

6 trials were identified, 5 of which were suitable for inclusion in meta-analyses. A small to moderate standardised effect size, in favour of functional exercise, was seen for function at 3-4 months post operatively. Small to moderate weighted mean differences, in favour of functional exercise, were seen for range of joint motion and quality of life at 3-4 months post operatively. Post treatment benefits were not carried through to 1 year.

**Discussion**

The review supports the use of functional exercise interventions following discharge, over traditional exercise programmes, to obtain short term benefit following elective primary knee arthroplasty.

**Conclusion**

Functional exercises should be considered for inclusion in post discharge physiotherapy programmes following knee arthroplasty.

## **AXIAL COORDINATION OF HEAD AND TRUNK MOVEMENTS: A COMPARISON BETWEEN HEALTHY SUBJECTS AND ACUTE STROKE PATIENTS**

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### **Background:**

Studies in healthy individuals have described a clear sequence of head and trunk coordination during horizontal gaze transfers. The aim of our study was to compare axial coordination of head and trunk movements between healthy subjects and people early after stroke.

### **Method**

Subjects with stroke were assessed at three, six and 12 weeks after stroke. Control subjects were also examined at three consecutive time points. Participants were asked verbally to rotate their head and look at a visual signal placed at 90° left and right from centre. 3-D motion recordings were made using CODAmotion. Non-parametric statistics were used for data analysis.

### **Results**

Healthy subjects (2 females, 4 males, median (IQR) age 64 (62-70) years) showed consistent rotation of the head before rotation of the shoulders ( $p=0.028$ ). The mildly impaired stroke group (1 female, 5 males; median (IQR) age 70 (65-79) years) showed no significant rotation of the head before the shoulders at three weeks after stroke ( $p=0.075$ ). This pattern changed over time with a significant rotation of the head before the shoulders at six ( $p=0.046$ ) and 12 weeks ( $p=0.028$ ) after stroke. There was no significant difference in degree of head rotation, shoulder rotation or delay of shoulder rotation between both groups.

### **Discussion**

Temporal differences found could influence movement strategies and dynamics of control and thus postural performance, balance and falls. Future studies should evaluate the relation with clinical parameters.

### **Conclusion**

Our results suggest that people early after stroke show a modified axial coordination pattern but recover over time towards the level of healthy subjects.

## **THE RELIABILITY AND MEASUREMENT ERROR OF THE PROXIMAT: A NEW TOOL FOR MEASURING HIP RANGE OF MOVEMENT IN CHILDREN WITH CEREBRAL PALSY**

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### **Background:**

Hip problems such as subluxation and dislocation are a common consequence of cerebral palsy (CP) and a significant cause of suffering. Regular clinical monitoring of the range of hip movement has been recommended for both the prevention and management of this condition. However this is difficult in every-day practice because of a lack of robust measurement tools. The aim of the project was to assess the clinical utility, reliability and responsiveness of a new measurement tool to measure range of movement at the hip: the Proximat

### **Method**

Subjects: 26 children with cerebral palsy (CP) attending three special schools

Procedure: Passive hip abduction, adduction, medial and lateral rotation were measured using the Proximat. Testing was undertaken by two physiotherapists to assess inter-rater reliability and repeated the following day to assess test-retest reliability. Total, random and systematic error were calculated for inter-rater and test-retesting.

Analysis: Intra-class correlations were used to assess reliability, with Bland and Altman's

methods used to assess systematic, random and total measurement error (responsiveness).

### **Results**

The Proximat was quick and easy to use and acceptable to the children. Reliability was high (ICCs = 0.83-0.93) with a total error of 2.5-12 degrees. Most error was random with little evidence of systematic bias

### **Discussion**

N/A

### **Conclusion**

The Proximat is a reliable, responsive and acceptable method of measuring passive hip movements in children with cerebral palsy in day-to-day clinical practice

## **VALIDATION OF THE BEHAVIOURAL INATTENTION TEST (BIT) IN PATIENTS WITH ACQUIRED BRAIN INJURY IN TURKEY**

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### **Background:**

Objective: To evaluate construct validity and reliability of the Behavioural Inattention Test (BIT) in a sample of acquired brain injury patients in Turkey.

### **Method**

Design: Internal construct validity was assessed by Rasch analysis. Reliability, and external construct validity were also assessed.

Participants: One hundred eighteen acquired brain injury patients undergoing inpatient rehabilitation

Outcome Measures: BIT, cognitive and physical subscale of FIM.

### **Results**

Neither Conventional nor the Behavioural subscales of the BIT met the expectations of the Rasch model. When re-analysed using the dichotomous cut-off scoring structure (0:abnormal; 1: normal) some subtests still deviated from model expectation. Given these problems, a common 10 item (BIT-10) scale using the cut-off scoring system was derived from both subscales. This version was found to meet model expectations and assumptions. Sensitivity and specificity to the cut points on the original scales, as well as the Star Cancellation Subtest was found to be high. Reliability of 0.87 met expectation for individual use. The BIT-10 correlated at 0.52 with the FIM cognitive scale upon admission.

### **Discussion**

The original version of BIT adapted for use in acquired brain injury in Turkey has been shown to lack internal construct validity. A revised 10 item version, using the dichotomous clinical cut scores gives a valid unidimensional summed score, with high sensitivity and specificity to the original abnormal cut points. Reliability of the BIT-10 was high and correlations with FIM were as expected.

### **Conclusion**

Further work needs to be done on the clinical validity of the BIT10.