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Interventions and Management

1. Arch Phys Med Rehabil. 2012 Sep 26. pii: S0003-9993(12)00932-X. doi: 10.1016/j.apmr.2012.09.012. [Epub ahead of print]

Systematic Review of the Clinimetric Properties of Laboratory and Field-based Aerobic and Anaerobic Fitness Measures in Children with Cerebral Palsy.

Balemans AC, Fragala-Pinkham MA, Lennon N, Thorpe D, Boyd RN, O'Neil ME, Bjornson K, Becher JG, Dallmeijer AJ.

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OBJECTIVE: To systematically evaluate the level of evidence of the clinimetric properties of measures of aerobic and anaerobic capacity used for children with cerebral palsy (CP). **DATA SOURCES:** A systematic search of databases PubMed, Embase, SPORTDiscus and PsycINFO through April 2011 was performed. **STUDY SELECTION:** Two independent raters identified and examined studies that reported laboratory or field-based measures of maximal aerobic or anaerobic capacity in children with CP aged 5-14 years. **DATA EXTRACTION:** The COSMIN checklist was used by two independent raters to evaluate the methodological quality of the included clinimetric studies and identify measures used in these studies. **DATA SYNTHESIS:** Twenty-four studies that used a maximal aerobic or anaerobic capacity measure were identified. Five studies reported clinimetric properties for five measures (2 aerobic and 3 anaerobic measures). Methodological quality was excellent in 3 studies showing good validity and reliability of field-based aerobic (Shuttle Run Test) and anaerobic (Muscle Power Sprint Test) measures. The studies on laboratory-based measures were rated fair, mainly due to inadequate statistics. The level of evidence was strong for good validity and reliability of the field-based tests. The level of evidence was unknown for validity and low to moderate for good reliability of laboratory-based tests. **CONCLUSIONS:** There is a paucity of research on the clinimetric properties of measurement instruments to assess aerobic and anaerobic capacity for children with cerebral palsy. Further clinimetric studies of laboratory-based measures in children with CP at all GMFCS levels and clinimetric studies of field-based measures in children who are classified at GMFCS levels III to V are required.

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2. Med Sci Sports Exerc. 2012 Oct 2. [Epub ahead of print]

Maximal Aerobic and Anaerobic Exercise Responses in Children with Cerebral Palsy.

Balemans AC, van Wely L, de Heer SJ, van den Brink J, de Koning JJ, Becher JG, Dallmeijer AJ.

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PURPOSE: Purpose: To compare the maximal aerobic and anaerobic exercise responses of children with cerebral palsy (CP) by level of motor impairment and in comparison with those of typically developing children (TD). **METHODS:** Seventy children with CP, with varying levels of motor impairment (Gross Motor Function Classification System, [GMFCS I-III]) and 31 TD performed an incremental continuous maximal aerobic exercise test and a 20 s anaerobic Wingate test on a cycle ergometer. Peak oxygen uptake (VO_{2peak}), anaerobic threshold (AT), peak ventilation (VE_{peak}), peak oxygen pulse (peak O₂ pulse), peak ventilatory equivalent of oxygen (peak VE/VO_2) and carbon dioxide (peak VE/VCO_2), peak aerobic power output (PO_{peak}) and mean anaerobic power (P_{20mean}) were measured. Isometric leg muscle strength was determined as a secondary outcome. **RESULTS:** Analysis revealed a lower VO_{2peak} for CP (I: 35.5 ± 1.2 (SE); II: 33.9 ± 1.6 ; III: 29.3 ± 2.5 mL·kg⁻¹·min) compared to TD (41.0 ± 1.3 , $p < 0.001$) and a similar effect for AT (I: 19.4 ± 0.9 ; II: 19.2 ± 1.2 ; III: 15.5 ± 1.9 ; TD: 24.1 ± 1.0 mL·kg⁻¹·min, $p < 0.001$). VE_{peak} and peak O₂ pulse were also lower, while peak VE/VCO_2 was higher in CP compared to TD ($p < 0.05$), and peak VE/VO_2 similar between groups. All these variables showed no differences for different motor impairment levels. PO_{peak} was lower for CP (I: 2.4 ± 0.1 ; II: 1.8 ± 0.1 ; III: 1.4 ± 0.2 W·kg) versus TD (3.0 ± 0.1 , $p < 0.001$), together with lower P_{20mean} in CP (I: 4.6 ± 0.2 ; II: 3.3 ± 0.2 ; III: 2.5 ± 0.4 W·kg) versus TD (6.4 ± 0.2 , $p < 0.001$), and both decreased significantly with increasing motor impairment. **CONCLUSION:** Children with CP have decreased aerobic and anaerobic exercise responses but decreases in respiratory and aerobic exercise responses were not as severe as predicted by motor impairment. Future research should reveal the role of inactivity on the exercise responses of children with CP and possibilities for improvement through training interventions.

[PMID: 23034639](#) [PubMed - as supplied by publisher]

3. Dev Neurorehabil. 2012 Oct 3. [Epub ahead of print]

The effect of the Nintendo Wii Fit on balance control and gross motor function of children with spastic hemiplegic cerebral palsy.

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Objective: To study the impact of training using the Nintendo Wii Fit in 14 children with spastic hemiplegic cerebral palsy. **Methods:** A single-subject single blinded design with multiple subjects and baselines was utilised. Interactive video gaming (IVG) in lieu of regular physiotherapy was given for 3 weeks. Outcome measures included modified balance and running speed and agility (RSA) scales of the Bruininks-Oserestky test of Motor Performance 2 and the timed up and down stairs (TUDS). **Results:** Balances score improved significantly ($F(2, 26) = 9.8286$, $p = 0.001$). Changes over time in the RSA ($F(2, 26) = 0.86198$, $p = 0.434$) and the TUDS ($F(2, 26) = 1.3862$, $p = 0.268$) were not significant. Ten children preferred the intervention to conventional physiotherapy. **Conclusion:** Most children preferred the IVG but as the effect did not carry over into function, IVG should not be used in place of conventional therapy and further research is needed into its use as an adjunct to therapy.

[PMID: 23030836](#) [PubMed - as supplied by publisher]

4. J Bone Joint Surg Am. 2012 Oct 3;94(19):e1421-10. doi: 10.2106/JBJS.K.01300.

Long-term results after distal rectus femoris transfer as a part of multilevel surgery for the correction of stiff-knee gait in spastic diplegic cerebral palsy.

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BACKGROUND: The evidence for distal rectus femoris transfer as a part of multilevel surgery for the correction of stiff-knee gait in children with spastic diplegic cerebral palsy is limited because of inconsistent outcomes reported in various studies and the lack of long-term evaluations. **METHODS:** This study investigated the long-term results (mean, nine years) for fifty-three ambulatory patients with spastic diplegic cerebral palsy and stiff-knee gait treated with standardized distal rectus femoris transfer as a part of multilevel surgery. Standardized three-dimensional gait analysis and clinical examination were carried out before surgery and at one year and nine years after surgery. Patients with decreased peak knee flexion in swing phase who had distal rectus femoris transfer to correct the decreased peak knee flexion in swing phase (C-DRFT) were evaluated separately from those with normal or increased peak knee flexion in swing phase who had distal rectus femoris transfer done as a prophylactic procedure (P-DRFT). **RESULTS:** A significantly increased peak knee flexion in swing phase was found in the C-DRFT group one year after surgery, while a significant loss (15°) in peak knee flexion in swing phase was noted in the P-DRFT group. A slight but not significant increase in peak knee flexion in swing phase in both groups was noted at the time of the long-term follow-up. A significant improvement in timing of peak knee flexion in swing phase was only found for the C-DRFT group, and was maintained after nine years. Knee motion and knee flexion velocity were significantly increased in both groups and were maintained at long-term follow-up in the C-DRFT group, while the P-DRFT showed a deterioration of knee motion. **CONCLUSIONS:** Distal rectus femoris transfer is an effective procedure to treat stiff-knee gait featuring decreased peak knee flexion in swing phase and leads to a long-lasting increase of peak knee flexion in swing phase nine years after surgery. Patients with more involvement showed a greater potential to benefit from distal rectus femoris transfer. However, 18% of the patients showed a permanently poor response and 15% developed recurrence. In patients with severe knee flexion who underwent a prophylactic distal rectus femoris transfer, a significant loss in peak knee flexion in swing phase was noted and thus a prophylactic distal rectus femoris transfer may not be indicated in these patients.

LEVEL OF EVIDENCE: Therapeutic Level IV. See Instructions for Authors for a complete description of levels of evidence.

[PMID: 23032593](#) [PubMed - in process]

5. J Pediatr Rehabil Med. 2012 Jan 1;5(3):171-9.

Effect of ankle-foot orthoses on trunk sway and lower limb intersegmental coordination in children with bilateral cerebral palsy.

Degelean M, De Borre L, Salvia P, Pelc K, Kerckhofs E, De Meirleir L, Cheron G, Dan B.

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Introduction: Ankle-foot orthoses may significantly improve lower limb kinematics in the gait of children with cerebral palsy. Here we aimed to analyze the effect of ankle-foot orthoses on trunk postural control and lower limb intersegmental coordination in children with mild spastic diplegia (GMFCS I or II). **Methods:** We recorded tridimensional trunk kinematics and thigh, shank, and foot elevation angles in 20 4-12 year-old children born preterm with spastic diplegia and 20 typically developing children while walking either barefoot or with ankle-foot orthoses. **Results:** We found significantly greater trunk excursions in children with cerebral palsy compared to typically developing children in both conditions. When wearing ankle-foot orthoses cerebral palsy children showed increased trunk frontal angular velocity. No significant changes in trunk displacement and angular velocity were recorded in the sagittal plane in either group. Typically developing children wearing orthoses showed increased trunk frontal displacement. Wearing orthoses induced significant changes in shank and foot elevation in both

groups. Conclusion: Ankle-foot orthoses affect postural control and intersegmental coordination in children with cerebral palsy. This should be taken into account when planning therapeutic management.

[PMID: 23023249](#) [PubMed - in process]

6. BMC Musculoskelet Disord. 2012 Oct 4;13(1):193. [Epub ahead of print]

Effect of posture-control insoles on function in children with cerebral palsy: Randomized controlled clinical trial.

Pasini Neto H, Grecco LA, Cristovão T, Braun LA, Giannasi LC, Salgado AS, Corrêa JC, Sampaio LM, Galli M, Oliveira CS.

INTRODUCTION: Cerebral palsy (CP) is a posture and movement disorder and different therapeutic modalities, such as the use of braces, have sought to favor selective motor control and muscle coordination in such patients. The aim of the proposed study is to determine the effect of the combination of posture-control insoles and ankle-foot orthoses (AFOs) improving functional limitation in children with CP. **METHODS:** The sample will be composed of 24 children with CP between four and 12 years of age. After the signing of the statement of informed consent, the children will be randomly allocated to two groups: a control group using AFOs alone and an experimental group using both posture-control insoles and AFOs. Evaluations will be performed on five occasions: without any accessory (insoles or AFOs), immediately after, one month after, six months after and one year after AFOs or insole and AFOs use. The evaluation will involve the analysis of gait, static and functional balance, mobility and hypertonia. The three-dimensional assessment of gait will involve the eight-camera SMART-D SMART-D 140(R) system (BTS Engineering), two Kistler force plates (model 9286BA) and an eight-channel, wireless FREEEMG(R) electromyography (BTS Engineering). Static balance will be assessed using a Kistler force plate (model 9286BA). Clinical functional balance and mobility will be assessed using the Berg Balance Scale, Timed Up-and-Go Test and Six-Minute Walk Test. The posture-control insoles will be made of ethylene vinyl acetate, with thermal molding for fixation. The fixed orthoses will be made of polypropylene and attached to the ankle region (AFO). The results will be analyzed statistically, with the level significance set to 5% ($p < 0.05$). Trial Registration Trial Registration Number: RBR6d342s (<http://www.ensaiosclinicos.gov.br/news/>).

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7. Sports Med Arthrosc Rehabil Ther Technol. 2012 Oct 2;4(1):36. [Epub ahead of print]

Anterior cruciate ligament reconstruction in a patient with Athetoid cerebral palsy: a case report.

Tajima T, Chosa E, Yamamoto K, Yamaguchi N, Watanabe S, Kawahara K.

Recent years have seen ACL reconstruction performed in a broad range of patients, regardless of age, sex or occupation, thanks to great advances in surgical techniques, instrumentation and the basic research. Favorable results have been reported; however, we have not been able to locate any reports describing ACL reconstruction in patients with athetoid cerebral palsy. We present herein a previously unreported anterior cruciate ligament (ACL) reconstruction performed in a patient with athetoid cerebral palsy. The patient was a 25-year-old woman with level II athetoid cerebral palsy according to the Gross Motor Function Classification System. She initially injured her right knee after falling off a bicycle. Two years later, she again experienced right-knee pain and a feeling of instability. A right-knee ACL tear and avulsion fracture was diagnosed upon physical examination and confirmed with magnetic resonance imaging (MRI) and X-ray examination at that time. An ACL reconstruction using an autologous hamstring double-bundle graft was performed for recurrent instability nine years after the initial injury. Cast immobilization was provided for 3 weeks following surgery and knee extension was restricted for 3 months with the functional ACL brace to prevent hyperextension due to involuntary movement. Partial weight-bearing was started 1 week postoperatively, with full weight-bearing after 4 weeks. The anterior drawer stress radiography showed a 63% anterior displacement of the involved tibia on the femur six months following the surgery, while the contralateral knee demonstrated a 60% anterior displacement of the tibia. The functional ACL functional brace was then removed. A second-look arthroscopy was performed 13 months after the ACL reconstruction, and both the anteromedial and posterolateral bundles were in excellent position as per Kondo's criteria. The Lachman and pivot shift test performed under anesthesia were also negative. An anterior drawer stress radiography of the involved knee at 36 months following surgery showed a 61% anterior translation of the tibia. The preoperative symptoms of

instability resolved and the patient expressed a high degree of satisfaction with the result of her surgery.

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8. Clin Biomech (Bristol, Avon). 2012 Sep 25. pii: S0268-0033(12)00214-8. doi: 10.1016/j.clinbiomech.2012.08.012. [Epub ahead of print]

Human spastic Gracilis muscle isometric forces measured intraoperatively as a function of knee angle show no abnormal muscular mechanics.

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BACKGROUND: To show whether mechanics of activated spastic muscle are representative of the functional deficiencies clearly apparent in the joints, our goal was to test the following hypotheses: (1) The muscle's joint range of force exertion is narrow, and (2) high muscle forces are available at low muscle length. **METHODS:** During remedial surgery, we measured the forces of the Gracilis muscle of spastic cerebral palsy patients (n=7, 10 limbs tested) as a function of knee joint angle from flexion (120°) to full extension (0°). **FINDINGS:** The spastic Gracilis exerted non-zero forces for the entire knee angles studied. For four limbs, the peak force was exerted at the highest length. For the remainder limbs, the closest knee angle of peak force exertion to 120° was 66°. Maximally 79.1%, and for most limbs only a much lower percentage (minimally 22.4%) of peak Gracilis force (mean 41.59N (SD 41.76N)) was available at 120° knee flexion. Moreover, a clinical metric was obtained showing that the occurrence of a contracture was not correlated significantly with key determinants of knee angle-Gracilis force characteristics. **INTERPRETATION:** Our hypotheses are rejected: the spastic Gracilis has no narrow operational joint range of force exertion and no supreme active resistance capacity to stretch at low length. We conclude that if activated alone, spastic muscle shows no abnormal mechanics representative of joint movement disorder. Simultaneous stimulation of other muscles as in daily activities may change this situation.

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9. Mov Disord. 2012 Oct 4. doi: 10.1002/mds.25204. [Epub ahead of print]

Surgical treatment for secondary dystonia.

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Surgical therapy for the secondary dystonias is generally perceived to be less effective than for primary disease. However, a number of case reports and small open series have recently appeared describing quite favorable outcomes following surgery for some nonprimary dystonias. We discuss surgical treatment options for this group of diverse conditions, including tardive dystonia, dystonic cerebral palsy, and certain hereditary degenerative diseases in which deep brain stimulation and ablative lesions of the posteroventral pallidum have been shown to be effective. Other types of secondary dystonia respond less well to pallidal surgery, particularly when anatomical lesions of the basal ganglia are prominent on preoperative imaging. For these conditions, central baclofen delivery and botulinum toxin denervation may be considered. With optimal medical and surgical care, some patients with secondary dystonia have achieved reductions in disability and pain that approach those documented for primary dystonia. © 2012 Movement Disorder Society.

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10. Comput Methods Biomech Biomed Engin. 2012 Sep;15 Suppl 1:263-5.**Simulation of muscle retraction in cerebral palsy. Validation of a decision support system for surgical lengthening of contractured muscles.**

Desailly E, Sebsadji A, Yepremian D, Hareb F, Khouri N.

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[PMID: 23009501](#) [PubMed - in process]

11. Comput Methods Biomech Biomed Engin. 2012 Sep;15 Suppl 1:177-9.**Description and classification of the effect of hamstrings lengthening in cerebral palsy children multi-site surgery.**

Sebsadji A, Khouri N, Djemal K, Yepremian D, Hareb F, Hoppenot P, Desailly E.

Fondation Ellen Poidatz, 77310, St Fargeau-Ponthierry, France.

[PMID: 23009470](#) [PubMed - in process]

12. J Child Orthop. 2011 Oct;5(5):363-70. Epub 2011 Sep 3.**Upper limb motion analysis in children with hemiplegic cerebral palsy: proximal kinematic changes after distal botulinum toxin or surgical treatments.**

Fitoussi F, Diop A, Maurel N, Laasel el M, Ilharreborde B, Penneçot GF.

Orthopaedic Department, AP-HP, Robert Debre Hospital, 48 Bd. Serurier, 75019 Paris, France.

PURPOSE: The purpose of this study is to describe the kinematic changes in children with cerebral palsy (CP) after treatments performed on the forearm, wrist or thumb, with specific attention to the changes around the trunk, shoulder and elbow kinematics. **METHODS:** With the use of a specific kinematic protocol, we first described the upper limb kinematics in a group of 27 hemiplegic patients during two simple daily tasks. Eight of these children were treated with botulinum toxin (Botox®), Allergan) injection or surgery and were, thereafter, evaluated with another kinematic analysis in order to compare the pre- and post-therapeutic condition. The target muscles were the pronator teres, flexor carpi radialis, flexor carpi ulnaris, flexor digitorum superficialis, flexor pollicis longus and the adductor pollicis. **RESULTS:** Significant kinematic changes were found after treatment. Patients increased forearm supination ($P < 0.05$) and wrist extension ($P < 0.05$) during both tasks. Patients also decreased trunk flexion/extension range of motion (ROM) ($P < 0.05$), improved elbow ROM ($P < 0.05$) and improved internal shoulder rotation ($P < 0.05$). **CONCLUSIONS:** Dynamic shoulder or elbow limitations in children with mild hemiplegia involvement could be related to a compensatory movement strategy and/or co-contractions. As these proximal kinematics anomalies are improved after treatments performed at the forearm, wrist and thumb, they should not be treated first but should be reconsidered after the treatment of more distal problems.

[PMID: 23024728](#) [PubMed] PMCID: PMC3179533

13. J Pediatr Rehabil Med. 2012 Jan 1;5(3):151-8.**Clusters of daily functioning and classification levels: Agreement of information in children with cerebral palsy.**

de Brito Brandão M, de Cássia Gonçalves S, Carvalho LA, Crepaldi PV, Abrahão LC, de Melo Mambrini JV, Mancini MC.

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Purpose: To analyze the agreement between gross motor and hand function levels and clusters of functional performance in children with cerebral palsy (CP). **Method:** The sample consisted of 129 children with CP aged 4 to 13-years. Children's gross motor and hand function were classified with the Gross Motor Classification System (GMFCS) and Manual Ability Classification System (MACS). Their daily functioning on self-care and mobility was assessed with the Pediatric Evaluation of Disability Inventory (PEDI). Cluster analyses grouped children with similar repertoires on self-care and mobility skills using the agglomerative hierarchical technique. The associations across self-care and mobility clusters with daily living skills were tested with Chi-Square tests. The level of agreement was quantified with the Kappa coefficient. **Results:** Four groupings of children's functional skills in self-care ($R^2 = 0.92$) and mobility ($R^2 = 0.95$) were identified. These groupings were associated with hand function ($\chi^2 = 145.43$; $p < 0.001$) and mobility levels ($\chi^2 = 198.13$; $p < 0.001$), respectively. The agreement between MACS and self-care skills was 61.7% ($Kappa = 0.47$; $p < 0.001$) and between GMFCS and mobility skills was 64.4% ($Kappa = 0.54$; $p < 0.001$). **Conclusion:** The findings support the adequacy of functional classifications and functioning repertoires. The magnitude of agreement reinforces the importance of the concomitant use of functional classification and assessments.

[PMID: 23023247](#) [PubMed - in process]

14. Dev Neurorehabil. 2012 Oct 3. [Epub ahead of print]

Wii™-habilitation of upper extremity function in children with Cerebral Palsy. An explorative study.

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Objective: Commercially available virtual reality systems can possibly support rehabilitation objectives in training upper arm function in children with Cerebral Palsy (CP). The present study explored the effect of the Nintendo Wii™ training on upper extremity function in children with CP. **Methods:** During six weeks, all children received twice a week training with the Wii™, with their most affected arm. The Melbourne Assessment of Upper Limb Function and ABILHAND-Kids were assessed pre- and post- training. In addition, user satisfaction of both children and health professionals was assessed after training. Enjoyment in gaming was scored on a visual analogue scale after each session by the children. **Results:** Fifteen children with CP participated in the study. The quality of upper extremity movements did not change (-2.1 , $p > 0.05$), while a significant increase of convenience in using hands/arms during performance of daily activities was found (0.6 , $p < 0.05$). **Conclusion:** Daily activities seem to be easier performed after Wii™ training for most of the included children with CP.

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15. Int J Speech Lang Pathol. 2012 Oct 1. [Epub ahead of print]

Kinematic changes in jaw and lip control of children with cerebral palsy following participation in a motor-speech (PROMPT) intervention.

Ward R, Strauss G, Leitão S.

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This study evaluates kinematic movements of the jaw and lips in six children (3-11 years) with moderate-to-severe speech impairment associated with cerebral palsy before, during, and after participation in a motor-speech (PROMPT) intervention program. An ABCA single subject research design was implemented. Subsequent to the baseline phase (A), phase B targeted each participant's first intervention priority on the PROMPT motor-speech hierarchy. Phase C then targeted one level higher. A reference group of 12 typically-developing peers, age- and sex-matched to each participant with CP, was recruited for comparison in the interpretation of the kinematic data. Jaw and lip measurements of distance, velocity, and duration, during the production of 11 untrained stimulus words, were obtained at the end of each study phase using 3D motion analysis (Vicon Motus 9.1). All participants showed significant changes in specific movement characteristics of the jaw and lips. Kinematic changes were associated

with significant positive changes to speech intelligibility in five of the six participants. This study makes a contribution to providing evidence that supports the use of a treatment approach aligned with dynamic systems theory to improve the motor-speech movement patterns and speech intelligibility in children with cerebral palsy.

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16. Dev Neurorehabil. 2012 Oct 3. [Epub ahead of print]

Visual impairment in children with spastic cerebral palsy measured by psychophysical and electrophysiological grating acuity tests.

Costa MF, Ventura DF.

Department Psicologia Experimental, Instituto de Psicologia, Universidade de São Paulo , São Paulo , Brazil.

Background: This study measured grating visual acuity in 173 children between 6-48 months of age who had different types of spastic cerebral palsy (CP). **Method:** Behavioural acuity was measured with the Teller Acuity Cards (TAC) using a staircase psychophysical procedure. Electrophysiological visual acuity was estimated using the sweep VEP (sVEP). **Results:** The percentage of children outside the superior tolerance limits was 44 of 63 (69%) and 50 of 55 (91%) of tetraplegic, 36 of 56 (64%) and 42 of 53 (79%) of diplegic, 10 of 48 (21%) and 12 of 40 (30%) of hemiplegic for sVEP and TAC, respectively. For the sVEP, the greater visual acuity deficit found in the tetraplegic group was significantly different from that of the hemiplegic group ($p < 0.001$). In the TAC procedure the mean visual acuity deficits of the tetraplegic and diplegic groups were significantly different from that of hemiplegic group ($p < 0.001$). The differences between sVEP and TAC means of visual acuity difference were statistically significant for the tetraplegic ($p < 0.001$), diplegic ($p < 0.001$), and hemiplegic group ($p = 0.004$). **Discussion:** Better visual acuities were obtained in both procedures for hemiplegic children compared to diplegic or tetraplegic. Tetraplegic and diplegic children showed greater discrepancies between the TAC and sVEP results. Inter-ocular acuity difference was more frequent in sVEP measurements. **Conclusions:** Electrophysiologically measured visual acuity is better than behavioural visual acuity in children with CP.

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17. J Pediatr Psychol. 2012 Oct 1. [Epub ahead of print]

Pain Catastrophizing in Youths With Physical Disabilities and Chronic Pain.

Engel JM, Wilson S, Tran ST, Jensen MP, Ciol MA.

Department of Occupational Science and Technology, University of Wisconsin-Milwaukee.

OBJECTIVE: The current study examined the associations between catastrophizing and pain intensity, psychological adjustment, functional ability, and community participation in youths with physical disability and chronic pain.

METHODS: Participants consisted of 80 youths, aged 8-20 years, with cerebral palsy ($n = 34$), neuromuscular disease ($n = 22$), or spina bifida ($n = 24$). Measures from a cross-sectional survey included demographic, pain, and disability information, the Pain Catastrophizing Scale, the Child Health Questionnaire, and the Functional Disability Inventory. **RESULTS:** Results suggested that catastrophizing was significantly associated with pain intensity and psychological adjustment; however, catastrophizing did not demonstrate significant associations with functional ability or community participation. **CONCLUSIONS:** The study extends previous findings of significant associations between catastrophizing and both pain intensity and psychological adjustment to samples of youths with chronic pain and disabilities not previously examined. Further research that examines the causal association between catastrophizing and outcomes in youths with chronic pain and physical disability is warranted.

[PMID: 23033363](#) [PubMed - as supplied by publisher]

18. Dev Neurorehabil. 2012 Oct 3. [Epub ahead of print]**An ICF-based approach for cerebral palsy from a biopsychosocial perspective.**

Andrade PM, Haase VG, Oliveira-Ferreira F.

Department of Physical Therapy, Federal University of Jequitinhonha and Mucuri Valleys (UFVJM), Diamantina, Brazil.

Objectives: To integrate instruments to operationalize an ICF-based approach for cerebral palsy (CP); to assess differences in activity and participation among children with hemiplegia, diplegia and quadriplegia CP; to verify the facilitators or barriers to functioning; and to investigate the explanatory factors (cognitive and motor) for the type of school attended by children with CP (regular or special). **Methods:** Sixty children with CP were assessed using the Mini-Mental State Examination and an ICF-based instrument and their parents were interviewed. Data were analysed by Chi-Squared, Anova's and Kruskal-Wallis tests and multivariate logistic regression. **Results:** Significant differences between CP sub-groups were found for chewing, urinary function, cognitive function and activities and participation. Twelve environmental factors were identified as barriers. Multivariate regression identified cognitive function as a significant explanatory variable for the type of school attended, whereas motor function was not significant. **Conclusions:** The ICF-based approach allows a comprehensive assessment, relevant for planning interventions.

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19. J Pediatr Rehabil Med. 2012 Jan 1;5(3):203-15.**Rehabilitation planning for children and adolescents with cerebral palsy.**

Jeglinsky I, Salminen AL, Carlberg EB, Autti-Rämö I.

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Objective: To explore the types of procedures and practices in rehabilitation planning for children with cerebral palsy and how multidisciplinary team members experience them. **Design, subjects, and setting:** A qualitative research approach was used. Participants were members of multidisciplinary teams in neuropediatric wards at five university hospitals. **Methods:** In order to explore the rehabilitation planning procedure within multidisciplinary teams, focus group interviews were conducted. The interviews were tape recorded and transcribed. Three content areas guided the interviews: goal setting, the different transition phases, and the use of the International Classification of Functioning, Disability and Health, Child and Youth version (ICF-CY). Qualitative content analysis was used to analyze the results. **Results:** Three themes arose from the focus group discussions; challenging goal setting, transition without routines, and ICF-CY not in use. A family-centered service model had been adopted, but there was no clear procedure in the collaboration with parents. Goal setting was found to be challenging and the concern arose of how to integrate goals into the child's everyday life. There was a lack of systematic planning of the different transition phases. There was also a general variation in the rehabilitation planning procedures due to local and regional differences in practice. The ICF-CY was familiar, but not in formal use in clinical practice. **Conclusion:** There is a need to enhance the procedures and to systematize coordination of services in the rehabilitation process. The ICF-CY framework might help to optimize collaborative goal setting and to structure both procedures and documentation of the rehabilitation plans and goals.

[PMID: 23023253](#) [PubMed - in process]

20. J Pediatr Rehabil Med. 2012 Jan 1;5(3):187-95.**In-home supportive services for individuals with cerebral palsy in California.**

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Introduction: Individuals with cerebral palsy (CP) may require personal assistance services for optimal functioning. The primary goal of this project is to determine if differences in health services exist between individuals with CP with family versus non-family member paid personal assistance providers. The secondary goal is to describe the population of children and non-elderly adults with CP receiving In-Home Supportive Services (IHSS) and determine their health care costs compared to other IHSS recipients. **Methods:** Administrative data from the California Departments of Health and Human Services, Social Services and Developmental Services were linked and de-identified to provide information about individuals receiving IHSS in California in 2005. Recipients with CP were characterized and compared by age. Then to determine the factors associated with hospital use and emergency room (ER) use for IHSS recipients with CP adjusted odds were calculated. Monthly expenditures were calculated from claims data. **Results:** 2.3% of all IHSS recipients in 2005 had CP of which 46% were children. 59% of recipients with CP have a parent as their paid provider. The presence of other medical diagnoses was the only factor associated with increased adjusted odds of hospital and ER use for both child-aged and non-elderly adult recipients with CP. Functional limitations and provider type were not associated with increased odds of health care utilization. Monthly health care expenditures for recipients with CP were ~ \$1000 higher than for other IHSS recipients. **Conclusions:** Having a parent as the IHSS provider was not associated with difference in health service utilization. This finding supports the policy of allowing parents to be paid providers.

[PMID: 23023251](#) [PubMed - in process]

21. J Pediatr Rehabil Med. 2012 Jan 1;5(3):181-6.**Influence of the environment on performance of gross motor function in children with cerebral palsy.**

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Assessment and physiotherapy intervention for children with cerebral palsy (CP) are conventionally carried out in the hospital or clinic setting. However, the daily lives of these children include a variety of environmental settings in addition to the clinical setting. The objective of this study was therefore to explore the possible influence of the environment on motor function in children with CP. Purposively selected children with CP (n=107), ages 1 and 6 years with mean age of 2.1 years (SD 1.10 yrs), were involved in this study. The motor function of each child was assessed in the hospital and at their homes within a one-week interval, using the Gross Motor Function Measure (GMFM); this was done at the baseline and on a monthly basis for eight consecutive months. The paired t-test rank was computed to compare the overall GMFM score and each of the sub-domain scores measured in the clinic and at home. GMFM scores measured at home were significantly higher than those measured in the clinic and this pattern was also obtained for the sub-domains throughout the study period, suggesting that children performed gross motor functions better at their homes than in the clinic.

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22. J Pediatr Rehabil Med. 2012 Jan 1;5(3):159-70.**The effect of intense physical therapy for children with cerebral palsy.**

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Purpose: To determine the effect of an intense physical therapy intervention on gross motor function, community

walking and participation in children with cerebral palsy (CP). Methods: A single group design was used with two pre-test and two post-test measures. Subjects were 17 ambulatory children with CP who participated in an intense intervention (i.e. four hours per day, five days per week, three weeks), a modified version of the TheraSuit™ protocol. Gross Motor Function Measure (GMFM-66), Step Watch Activity Monitor (SAM), Canadian Occupational Performance Measure (COPM) and Pediatric Outcomes Data Collection Instrument (PODCI) were tested twice at baseline, immediately following the intervention, and three months later. Results: Immediately following the intervention, GMFM-66, COPM and PODCI scores improved significantly ($p < 0.001$). At three months, improvements remained for GMFM-66 and COPM ($p < 0.01$). Walking amount or intensity (SAM) did not improve. Conclusions: Participants improved gross motor skills and participation but not community ambulation following this intense physical therapy intervention.

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23. Phys Occup Ther Pediatr. 2012 Oct 3. [Epub ahead of print]

Evidence to Practice Commentary: Is More Therapy Better?

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Cerebral Palsy Alliance, School of Medicine, University of Notre Dame , Darlinghurst , Australia.

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24. Physiother Theory Pract. 2012 Oct 4. [Epub ahead of print]

Describing the clinical reasoning process: Application of a model of enablement to a pediatric case.

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Background and purpose: Clinical reasoning is a core tenet of physical therapy practice leading to optimal patient care. The purpose of this case was to describe the outcomes, subjective experience, and reflective clinical reasoning process for a child with cerebral palsy using the International Classification of Functioning, Disability, and Health (ICF) model. Case description: Application of the ICF framework to a 9-year-old boy with spastic triplegic cerebral palsy was utilized to capture the interwoven factors present in this case. Interventions in the pool occurred twice weekly for 1 h over a 10-week period. Outcomes: Immediately post and 4 months post-intervention, the child made functional and meaningful gains. The family unit also developed an enjoyment of exercising together. Each individual family member described psychological, emotional, or physical health improvements. Discussion: Reflection using the ICF model as a framework to discuss clinical reasoning can highlight important factors contributing to effective patient management.

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