

Monday 26 July 2010

This free weekly bulletin lists the latest research on cerebral palsy (CP), as indexed in the NCBI, PubMed (Medline) and Entrez (GenBank) databases. These articles were identified by a search using the key term "cerebral palsy".

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## Interventions

### 1. *Physiother Res Int.* 2010 Jul 22. [Epub ahead of print]

#### **Characteristics of associated reactions in people with hemiplegic cerebral palsy.**

Chiu HC, Ada L, Butler J, Coulson S.

Discipline of Physiotherapy, The University of Sydney, NSW, Australia.

**Purposes.** To investigate the relationship between associated reactions and a) spasticity, b) contracture and c) coordination. **Methods.** Associated reactions were measured as magnitude of muscle activity in the affected limb during a 50% maximum voluntary contraction of muscles in the unaffected limb. Spasticity was measured as hyper-reflexia during passive muscle stretch, coordination as performance during a tracking task, and contracture as loss of range of motion. Chi-square analysis was used to examine the association between associated reactions and spasticity, and linear regression to examine the relationship between associated reactions and spasticity, coordination and contracture. **Results.** Twenty-three people with hemiplegic cerebral palsy aged from 15 to 47 years (mean [SD]: 29 years [9]) participated. Thirteen participants exhibited spasticity, and six participants exhibited associated reactions. Five of the six participants with associated reactions also had spasticity ( $\chi^2 = 2.37$ ,  $p = 0.12$ ). Associated reactions were highly correlated with spasticity ( $r = 0.77$ ,  $p = 0.001$ ), but not with contracture ( $r = 0.35$ ,  $p = 0.29$ ) or coordination ( $r = -0.31$ ,  $p = 0.30$ ). **Conclusions.** Although 27% of participants exhibited associated reactions, and these were mostly small, associated reactions appear to be an expression of spasticity in hemiplegic cerebral palsy. Copyright (c) 2010 John Wiley & Sons, Ltd.

PMID: 20652864 [PubMed - as supplied by publisher]

### 2. *Child Care Health Dev.* 2010 Jul 19. [Epub ahead of print]

#### **Domains of importance for parents, medical professionals and youth with cerebral palsy considering treatment outcomes.**

Vargus-Adams JN, Martin LK.

Cincinnati Children's Hospital Medical Center, University of Cincinnati School of Medicine, Departments of Pediatrics and Physical Medicine and Rehabilitation, Division of Pediatric Rehabilitation and Center for Epidemiology and Biostatistics, Cincinnati, OH, USA.

**Background:** The aim of this study was to assess the domains of importance in therapeutic intervention for cerebral palsy (CP) using categories of the International Classification of Functioning, Disability, and Health - Children and Youth Version (ICF-CY). **Methods:** A total of 17 youth, 19 parents and 39 medical professionals responded to the open-ended query: 'What are the things you find most important to consider when you evaluate the effects of an intervention for yourself/your child/your patient with cerebral palsy?' Surveys were either mailed or conducted

on-line. Responses were coded by two reviewers using the ICF-CY and discrepancies were resolved. Results: Responses were distributed across the ICF-CY domains of Body Functions and Structures, Activities and Participation, and Environmental Factors, as well as non-ICF-CY concepts including quality of life. The most common responses overall were pain, motor function, mobility, community life and public services. Youth identified strength, gait pattern, hand/arm use and use of assistive technologies as priorities whereas parents were concerned with motor function, communication, mobility and provision of public services. Medical professionals listed pain, function, mobility, community life and participation most often. Conclusions: All surveyed groups indicate a desire to see changes in body functions and structures (pain, mental function, strength, movement), activities and participation (communication, hand/arm use, walking, school, recreation/community life) and quality of life following therapeutic interventions for CP. These results demonstrate the multiple, varied concerns regarding CP across the spectrum of functioning and health.

PMID: 20637027 [PubMed - as supplied by publisher]

### 3. J Speech Lang Hear Res. 2010 Jul 19. [Epub ahead of print]

#### **Classification of speech and language profiles in 4-year old children with cerebral palsy: A prospective preliminary study.**

Hustad KC, Gorton K, Lee J.

Department of Communicative Disorders, University of Wisconsin - Madison.

**PURPOSE:** Little is known about the speech and language abilities of children with cerebral palsy (CP) and there is currently no system for classifying speech and language profiles. Such a system would have epidemiological value and would have the potential to advance the development of interventions that improve outcomes. In this study, we propose and test a preliminary speech and language classification system by quantifying how well speech and language data differentiate among children classified into different hypothesized profile groups. **METHOD:** Speech and language assessment data were collected in a laboratory setting from 34 children with CP (18 males; 16 females) who were a mean age of 54 months (SD 1.8 months). Measures of interest were vowel area, speech rate, language comprehension scores, and speech intelligibility ratings. **RESULTS:** Canonical discriminant function analysis showed that three functions accounted for 100% of the variance among profile groups, with speech variables accounting for 93% of the variance. Classification agreement varied from 74% to 97% using four different classification paradigms. **CONCLUSIONS:** Results provide preliminary support for the classification of speech and language abilities of children with CP into four initial profile groups. Further research is necessary to validate the full classification system.

PMID: 20643795 [PubMed - as supplied by publisher]

### 4. Rev Neurol. 2010 Aug 1;51(3):135-45.

#### **Treadmill training with or without partial body weight support in children with cerebral palsy: systematic review and meta-analysis. [Article in Spanish]**

Molina-Rueda F, Aguila-Maturana AM, Molina-Rueda MJ, Miangolarra-Page JC.

Universidad Rey Juan Carlos. Facultad de Ciencias de la Salud, 28922 Alcorcon, Espana.

**INTRODUCTION.** The limitations of gait in children with cerebral palsy are common. In fact, the training of locomotion is an essential therapeutic goal. There are various treatment approaches, but in recent years, the treadmill training, framed within the motor learning task-oriented, has increased its presence at the clinical level. **AIM.** To determine whether treadmill training with or without partial body weight support, improves the ability to walk, the motor function of the lower limb, the disability and the quality of life in children with cerebral palsy. **MATERIALS AND METHODS.** We selected only those articles with the highest level of evidence for each type of intervention. We searched in the National Guideline Clearinghouse, Trip Database, SUMsearch, Medline, CINHALL, Embase, Amed, Cochrane Library Plus and PEDro. Data were extracted from these six studies, which recruited 127 participants. Only a meta-analysis was given. We used a fixed effects model, data were not significant between increased of speed and treadmill training. **RESULTS.** According to the individual studies, the intervention improved lower ex-

tremity function and spatiotemporal parameters during gait. However, the differences between groups in favor of the experimental condition, were mostly not significant. **CONCLUSIONS.** The systematic review shows some limitations. Firstly, it includes a small number of studies, which is also a small sample of participants. In addition, among the studies, there is a great clinical diversity and many articles did not described relevant data exactly for critical reading.

PMID: 20645264 [PubMed - in process]

##### **5. Int J Paediatr Dent. 2010 Jul 18. [Epub ahead of print]**

###### **Oral health in preschool children with cerebral palsy: a case-control community-based study.**

DU RY, McGrath C, Yiu CK, King NM.

Paediatric Dentistry, Faculty of Dentistry, The University of Hong Kong, Hong Kong SAR, China.

International Journal of Paediatric Dentistry 2010 Objectives. To assess and compare the oral health status of preschool children with and without cerebral palsy (CP). Methods. Preschool children with CP (72) were recruited from 23 Special Child Care Centers in Hong Kong. An age (+/-3 months) and gender matched sample of preschool children from mainstream preschools were recruited as the control group. Dental caries status, gingival health status, tooth wear, developmental defect of enamel, malocclusion, dental trauma and oral mucosal health were assessed and compared between the two groups. Results. Significant differences in gingival health status were found between children with and without CP (mean plaque index scores,  $P = 0.001$  and mean gingival index scores,  $P < 0.05$ ). Tooth wear involving dentine was more prevalent among CP children ( $P < 0.001$ ), as were evidence of anterior open-bite ( $P < 0.001$ ) and oral mucosal lesions ( $P < 0.05$ ). Children with and without CP had similar caries experiences ( $P > 0.05$ ), prevalence of enamel defects ( $P > 0.05$ ) and dental trauma ( $P > 0.05$ ). Conclusions. Differences of oral health status exist among preschool children with and without CP. Preschool children fare worse in terms of gingival health, tooth wear, oral mucosal health and malocclusion.

PMID: 20642472 [PubMed - as supplied by publisher]

##### **6. Dev Med Child Neurol. 2010 Jul 15. [Epub ahead of print]**

###### **Physiotherapy and Occupational Therapy for People with Cerebral Palsy: A Problem-Based Approach to Assessment and Management.**

Novak I.

Head of Research, Cerebral Palsy Institute, Australia.

PMID: 20636391 [PubMed - as supplied by publisher]

##### **7. Dev Med Child Neurol. 2010 Jul 14. [Epub ahead of print]**

###### **Measuring mobility limitations in children with cerebral palsy: content and construct validity of a mobility questionnaire (MobQues).**

VAN Ravesteyn NT, Scholtes VA, Becher JG, Roorda LD, Verschuren O, Dallmeijer AJ.

Department of Rehabilitation Medicine, VU University Medical Center, Amsterdam, the Netherlands.

**Aim:** The objective of this study was to assess the validity of a mobility questionnaire (MobQues) that was developed to measure parent-reported mobility limitations in children with cerebral palsy (CP). **Method:** The parents of 439 children with CP (256 males and 183 females; age range 2-18y; Gross Motor Function Classification System [GMFCS] levels I-IV) completed the mobility questionnaire (MobQues). To assess content validity, we linked all meaningful concepts of the MobQues items to the International Classification of Functioning, Disability and Health (ICF). To assess construct validity, we compared the total scores of the two versions of the MobQues (MobQues47

and MobQues28) according to GMFCS level, and determined Pearson's correlation coefficient ( $r$ ) with the Gross Motor Function Measure-66 (GMFM-66). Results: Content validity was demonstrated by the fact that 46 of the 47 MobQues items were linked to categories in the 'Mobility' chapter of the ICF. Construct validity was demonstrated by the finding that MobQues scores decreased with increasing GMFCS levels ( $p < 0.001$ ). In a subgroup of 162 children, positive correlations were found between total scores and the GMFM-66 (MobQues47,  $r = 0.75$ ; MobQues28,  $r = 0.67$ ,  $p < 0.001$ ). Interpretation: The results of this study provide evidence supporting the content and construct validity of the MobQues as a measure of mobility limitation in children with CP.

PMID: 20646033 [PubMed - as supplied by publisher]

## 8. Dev Med Child Neurol. 2010 Jul 14. [Epub ahead of print]

### Level of motivation in mastering challenging tasks in children with cerebral palsy.

Majnemer A, Shevell M, Law M, Poulin C, Rosenbaum P.

School of Physical & Occupational Therapy, McGill University Health Centre, QC, Canada.

**Aim:** The aim of this study was to describe and identify factors associated with motivation in children with cerebral palsy (CP). **Method:** Children with CP were recruited for this cross-sectional study. Children were assessed using the Leiter Intelligence Test, the Gross Motor Function Measure, and the Vineland Adaptive Behavior Scale. Parents completed the Dimensions of Mastery Questionnaire (DMQ) and questionnaires on demographics, child behaviour, and family functioning. **Results:** The parents of 74 children (46 males, 28 females; mean age 9y 2mo, SD 2y 1mo, range 5y 10mo-12y 11mo) completed the DMQ. Just over half of the children (39/74) were classified at Gross Motor Function Classification System (GMFCS) level I, with 13 classified at GMFCS level II, one at level III, six at level IV, and 14 at level V; one child was not classified. The most common diagnoses were spastic hemiplegia and quadriplegia (23 each), followed by diplegia (14). The highest motivation scores were obtained for the dimensions of mastery pleasure and social persistence and the lowest for persistence with motor or cognitive tasks. Age and sex were not predictive of scores on the DMQ. Higher IQ ( $r = 0.41$ ), better motor ability ( $r = 0.43$ ), and fewer limitations in self-care, communication, and socialization ( $r = 0.44-0.53$ ) were positively associated with motivation total score. A negative impact of the child's disability on the family was associated with lower motivation ( $r = -0.44$ ). Positive social behaviours were positively correlated with motivation ( $r = 0.38-0.66$ ), whereas hyperactivity and peer problems were negatively associated. **Interpretation:** High motivation was associated with fewer activity limitations and behavioural problems and reduced family burden. Low motivation may adversely influence a child's functional potential and the effectiveness of interventions. Strategies focusing on the child, peers, adults, or activities are proposed to enhance the children's motivation to engage in more challenging activities.

PMID: 20646031 [PubMed - as supplied by publisher]

## 9. Dev Med Child Neurol. 2010 Jul 14. [Epub ahead of print]

### Physical activity measurement instruments for children with cerebral palsy: a systematic review.

Capio CM, Sit CH, Abernethy B, Rotor ER.

Institute of Human Performance, The University of Hong Kong, Hong Kong.

**Aim:** This paper is a systematic review of physical activity measurement instruments for field-based studies involving children with cerebral palsy (CP). **Method:** Database searches using PubMed Central, MEDLINE, CINAHL Plus, PsycINFO, EMBASE, Cochrane Library, and PEDro located 12 research papers, identifying seven instruments that met the inclusion criteria of (1) having been developed for children aged 0 to 18 years, (2) having been used to evaluate a physical activity dimension, and (3) having been used in a field-based study involving children with CP. The instruments reviewed were the Activities Scale for Kids - Performance version (ASKp), the Canada Fitness Survey, the Children's Assessment of Participation and Enjoyment/Preferences for Activities of Children (CAPE/PAC), the Compendium of Physical Activities, the Physical Activity Questionnaire - Adolescents (PAQ-A), Step-Watch, and the Uptimer. Second-round searches yielded 11 more papers, providing reliability and validity evidence for the instruments. **Results:** The instruments measure physical activity frequency, mode, domain, and duration. Although most instruments demonstrated adequate reliability and validity, only the ASKp and CAPE/PAC have es-

established reliability and validity for children with physical disabilities; the Uptimer has established concurrent validity. No instrument measuring intensity in free-living has been validated or found reliable for children with CP. Interpretation: The findings suggest that further studies are needed to examine the methodological properties of physical activity measurement in children with CP. Combining subjective and objective instruments is recommended to achieve better understanding of physical activity participation.

PMID: 20646029 [PubMed - as supplied by publisher]

#### **10. Dev Med Child Neurol. 2010 Jul 14. [Epub ahead of print]**

**Improving growth charts for children and adolescents with cerebral palsy through evidence-based clinical practice.**

Day SM.

Life Expectancy Project, San Francisco, CA, USA.

PMID: 20646030 [PubMed - as supplied by publisher]

#### **11. Kaohsiung J Med Sci. 2010 Jul;26(7):341-9.**

**Developmental profiles of preschool children with spastic diplegic and quadriplegic cerebral palsy.**

Lee YC, Wu CY, Liaw MY, Lin KC, Tu YW, Chen CL, Chen CY, Liu WY.

Department of Physical Medicine and Rehabilitation, Sijhih Cathay General Hospital, Taipei, Taiwan.

Cerebral palsy (CP) is a disorder of movement and posture control with multiple impairments. The clinical manifestations of CP vary among children. The aim of this study was to compare the developmental profiles of preschool children with either of two types of CP: spastic diplegic (SD) CP and spastic quadriplegic (SQ) CP. Relationships between the children's various developmental functions were also investigated. We recruited 137 children with spastic CP, aged 1-5 years (mean age = 3.7 +/- 2.1 years), and we classified them into two groups: SD (n = 59) and SQ (n = 78). The comparison group comprised 18 children with typical development. Developmental functions were assessed in all the children, using the Chinese Child Development Inventory with the updated norms. This scale addressed eight functional domains: gross motor ability, fine motor ability, expressive language ability, concept comprehension ability, situation comprehension ability, self-help ability, personal-social skills, and general development. A development quotient (DQ) was determined for each domain as a percentage of the developmental age divided by the chronological age. The developmental profiles of the CP subtypes were found to differ. Children with SQ were found to have lower DQs than those with SD ( $p < 0.01$ ). There was also a difference in the distribution of DQs between the SD and SQ groups, although the lowest DQ in both groups was for the gross motor domain. An uneven delay in the development of gross motor function was found in both groups of children with CP. Motor functions, including gross motor and fine motor functions, were significantly related to self-help ability. Complex and significant correlations among developmental functions were also identified in children with CP. The findings in the present study may allow clinicians to anticipate the developmental profile of children with CP on the basis of whether they have the SD or SQ subtype. This, in turn, is likely to facilitate individual assessment, goal setting, and the planning of interventions in children with CP. Copyright 2010 Elsevier. Published by Elsevier B.V. All rights reserved.

PMID: 20638036 [PubMed - in process]

**12. Clin Ther. 2010 Jun;32(6):1083-7.****Preference for formulations containing calcium and vitamin D(3) in childhood: a randomized-sequence, open-label trial.**

Bianchetti AA, Lava SA, Bettinelli A, Rizzi M, Simonetti GD, Bianchetti MG.

Department of Pediatrics, Bellinzona and Mendrisio Hospitals, University of Bern, Bern, Switzerland.

**BACKGROUND:** Children who experience adverse reactions to cow's milk or who have diseases predisposing them to low bone mass are often prescribed a supplementation of calcium and vitamin D(3), but adherence can be poor. Age-specific preferences for different formulations may exist and at least partially explain poor compliance. **OBJECTIVE:** The aim of this study was to compare the preference of Swiss children at risk for low bone mass for either a single-serving sachet or a suspension containing calcium and vitamin D(3). **METHODS:** Two different commercial formulations containing calcium and vitamin D(3), either as a lemon-flavored single-serving sachet or as a banana-flavored commercial suspension, were tested for preference by means of a 5-point facial hedonic scale in children aged 4 to 7 and 8 to 11 years. A concealed random allocation procedure was used. The investigator asking about preference was blinded to the sequence. **RESULTS:** A total of 40 Swiss children (13 boys and 7 girls aged 4-7 years; 11 boys and 9 girls aged 8-11 years) were assessed in this study. Low bone mass risks included adverse reactions to cow's milk (n = 25); cerebral palsy (4), juvenile idiopathic arthritis (4), cystic fibrosis (3), inflammatory bowel diseases (2), anorexia nervosa (1), and osteogenesis imperfecta (1). Two children (10%) aged 4 to 7 years were not able to express their preference. Twelve of the remaining 18 children (67%) aged 4 to 7 years preferred the suspension, 5 (28%) did not express a clear preference, and 1 (5%) preferred the sachet (P < 0.002). In children aged 8 to 11 years, 15 (75%) preferred the sachet, 4 (20%) did not express a clear preference, and 1 (5%) preferred the suspension (P < 0.001). The results were not significantly different between boys and girls or between children initially presented the suspension and those initially presented the sachet. **CONCLUSIONS:** In this small study, significantly more Swiss children aged 4 to 7 years who were prescribed a supplementation of calcium and vitamin D(3) preferred a banana-flavored suspension compared with those who preferred a lemon-flavored single-serving sachet. However, significantly more children aged 8 to 11 years prescribed the same supplementation preferred the single-serving sachet compared with the suspension.

PMID: 20637962 [PubMed - in process]

## Epidemiology / Aetiology / Diagnosis & Early Treatment

*Please note: This is not yet a comprehensive outline of cerebral palsy prevention literature. It is expected that more research will be included when the search terms are expanded to include key terms other than "cerebral palsy". It is a work-in-progress and it will be expanded in coming months.*

**13. Early Hum Dev. 2010 Jun;86(6):339-44.****Obstetric aspects of hypoxic ischemic encephalopathy.**

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Hypoxic ischemic encephalopathy (HIE) describes neonatal encephalopathy that is caused by intrapartum asphyxia and it can result in the long term sequelae of cerebral palsy which is a major cause of disability. The incidence of cerebral palsy has not changed over the last few decades and the challenge to obstetricians remains how best to recognise those babies at risk of this intrapartum insult both before and during labour. Many associations and risk factors are unavoidable or unrecognisable, and others are fairly common and associated with poor predictive value. Intrapartum fetal heart monitoring remains the main focus of attention but how this is best achieved is still the subject of research. Computerised decision support systems built into fetal heart rate monitoring and non-invasive fetal ECG signal pick-up are currently being explored. Copyright 2010 Elsevier Ireland Ltd. All rights reserved.

PMID: 20638984 [PubMed - in process]

**14. Rev Esp Anesthesiol Reanim. 2010 Jun-Jul;57(6):391-2.**

**Epidural anesthesia for cesarean section in a patient with congenital cerebral paralysis [Article in Spanish]**

Cobeta P, Mira A, Guasch E, Gilsanz F.

PMID: 20645496 [PubMed - in process]



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