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CP Research News

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1: Am J Phys Med Rehabil. 2008 Nov;87(11):929-36.

Upper limb robotic therapy for children with hemiplegia.

Fasoli SE, Fragala-Pinkham M, Hughes R, Hogan N, Krebs HI, Stein J.

Department of Physical Medicine and Rehabilitation, Spaulding Rehabilitation Hospital, Harvard Medical School, Boston, Massachusetts, USA.

OBJECTIVE: Our aim was to examine the feasibility and effects of robotic therapy for children with cerebral palsy and upper limb hemiplegia. **DESIGN:** A single group within-subjects design was used. Twelve children aged 5-12 yrs with moderate to severe motor impairments participated in 1-hr robotic therapy sessions, 2 times per week for 8 wks. During each session, children used the paretic arm to perform 640 repetitive, goal-directed planar reaching movements, with robotic assistance as needed. Primary outcomes were the Quality of Upper Extremity Skills Test (QUEST) and the Fugl-Meyer Assessment upper limb subtest. Secondary outcomes were the Modified Ashworth Scale, peak isometric strength of shoulder and elbow muscles, and parent questionnaire scores. **RESULTS:** We found significant gains in total QUEST and Fugl-Meyer Assessment scores at discharge and follow-up and in isometric strength of elbow extensors at discharge. The parent questionnaire showed significant improvements in "how much" and "how well" children used the paretic arm during daily functional tasks at home. **CONCLUSION:** Robotic therapy can provide new opportunities for improving upper limb coordination and function in children with moderate to severe impairments due to cerebral palsy or stroke.

Publication Types:
Research Support, Non-U.S. Gov't

PMID: 18936558 [PubMed - in process]

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2: *Pediatr Neurol.* 2008 Nov;39(5):361-2.****

Bilateral, hyperdense middle cerebral arteries predict bihemispheric stroke.

Kuo SH, El-Hakam LM.

Department of Neurology, Baylor College of Medicine, Houston, Texas.

The hyperdense vessel sign is a debated topic in terms of its sensitivity and specificity for acute cerebral ischemia. Bilateral, hyperdense middle cerebral artery signs are rare presentations of bilateral cerebral infarction. We describe a 17-year-old boy with a history of cerebral palsy and a repaired atrial septal defect, presenting with lethargy and respiratory failure. Noncontrast computed tomography of the brain revealed bilateral, hyperdense middle cerebral artery signs, and he subsequently demonstrated bilateral cerebral infarctions in the distributions of the middle cerebral arteries. Hyperdense artery signs must alert physicians to evaluate patients for stroke, with an especially high index of suspicion for pediatric patients with hyperdense vessels, who are less likely to present with atherosclerotic disease causing vascular calcifications; rather, hyperdense artery signs could be an early sign of large-vessel thrombosis and cerebral infarction.

PMID: 18940562 [PubMed - in process]

3: *Pediatr Neurol.* 2008 Nov;39(5):341-9.****

Treatment-induced plasticity in cerebral palsy: a diffusion tensor imaging study.

Trivedi R, Gupta RK, Shah V, Tripathi M, Rathore RK, Kumar M, Pandey CM, Narayana PA.

Magnetic Resonance Section, Department of Radiodiagnosis, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, India.

Diffusion tensor imaging is used as a measure of white-matter organization to probe mechanisms underlying clinical responses. Diffusion tensor imaging and clinical assessment in 8 patients with spastic quadriplegia (mean age, 6.13 years) was performed before and 6 months after therapy (botulinum injection, followed by physiotherapy). All patients were graded on the basis of gross motor function. Serial diffusion tensor imaging was also performed on 10 age/sex-matched controls at baseline and after 6 months. Regions of interests were placed on corticospinal tracts at different levels (i.e., corona radiata, posterior limb of internal capsule, midbrain, pons, and upper medulla) and on other major white-matter tracts, in both patients and controls. A significant increase in fractional anisotropy was evident in corticospinal tracts at the level of the posterior limb of the internal capsule and periventricular white matter of the temporal lobe, relative to baseline values in the patient group. Gross motor function classification system grades improved in all patients during follow-up relative to baseline values. The increase in fractional anisotropy in corticospinal tracts, along with improved clinical motor scores, suggests plasticity of the central motor pathway after combined therapy.

PMID: 18940558 [PubMed - in process]

4: *Pediatr Neurol.* 2008 Nov;39(5):335-40.****

The effect of frequency of cerebral palsy treatment: a matched-pair pilot study.

Gagliardi C, Maghini C, Germiniasi C, Stefanoni G, Molteni F, Burt DM, Turconi AC.

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The feasibility and effectiveness of a year-long integrated rehabilitation program for young children (less than 6 years old) with cerebral palsy was evaluated, and efficacy of different treatment schedules was

compared. A sample of 40 children (20 male; mean age, 3 years +/-1.22) took part: 20 presented with tetraparesis, 12 with diparesis, and 8 with hemiparesis. Participants' motor abilities were classified according to the Gross Motor Function Measure classification system at baseline and after 1 year of treatment. For half of the participants, treatment consisted of continuous integrated intervention twice a week; for the other half, treatment was the 3i intervention (Intermittent, Intensive, Integrated), in which a month of intensive, twice-a-day treatment was followed by a continuous, twice-a-week phase, lasting 5 months. Overall, there was an improvement in gross motor function, with 37% of children improving and no children showing lowered function. Neither baseline general cognitive abilities nor age had a significant effect on the level of improvement, although initial gross motor function did. Children undergoing the intensive intermittent intervention showed the greatest motor function improvement. Results support the effectiveness of the integrated intervention and of periods of higher frequency intervention in young children.

PMID: 18940557 [PubMed - in process]

5: *Pediatr Neurol.* 2008 Nov;39(5):330-4.****

Effect of nutritional support in children with spastic quadriplegia.

Soylu OB, Unalp A, Uran N, Dizdärer G, Ozgonul FO, Conku A, Ataman H, Ozturk AA.

Department of Pediatrics, Dr. Behcet Uz Children's Disease and Pediatric Surgery Training and Research Hospital, Alsancak, Izmir, Turkey.

Malnutrition is a common problem in patients with cerebral palsy. We evaluated the effect of nutritional support on clinical findings in children with spastic quadriplegia. Feeding history, numbers of lower respiratory tract infections, and gastrointestinal and neurologic findings were evaluated via questionnaire. Weight, height, head circumference, midarm circumference, and triceps skinfold thickness were measured. Height for age, weight for age, weight for height, body mass index, and weight and height z-scores were calculated. Clinical findings and anthropometric parameters were re-evaluated after nutritional support for 6 months. Forty-five patients were enrolled. No difference was evident between the first and the last height z-scores of 31 patients who completed the follow-up. Weight, height, weight z-scores, weight for age, weight for height, body mass index, midarm circumference, and triceps skinfold thickness exhibited improvement. Moreover, a significant decrease in number of infections was evident. Frequency of seizures and Gross Motor Function Classification System status did not change. Constipation decreased significantly. Nutritional therapy revealed improvements in some anthropometric findings and a decrease in number of infections. Although there was no difference regarding motor development or seizure frequency, further studies with a longer follow-up are required.

PMID: 18940556 [PubMed - in process]

6: *J Child Neurol.* 2008 Oct 20. [Epub ahead of print]

An Age and Gender Dependency of Metabolite Concentrations in Basal Ganglia in Children with Spastic Diplegia: Proton Magnetic Resonance Spectroscopy Study.

Kulak W, Sobaniec W, Smigielska-Kuzia J, Kubas B, Zawada B, Otapowicz D.

Department of Pediatric Rehabilitation, Medical University of Bialystok, Bialystok, Poland.

We determined metabolite profile in spastic diplegic children compared to controls in left basal ganglia of brain in using proton magnetic resonance spectroscopy in correlation with age and gender. Twenty-four patients with spastic diplegia and twenty-six healthy children were examined. The relative concentrations of N-acetylaspartate, choline, and myoinositol were measured in relation to creatine and different combinations of metabolites within 8-cm(3) brain voxel. Children with spastic diplegia showed reduced ratios of N-acetylaspartate/creatinine, N-acetylaspartate/choline, and N-acetylaspartate/myoinositol in the basal

ganglia compared to the control group. Patients and controls subjects demonstrated a significant age-dependent increase in N-acetylaspartate/creatine, N-acetylaspartate/choline in the basal ganglia. No gender-dependent difference was shown in children with cerebral palsy for all tested metabolite ratios. Gender-related differences because of increased ratio N-acetylaspartate/choline in girls in controls were detected. These results indicate that maturation of brain exists in cerebral palsy and healthy children to a higher degree in healthy children.

PMID: 18936194 [PubMed - as supplied by publisher]

7: Neonatology. 2008 Oct 17;95(3):240-247. [Epub ahead of print]

Trial of Early Neonatal Hydrocortisone: Two-Year Follow-Up.

Peltoniemi OM, Lano A, Puosi R, Yliherva A, Bonsante F, Kari MA, Hallman M.

Department of Pediatrics, University of Oulu, Oulu, Finland.

Background: Dexamethasone treatment is associated with an increased risk of cerebral palsy (CP). Early hydrocortisone (HC) treatment may decrease the incidence of bronchopulmonary dysplasia; however, the long-term effects are still under evaluation. Follow-up of randomized studies concerning early HC treatment is essential to confirm the long-term safety. **Objective:** We hypothesized that early HC treatment in very preterm infants does not impair the neurologic outcome. **Methods:** We report follow-up data from a randomized trial of early HC given for 10 days. Before the HC or placebo treatment, serum cortisol levels were measured. Receiver-operating characteristic was defined. Values below the median were classified as low endogenous cortisol and those above the median as high endogenous cortisol. A meta-analysis was performed. **Results:** Altogether 98% of the 46 surviving infants participated in a follow-up study at a corrected age of 2 years. The growth characteristics were similar between the study groups. The developmental quotients (DQs) of the children with high endogenous cortisol and placebo treatment shortly after birth (100 +/- 13) and those with low endogenous cortisol and HC (97 +/- 7) were not lower than the DQs of the children with high endogenous cortisol and HC (92 +/- 3) or low cortisol and placebo (96 +/- 2). According to a meta-analysis of three available trials (411 children), the rate of CP and survival without neurosensory or cognitive impairment was not influenced by HC. **Conclusion:** Early low-dose HC administration had no adverse effects at 2 years of age. Further studies are required to define the target group for neonatal HC. Copyright © 2008 S. Karger AG, Basel.

PMID: 18931525 [PubMed - as supplied by publisher]

8: An Pediatr (Barc). 2008 Oct;69(4):335-41.

Sleep disturbances among children and adolescents with learning disabilities. Comparative study between students from a mainstream school and a special school in the Valencia Community (Spain). [Article in Spanish]

Tomás Vila M, Beseler Soto B, Benac Prefasi M, Cardona Ferrer C, Pascual Olmos MJ, Lozano Campos I.

Unidad de Neuropediatría. Servicio de Pediatría. Hospital Francesc de Borja. Gandía. Valencia. España. tomas_mig@gva.es.

INTRODUCTION: Sleep disturbances affect daytime behaviour and cognitive functions in children. These disorders make the situation worse in children who already have learning difficulties. The objective of the present study was to study the prevalence of sleep disturbances among children from special schools and carry out a comparative study with children from mainstream schools. **PATIENTS AND METHODS:** We use the Spanish version of the Paediatric Sleep Questionnaire, which was given out in three special schools of the Valencia Community. Results were compared with a previous study in children from mainstream schools. **RESULTS:** A significantly higher proportion of children in special schools

had insomnia, 32.3 % against 10.5 % in main-stream school, and sleep breathing disorders, 26.8 % against 5.7 % in mainstream schools, and a lower proportion of parasomnias. Among the whole population with learning difficulties, children with cerebral palsy are the most affected. **CONCLUSIONS:** Our results clearly show that children with learning difficulties have a higher risk of sleep disturbances and these disturbances have repercussions on daily functioning. It is important to rule out sleep disturbances when we see children with learning difficulties.

Publication Types:
English Abstract

PMID: 18928701 [PubMed - in process]

9: Arch Phys Med Rehabil. 2008 Oct;89(10):2025-30.

The effects of a shank guide on cycling biomechanics of an adolescent with cerebral palsy: a single-case study.

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OBJECTIVE: To examine 3-dimensional lower-extremity joint kinematics and muscle activity during cycling with and without a shank guide for a single subject with spastic diplegic cerebral palsy (CP). **DESIGN:** Single case. **SETTING:** Pediatric referral hospital. **PARTICIPANT:** A 13-year-old adolescent with spastic diplegic CP and limited ambulation abilities. **INTERVENTIONS:** Not applicable. **MAIN OUT-COME MEASURES:** Kinematic data were collected for 6 joint motions and electromyographic data for 7 muscles during 10- to 15-second trials. Average variability in the kinematic curves was calculated, and kinematic and electromyographic data were analyzed descriptively. **RESULTS:** With the guide, the subject cycled at 40.1 \pm 2.0 rpm compared with 13.7 \pm 4.0 rpm without it. In addition, there was less variability in the kinematic curves ($P=.03$) and muscles tended to turn on sooner and off later. These results indicate that this subject could cycle faster with the guide, which is desirable for cardiovascular health, and that there was a possible increase in motor control due to reduced needs to control excessive joint motions. **CONCLUSIONS:** Based on these findings, a shank guide may allow some people with CP to cycle faster and provide improved joint kinematics.

Publication Types:
Research Support, N.I.H., Extramural
Research Support, Non-U.S. Gov't

PMID: 18929033 [PubMed - in process]

10: J Am Osteopath Assoc. 2008 Oct;108(10):559-70.

Effectiveness of osteopathy in the cranial field and myofascial release versus acupuncture as complementary treatment for children with spastic cerebral palsy: a pilot study.

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CONTEXT: Case reports and clinical trials have indicated that osteopathic manipulative treatment (OMT) may improve motor function and quality of life for children with cerebral palsy. **OBJECTIVE:** To assess the effectiveness of osteopathy in the cranial field, myofascial release, or both versus acupuncture in children with moderate to severe spastic cerebral palsy, as measured by several outcomes instruments

in a randomized controlled trial. **METHODS:** Children between the ages of 20 months and 12 years with moderate to severe spastic cerebral palsy were enrolled in a single-blind, randomized wait-list control pilot study. There were three arms in the study: OMT (ie, osteopathy in the cranial field, myofascial release, or both, using direct or indirect methods), acupuncture, and control (ie, nontherapeutic attention). Children who were initially randomly assigned to the control arm were subsequently randomly reassigned to the intervention arms, increasing the sample size. Outcome measures included standard instruments used in the evaluation of children with cerebral palsy. Less traditional measures were also used, including serial evaluations by an independent blind osteopathic physician and visual analog scale assessments by an independent osteopathic physician and the parents or guardians. A total of 11 outcome variables were analyzed. **RESULTS:** Fifty-five patients were included in the study. Individual analyses of the 11 outcome variables revealed statistically significant improvement in two mobility measures for patients who received OMT--the total score of Gross Motor Function Measurement and the mobility domain of Functional Independence Measure for Children ($P < .05$). No statistically significant improvements were seen among patients in the acupuncture treatment arm. **CONCLUSIONS:** A series of treatments using osteopathy in the cranial field, myofascial release, or both improved motor function in children with moderate to severe spastic cerebral palsy. These results can be used to guide future research into the effectiveness of OMT or acupuncture in treating children with spastic cerebral palsy.

Publication Types:
Research Support, N.I.H., Extramural

PMID: 18948639 [PubMed - in process]

11: J Hand Surg [Am]. 2008 Oct;33(8):1337-47.

Hand function in cerebral palsy. Report of 367 children in a population-based longitudinal health care program.

Arner M, Eliasson AC, Nicklasson S, Sommerstein K, Hägglund G.

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PURPOSE: To describe aspects of hand function in a total population of children with cerebral palsy (CP). **METHODS:** Upper extremity data were collected for 367 children who were born between 1992 and 2001 and were registered in a population-based health care program for children with CP. Hand function was classified according to the Manual Ability Classification System (MACS), the House functional classification, and the Zancolli classification. The type of spastic thumb-in-palm deformity was evaluated according to House. **RESULTS:** In the total population of children with CP aged 4 to 14 years, 60% had more than minor problems with hand function ($>MACS$ I). Independence in age-relevant, daily manual activities (MACS I-II) was noted in 87% of children with spastic unilateral CP and in 63% of children with spastic bilateral CP, but in only 20% of children with dyskinetic CP. According to the House functional classification, both hands were spontaneously and independently used in 55% of children (House 7-8), whereas 5% did not use either of their hands (House 0). Minor increase of flexor muscle tone (Zancolli level 1) was found in 69% of all children. Only 2% were in level 3 in both hands. Spastic thumb-in-palm deformity in 1 hand was found in 25% and in both hands in another 15%. **CONCLUSIONS:** Limitations in hand function are common in all types of CP, but characteristics of the disability vary considerably between different CP subtypes. The MACS classification is useful to evaluate how well children can handle objects in daily activities. The House functional classification describes grip function in each hand separately; the Zancolli classification of finger and wrist extension and the classification of thumb-in-palm deformity according to House give an estimate of dynamic spasticity. All these classifications were shown to be useful in a population-based health care program, but further studies of the psychometric properties are required.

PMID: 18929198 [PubMed - in process]

12: Pediatr Clin North Am. 2008 Oct;55(5):1209-1225.

Cerebral Palsy: Orthopedic Aspects and Rehabilitation.

Berker AN, Yalçın MS.

Department of Physical Medicine and Rehabilitation, American Hospital, Anka Med Bagdad Cad. 333/8 Erenkoy, 34728 Istanbul, Turkey.

Cerebral palsy is the most common chronic disability of childhood today. The concept of management rather than cure forms the basis of intervention. Therapy programs should be integrated with summer camps, home activities, and school, enabling the child and the family to live as close to normal as possible. Successful rehabilitation should prevent additional problems, minimize disability, and create a happy child.

PMID: 18929061 [PubMed - as supplied by publisher]

13: Pediatr Clin North Am. 2008 Oct;55(5):1189-207.

Cerebral palsy: medical aspects.

Dodge NN.

Michigan State University, Lansing, MI, USA; Neurodevelopmental Pediatrics, Helen DeVos Children's Hospital, 426 Michigan NE, Grand Rapids, MI 49503, USA.

Cerebral palsy describes a wide spectrum of motor problems caused by a nonprogressive lesion of the developing brain. It is variably associated with a variety of other developmental and medical problems that present challenges to parents and care providers alike. This article provides an overview of etiology and diagnosis, with a system-based discussion of management.

PMID: 18929060 [PubMed - in process]

14: J Paediatr Child Health. 2008 Sep;44(9):478-82.

Transition in chronic illness: Who is going where?

Steinbeck KS, Brodie L, Towns SJ.

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AIM: With increasing survival rates for chronic childhood illness, there has been an increasing focus on the transition of clinical care from paediatric to adult services. Data regarding patient numbers are essential for strategic planning and for optimal management. We report on a data collection exercise from the New South Wales Greater Metropolitan Clinical Taskforce Transition Program. METHODS: Data were collected between August 2004 and October 2005 through face-to-face interviews with over 200 clinicians in 68 clinical services in tertiary paediatric hospitals in New South Wales, providing information on approximately 4200 patients. RESULTS: Sixty-eight services kept a database on patients with chronic illness but less than half were electronic. Eight services (12%) could specifically identify patients in the active phase of transition on their databases. The five most prevalent clinical groups requiring transition to adult specialist health care (excluding cerebral palsy and developmental disability) were diabetes, other endocrinology, neurology, spina bifida and gastroenterology. CONCLUSIONS: There are large numbers of young people with chronic illness and disability who need effective transition to long-term adult care. This study has enabled the identification of paediatric aspects of the transition process that require attention.

PMID: 18928466 [PubMed - in process]

15: Augment Altern Commun. 2008 Mar;24(1):16-28.

"I have chosen to live life abundantly": perceptions of leisure by adults who use augmentative and alternative communication.

Dattilo J, Estrella G, Estrella LJ, Light J, McNaughton D, Seabury M.

Department of Recreation, Park and Tourism Management, The Pennsylvania State University, University Park, PA 16802, USA. jxd8@psu.edu

An online focus group was used to investigate perceptions of eight adults with cerebral palsy who used AAC systems about their recreation activities and leisure experiences. Six themes emerged from discussions on benefits of leisure and community recreation: improved physical health, enjoyment, improved mental health, increased independence, enhanced social connections, and education of society. Nine barriers to leisure participation were identified including: personal, social, communication, technology, financial, accessibility, safety, transportation, and personal care attendants. Despite numerous barriers to leisure, participants described six supports that helped them overcome these barriers: personal, social, family, personal care attendants, AAC devices, and other assistive technologies. Participants provided recommendations for other individuals who use AAC, their families, and service providers.

PMID: 18938755 [PubMed - in process]

16: Med J Malaysia. 2008 Mar;63(1):17-20.

Reassessment on the development of children with disability in Malaysia.

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This is a cohort study investigating the profile of children with disability registered with the primary health care clinics in Malaysia. The purpose of the study was to determine whether reassessment on the development of children with disability under rehabilitation should be done at three months interval or six months interval. Secondary data from the pilot project conducted by the Family Health Development Division, Ministry of Health Malaysia was used in this study. The study was carried out for seven months from 1st August 2004 until 28th February 2005. A total of 168 disabled children followed up for six months were selected in this study. Schedule of Growing Scale (SGS) II was the tool used for analysis. Results showed a statistically significant difference in the mean total SGS score at six months interval but not at three months interval. The result suggests that reassessment on children with Down Syndrome, Autism, Cerebral Palsy, mental retardation and delayed speech under rehabilitation should be carried out every six months while children with gross developmental delay and slow learner might need a longer interval for reassessment.

PMID: 18935725 [PubMed - in process]

17: Arq Neuropsiquiatr. 2008;66(3b):652-658.

Quality of life of children with cerebral palsy treated with botulinum toxin: are well-being measures appropriate?

Assis TR, Forlin E, Bruck I.

Neuropediatrics Center, General Hospital, Federal University of Parana, Curitiba, PR, Brazil.

AIM: To analyze quality of life (QOL) of children with cerebral palsy (CP) treated with botulinum toxin type A (BTXA). METHOD: Two QOL evaluation tools, translated into Portuguese, were used: Pediatric Outcomes Data Collection Instrument (PODCI) and Child's Caregiver Questionnaire (CCQ). Questionnaires were answered by caregivers on two occasions. Patients were divided into 3 groups: I - patients who had been previously treated with BTXA and who underwent a session of BTXA; II - patients who used BTXA for the first time; III - patients previously treated with BTXA but did not in this interval. RESULTS: Sixty-eight patients were evaluated. In group I (n=26) the functional ability had improvement for all types of CP ($p=0.04$), and tetraplegic increased interaction/communication ($p=0.02$). In group II (n=14) positioning improved ($p=0.02$). Group III (n=28) showed no change in QOL. CONCLUSIONS: PODCI and CCQ are able to capture outcome in children with CP.

PMID: 18949257 [PubMed - as supplied by publisher]

18: Zh Nevrol Psikhiatr Im S S Korsakova. 2008;108(3):80-5.

Pathogenetic therapy of spasticity [Article in Russian]

Kasatkin DS.

Publication Types:
Comparative Study

PMID: 18697257 [PubMed - indexed for MEDLINE]



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