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## Interventions and Management

**1. Res Dev Disabil. 2012 Jan;33(1):240-50. Epub 2011 Oct 11.**

**Bimanual behaviours in children aged 8-18 months: A literature review to select toys that elicit the use of two hands.**

Greaves S, Imms C, Krumlinde-Sundholm L, Dodd K, Eliasson AC.

Royal Children's Hospital, Flemington Rd., Parkville 3052, Australia; La Trobe University, Bundoora 3086, Australia.

Toys that provoke the use of both hands are required to develop a test of bimanual performance in children 8-18 months with unilateral cerebral palsy (Mini-AHA). To choose the toys, a conceptual model based on perception-action theory and object use was used to guide a literature review. Evidence was sought for three critical relationships identified in the model which help determine bimanual performance: (1) the child-toy relationship, (2) the child-task relationship, and (3) the toy-task relationship. Evidence for both typically developing children and children with unilateral CP in this age range was sought. Thirty-five papers provided information about one or more of the relationships in typically developing children. No evidence was found for children with unilateral CP. Synthesis of the evidence from these three relationships informed toy selection for this new assessment.

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**2. Pediatr Phys Ther. 2011 Winter;23(4):399-406.**

**Power Mobility and Socialization in Preschool: Follow-up Case Study of a Child With Cerebral Palsy.**

Ragonesi CB, Chen X, Agrawal S, Galloway JC.

Infant Motor Behavior Laboratory, Department of Physical Therapy (Ms Ragonesi and Dr Galloway), Biomechanics and Movement Sciences Program (Ms Ragonesi and Drs Agrawal and Galloway), and Mechanical Systems Laboratory, Department of Mechanical Engineering (Mr Chen and Dr Agrawal), University of Delaware, Newark, Delaware.

**PURPOSE:** Our previous study found it feasible for a preschooler with cerebral palsy (CP) to use a power mobility

device in his classroom but noted a lack of typical socialization. The purpose of this follow-up study was to determine the feasibility of providing mobility and socialization training for this child. METHODS: Will, a 3-year-old with CP, 1 comparison peer, 2 preschool teachers, and 2 therapists were filmed daily during a training and posttraining phase. Adult-directed training was provided in the classroom by therapists and teachers during the training phase. Mobility and socialization measures were coded from video. OUTCOMES: During training, Will demonstrated greater socialization but less mobility than the comparison peer. Posttraining, Will socialized less but was more mobile, though less mobile than the comparison peer. DISCUSSION: Short-term, adult-directed power mobility and socialization training appear feasible for the preschool classroom. Important issues regarding socialization and power mobility are discussed.

[PMID: 22090084](#) [PubMed - in process]

### **3. Clin Rehabil. 2011 Nov 11. [Epub ahead of print]**

#### **Reliability and validity of the five-repetition sit-to-stand test for children with cerebral palsy.**

Wang TH, Liao HF, Peng YC.

School and Graduate Institute of Physical Therapy, College of Medicine, National Taiwan University, Taiwan.

Objective: To investigate the psychometric properties of the five-repetition sit-to-stand test, a functional strength test, in children with spastic diplegia. Design: Methodology study. Settings: Hospital, laboratory or home. Participants: In total, 108 children with spastic diplegia and 62 with typical development aged from five to 12 years were tested. For test-retest reliability, 22 children with spastic diplegia were tested twice within one week. Interventions: Not applicable. Main measures: The five-repetition sit-to-stand test measures time needed to complete five consecutive sit-to-stand cycles as quickly as possible. The higher the rate of five-repetition sit-to-stand (repetitions per second), the more strength a person has. Results: The intraclass correlation coefficients of intra-session reliability and test-retest reliability were 0.95 and 0.99 respectively. The minimal detectable difference was 0.06 rep/sec. The convergent validity of the five-repetition sit-to-stand test was supported by significant correlation with one-repetition maximum of the loaded sit-to-stand test, isometric muscle strength, scores of Gross Motor Function Measure, and gait function ( $r$  or  $\rho = 0.40-0.78$ ). For known group validity, children with typical development and children classified as Gross Motor Function Classification System level I performed higher rates of five-repetition sit-to-stand than children classified as level II, and children classified as level II performed higher rates than level III. Conclusion: The five-repetition sit-to-stand test was a reliable and valid test to measure functional muscle strength in children with spastic diplegia in clinics.

[PMID: 22080526](#) [PubMed - as supplied by publisher]

### **4. Res Dev Disabil. 2012 Jan;33(1):181-8. Epub 2011 Oct 11.**

#### **Effectiveness of functional progressive resistance exercise training on walking ability in children with cerebral palsy: A randomized controlled trial.**

Scholtes VA, Becher JG, Janssen-Potten YJ, Dekkers H, Smallegenbroek L, Dallmeijer AJ.

Department of Rehabilitation Medicine, EMGO Institute for Health and Care Research and Research Institute MOVE, VU University Medical Center, Amsterdam, The Netherlands.

The objective of the study was to evaluate the effectiveness of functional progressive resistance exercise (PRE) training on walking ability in children with cerebral palsy (CP). Fifty-one ambulant children with spastic CP (mean age 10 years 5 months, 29 boys) were randomized to an intervention ( $n=26$ ) or control group ( $n=25$ , receiving usual care). The intervention consisted of 12 weeks functional PRE circuit training, for 3 times a week. Main outcome measures were walking ability and participation. Secondary outcomes were muscle strength and anaerobic muscle power. Possible adverse outcomes were spasticity and passive range of motion (ROM). Muscle strength increased significantly in the training group compared to the control group, but walking ability, participation and anaerobic muscle power did not change. Spasticity and ROM remained unchanged, except for a significant decrease in rectus femoris length in the intervention group. It is concluded that twelve weeks of functional PRE-training does not improve walking ability, despite improved muscle strength.

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**5. Dev Med Child Neurol. 2011 Dec;53(12):1107-12. doi: 10.1111/j.1469-8749.2011.04130.x.**

**Verification of the Robin and Graham classification system of hip disease in cerebral palsy using three-dimensional computed tomography.**

Gose S, Sakai T, Shibata T, Akiyama K, Yoshikawa H, Sugamoto K.

Department of Orthopaedic Surgery, Morinomiya Hospital, Osaka Department of Orthopaedic Surgery, Osaka University Graduate School of Medicine, Suita Department of Orthopaedic Biomaterial Science, Osaka University Graduate School of Medicine, Suita, Japan.

**Aim:** We evaluated the validity of the Robin and Graham classification system of hip disease in cerebral palsy (CP) using three-dimensional computed tomography in young people with CP. **Method:** A total of 91 hips in 91 consecutive children with bilateral spastic CP (57 males, 34 females; nine classified at Gross Motor Function Classification System level II, 42 at level III, 32 at level IV, and eight at level V; mean age 5y 2mo, SD 11mo; range 2-6y) were investigated retrospectively using anteroposterior plain radiographs and three-dimensional computed tomography (3D-CT) of the hip. The migration percentage was calculated on plain radiographs and all participants were classified into four groups according to migration percentage: grade II, migration percentage  $\geq 10\%$  but  $\leq 15\%$ , (four hips), grade III, migration percentage  $> 15\%$  but  $\leq 30\%$ , (20 hips); grade IV, migration percentage  $> 30\%$  but  $< 100\%$ , (63 hips); and grade V, migration percentage  $\geq 100\%$ , (four hips). The lateral opening angle and the sagittal inclination angle of the acetabulum, the neck-shaft angle, and the femoral anteversion of the femur were measured on 3D-CT. **Results:** The three-dimensional quantitative evaluation indicated that there were significant differences in the lateral opening angle and the neck-shaft angle between the four groups (Kruskal-Wallis test,  $p \leq 0.001$ ). **Interpretation:** This three-dimensional evaluation supports the validation of the Robin and Graham classification system for hip disease in 2- to 7-year-olds with CP.

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**6. Dev Med Child Neurol. 2011 Dec;53(12):1072-3. doi: 10.1111/j.1469-8749.2011.04140.x. Epub 2011 Nov 10.**

**2D versus 3D imaging of hip displacement in children with cerebral palsy.**

Rutz E, Willoughby K, Cain T.

Department of Orthopaedics, University Children's Hospital, Basle, Switzerland. Cerebral Palsy and Hip Surveillance, The Royal Children's Hospital, Parkville, Victoria, Australia. Director of Medical Imaging, The Royal Children's Hospital, Parkville, Victoria, Australia.

[PMID: 22074609](#) [PubMed - in process]

**7. Iowa Orthop J. 2011;31:69-72.**

**Hinged cast brace for persistent flexion contracture following total knee replacement.**

Karam MD, Pugely A, Callaghan JJ, Shurr D.

The reported incidence of persistent knee flexion contracture following total knee arthroplasty (TKA) has varied from 1-15 percent. Various treatment modalities have been described in attempts to manage this often difficult problem. This paper describes a novel method of treatment by using a hinged cast brace (previously reported for treatment of femur fractures and knee contractures secondary to hemophilia and cerebral palsy) for use in patients

with symptomatic knee flexion contractures. Application of this cast brace with frequent adjustment (every three to four days, initially) toward full extension can often improve knee extension, after physical therapy and other modalities such as extension-assist braces have failed. Care must be taken in the application and use of this device which utilizes frequent manipulations to reduce and maintain the knee flexion angle. We report two clinical cases in which this protocol was effectively used in decreasing symptomatic knee flexion contractures.

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## **8. *Pediatr Phys Ther.* 2011 Winter;23(4):354-63.**

### **Walking stride rate patterns in children and youth.**

Bjornson KF, Song K, Zhou C, Coleman K, Myaing M, Robinson SL.

Seattle Children's Research Institute, Seattle, Washington (Drs Bjornson, Zhou, and Myaing); Orthopedic Surgery, Seattle Children's Hospital, Seattle, Washington (Dr Song and Robinson); OrthoCare Innovations (Ms Coleman), Mountlake Terrace, Washington.

**PURPOSE:** To describe walking activity patterns in youth who are typically developing (TD) using a novel analysis of stride data and compare to youth with cerebral palsy (CP) and arthrogyrosis (AR). **METHOD:** Stride rate curves were developed from 5 days of StepWatch data for 428 youth ages 2 to 16 years who were TD. **RESULTS:** Patterns of stride rates changed with age in the TD group ( $P = .03$  to  $< .001$ ). Inactivity varied with age ( $P < .001$ ); peak stride rate decreased with age ( $P < .001$ ). Curves were stable over a 2-week time frame ( $P = .38$  to  $.95$ ). Youth with CP and AR have lower stride rate patterns ( $P = .04$  to  $.001$ ). **CONCLUSION:** This is the first documentation of pediatric stride-rate patterns within the context of daily life. Including peak stride rates and levels of walking activity, this single visual format has potential clinical and research applications.

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## **9. *Res Dev Disabil.* 2012 Jan;33(1):129-35. Epub 2011 Oct 4.**

### **Stability and harmony of gait in children with cerebral palsy.**

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The aim of this study was to quantitatively assess the stability and harmony of gait in children with cerebral palsy. Seventeen children with spastic hemiplegia due to cerebral palsy ( $5.0 \pm 2.3$  years old) who were able to walk autonomously and seventeen age-matched children with typical development ( $5.7 \pm 2.5$  years old,  $p = 0.391$ ) performed a 10-m walking test with a wearable device fixed to their lower trunk and included a triaxial accelerometer and three gyroscopes. Three parameters related to gait stability and three related to gait harmony were computed; all of these yielded significant differences between children with cerebral palsy and those with typical development ( $p < 0.020$  for all the computed parameters). In the latter group of children, trunk accelerations were found to be negatively correlated with age (partial correlation controlled for walking speed:  $R(p) < -0.58$ ,  $p > 0.020$ ). Conversely, in children with cerebral palsy, the upper body accelerations were proportionally correlated with their gait speed ( $R = 0.548$ ,  $p = 0.023$  in the antero-posterior direction) but not with their age ( $p > 0.05$ ). This finding can be related both to difficulties in managing the higher upper body accelerations involved in rapid walking and to compensation strategies.

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**10. Prog Brain Res. 2011;192:181-97.****Involvement of the corticospinal tract in the control of human gait.**

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Given the inherent mechanical complexity of human bipedal locomotion, and that complete spinal cord lesions in human leads to paralysis with no recovery of gait, it is often suggested that the corticospinal tract (CST) has a more predominant role in the control of walking in humans than in other animals. However, what do we actually know about the contribution of the CST to the control of gait? This chapter will provide an overview of this topic based on the premise that a better understanding of the role of the CST in gait will be essential for the design of evidence-based approaches to rehabilitation therapy, which will enhance gait ability and recovery in patients with lesions to the central nervous system (CNS). We review evidence for the involvement of the primary motor cortex and the CST during normal and perturbed walking and during gait adaptation. We will also discuss knowledge on the CST that has been gained from studies involving CNS lesions, with a particular focus on recent data acquired in people with spinal cord injury.

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**11. Pediatr Phys Ther. 2011 Winter;23(4):391-398.****Continued Ambulation Gains Through High School in a Student With Cerebral Palsy: A Case Report.**

McCoy JO.

Department of Physical Therapy, College of Applied Health Sciences, University of Illinois at Chicago, Chicago, Illinois.

**PURPOSE:** The purpose of this case report is to describe school-based physical therapy services received throughout high school by a student with diplegic cerebral palsy and to share her functional gains. **KEY POINTS:** This previously discharged 15-year-old freshman was re-referred due to a perceived walking regression using long-leg braces/reverse rolling walker and her desire to again try crutches. She subsequently resumed walking, typically 4 days per week at school and progressed to axillary crutches on level surfaces and stairs. Gross Motor Function Measure scores increased from 66.4% freshman year to 78.8% senior year, with the greatest dimension changes in standing (35.9%-69.2%) and walking, running, and jumping (8.3%-25.0%). **CONCLUSION:** School-based physical therapists are uniquely positioned to work with students in natural environments to optimize activity and participation. This report shows that continued ambulation gains in individuals with cerebral palsy are possible throughout adolescence.

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**12. Res Dev Disabil. 2012 Jan;33(1):258-64. Epub 2011 Oct 11.****The effects of diagnostic group and gender on challenging behaviors in infants and toddlers with cerebral palsy, Down syndrome or seizures.**

Hattier MA, Matson JL, Belva B, Kozlowski A.

Louisiana State University, USA.

Challenging behaviors are frequently studied in individuals with various developmental disabilities, although specific conditions are rarely compared to one another. Such data would be informative to clinicians who assess and develop treatment plans for children with these disabilities. For that reason, the current study's aim was to analyze

problem behavior deficits in infants and toddlers diagnosed with cerebral palsy (CP), Down syndrome (DS), and a history of seizures/seizure disorder. Seventy six children participated in this study and were administered the Baby and Infant Screen for Children with aUtism Traits-Part 2 (BISCUIT-Part 2). Inspection of the Tantrum/Conduct Behavior subscale of this measure revealed that children with a history of seizures/seizure disorder exhibited significantly higher scores, indicating greater impairment, than those with CP or DS. Children with DS and those diagnosed with CP did not significantly differ from one another. Additionally, there was no significant main effect by gender. The CP and DS groups also had fewer endorsements on all 18 items of the subscale as compared to the seizures group. Implications of these results are discussed.

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### **13. Res Dev Disabil. 2012 Jan;33(1):45-53. Epub 2011 Oct 4.**

#### **Gaze behaviour during interception in children with Spastic Unilateral Cerebral Palsy.**

van Kampen PM, Ledebt A, Smorenburg AR, Vermeulen RJ, Kelder ME, van der Kamp J, Savelsbergh GJ.

Institute for Biomedical Research into Human Movement and Health, Manchester Metropolitan University, John Dalton Tower, Chester Street, Manchester M1 5 GD, UK.

Anticipatory gaze behaviour during interceptive movements was investigated in children with Spastic Unilateral Cerebral Palsy (SUCP), and related to the side of the intracerebral lesion. Five children with lesions of the right hemisphere (RHL) and five children with lesions of the left hemisphere (LHL) had to walk towards and intercept a ball that moved perpendicular to the walking path. Interception accuracy and gaze patterns were measured in a no-occlusion and occlusion condition, in which the ball was occluded from view for half of its trajectory. There was a clear support for a relationship between gaze behaviour and success in interception performance, with some evidence for the presence of anticipatory gaze behaviour. There were also differences in gaze behaviour between children with RHL and children with LHL that might be related to planning, but these did not affect interception accuracy. It is concluded that gaze behaviour during interceptive movements is anticipatory, and at least partly dependent on the lesional side.

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### **14. J Oral Pathol Med. 2011 Nov 14. doi: 10.1111/j.1600-0714.2011.01112.x. [Epub ahead of print]**

#### **Dental erosion and salivary flow rate in cerebral palsy individuals with gastroesophageal reflux.**

Guaré RO, Ferreira MC, Leite MF, Rodrigues JA, Lussi A, Santos MT.

Cruzeiro do Sul University - UNICSUL, São Paulo, Brazil Paulista University - UNIP, São Paulo, Brazil Federal University of Rio Grande do Sul, Porto Alegre, Brazil Department of Preventive, Restorative and Pediatric Dentistry, University of Bern, Bern, Switzerland.

Background: A high prevalence of gastroesophageal reflux (GERD) has been observed in individuals with cerebral palsy (CP). One of the main risks for dental erosion is GERD. This study aimed to evaluate the presence of GERD, variables related to dental erosion and associated with GERD (diet consumption, gastrointestinal symptoms, bruxism), and salivary flow rate, in a group of 46 non-institutionalized CP individuals aged from 3 to 13 years. Methods: Twenty CP individuals with gastroesophageal reflux (GERDG) and 26 without gastroesophageal reflux (CG) were examined according to dental erosion criteria, drinking habits, presence of bruxism, and salivary flow rate. A face-to-face detailed questionnaire with the consumption and frequency of acid drinks, gastrointestinal symptoms (regurgitation and heart burn), and the presence of bruxism were answered by the caregivers of both groups. Unstimulated whole saliva was collected under slight suction, and salivary flow rate (ml/min) was calculated. Results: The GERDG presented higher percentages of younger quadriplegic individuals compared to CG. The presence of regurgitation, heart burn, and tooth erosion (Grade 1) was significantly more prevalent in

GERDG. It was observed difference in the salivary flow rate between the studied groups. On logistic multivariate regression analysis, the unique variable independently associated with the presence of GERD was dental erosion ( $P = 0.012$ , OR 86.64). Conclusion: The presence of GERD contributes significantly to dental erosion in the most compromised individuals with quadriplegics cerebral palsy individuals, increasing the risk of oral disease in this population.

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**15. Child Care Health Dev. 2011 Nov 15. doi: 10.1111/j.1365-2214.2011.01327.x. [Epub ahead of print]**

**Feeding difficulties in children with cerebral palsy: low-cost caregiver training in Dhaka, Bangladesh.**

Adams MS, Khan NZ, Begum SA, Wirz SL, Hesketh T, Pring TR.

Centre for International Health and Development, UCL Institute of Child Health City University London, London, UK, and Child Development and Neurology Unit, Dhaka Shishu (Children's) Hospital, Dhaka, Bangladesh.

Background: The majority of children with cerebral palsy have feeding difficulties, which, if not managed, result in stressful mealtimes, chronic malnutrition, respiratory disease, reduced quality of life for caregiver and child, and early death. In well-resourced countries, high- and low-cost medical interventions, ranging from gastrostomy tube feeding to caregiver training, are available. In resource-poor countries such as Bangladesh, the former is not viable and the latter is both scarce and its effectiveness not properly evaluated. The aim of this study was to evaluate the effectiveness of a low-cost, low-technology intervention to improve the feeding practices of carers of children with moderate-severe cerebral palsy and feeding difficulties in Bangladesh. Methods: An opportunistic sample of 37 caregivers and their children aged 1-11 years were invited to a six-session training programme following an initial feeding assessment with brief advice. During home visits, pre- and post-measures of nutritional status, chest health and feeding-related stress were taken and feeding practices were observed. A control phase was evaluated for 20 of the participant pairs following initial assessment with advice, while awaiting full training. Results: A minimum of four training sessions showed significant improvements in the children's respiratory health ( $P = 0.005$ ), cooperation during mealtimes ( $P = 0.003$ ) and overall mood ( $P < 0.001$ ). Improvements in growth were inconsistent. Dramatic reductions were observed in caregiver stress ( $P < 0.001$ ). A significant difference in the outcomes following advice only compared with advice plus training was also observed. Conclusions In situations of poverty, compliance is restricted by lack of education, finances and time. Nonetheless, carers with minimal formal education, living in conditions of extreme poverty were able to change feeding practices after a short, low-cost training intervention, with highly positive consequences. The availability of affordable food supplementation for this population, however, requires urgent attention.

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**16. Adapt Phys Activ Q. 2011 Jul;28(3):189-209.**

**Evidence-based practice and research: a challenge to the development of adapted physical activity.**

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Evidence-based practice (EBP) is a growing movement in the health and educational disciplines that recommends emphasis on research outcomes during decision making in practice. EBP is made possible through evidence based research (EBR), which attempts to synthesize the volume and scientific rigor of intervention effectiveness. With the purpose of assessing the impact of this movement on adapted physical activity, this article (a) describes EBP/EBR and outlines its methodological development, (b) provides an historical perspective of EBP/EBR in APA, (c) examines EBR quality indicators in the review literature published in Adapted Physical Activity Quarterly, (d)

identifies and synthesizes thematic domains appearing in these review articles, and (e) discusses practical examples of professional issues in APA arising from a lack of EBR.

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## Prevention and Cure

### 17. Brain Dev. 2011 Nov 12. [Epub ahead of print]

#### **Early predictors of short term neurodevelopmental outcome in asphyxiated cooled infants. A combined brain amplitude integrated electroencephalography and near infrared spectroscopy study.**

Ancora G, Maranella E, Grandi S, Sbravati F, Coccolini E, Savini S, Faldella G.

Neonatology Unit, Department of Woman, Child and Adolescent Health, Sant'Orsola Hospital, University of Bologna, Bologna, Italy.

**Background:** Brain Cooling (BC) represents the elective treatment in asphyxiated newborns. Amplitude Integrated Electroencephalography (aEEG) and Near Infrared Spectroscopy (NIRS) monitoring may help to evaluate changes in cerebral electrical activity and cerebral hemodynamics during hypothermia. **Objectives:** To evaluate the prognostic value of aEEG time course and NIRS data in asphyxiated cooled infants. **Methods:** Twelve term neonates admitted to our NICU with moderate-severe Hypoxic-Ischemic Encephalopathy (HIE) underwent selective BC. aEEG and NIRS monitoring were started as soon as possible and maintained during the whole hypothermic treatment. Follow-up was scheduled at regular intervals; adverse outcome was defined as death, cerebral palsy (CP) or global quotient <88.7 at Griffiths' Scale. **Results:** 2/12 Infants died, 2 developed CP, 1 was normal at 6months of age and then lost at follow-up and 7 showed a normal outcome at least at 1year of age. The aEEG background pattern at 24h of life was abnormal in 10 newborns; only 4 of them developed an adverse outcome, whereas the 2 infants with a normal aEEG developed normally. In infants with adverse outcome NIRS showed a higher Tissue Oxygenation Index (TOI) than those with normal outcome (80.0±10.5% vs 66.9±7.0%, p=0.057; 79.7±9.4% vs 67.1±7.9%, p=0.034; 80.2±8.8% vs 71.6±5.9%, p=0.069 at 6, 12 and 24h of life, respectively). **Conclusions:** The aEEG background pattern at 24h of life loses its positive predictive value after BC implementation; TOI could be useful to predict early on infants that may benefit from other innovative therapies.

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### 18. Early Hum Dev. 2011 Nov 14. [Epub ahead of print]

#### **Neonatal factors associated with alteration of palatal morphology in very preterm children The EPIPAGE cohort study.**

Germa A, Marret S, Thiriez G, Rousseau S, Hascoët JM, Paulsson-Björnsson L, Söderfeldt B, Ancel PY, Larroque B, Kaminski M, Nabet C.

Institut National de la Santé et de la Recherche Médicale Unit 953, Epidemiological Research Unit in Perinatal Health, Children and Women's Health, Villejuif, France; Paris Descartes University, France.

**BACKGROUND:** Altered palatal morphology has been observed among some preterm children, with possible consequences on chewing, speaking and esthetics, but determinants remain unknown. **AIM:** To explore the role of neonatal characteristics and neuromotor dysfunction in alteration of palatal morphology at 5 years of age in very preterm children. **STUDY DESIGN:** Prospective population-based cohort study. **SUBJECTS:** 1711 children born between 22 and 32 weeks of gestation in 1997 or born between 22 and 26 weeks of gestation in 1998 were included in the study. They all had a medical examination at 5 years of age. **OUTCOME MEASURES:** Alteration of

palatal morphology. RESULTS: The prevalence of altered palatal morphology was 3.7% in the overall sample, 5.1% among boys and 2.2% among girls (adj OR: 2.52; 95%CI: 1.44-4.42). The risk for altered palatal morphology was higher for lower gestational age (adj OR: 0.85; 95%CI: 0.74-0.97 per week), small-for-gestational age children (adj OR: 2.11; 95%CI: 1.20-3.72) or children intubated for more than 28 days (adj OR: 3.16; 95%CI: 1.11-8.98). Altered palatal morphology was more common in case of cerebral palsy or moderate neuromotor dysfunction assessed at 5 years. Results were basically the same when neuromotor dysfunction was taken into account, except for intubation. CONCLUSION: Male sex, low gestational age, small-for-gestational age and long intubation have been identified as probable neonatal risk factors for alteration of palatal morphology at 5 years of age in very preterm children. Further studies are needed to confirm these results.

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## 19. Epidemiology. 2011 Nov 10. [Epub ahead of print]

### Children With Cerebral Palsy: Racial Disparities in Functional Limitations.

Maenner MJ, Benedict RE, Arneson CL, Yeargin-Allsopp M, Wingate MS, Kirby RS, Van Naarden Braun K, Durkin MS.

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BACKGROUND: Previous studies of the frequency of cerebral palsy in the United States have found excess prevalence in black children relative to other groups. Whether the severity of cerebral palsy differs between black and white children has not previously been investigated. METHODS: A population-based surveillance system in 4 regions of the United States identified 476 children with cerebral palsy among 142,338 8-year-old children in 2006. Motor function was rated by the Gross Motor Function Classification System and grouped into 3 categories of severity. We used multiple imputation to account for missing information on motor function and calculated the race-specific prevalence of each cerebral palsy severity level. RESULTS: The prevalence of cerebral palsy was 3.7 per 1000 black children and 3.2 per 1000 white children (prevalence odds ratio [OR] = 1.2 [95% confidence interval = 1.0-1.4]). When stratified by severity of functional limitation, the racial disparity was present only for severe cerebral palsy (black vs. white prevalence OR = 1.7 [1.1-2.4]). The excess prevalence of severe cerebral palsy in black children was evident in term and very preterm birth strata. CONCLUSION: Black children in the United States appear to have a higher prevalence of cerebral palsy overall than white children, although the excess prevalence of cerebral palsy in black children is seen only among those with the most severe limitations. Further research is needed to explore reasons for this disparity in functional limitations; potential mechanisms include racial differences in risk factors, access to interventions, and under-identification of mild cerebral palsy in black children.

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## 20. Eur J Paediatr Neurol. 2011 Nov 10. [Epub ahead of print]

### Epilepsy and cerebral palsy: Characteristics and trends in children born in 1976-1998.

Sellier E, Uldall P, Calado E, Sigurdardottir S, Torrioli MG, Platt MJ, Cans C.

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BACKGROUND: Although epilepsy is common in children with cerebral palsy (CP), no data exists on prevalence

rates of CP and epilepsy. AIMS: To describe epilepsy in children with CP, and to examine the association between epilepsy and neonatal characteristics, associated impairments and CP subtypes. METHODS: Data on 9654 children with CP born between 1976 and 1998 and registered in 17 European registers belonging to the SCPE network (Surveillance of Cerebral Palsy in Europe) were analyzed. RESULTS: A total of 3424 (35%) children had a history of epilepsy. Among them, seventy-two percent were on medication at time of registration. Epilepsy was more frequent in children with a dyskinetic or bilateral spastic type and with other associated impairments. The prevalence of CP with epilepsy was 0.69 (99% CI, 0.66-0.72) per 1000 live births and followed a quadratic trend with an increase from 1976 to 1983 and a decrease afterwards. Neonatal characteristics independently associated with epilepsy were the presence of a brain malformation or a syndrome, a term or moderately preterm birth compared with a very premature birth, and signs of perinatal distress including neonatal seizures, neonatal ventilation and admission to a neonatal care unit. CONCLUSIONS: The prevalence of CP with epilepsy followed a quadratic trend in 1976-1998 and mirrored that of the prevalence of CP during this period. The observed relationship between epilepsy and associated impairments was expected; however it requires longitudinal studies to be better understood.

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[PMID: 22079130](#) [PubMed - as supplied by publisher]

## 21. J Pediatr. 2011 Dec;159(6):A2.

### Can cytokines predict which ELBW infants are at risk for cerebral palsy?

Clyman RI.

[PMID: 22075395](#) [PubMed - in process]

## 22. J Perinatol. 2011 Nov 17. doi: 10.1038/jp.2011.168. [Epub ahead of print]

### Randomized controlled trial of magnesium sulfate in women at risk of preterm delivery: neonatal cardiovascular effects.

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Objective: Use of antenatal magnesium sulfate (MgSO<sub>4</sub>) may reduce cerebral palsy in infants born very preterm. Low systemic blood flow in the first day in very preterm infants has been associated with cerebral injury and adverse motor outcome. The aim was to determine the effect of MgSO<sub>4</sub> on systemic blood flow in preterm infants. Study Design: Randomized trial of MgSO<sub>4</sub> versus saline placebo given to mothers at risk of delivery before 30 weeks gestation. Echocardiographic monitoring performed at 3 to 5, 10 to 12 and 24 h. Result: A total of 48 infants were exposed to MgSO<sub>4</sub> and 39 to placebo. Infants exposed to MgSO<sub>4</sub> were significantly more likely to receive volume expansion (42% versus 21%). Inotrope use did not differ significantly (40% versus 26%). There was no significant difference in mean lowest superior vena cava (SVC) flow or right ventricular output (RVO), or incidence of low SVC flow or RVO in the first 24 h. Infants exposed to MgSO<sub>4</sub> had a significantly higher heart rate and were more likely to have low SVC flow at 10 to 12 h but not other times. Conclusion: Antenatal MgSO<sub>4</sub> produced no consistent cardiovascular effects in the infant in the first 24 h. There is no evidence from this study to suggest the mechanism by which antenatal MgSO<sub>4</sub> prevents cerebral palsy is through a cardiovascular effect in the newborn.

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**23. Neonatology. 2011 Nov 10;101(3):210-216. [Epub ahead of print]****Cognitive and Neurological Outcome at the Age of 5-8 Years of Preterm Infants with Post-Hemorrhagic Ventricular Dilatation Requiring Neurosurgical Intervention.**

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Background: Preterm infants with progressive post-hemorrhagic ventricular dilatation (PHVD) in the absence of associated parenchymal lesions may have a normal neurodevelopmental outcome. Objectives: To evaluate neurodevelopmental and cognitive outcomes among preterm infants with severe intraventricular hemorrhage (IVH) and PHVD requiring neurosurgical intervention. Methods: 32 preterm infants were admitted to a neonatal intensive care unit with PHVD requiring neurosurgical intervention, and were seen in the follow-up clinic for standardized cognitive, behavioral and neurological assessments between 5 and 8 years of age. Only preterm infants with a gestational age (GA) of <30 weeks, as well as preterm and full-term infants with PHVD and full-term infants with perinatal asphyxia are seen in our follow-up clinic at this age. There were 23 infants with a GA of <30 weeks in this study population. For these 23, matched controls were available and compared with the IVH group. Results: The majority (59.4%) had no impairments. None of the children with grade III and 8 of the 15 children (53%) with grade IV hemorrhage developed cerebral palsy. More subtle motor problems assessed with the Movement-ABC score were seen in 39% (n = 9); the mean IQ of all children was 93.4, and 29% of the children had an IQ of <85 (-1 SD). Timing of intervention did not have a beneficial effect on outcome. With respect to cognition, no significant differences were found between the IVH and the control group. Conclusion: The majority of the children in our population had no impairments. Cerebral palsy was not seen in any of the infants with a grade III hemorrhage.

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