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## Interventions and Management

### 1. Disabil Rehabil. 2012 Jan 12. [Epub ahead of print]

#### Indicators of distress in families of children with cerebral palsy.

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

Departments of Neurology and Neurosurgery and Pediatrics.

**Purpose:** To describe family distress as reported by parents of children with cerebral palsy (CP) and to identify factors associated with distress. **Method:** In this descriptive, historical cohort study, parents of school-age children ( $9.2 \pm 2.1$  years) with CP completed the Parenting Stress Index, the Impact on Family Scale and family-related items on the Child Health Questionnaire. Predictor variables considered were sociodemographic factors, motor, cognitive and behavioral difficulties and functional limitations. These were assessed using the Gross Motor Function Measure, Leiter IQ, Strengths and Difficulties Questionnaire and Vineland Adaptive Behavior Scale. **Results:** Parents of 95 children were recruited, of whom 45% were highly stressed and 11% defensive. Half indicated that their child's health impacted on their time, emotional status and family activities. Family distress measures were modestly associated with motor ( $r = 0.30-0.48$ ) and cognitive abilities ( $r = 0.29-0.37$ ) but more strongly correlated with particular behavioral difficulties ( $r = -0.42$  to  $0.55$ ). Activity limitations across domains were highly associated with measures of distress. **Conclusions:** Parents of school-aged children with CP are likely to experience high stress, increased time constraints and financial and psychological burden. Findings illustrate the need to monitor family functioning intermittently as the child develops and direct appropriate resources to optimize child and family well-being. [Box: see text].

[PMID: 22235883](https://pubmed.ncbi.nlm.nih.gov/22235883/) [PubMed - as supplied by publisher]

### 2. Dev Med Child Neurol. 2012 Feb;54(2):170-5. doi: 10.1111/j.1469-8749.2011.04166.x.

#### Nutritional rehabilitation increases the resting energy expenditure of malnourished children with severe cerebral palsy.

Arrowsmith FE, Allen JR, Gaskin KJ, Somerville H, Birdsall J, Barzi F, O'Loughlin EV.

University of Sydney at the Children's Hospital at Westmead, Westmead, New South Wales. James Fairfax Institute of Paediatric Nutrition at the Children's Hospital at Westmead, Westmead, New South Wales. Department of Gastroenterology, the Children's Hospital at Westmead, Westmead, New South Wales. University of Sydney,

Sydney, New South Wales. Kids Research Institute, the Children's Hospital at Westmead, Westmead, New South Wales, Australia.

**Aim:** The aim of this study was to measure resting energy expenditure (REE) and energy intake in children with quadriplegic cerebral palsy (CP), to relate these to anthropometric measurements, and to determine the influence of nutritional rehabilitation on REE. **Methods:** Fifty-six children (20 females, 36 males; age range 3y 11mo-18y; mean age 10y; SD 3y 11mo) with CP (Gross Motor Function Classification System level V) participated in this cross-sectional study. Children were excluded if they had a known metabolic disorder, genetic syndrome, or chromosomal abnormality. Thirty-three of the children were tube fed and 23 were fed orally. A comparison group comprised 111 (42 females, 69 males) healthy children who had undergone anthropometric and REE measurements and were of similar age to the children with CP (4-19y). REE was measured by indirect calorimetry and energy intake was determined from weighed food records. **Results:** The REE in the children with CP was low (79.5%) compared with that predicted and highly variable (SD 38.4%). Fat-free mass was the strongest predictor of REE, accounting for 27% of the variation. Energy intake as a percentage of REE in was greatly overestimated in oral-fed children with CP (293%). In a subset of children with CP (n=14), an increased energy intake by gastrostomy tube feeding resulted in an increase in REE from 70.0% to 101.9% of that predicted. **Interpretation:** The REE of children with CP is low and variable and is not strongly related to any one anthropometric measurement. Food records in oral-fed children with CP are of little value owing to their inaccuracy. This study provided support for the hypothesis that the low REE found in malnourished children with CP is partly due to a low energy intake.

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### 3. Agri. 2011 Jul;23(3):107-13. doi: 10.5505/agri.2011.93695.

#### **The effect of pain on activity independence and health -related quality of life in cerebral palsied individuals [Article in Turkish]**

Tarsuslu Şimşek T, Livanelioğlu A.

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**OBJECTIVES:** The aim of this study was to determine the effect of pain on activity independence and health-related quality of life (HRQoL) in cerebral palsied (CP) individuals. **METHODS:** Individuals with CP aged 15 and above 50 with an average age of  $22.18 \pm 7.77$  years were included in the study. After obtaining demographic information of the individuals who joined the study, Visual Analogue Scale (VAS), Functional Independence Measurement (FIM) and Nottingham Health Profile (NHP) were used for the evaluation of pain, daily living activity and HRQoL, respectively. Changes in pain with time and the limiting magnitude of pain in ambulation and daily activities were also questioned. **RESULTS:** Pain prevalence was found as 36%. Pain localization was determined in the lower back, hip, shoulder, and lower extremity. Average pain magnitude was determined as: current ( $4 \pm 2.02$ ), minimal ( $2.88 \pm 1.77$ ), moderate ( $4.77 \pm 1.55$ ), or intense ( $6.88 \pm 2.02$ ) pain. Individuals stated that the pain limited their ambulation ( $6.55 \pm 3.27$ ) and daily activities ( $5.22 \pm 2.55$ ) moderately. A significant difference was found among the energy level of the NHP and total NHP in individuals with pain versus those having no pain ( $p < 0.05$ ); there was no significant difference between the sub-parameters of FIM and total FIM ( $p > 0.05$ ). **CONCLUSION:** Pain was found to affect daily activities and ambulation ranging in degree from mild to severe, leading to an effect on HRQoL of the individuals with CP. We suggest that approaches oriented to the determination and treatment of pain in CP individuals will increase activity participation and HRQoL.

[PMID: 21935816](#) [PubMed - indexed for MEDLINE]

**4. J Speech Lang Hear Res. 2012 Jan 9. [Epub ahead of print]****Intelligibility of 4 year old children with and without cerebral palsy.**

Hustad KC, Schueler B, Schultz L, Duhadway C.

Department of Communicative Disorders, University of Wisconsin - Madison.

**PURPOSE:** We examined speech intelligibility in typically developing (TD) children and three groups of children with cerebral palsy (CP) who were classified into speech / language profile groups following Hustad et al. (2010). Questions addressed differences in transcription intelligibility scores among groups, the effects of utterance length on intelligibility, the relationship between ordinal ratings of intelligibility and orthographic transcription intelligibility scores, and the difference between parent and naïve listener ordinal ratings.

**METHOD:** Speech samples varying in length from 1-7 words were elicited from 23 children with CP (mean age 54.3 months) and 20 typically developing children (mean age 55.1 months). 215 naïve listeners made orthographic transcriptions and ordinal ratings of intelligibility. Parent ordinal ratings of intelligibility were obtained from a previous study (Hustad et al., 2010). **RESULTS:**

Intelligibility varied with speech / language profile group and utterance length, with different patterns observed by profile group. Ratings of intelligibility by parents and naïve listeners did not differ and were both highly correlated with transcription intelligibility scores.

**CONCLUSIONS:** Intelligibility was reduced for all groups of children with CP relative to TD children, suggesting the importance of speech-language intervention and the need for research investigating variables associated with changes in intelligibility in children.

[PMID: 22232403](#) [PubMed - as supplied by publisher]

**5. J Speech Lang Hear Res. 2012 Jan 9. [Epub ahead of print]****Intensive Voice Treatment (LSVT LOUD) for Children with Spastic Cerebral Palsy and Dysarthria.**

Fox CM, Boliek CA.

National Center for Voice and Speech, Denver, CO.

**PURPOSE:** The purpose of this study was to examine the effects of an intensive voice treatment (LSVT LOUD) for children with spastic cerebral palsy (CP) and dysarthria. **METHOD:** A non-concurrent multiple baseline single-subject design with replication across five children with spastic CP was used. Auditory-perceptual analysis of speech, acoustic measures of vocal functioning, and perceptual ratings by parents of participants were obtained from baseline, post-treatment, and 6-week follow-up recording sessions. **RESULTS:** Listeners consistently preferred the speech samples taken immediately post-treatment over those taken during the baseline phase for most perceptual characteristics rated in this study. Changes in acoustic measures of vocal functioning were not consistent across participants and occurred more frequently for maximum performance tasks as opposed to speech. Although parents of the treated participants reported an improved perception of vocal loudness immediately following treatment, maintenance of changes at 6-week follow-up varied across the participants. No changes were observed in the 5(th) participant who did not receive treatment. **CONCLUSIONS:** These findings provide some preliminary observations that the children with spastic CP in this study not only tolerated intensive voice treatment but also showed improvement on select aspects of vocal functioning. These outcomes warrant further research through Phase 2 treatment studies.

[PMID: 22232407](#) [PubMed - as supplied by publisher]

**6. J Child Neurol. 2012 Jan 12. [Epub ahead of print]****Efficacy of Constraint-Induced Therapy on Functional Performance and Health-Related Quality of Life for Children With Cerebral Palsy: A Randomized Controlled Trial.**

Hsin YJ, Chen FC, Lin KC, Kang LJ, Chen CL, Chen CY.

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To better generalize training effects to the context of daily living, home-based constraint-induced therapy has been proposed. Therapeutic success of constraint-induced therapy is limited as to whether the improvements in functional performance can be transferred to quality of life. This randomized controlled trial aimed to investigate the efficacy of home-based constraint-induced therapy on functional performance and health-related quality of life. Twenty-two children with spastic unilateral cerebral palsy (6-8 years, 10 boys) were randomly assigned to receive constraint-induced therapy or traditional rehabilitation. Home-based constraint-induced therapy had immediate and maintaining effects on motor efficacy and functional performance and induced greater gains in health-related quality of life in the long run than in the short term. The home-based constraint-induced therapy protocol (relatively moderate intensity and shortened constraint time), which might balance the effectiveness and compliance of participants and caregivers, may be an effective alternative to conventional constraint-induced therapy.

[PMID: 22241704](#) [PubMed - as supplied by publisher]

**7. Phys Occup Ther Pediatr. 2012 Jan 5. [Epub ahead of print]****Passive Range of Motion in a Population-Based Sample of Children with Spastic Cerebral Palsy Who Walk.**

McDowell BC, Salazar-Torres JJ, Kerr C, Cosgrove AP.

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While passive range of motion (PROM) is commonly used to inform decisions on therapeutic management, knowledge of PROM of children with spastic cerebral palsy (CP) is limited. A population-based sample of 178 children with spastic CP (110 male; unilateral, n = 94; bilateral, n = 84; age range 4-17 years) and 68 typically developing children (24 male; age range 4-17 years) were recruited to the study. All children were able to walk a minimum of 10 m over a straight flat course, with or without assistive devices. Gross Motor Function Classification System (GMFCS) levels of participants with CP were: Level I = 55, Level II = 88, Level III = 21, and Level IV = 14. Ankle dorsiflexion, knee extension, popliteal angle, hip abduction, hip internal rotation, and hip external rotation were measured using a goniometer. The results indicate that the children with CP had significantly reduced PROM compared to the children with typical development. Children with CP demonstrated reduced length in the hamstrings, hip adductor, iliopsoas and gastrocnemius-soleus musculature, and contracture at the knee joint. Among children with CP, there were significant reductions in range with increasing functional limitation (higher GMFCS level) and variations based on unilateral or bilateral involvement. This was particularly the case for the hamstrings and hip adductor musculature, where PROM varied considerably across GMFCS Levels I to IV.

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**8. J Altern Complement Med. 2012 Jan 10. [Epub ahead of print]****Using Whole-Body Vibration Training in Patients Affected with Common Neurological Diseases: A Systematic Literature Review.**

Pozo-Cruz BD, Adsuar JC, Parraca JA, Pozo-Cruz JD, Olivares PR, Gusi N.

Physical Education Department, University of Seville, Seville, Spain.

Objectives: This systematic review critically evaluates the effects of whole body vibration (WBV) exercises on gait, balance, proprioception, strength, and health-related quality of life in patients with common neurological diseases. It

specifically focuses on assessing the quality of reported studies and comparing quantitative results. Design: This is a systematic literature review. Results: A specific search strategy of 11 databases identified 13 published articles (5 studies of patients with Parkinson disease, 2 with cerebral palsy, 3 with multiple sclerosis, and 3 with stroke) that fulfilled the selection criteria. The quality of the articles was evaluated using a Physiotherapy Evidence Database scale and Dutch Institute for Healthcare Improvement guidelines. Conclusions: There is moderate evidence that one session of WBV has positive effects on strength, whereas there is a weak level of evidence that WBV could improve proprioception and health-related quality of life measures in neurological patients. With respect to long-term effects of WBV, there is minor evidence from the studies with the best methodological quality that WBV improves strength, proprioception, gait, and balance. Further research on the intervention is strongly needed.

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## 9. Clin J Sport Med. 2012 Jan;22(1):31-8.

### Physiologic responses of competitive Canadian cross-country skiers with disabilities.

Bhambhani Y, Forbes S, Forbes J, Craven B, Matsuura C, Rodgers C.

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**OBJECTIVE:** To examine the acute cardiorespiratory and metabolic responses in competitive cross-country skiers with disabilities. **DESIGN:** Cross-sectional comparisons using a select group of Canadian athletes training for the Vancouver 2010 Paralympic Winter Games. **SETTING:** Canmore Nordic Centre Provincial Park, Canmore, Alberta. **PARTICIPANTS:** Nine competitive cross-country skiers (4 with visual impairment, 1 with traumatic brain injury, 3 with spinal cord injury, and 1 with cerebral palsy). **INTERVENTIONS:** Three-minute and 12-minute exercise tests in the standing or sitting skiing position to voluntary fatigue. **MAIN OUTCOME MEASURES:** Cardiorespiratory responses using a telemetric system to compare the physiologic responses among the athletes with different disabilities. Heart rate (HR) and capillary lactate were measured at 2, 5, and 10 minutes of recovery. **RESULTS:** The t test results indicated that the peak values of the absolute and relative oxygen uptake ( $V[\text{Combining Dot Above}]\text{O}_2\text{peak}$ ), HR, and ventilation rate were significantly higher during the 12-minute compared with the 3-minute protocol during standing skiing. However, the oxygen pulse and ventilatory equivalent for oxygen ratio were not significantly ( $P > 0.05$ ) different between the 2 protocols. Analysis of variance revealed no significant ( $P > 0.05$ ) differences among the 3 trials for these peak physiologic responses during sitting skiing. Cross-sectional comparisons of the peak physiologic responses between the standing and sitting skiers indicated significantly ( $P < 0.05$ ) higher values in the standing compared with the sitting position. Cardiorespiratory respiratory efficiency was significantly ( $P < 0.05$ ) lower in the sitting compared with the standing position. HR during 10 minutes of recovery was significantly correlated with  $V[\text{Combining Dot Above}]\text{O}_2\text{peak}$ . Pearson correlations were not significant between  $V[\text{Combining Dot Above}]\text{O}_2\text{peak}$  and lactate removal during recovery. **CONCLUSION:** These descriptive findings during the standing and sitting skiing protocols provide preliminary data that would be useful in testing, training, and classification of competitive skiers with disabilities.

[PMID: 22222595](#) [PubMed - in process]

## 10. Clin J Sport Med. 2012 Jan;22(1):65-9.

### Game performance in ice sledge hockey: an exploratory examination into type of disability and anthropometric parameters.

Molik B, Morgulec-Adamowicz N, Kosmol A, Yilla AB, Filipkowska A, Lewandowski M, Pijanowska J, Słyk K, Zubala T, Flis S, Herink R.

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**OBJECTIVE:** To compare first disability and anthropometric variables and second disability and game efficiency measures. **DESIGN:** Prospective cohort study. **SETTING:** Winter Paralympic Games in Vancouver (2010). **PARTICIPANTS:** A sample of 54 (age,  $30.85 \pm 7.99$  y) of the 114 elite ice sledge hockey athletes participated in this study. To be included in the analysis, an athlete had to participate for a minimum of 45 minutes in total and in a minimum of 2 games during the tournament. **ASSESSMENT OF RISK FACTORS:** Athletes were categorized according to type of disability into 4 groups: group 1 (double amputee above and below the knee), group 2 (single amputee above and below the knee), group 3 (spinal cord injury), and group 4 (other physical disabilities, including phocomelia, cerebral palsy, sclerosis multiplex, and lower limb paresis, and players with minimal disability). Before the tournament, athletes completed a Personal Questionnaire Form. Data including anthropometric measurements (seated position and range of arms) and length of the sledge were also collected. **MAIN OUTCOME MEASURES:** All 20 scheduled games were videotaped using 3 video cameras. The games were analyzed after the tournament by 5 observers. All observations were recorded using the Game Efficiency Sheet for Ice Sledge Hockey developed by the authors. Fourteen game parameters were included for analysis. **RESULTS:** The instrument was developed specifically for this project's exploratory analysis. Interobserver and intraobserver reliability were established by statistical analysis ( $r > 0.93$  and  $r > 0.95$ , respectively). Significant differences between disability groups were found for training frequency ( $F_{3,50} = 4.73$ ,  $P = 0.006$ ), height ( $F_{3,50} = 12.54$ ,  $P = 0.001$ ), and sledge length ( $F_{3,50} = 12.35$ ,  $P = 0.001$ ). The results of the Tukey honestly significant difference post hoc analyses revealed significant differences between groups 1 and 4 ( $P = 0.026$ ), 2 and 4 ( $P = 0.007$ ), and 3 and 4 ( $P = 0.013$ ) for training frequency. There were also significant differences between groups 1 and 2 ( $P < 0.001$ ), 1 and 4 ( $P < 0.001$ ), and 2 and 4 ( $P = 0.021$ ) for body height. In sledge length, significant differences were observed between groups 1 and 2 ( $P < 0.001$ ), 1 and 3 ( $P < 0.001$ ), 1 and 4 ( $P = 0.016$ ), and 2 and 4 ( $P = 0.028$ ). There was no strong evidence to support disability group differences in game efficiency measures. **CONCLUSIONS:** The results may confirm the lack of a need for additional classification in sledge hockey beyond minimum eligibility or may enhance the argument that a classification system may be needed because the lower functioning disabilities are not being represented in the sport.

[PMID: 22222590](#) [PubMed - in process]

#### **11. J Rehabil Med. 2012 Jan 11. doi: 10.2340/16501977-0918. [Epub ahead of print]**

##### **Intrathecal baclofen pump: A foreign-body reaction case report and its solution.**

Bernuz B, Assier H, Bissierix H, Thiebaut JB, Rech C, Schnitzler A.

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**Case report:** A 43-year-old woman with cerebral palsy and disabling spasticity underwent a series of 4 implantations of intrathecal baclofen pumps, performed by two teams. A history of 3 aseptic local skin reactions over the site of insertion started 4 months after the first insertion, once with partial pump exposure. There were no clinical or biological signs of infection. Skin patch tests were negative. Relocation of the system was followed by a relapse, while removal of the pump was followed each time by complete resolution of the symptoms. Histological findings showed slight mononuclear dermal infiltration without epidermal lesions, which excluded contact dermatitis. Pump intolerance with a foreign-body reaction was diagnosed. A pump wrapped with polyethylene terephthalate was reimplanted. No recurrence of symptoms occurred after a 3-year follow-up period, with improvement in impairment, activity and satisfaction due to intrathecal baclofen therapy. **Conclusion:** A foreign-body reaction after intrathecal baclofen pump implantation is a rare complication, which has not been reported previously, and which is associated with negative skin patch tests. In cases with no signs of infection, skin intolerance must be suspected and dermatological assessments should be carried out. Replacement with a pump wrapped in an inert coating is an effective and available solution.

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**12. Pediatr Neurosurg. 2011 Dec 29. [Epub ahead of print]****Erosive Bladder Perforation as a Complication of Ventriculoperitoneal Shunt with Extrusion from the Urethral Meatus: Case Report and Literature Review.**

Pohlman GD, Wilcox DT, Hankinson TC.

Division of Urology, Anschutz Medical Campus, University of Colorado Denver, Aurora, Colo., USA.

Ventriculoperitoneal (VP) shunt surgery is the most common technique used in the treatment of hydrocephalus. Erosive bladder perforation is an extremely rare complication of VP shunt surgery. Only 2 cases of erosive bladder perforation by a peritoneal catheter have been reported in the English literature. The authors present the case of a 14-year-old male with a history of cerebral palsy, severe developmental delay and hydrocephalus who presented with VP shunt tubing protruding from his urethral meatus. The patient had no evidence of neurological change. The VP shunt had been last revised over 11 years prior to admission. Imaging demonstrated the VP shunt to be intact, but displaced inferiorly, with the ventricular catheter in the extracranial soft tissue of the neck and the peritoneal catheter passing into the abdomen, bladder, and out through the urethra. Shunt removal was achieved through a multidisciplinary approach, involving both neurosurgery and urology teams. The authors discuss other reported cases of perforation by a VP shunt, potential mechanisms, and considerations for management of this rare complication.

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**13. Duodecim. 2011;127(22):2417-24.****Botulinum toxin treatment in children [Article in Finnish]**

Sätälä H, Vähäsarja V, Paavilainen P.

Kanta-Hämeen keskussairaalan lastenneurologinen yksikkö, TAYS:n lastenneurologinen yksikkö.

Botulinum toxin type A treatments in children were started nearly 20 years ago. The first and still most common indication is spastic equinus gait in cerebral palsy, but other indications have emerged, such as idiopathic toe-walking, peri- and post-operative pain, drooling and idiopathic congenital torticollis. The official indication for botulinum toxin treatment is spastic equinus gait in children over 2 years of age. Botulinum toxin is known as the most potent toxin. However, it has proved to be safe and well tolerated among paediatric patients. Adverse events are infrequent, mostly bruising and limited, temporary muscle weakness. With higher doses the risk for generalized adverse events increases.

[PMID: 22238919](#) [PubMed - in process]

## Prevention and Cure

### 14. Curr Opin Pediatr. 2012 Jan 5. [Epub ahead of print]

#### Antenatal magnesium sulfate and neuroprotection.

Doyle LW.

Murdoch Childrens Research Institute, The Royal Women's Hospital, University of Melbourne, Melbourne, Victoria, Australia.

**PURPOSE OF REVIEW:** Antenatal magnesium sulfate may reduce the excessive rates of cerebral palsy in survivors of very preterm birth. **RECENT FINDINGS:** There are five randomized controlled trials of magnesium sulfate therapy given to the mother prior to very preterm birth which have reported neurological outcomes for the child, in four of which the primary aim of the trial was neuroprotection for the fetus. From meta-analysis of these randomized trials, the rate of cerebral palsy was reduced by magnesium sulfate [relative risk (RR) = 0.69; 95% confidence interval (CI) = 0.54-0.87; five trials; 6145 infants]. Magnesium sulfate also lowered the rate of substantial motor dysfunction in early childhood (RR = 0.61; 95% CI = 0.44-0.85; four trials; 5980 infants). In addition, where the main aim of the trial was neuroprotection of the fetus, the rates of the combined outcomes of death or cerebral palsy (RR = 0.86; 95% CI = 0.74-0.98; four trials; 4446 infants) and death or substantial motor dysfunction (RR = 0.85; 95% CI = 0.73-0.98; three trials; 4387 infants) were significantly lower with magnesium. **SUMMARY:** On the basis of these findings several countries have now released clinical practice guidelines recommending antenatal magnesium sulfate prior to very preterm birth.

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### 15. Early Hum Dev. 2012 Jan 9. [Epub ahead of print]

#### Outcomes of extremely low birth weight infants with bronchopulmonary dysplasia: Impact of the physiologic definition.

Natarajan G, Pappas A, Shankaran S, Kendrick DE, Das A, Higgins RD, Laptook AR, Bell EF, Stoll BJ, Newman N, Hale EC, Bara R, Walsh MC.

Department of Pediatrics, Wayne State University, Detroit, MI, United States.

**AIMS:** We compared neurodevelopmental outcomes of extremely low birth weight (ELBW) infants with and without bronchopulmonary dysplasia (BPD), using the physiologic definition. **STUDY DESIGN:** ELBW (birth weights <1000g) infants admitted to the Neonatal Research Network centers and hospitalized at 36 weeks postmenstrual age (n=1189) were classified using the physiologic definition of BPD. Infants underwent Bayley III assessment at 18-22 months corrected age. Multivariable logistic regression was used to determine the association between physiologic BPD and cognitive impairment (score <70). **RESULTS:** BPD by the physiologic definition was diagnosed in 603 (52%) infants, 537 of whom were mechanically ventilated or on FiO<sub>2</sub> >30% and 66 who failed the room air challenge. Infants on room air (n=505) and those who passed the room air challenge (n=51) were classified as "no BPD" (n=556). At follow up, infants with BPD had significantly lower mean weight and head circumference. Moderate to severe cerebral palsy (7 vs. 2.1%) and spastic diplegia (7.8 vs. 4.1%) and quadriplegia (3.9 vs. 0.9%) phenotypes as well as cognitive (12.8 vs. 4.6%) and language scores <70 (24.2 vs. 12.3%) were significantly more frequent in those with BPD compared to those without BPD. BPD was independently associated (adjusted OR 2.4; 95% CI 1.40-4.13) with cognitive impairment. **CONCLUSIONS:** Rates of adverse neurodevelopmental outcomes in early childhood were significantly higher in those with BPD. BPD by the physiologic definition was independently associated with cognitive impairment using Bayley Scales III. These findings have implications for targeted post-discharge surveillance and early intervention.

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**16. Indian J Pediatr. 2012 Jan 10. [Epub ahead of print]****The Efficacy of Hypothermia in Hypoxic-Ischemic Encephalopathy at 18 Mo or More.**

Wu L, Yi B, Hu Y, Ji C, Zhang T, Wang Y.

Department of Maternal and Child Health, Tongji Medical College, Huazhong University of Science and Technology, Hangkong Road 13, Wuhan, Hubei, 430030, China.

**OBJECTIVE:** To evaluate the efficacy of hypothermia in the treatment of hypoxic-ischemic encephalopathy (HIE) in neonates at 18 mo of age or more. Also to examine whether the severity of encephalopathy affects the efficacy of hypothermia on mortality and neurodevelopmental disability. **METHODS:** The authors recruited the trials that assessed the efficacy of therapeutic hypothermia in the treatment of HIE in neonates at 18 mo of age or older up to April 2011. The meta-analysis was performed using a fixed effect model. **RESULTS:** Hypothermia significantly reduced the combined rate of death or neurodevelopmental disability (RR = 0.74, 95% CI: 0.67 to 0.82; RD = -0.13, 95% CI: -0.18 to -0.08; NNT = 7, 95% CI: 6 to 9) among infants at 18 mo of age or older. Hypothermia reduced the rate of death (RR = 0.75, 95% CI: 0.64 to 0.88), neurodevelopmental disability (RR = 0.65, 95% CI: 0.54 to 0.79), cerebral palsy (RR = 0.65, 95% CI: 0.53 to 0.80), developmental delay (RR = 0.72, 95% CI: 0.57 to 0.92), neuromotor delay (RR = 0.78, 95% CI: 0.61 to 0.99) and visual deficit (RR = 0.59, 95% CI: 0.36 to 0.99). Analysis of the severity of disease showed that hypothermia reduced the combined rate of death or neurodevelopmental disability not only in moderate encephalopathy infants (RR = 0.63, 95% CI: 0.53 to 0.76) but also in severe encephalopathy infants (RR = 0.82, 95% CI: 0.74 to 0.92).

**CONCLUSIONS:** Hypothermia has a beneficial effect in the treatment of HIE in neonates at 18 mo of age or older.

[PMID: 22231774](#) [PubMed - as supplied by publisher]

**17. Int J Pediatr. 2011;2011:783893. Epub 2011 Dec 20.****Pulmonary effects of neonatal hydrocortisone treatment in ventilator-dependent preterm infants.**

de Jong SE, Groenendaal F, van Bel F, Rademaker KJ.

Department of Neonatology, University Medical Center Utrecht/Wilhelmina Children's Hospital, P.O. Box 85090, 3508 AB Utrecht, The Netherlands.

**Background/Objective.** Hydrocortisone, administered to ventilated preterm neonates to facilitate extubation, has no adverse long-term effects, but short-term pulmonary effects have not been described previously. In the present study, we analyzed effects of hydrocortisone on ventilator settings and FiO<sub>2</sub> in ventilator-dependent preterm infants. **Patients and Methods.** Fifty-five preterm children were included in this retrospective cohort study. Hydrocortisone was administered at a postnatal age of > 7 days to treat chronic lung disease (CLD). Ventilator settings before and after hydrocortisone administration were recorded as well as FiO<sub>2</sub> at 36 weeks' gestational age. Presence of cerebral palsy was assessed at a mean corrected age of 24.1 months. **Results.** Hydrocortisone administered at a median postnatal age of 14 days significantly reduced FiO<sub>2</sub> from a median of 0.39 to 0.30, mean airway pressure (MAP) from a median of 10.0 cm H<sub>2</sub>O to 7.6 cm H<sub>2</sub>O, and PaCO<sub>2</sub> from a median of 53.5 mmHg to 47 mmHg. Extubation was achieved in all patients. CLD at 36 weeks was present in 11 of the 52 patients (21.1%). None developed cerebral palsy. **Conclusions.** Hydrocortisone was effective in reducing the FiO<sub>2</sub>, MAP, and PaCO<sub>2</sub> and facilitated extubation. Hydrocortisone was not associated with cerebral palsy.

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**18. J Child Neurol. 2012 Jan;27(1):22-29.****Intraventricular Hemorrhage and Developmental Outcomes at 24 Months of Age in Extremely Preterm Infants.**

O'Shea TM, Allred EN, Kuban KC, Hirtz D, Specter B, Durfee S, Paneth N, Leviton A; for the ELGAN Study Investigators.

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Whether intraventricular hemorrhage increases the risk of adverse developmental outcome among premature infants is controversial. Using brain ultrasound, we identified intraventricular hemorrhage and white matter abnormalities among 1064 infants born before 28 weeks' gestation. We identified adverse developmental outcomes at 24 months of age using a standardized neurologic examination and the Bayley Scales of Infant Development Mental and Motor Scales. In logistic regression models that adjusted for gestational age, sex, and public insurance, isolated intraventricular hemorrhage was associated with visual fixation difficulty but no other adverse outcome. Infants who had a white matter lesion unaccompanied by intraventricular hemorrhage were at increased risk of cerebral palsy, low Mental and Motor Scores, and visual and hearing impairments. Except when accompanied or followed by a white matter lesion, intraventricular hemorrhage is associated with no more than a modest increase (and possibly no increase) in the risk of adverse developmental outcome during infancy.

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**19. J Crit Care. 2012 Jan 6. [Epub ahead of print]****Respiratory syncytial virus morbidity, premorbid factors, seasonality, and implications for prophylaxis.**

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**OBJECTIVES:** We investigated factors associated with morbidity and pediatric intensive care unit (PICU) admission in children with respiratory syncytial virus (RSV) infection and explored seasonality and implication of prophylaxis. **METHODS:** A retrospective study between 2006 and 2008 of every child with a laboratory-confirmed RSV infection was included. **RESULTS:** Six hundred seventy RSV admissions were identified. Ten (1.5%) required PICU admissions. Children admitted to PICU were younger than non-PICU admissions (median [interquartile range] age, 0.3 [0.11-0.48] vs 1.18 [0.46-2.49] years;  $P = .001$ ). Odds associated with PICU admissions included history of chronic lung disease (odds ratio [95% confidence interval], 18.08 [2.29-114.95];  $P = .010$ ), history of acyanotic heart disease (7.61 [1.04-42.59],  $P = .043$ ), and neurodevelopmental conditions (mental retardation, cerebral palsy, or neuromuscular disease; 8.41 [1.63-38.57],  $P = .012$ ). Odds of bacterial coinfections was 13.50 (1.77-81.29),  $P = .017$ . There appeared no significant PICU predilection in terms of sex, history of prematurity, cyanotic heart disease, seizure disorders, chromosomal disorders, or malignancy. Admissions associated with proven RSV infections accounted for 2.4% of PICU annual admissions. The duration of PICU stay was generally brief (median, 3 days). However, median length of hospital stay was significantly longer in the PICU category (8.5 vs 3 days,  $P < .001$ ). There was no death in the study period. Only 5 (0.75%) of 665 patients were readmitted to the pediatric infectious disease isolation ward in consecutive years, and none required PICU support. Twenty (3%) of admissions involved neonates younger than 30 days. There was no definite seasonality, but incidence was lowest between October and January.

**CONCLUSIONS:** Most infants have mild disease and do not require PICU support. Young infants with history of chronic lung disease, congenital heart disease, and neurodevelopmental conditions appear to be at significantly increased risk for PICU support. There is no winter seasonality for RSV disease in Hong Kong. Therefore, any prophylaxis for at-risk population should provide adequate coverage for the warmer months in subtropical regions.

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**20. Korean J Pediatr. 2011 Sep;54(9):359-62. Epub 2011 Sep 30.****Optimal oxygen saturation in premature infants.**

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There is a delicate balance between too little and too much supplemental oxygen exposure in premature infants. Since underuse and overuse of supplemental oxygen can harm premature infants, oxygen saturation levels must be monitored and kept at less than 95% to prevent reactive oxygen species-related diseases, such as retinopathy of prematurity and bronchopulmonary dysplasia. At the same time, desaturation below 80 to 85% must be avoided to prevent adverse consequences, such as cerebral palsy. It is still unclear what range of oxygen saturation is appropriate for premature infants; however, until the results of further studies are available, a reasonable target for pulse oxygen saturation (SpO<sub>2</sub>) is 90 to 93% with an intermittent review of the correlation between SpO<sub>2</sub> and the partial pressure of arterial oxygen tension (PaO<sub>2</sub>). Because optimal oxygenation depends on individuals at the bedside making ongoing adjustments, each unit must define an optimal target range and set alarm limits according to their own equipment or conditions. All staff must be aware of these values and adjust the concentration of supplemental oxygen frequently.

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**21. J Inherit Metab Dis. 2012 Jan 10. [Epub ahead of print]****Hyperinsulinaemic hypoglycaemia: genetic mechanisms, diagnosis and management.**

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Hyperinsulinaemic hypoglycaemia (HH) is due to the unregulated secretion of insulin from pancreatic  $\beta$ -cells. A rapid diagnosis and appropriate management of these patients is essential to prevent the potentially associated complications like epilepsy, cerebral palsy and neurological impairment. The molecular basis of HH involves defects in key genes (ABCC8, KCNJ11, GLUD1, GCK, HADH, SLC16A1, HNF4A and UCP2) which regulate insulin secretion. The most severe forms of HH are due to loss of function mutations in ABCC8/KCNJ11 which encode the SUR1 and KIR6.2 components respectively of the pancreatic  $\beta$ -cell K(ATP) channel. At a histological level there are two major forms (diffuse and focal) each with a different genetic aetiology. The diffuse form is inherited in an autosomal recessive (or dominant) manner whereas the focal form is sporadic in inheritance and is localised to a small region of the pancreas. The focal form can now be accurately localised pre-operatively using a specialised positron emission tomography scan with the isotope Fluorine-18L-3, 4-dihydroxyphenylalanine (18F-DOPA-PET). Focal lesionectomy can provide cure from the hypoglycaemia. However the diffuse form is managed medically or by near total pancreatectomy (with high risk of diabetes mellitus). Recent advances in molecular genetics, imaging with 18F-DOPA-PET/CT and novel surgical techniques have changed the clinical approach to patients with HH.

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**22. J Vis Exp. 2011 Nov 11;(57). pii: 3258. doi: 10.3791/3258.****Behavioral assessment of manual dexterity in non-human primates.**

Schmidlin E, Kaeser M, Gindrat AD, Savidan J, Chatagny P, Badoud S, Hamadjida A, Beaud ML, Wannier T, Belhaj-Saif A, Rouiller EM.

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The corticospinal (CS) tract is the anatomical support of the exquisite motor ability to skillfully manipulate small objects, a prerogative mainly of primates(1). In case of lesion affecting the CS projection system at its origin (lesion

of motor cortical areas) or along its trajectory (cervical cord lesion), there is a dramatic loss of manual dexterity (hand paralysis), as seen in some tetraplegic or hemiplegic patients. Although there is some spontaneous functional recovery after such lesion, it remains very limited in the adult. Various therapeutic strategies are presently proposed (e.g. cell therapy, neutralization of inhibitory axonal growth molecules, application of growth factors, etc), which are mostly developed in rodents. However, before clinical application, it is often recommended to test the feasibility, efficacy, and security of the treatment in non-human primates. This is especially true when the goal is to restore manual dexterity after a lesion of the central nervous system, as the organization of the motor system of rodents is different from that of primates(1,2). Macaque monkeys are illustrated here as a suitable behavioral model to quantify manual dexterity in primates, to reflect the deficits resulting from lesion of the motor cortex or cervical cord for instance, measure the extent of spontaneous functional recovery and, when a treatment is applied, evaluate how much it can enhance the functional recovery. The behavioral assessment of manual dexterity is based on four distinct, complementary, reach and grasp manual tasks (use of precision grip to grasp pellets), requiring an initial training of adult macaque monkeys. The preparation of the animals is demonstrated, as well as the positioning with respect to the behavioral set-up. The performance of a typical monkey is illustrated for each task. The collection and analysis of relevant parameters reflecting precise hand manipulation, as well as the control of force, are explained and demonstrated with representative results. These data are placed then in a broader context, showing how the behavioral data can be exploited to investigate the impact of a spinal cord lesion or of a lesion of the motor cortex and to what extent a treatment may enhance the spontaneous functional recovery, by comparing different groups of monkeys (treated versus sham treated for instance). Advantages and limitations of the behavioral tests are discussed. The present behavioral approach is in line with previous reports emphasizing the pertinence of the non-human primate model in the context of nervous system diseases(2,3).

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