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Interventions and Management

1. J Pediatr Orthop. 2012 Apr;32(3):266-70.

A multidisciplinary approach improves infection rates in pediatric spine surgery.

Ballard MR, Miller NH, Nyquist AC, Elise B, Baulesh DM, Erickson MA.

* Department of Orthopaedic Surgery, The Musculoskeletal Research Center ‡ Department of Epidemiology, The Children's Hospital §Department of Pediatrics, University of Colorado School of Medicine, Aurora † Department of Orthopedic Surgery, University of Colorado, Denver, CO.

BACKGROUND: Surgical site infections (SSI) associated with elective pediatric spinal surgery are a commonly reported complication, increasing hospital length of stay, readmissions, operations, and financial costs. In July 2007, a multidisciplinary task force, designated Target Zero, was created to address this issue and establish prevention protocols at our institution. **METHODS:** A consecutive series of 394 patient charts from April 2006 to September 2008 were retrospectively reviewed to identify patients who developed an SSI secondary to elective spinal surgery. Four cohorts were evaluated; high-risk (HR) and low-risk (LR) patients who underwent surgery before (April 2006 to June 2007) and after (July 2007 to September 2008) Target Zero initiation. The definition of HR included diagnoses of cerebral palsy, spina bifida, muscle disease, paralytic deformities, and vertebral column resections. Patients were followed for 1 year to meet The Center for Disease Control-National Health Safety Network's definition of an SSI with an implantable device. Overall infection rates were determined for each group and compared statistically. **RESULTS:** A total of 192 patients (70 HR and 122 LR) underwent surgery before, and 202 patients (92 HR and 110 LR) underwent surgery after Target Zero initiation. Overall infection rates were reduced from 7.8% to 4.5% ($P=0.203$), 12.9% to 6.5% ($P=0.183$), and 4.9% to 2.7% ($P=0.505$) for all patients, HR patients, and LR patients, respectively. The relative risk reduction was 43.0% for all patients, 49.3% for HR patients, and 44.6% for LR patients. **CONCLUSIONS:** Although decreases in overall infection rates were not statistically significant, the results from Target Zero were shown to be clinically meaningful with a relative risk reduction approaching 50% overall and in defined subgroups. Based on the number needed to treat analysis, 1 infection in every 16 patients within the HR group, and 1 in 30 overall, was prevented up to 1 year postoperatively. This study is the first to document the effectiveness of a multidisciplinary team implementing protocols for decreasing infection rates in pediatric spine surgery.

[PMID: 22411332](https://pubmed.ncbi.nlm.nih.gov/22411332/) [PubMed - in process]

2. Eur Spine J. 2012 Mar 10. [Epub ahead of print]

Sagittal profile control in patients affected by neurological scoliosis using Universal Clamps: a 4-year follow-up study.

La Rosa G, Giglio G, Oggiano L.

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PURPOSE: Patients affected by cerebral palsy often develop progressive scoliosis that can result in trunk instability with an impairment of both coronal and sagittal balance. The aim of this retrospective study was to demonstrate the ability of UC to control the sagittal profile in a consecutive series of patients affected by neurological scoliosis. **METHODS:** From 2006 to 2008, 84 patients (57 F, 27 M) affected by neurological scoliosis were treated surgically. Mean age was 14 years (range 10-17). The etiology was mainly cerebral palsy. The average pre-operative Cobb angle was $73^\circ \pm 16^\circ$. Patients were divided into three groups according to the pre-operative presence of: physiological kyphosis (mean $29^\circ \pm 8^\circ$), thoracic lordosis (mean $10^\circ \pm 6^\circ$) and hyperkyphosis ($51^\circ \pm 8^\circ$). A posterior access was performed in all patients using thoracic UC associated with transpedicular lumbar screws and a conventional claw at the upper extremity of the construct. **RESULTS:** The average percentage of coronal correction was 72%. In all three groups, we observed a common trend toward maintaining or restoring the physiological values. Mean follow-up time was 36 months. At the 1-year follow-up, the mean loss of correction was $7^\circ \pm 2^\circ$ in the coronal plane and $2^\circ \pm 1^\circ$ in the sagittal plane with no other change thereafter. **CONCLUSIONS:** The hybrid construct using UC appears effective in neurological scoliosis treatment, providing a good correction of the deformity in both coronal and sagittal planes. In the present series, physiological thoracic kyphosis has been restored in all patients, providing better sitting tolerance in wheelchair-bound patients, and retaining standing and walking abilities in ambulatory patients.

[PMID: 22407266](#) [PubMed - as supplied by publisher]

3. Arch Phys Med Rehabil. 2012 Mar 9. [Epub ahead of print]

Feasibility and Test-Retest Reliability of an Electroencephalography-Based Brain Mapping System in Children With Cerebral Palsy: A Preliminary Investigation.

Lee NG, Kang SK, Lee DR, Hwang HJ, Jung JH, You JS, Im CH, Kim DA, Lee JA, Kim KS.

Department of Physical Therapy, Yonsei University, Wonju City, Kangwon-do, Republic of South Korea.

OBJECTIVE: To investigate the feasibility and test-retest reliability of a novel electroencephalography (EEG)-based brain mapping system in healthy children and children with cerebral palsy (CP). **DESIGN:** Correlation statistics. **SETTING:** University brain mapping and neurorehabilitation laboratory. **PARTICIPANTS:** A convenience sample of children (N=12; 5 healthy children, mean \pm SD, 12.6 ± 0.89 y; 7 children with CP, mean \pm SD, 9.71 ± 1.1 y) participated in the study. **INTERVENTIONS:** Not applicable. **MAIN OUTCOME MEASURES:** Mu band (8-12Hz) power values in event-related spectral perturbation maps during reach and grasp hand movements were repeatedly measured on 2 separate occasions (2h apart). Intraclass correlation coefficient (ICC(1,2)) tests were computed to determine test-retest reliability at the standard level of significance ($P < .004$). In addition, the feasibility of the system was determined by evaluating potential differences in the cortical activation areas obtained from topographical maps during actual reach and grasp motor tasks between healthy children and children with CP. **RESULTS:** The test-retest reliability results showed excellent reliability between the repeated measures, ranging from .93 ($P = .000$) to .99 ($P = .000$). Our EEG brain mapping system was capable of distinguishing differences in the cortical activity power (mu band power spectra) between healthy children and children with CP. **CONCLUSIONS:** To our knowledge, this study is the first evidence demonstrating the feasibility and reliability of the EEG brain mapping system. Clinically, this system provides important insights into neuroplasticity associated with motor recovery after treatment and can also be used as real-time neurofeedback or noninvasive neuromodulation in the course of neurologic rehabilitation.

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[PMID: 22405955](#) [PubMed - as supplied by publisher]

4. Arch Phys Med Rehabil. 2012 Mar 10. [Epub ahead of print]

Reuse and Refurbish: A Cost Savings Delivery Model for Specialized Seating.

Li Pi Shan RS, Chrusch WM, Linassi AG, Sankaran R, Munchinsky J.

Division of Physical Medicine and Rehabilitation, University of Calgary, Calgary, AB, Canada; Foothills Medical Centre, Calgary, AB, Canada.

OBJECTIVES: To describe a unique specialized seating delivery model for children with disabilities that focuses on cost containment and environmental preservation. To determine whether this delivery model achieves cost containment. **DESIGN:** A retrospective cost analysis using data from billing records and annual statistical reports of the specialized seating program, for the 2004 to 2009 billing period. **SETTING:** The specialized seating program is a service provided on a referral basis by the Saskatchewan Abilities Council, which is under contract to Saskatchewan Health. **PARTICIPANTS:** Pediatric patients (N=40) with physical disabilities (cerebral palsy, developmental delay, acquired brain injury, spinal cord injury, Down syndrome, other) who were referred, assessed, and met inclusion criteria. **INTERVENTIONS:** Not applicable. **MAIN OUTCOME MEASURE:** Relative cost (in Canadian dollars) of providing units with recycled components compared with purchasing new units. **RESULTS:** The average cost of a used wheelchair was Can \$698.11. The average cost of a new chair was \$2143.69, leading to an average savings per chair of \$1445.58. Of the 49 chairs issued, this resulted in a total cost savings of \$85,393.97. When labor costs were taken into account (\$50,060.26), the savings amounted to \$35,333.71. Overall cost reduction was 41.3%. **CONCLUSIONS:** A retrospective analysis shows evidence of cost containment. Long-term sustainability of the program requires ongoing analysis of the cost and environmental advantages of a recycling program and review of benefits provided in relation to the ability to meet patient needs. This delivery model does incorporate accountability and a policy framework, which could serve as a model for other centers.

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[PMID: 22410182](#) [PubMed - as supplied by publisher]

5. Dev Med Child Neurol. 2012 Mar 13. doi: 10.1111/j.1469-8749.2012.04251.x. [Epub ahead of print]

Ambulatory activity of children with cerebral palsy: which characteristics are important?

VAN Wely L, Becher JG, Balemans AC, Dallmeijer AJ.

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

Aim: To assess ambulatory activity of children with cerebral palsy (CP), aged 7 to 13 years, and identify associated characteristics. **Method:** Sixty-two children with spastic CP (39 males, 23 females; mean age 10y 1mo, SD 1y 8mo; age range 7-13y), classified as Gross Motor Function Classification System (GMFCS) levels I to III, participated. Ambulatory activity was measured during 1 week with a StepWatch activity monitor as steps per day, and time spent at medium and high step rates. Multiple linear regression analyses were performed following a backward selection procedure until only independent variables with $p < 0.05$ remained in the model. Ambulatory activity outcome parameters served as dependent variables, and disease, personal, and environmental characteristics as independent variables. Ambulatory activity was corrected for body height. **Results:** Children took more steps during school days (5169 steps, SD 1641) than during weekend days (4158 steps, SD 2048; $p < 0.001$). Higher GMFCS level, bilateral CP, and higher age were associated with lower ambulatory activity on school days (R^2 ranged from 43-53%), whereas bilateral CP, higher age, and no sport club participation were associated with lower ambulatory activity in the weekend (R^2 ranged from 21-42%). Correcting for body height decreased the association with age. **Interpretation:** Interventions should focus at increasing physical activity at the weekend for children with bilateral spastic CP.

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6. Dev Med Child Neurol. 2012 Mar 13. doi: 10.1111/j.1469-8749.2012.04270.x. [Epub ahead of print]

Physical activity of children with cerebral palsy: what are the considerations?

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[PMID: 22414112](#) [PubMed - as supplied by publisher]

7. Dev Med Child Neurol. 2012 Mar 14. doi: 10.1111/j.1469-8749.2012.04231.x. [Epub ahead of print]

Rasch analysis of items from two self-report measures of motor function: determination of item difficulty and relationships with children's ability levels.

Stout JL, Gorton GE 3rd, Novacheck TF, Bagley AM, Tervo RC, Bevans K, Tucker CA.

Gillette Children's Specialty Healthcare, St Paul, MN; Shriners Hospitals for Children, Springfield, MA; Shriners Hospitals for Children- Northern California Unit, Sacramento, CA; Children's Hospital of Philadelphia, Philadelphia, PA; Temple University, Philadelphia, PA, USA.

Aim: The aim of this article was to determine item measurement properties of a set of items selected from the Gillette Functional Assessment Questionnaire (FAQ) and the Pediatric Outcome Data Collection Instrument (PODCI) using Rasch analysis, and to explore relationships between the FAQ/PODCI combined set of items, FAQ walking scale level, Gross Motor Function Classification System (GMFCS) levels, and the Gait Deviation Index on a common measurement scale. **Method:** Rasch analysis was performed on data from a retrospective chart review of parent-reported FAQ and PODCI data from 485 individuals (273 males; 212 females; mean age 9y 10mo, SD 3y 10mo) who underwent first-time three-dimensional gait analysis. Of the 485 individuals, 289 had a diagnosis of cerebral palsy (104 GMFCS level I, 97 GMFCS level II, 69 GMFCS level III, and 19 GMFCS level IV). Rasch-based person abilities and item difficulties based on subgroups defined by the FAQ walking scale level, Gait Deviation Index, and the GMFCS level were compared. **Results:** The FAQ/PODCI item set demonstrated necessary Rasch characteristics to support its use as a combined measurement scale. Item groupings at similar difficulty levels were consistent with the mean person abilities of subgroups based on FAQ walking scale level, Gait Deviation Index, and GMFCS level. **Interpretation:** Rasch-derived person ability scores from the FAQ/PODCI combined item set are consistent with clinical measures. Rasch analysis provides insights that may improve interpretation of the difficulty of motor functions for children with disabilities.

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[PMID: 22414116](#) [PubMed - as supplied by publisher]

8. IEEE Trans Biomed Eng. 2012 Mar 9. [Epub ahead of print]

A Practical Strategy for sEMG-based Knee Joint Moment Estimation during Gait and Its Validation in Individuals with Cerebral Palsy.

Kwon S, Park H, Stanley C, Kim J, Kim J, Damiano D.

Individuals with cerebral palsy (CP) have neurological deficits that may interfere with motor function and lead to abnormal walking patterns. It is important to know the joint moment generated by the patients muscles during walking in order to assist the sub-optimal gait patterns. In this paper, we describe a practical strategy for estimating the internal moment of a knee joint from surface electromyography (sEMG) and knee joint angle measurements. This strategy requires only isokinetic knee flexion and extension tests to obtain a relationship between the sEMG and the knee internal moment, and it does not necessitate comprehensive laboratory calibration, which typically

requires a 3D motion capture system and ground reaction force (GRF) plates. Four estimation models were considered based on different assumptions about the functions of the relevant muscles during the isokinetic tests and the stance phase of walking. The performance of the four models was evaluated by comparing the estimated moments with the gold standard internal moment calculated from inverse dynamics. The results indicate that an optimal estimation model can be chosen based on the degree of co-contraction. The estimation error of the chosen model is acceptable (NRMSE: 0.15-0.29, R: 0.71-0.93) compared to previous studies [13], and this strategy provides a simple and effective solution for estimating knee joint moment from sEMG.

[PMID: 22410952](#) [PubMed - as supplied by publisher]

9. J Pediatr Orthop. 2012 Apr;32(3):295-300.

Distal Femoral Osteotomy Using the LCP Pediatric Condylar 90-Degree Plate in Patients With Neuromuscular Disorders.

Rutz E, Gaston MS, Camathias C, Brunner R.

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BACKGROUND: In patients with cerebral palsy and other neuromuscular disorders, correction of a fixed knee flexion deformity is thought to be crucial for the improvement of gait. The distal femoral extension osteotomy (DFO) is one method to achieve this goal. The standard implant for fixation of the 2 fragments in DFO is the conventional AO blade plate. The aim of this study was to report the outcome of using the new LCP Pediatric Condylar 90-Degree Plate for DFO. **METHODS:** Thirty-eight patients undergoing 63 DFOs were included. The mean age was 16.3±4.4 years (range, 4 to 27 y) at the time of surgery. Thirty-two patients had a diagnosis of cerebral palsy and 6 patients had other neuromuscular disorders including myelomeningocele and arthrogryposis. Thirteen patients had unilateral procedures and 25 had bilateral procedures. **RESULTS:** The mean duration of the surgical intervention was 67.9±26.5 minutes (range, 30 to 180 min) and the mean blood loss was 100.0±42.1 mL (range, 50 to 250 mL). In 84% of the cases, large-fragment (5.0 mm) implants were used. The mean extension correction in 84% of the patients (n=53) was 22.8±10.3 degrees (range, 5 to 50 degrees). In this series, there were 2 complications in 63 osteotomies (3%). Radiologic follow-up of the cohort was until the time of plate removal (14.2±4.3 mo; range, 6 to 26 mo). Three months after the index operation, all osteotomies were radiologically consolidated. At this time and at plate removal, there were no malunions or nonunions in this cohort. Clinical follow-up of the cohort was performed until the end of the study (mean 35.5±6.7 mo; range, 22 to 46 mo). At the end of the study, 59 plates (94%) had been removed. **CONCLUSIONS:** The new LCP Pediatric Condylar 90-Degree Plate provides stable and safe fixation of distal femoral correction osteotomies in patients with neuromuscular disorders.

LEVEL OF EVIDENCE: Level IV.

[PMID: 22411337](#) [PubMed - in process]

10. Clin Orthop Relat Res. 2012 Mar 14. [Epub ahead of print]

Current Approaches in Cerebral Palsy, A Focus on Gait Problems: Editorial Comment.

Dabney KW, Miller F.

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[PMID: 22415730](#) [PubMed - as supplied by publisher]

11. Neurorehabil Neural Repair. 2012 Mar 12. [Epub ahead of print]**Should Body Weight-Supported Treadmill Training and Robotic-Assistive Steppers for Locomotor Training Trot Back to the Starting Gate?**

Dobkin BH, Duncan PW.

Body weight-supported treadmill training (BWSTT) and robotic-assisted step training (RAST) have not, so far, led to better outcomes than a comparable dose of progressive over-ground training (OGT) for disabled persons with stroke, spinal cord injury, multiple sclerosis, Parkinson's disease, or cerebral palsy. The conceptual bases for these promising rehabilitation interventions had once seemed quite plausible, but the results of well-designed, randomized clinical trials have been disappointing. The authors reassess the underpinning concepts for BWSTT and RAST, which were derived from mammalian studies of treadmill-induced hind-limb stepping associated with central pattern generation after low thoracic spinal cord transection, as well as human studies of the triple crown icons of task-oriented locomotor training, massed practice, and activity-induced neuroplasticity. The authors retrospectively consider where theory and practice may have fallen short in the pilot studies that aimed to produce thoroughbred interventions. Based on these shortcomings, the authors move forward with recommendations for the future development of workhorse interventions for walking. In the absence of evidence for physical therapists to employ these strategies, however, BWSTT and RAST should not be provided routinely to disabled, vulnerable persons in place of OGT outside of a scientifically conducted efficacy trial.

[PMID: 22412172](#) [PubMed - as supplied by publisher]

12. Phys Ther. 2012 Mar 15. [Epub ahead of print]**Interaction of Feedback Frequency and Task Difficulty in Children's Motor Skill Learning.**

Sidaway B, Bates J, Occhiogrosso B, Schlagenhauer J, Wilkes D.

B. Sidaway, PT, PhD, Department of Physical Therapy, Husson University, One College Circle, Bangor, ME 04401 (USA).

Background: Providing adults with knowledge of results after each practice trial (KR 100%) is usually found to be detrimental to motor skill learning when compared to conditions in which feedback is less frequently provided. The effect of KR 100% on children's learning is less clear with research showing that children with cerebral palsy benefit from less frequent KR while children with typical development do not. **Objective:** This study was designed to examine the interaction of KR frequency and task complexity on the acquisition, retention and transfer of a novel throwing skill in typically developing fourth and fifth grade children **Design:** This was a randomized control trial. **METHODS:** Children threw beanbags for accuracy at an unseen target while walking or while standing still. These two levels of task complexity were crossed with two frequencies (100%, 33%) of KR provision. Following practice retention tests without feedback were performed 5 minutes later and then one-week later along with transfer tests to assess the generalizability of learning. **RESULTS:** Analyses revealed that learning was improved on the easy version of the task when a 33% KR frequency was provided during practice. In contrast, in the difficult version, learning was facilitated by provision of a 100% KR frequency during practice. **CONCLUSIONS:** Structuring practice conditions for children should take into account task complexity and feedback frequency in determining the cognitive challenge necessary for optimal skill learning. More generally, the findings suggest that practitioners teaching motor skills should design practice conditions in accordance with the cognitive processing capacity of the learner.

[PMID: 22421736](#) [PubMed - as supplied by publisher]

13. Curr Drug Deliv. 2012 Jan 1;9(1):85-94.**Botulinum toxin a in prostate disease: a venom from bench to bed-side.**

Mearini L, Giannantoni A.

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Botulinum toxin is one of the most toxic natural substances; it acts by blocking the neuromuscular transmission by inhibiting Acetylcholine (ACh) releasing from the motor nerve into the neuromuscular junction. Although the toxin inhibits ACh release, other transmitters can also be inhibited. Botulinum toxin, specifically toxin type A (BONT-A) has been used since the 1970s to treat many different disorders, such as general spasticity resulting from stroke, multiple sclerosis or cerebral palsy, strabismus, hyperhidrosis or excessive sweating, pain, and it is effective in combating migraine and tension headaches. Since prostate gland is under the influence of autonomic innervation and associated neurotransmitters, the effects of BONT-A on the prostate have gained attention in the urological community and it has been studied in different species, including rats, dogs and humans. The aim of this paper is to review the mechanism of action of botulinum toxin and to discuss in particular the results of BONT-A treatment for benign prostatic hyperplasia (BPH), providing perspectives on potential therapy according to actual knowledge.

[PMID: 22409179](#) [PubMed - in process]**14. J Pediatr Ophthalmol Strabismus. 2012 Mar 1;49(2):125. doi: 10.3928/01913913-20120301-14.****Botulinum toxin for the treatment of early-onset esotropia in children with cerebral palsy.**

Petrushkin H, Oyewole K, Jain S.

[PMID: 22420914](#) [PubMed - in process]**15. Acta Paediatr. 2012 Mar 8. doi: 10.1111/j.1651-2227.2012.02641.x. [Epub ahead of print]****Identification Of Feeding Risk Factors For Impaired Nutrition Status In Paediatric Patients With Cerebral Palsy.**

Karagiozoglou T, Daskalou E, Vargiami E, Zafeiriou D.

Clinical Nutrition Lab, Nutrition-Dietetics Dept, Alexander Technological Education Institute (A.T.E.I.) of Thessaloniki, Greece 1st Paediatric Dept, Aristotle University of Thessaloniki, Greece.

Aim: To assess the nutrition status of children with CP, applying WHO growth standards, to identify feeding risk factors and to evaluate their impact on CP children's growth. **Methods:** In 42 paediatric patients (mean age 8.00±4.00 years), anthropometry and food intake records were assessed. Z-scores were calculated using WHO Anthro software. Intake to requirements ratio (I/R) was calculated and patients were classified according to their feeding ability (PFA) in six groups. Overall diet quality was assessed using the Diet Quality Index International (DQI-I). **Results:** Based on WAZ, 15 patients (38.1%) were undernourished. No association was found between I/R ratio and BMI z-score, while PFA and DQI-I displayed a significant correlation to both (p<0.05). DQI-I was also correlated to macronutrient distribution (p<0.05). CP patients were undernourished in a considerable proportion. Malnutrition in CP patients is not associated to the intake of estimated energy requirements. Among the other feeding risk factors studied, PFA and DQI-I represented important parameters associated with malnutrition. **Conclusion:** WHO z-scores represent accurate parameters for the assessment of malnutrition in CP patients. Together with anthropometry and PFA evaluation, the use of the DQI-I, would add prognostic value to both the initial growth assessment, and the patients' growth monitoring

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16. Dev Med Child Neurol. 2012 Mar 14. doi: 10.1111/j.1469-8749.2012.04263.x. [Epub ahead of print]**Wallen et al. reply.**

Wallen M, Ziviani J, Naylor O, Evans R, Novak I, Herbert RD.

Occupational Therapy, The Children's Hospital at Westmead, Sydney, NSW. The University of Queensland, Brisbane, QLD. Children's Allied Health Research, Queensland Health, Brisbane, QLD. Princess Margaret Hospital, Subiaco, WA. Department of Rehabilitation, The Children's Hospital at Westmead, Sydney, NSW. Cerebral Palsy Alliance, University of Notre Dame, Sydney, NSW. Musculoskeletal Division, The George Institute for Global Health, Sydney, NSW, Australia.

[PMID: 22414070](#) [PubMed - as supplied by publisher]

17. J Thorac Cardiovasc Surg. 2012 Mar 9. [Epub ahead of print]**Risk factors for neurodevelopmental impairments in school-age children after cardiac surgery with full-flow cardiopulmonary bypass.**

von Rhein M, Dimitropoulos A, Valsangiacomo Buechel ER, Landolt MA, Latal B.

Child Development Center, Children's Hospital, Zurich, Switzerland; Department of Pediatric Neurology, University Children's Hospital, Mainz, Germany.

OBJECTIVE: To determine the risk factors for adverse neurodevelopmental outcomes in school-age children after full flow open-heart surgery for congenital heart disease. **METHODS:** The outcome was assessed in 117 children without a genetic comorbidity at a mean age of 10.4 ± 2.5 years. Intelligence was assessed using the Raven's Progressive Matrices and neuromotor function using the Zurich Neuromotor Assessment. Risk factors were retrieved from detailed chart review. **RESULTS:** The mean intelligence score was 89 ± 16 , significantly lower than the norm ($P < .001$). Cerebral palsy was diagnosed in 10% of patients. Poor neuromotor performance (less than p10) was present in 15% to 20% of the children, depending on the motor task (all $P < .001$). Pure motor and static balance performance was also significantly impaired when patients with cerebral palsy were excluded ($P < .01$). Intelligence was only related to socioeconomic status ($P = .006$), and neuromotor outcome was related to the length of hospital stay and postoperative neurologic abnormalities ($P < .03$). The extracorporeal circulation time was related to adaptive fine motor performance ($P = .05$). All other variables were not related to outcome. **CONCLUSIONS:** Children without a genetic comorbidity are at risk of long-term intellectual and motor impairments also after full-flow cardiac repair. Surgery-related parameters play a less important role for adverse outcomes than postoperative complications. Our findings stress the importance of specialized follow-up assessments for all children with CHD undergoing open heart surgery.

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Prevention and Cure

18. *Dev Med Child Neurol.* 2012 Mar 14. doi: 10.1111/j.1469-8749.2012.04259.x. [Epub ahead of print]

Active head lifting from supine in early infancy: an indicator for non-optimal cognitive outcome in late infancy.

VAN Haastert IC, Groenendaal F, VAN DE Waarsenburg MK, Eijssermans MJ, Koopman-Esseboom C, Jongmans MJ, Helden PJ, DE Vries LS.

Department of Neonatology, Wilhelmina Children's Hospital, University Medical Center Utrecht, Utrecht Faculty of Medicine, University Medical Centre Utrecht, Utrecht Child Development and Exercise Center, Division of Pediatrics, Wilhelmina Children's Hospital, University Medical Center Utrecht, Utrecht Faculty of Social Sciences, Department of Special Education, Utrecht University, Utrecht, the Netherlands.

Aim: To explore whether active head lifting from supine (AHLS) in early infancy is associated with cognitive outcome in the second year of life. **Method:** The presence of AHLS was always recorded in the notes of infants admitted to our tertiary neonatal intensive care unit. Random sampling was used to pair infants with AHLS with two comparison infants without AHLS whose sex, gestational age, birth year (1993-2009), time of assessment, and developmental test (Griffiths Mental Development Scales, Mental Scale of the Bayley Scales of Infant Development-II, or cognitive subtest of the Bayley Scales of Infant and Toddler Development-III) were comparable. Brain injury identified from neonatal cranial ultrasound scans was classified as no - mild or moderate - severe. Z-scores of cognitive test outcomes were calculated for multivariable analysis. **Results:** Eighty-seven preterm (34 males, 53 females) and 40 term (17 males, 23 females) infants with AHLS were identified. AHLS was documented at a mean (corrected) age of 7.0 (SD 1.7) and 8.1 (SD 2.2) months respectively. The cognitive assessments were performed at a mean corrected age of 15.7 (SD 1.7) and 23.9 (SD 1.6) months in preterm infants, and 19.1 (SD 2.3) months in term infants. The mean cognitive outcome of preterm and term infants with AHLS was lower than that of infants without AHLS ($p=0.002$ and $p=0.004$ respectively). This remained after excluding infants with cerebral palsy with matching comparison infants ($p=0.001$ in preterm and $p=0.001$ in term infants). The mean difference was highest (1.35SD) between term male infants and comparison infants ($p=0.001$). **Interpretation:** AHLS is associated with a less favourable cognitive outcome in the second year of life in preterm as well as in term-born infants than in comparison infants.

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19. *Dev Med Child Neurol.* 2012 Apr;54(4):383-4. doi: 10.1111/j.1469-8749.2012.04236.x.

Survival in children with severe cerebral palsy: a further international comparison.

Brooks JC, Shavelle RM, Strauss DJ.

Life Expectancy Project, San Francisco, CA, USA.

[PMID: 22404620](#) [PubMed - in process]

20. *J Pediatr Neurosci.* 2011 Jul;6(2):103-5.

Prevalence of neurological disorders in children less than 10 years of age in RS Pura town of Jammu and Kashmir.

Raina SK, Razdan S, Nanda R.

Department of Community Medicine, Dr. Rajendra Prasad Government Medical College, Kangra, Himachal

Pradesh, India.

OBJECTIVE: To determine the prevalence of major neurological disorders in children less than 10 years of age. **MATERIALS AND METHODS:** The study was conducted in the framework of a population based, single centre, cross-sectional study at Ranbir Singh Pura town, 22 km south-west of Jammu city. **RESULTS:** Eight cases of active epilepsy with a crude prevalence rate of 202 (95% confidence interval [CI] 180-220), five cases of Febrile seizures with a crude prevalence of 126 (95% CI 110-140) and eleven cases of cerebral palsy with a crude prevalence rate of 277 (95% CI 245-309) per 100,000 were found. Very few cases of other major neurological disorders were found. The prevalence rate of these disorders is estimated at same level as for other disorders such as - Post-meningitic sequelae, Infantile hemiparesis, Spinal deformity and Tic disorder is at 25 (95% CI 15-34) per 100,000. **INTERPRETATION:** On the basis of the data obtained, the present study provides some valuable data on common neurological diseases among children in RS Pura town of Jammu district of Jammu and Kashmir.

[PMID: 22408654](#) [PubMed - in process] [PMCID: PMC3296399](#)

21. *Pediatr Radiol.* 2012 Jan;42 Suppl 1:33-61. Epub 2012 Mar 6.

Neuroimaging biomarkers of preterm brain injury: toward developing the preterm connectome.

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For typically developing infants, the last trimester of fetal development extending into the first post-natal months is a period of rapid brain development. Infants who are born premature face significant risk of brain injury (e.g., intraventricular or germinal matrix hemorrhage and periventricular leukomalacia) from complications in the perinatal period and also potential long-term neurodevelopmental disabilities because these early injuries can interrupt normal brain maturation. Neuroimaging has played an important role in the diagnosis and management of the preterm infant. Both cranial US and conventional MRI techniques are useful in diagnostic and prognostic evaluation of preterm brain development and injury. Cranial US is highly sensitive for intraventricular hemorrhage (IVH) and provides prognostic information regarding cerebral palsy. Data are limited regarding the utility of MRI as a routine screening instrument for brain injury for all preterm infants. However, MRI might provide diagnostic or prognostic information regarding PVL and other types of preterm brain injury in the setting of specific clinical indications and risk factors. Further development of advanced MR techniques like volumetric MR imaging, diffusion tensor imaging, metabolic imaging (MR spectroscopy) and functional connectivity are necessary to provide additional insight into the molecular, cellular and systems processes that underlie brain development and outcome in the preterm infant. The adult concept of the "connectome" is also relevant in understanding brain networks that underlie the preterm brain. Knowledge of the preterm connectome will provide a framework for understanding preterm brain function and dysfunction, and potentially even a roadmap for brain plasticity. By combining conventional imaging techniques with more advanced techniques, neuroimaging findings will likely be used not only as diagnostic and prognostic tools, but also as biomarkers for long-term neurodevelopmental outcomes, instruments to assess the efficacy of neuroprotective agents and maneuvers in the NICU, and as screening instruments to appropriately select infants for longitudinal developmental interventions.

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