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Interventions and Management

1. Dev Med Child Neurol. 2016 Jul 16. doi: 10.1111/dmcn.13204. [Epub ahead of print]

The relation between mirror movements and non-use of the affected hand in children with unilateral cerebral palsy.

Zielinski IM, Green D, Rudisch J, Jongsma ML, Aarts PB, Steenberg B.

AIM: In children with unilateral cerebral palsy (CP), it is widely believed that mirror movements contribute to non-use of the affected hand despite preserved capacity, a phenomenon referred to as developmental disregard. We aimed to test whether mirror movements are related to developmental disregard, and to clarify the relation between mirror movements and bimanual function. **METHOD:** A repetitive squeezing task simultaneously measuring both hands' grip-forces was developed to assess mirror movements by using maximum cross-correlation coefficient (CCCmax) as well as strength measures (MMstrength). Developmental disregard, bimanual performance, and capacity were assessed using a validated video-observation method. Twenty-one children with unilateral CP participated (Median age 10y 7mo, interquartile range [IQR] 10y 1mo-12y 9mo). Outcome measures of mirror movements were correlated to developmental disregard, bimanual performance, and capacity scores using Spearman's correlations (significance level: $\alpha < 0.05$). **RESULTS:** Mirror movements were not related to developmental disregard. However, enhanced mirror movements in the less-affected hand were related to reduced performance (CCCmax : $\rho = -0.526$, $p = 0.007$; MMstrength : $\rho = -0.750$, $p < 0.001$) and capacity (CCCmax : $\rho = -0.410$, $p = 0.033$; MMstrength : $\rho = -0.679$, $p < 0.001$). These relations were only moderate (performance:MMstrength : $\rho = -0.504$, $p = 0.010$), low (capacity: MMstrength : $\rho = -0.470$, $p = 0.016$) or absent for mirror movements in the affected hand. Additionally, seven children showed stronger movements in their less-affected hands when actually being asked to move their affected hand. **INTERPRETATION:** These findings show no relation between mirror movements and developmental disregard, but support an association between mirror movements and bimanual function.

[PMID: 27421246](#)

2. Braz J Phys Ther. 2016 Mar 22;20(3):267-74. doi: 10.1590/bjpt-rbf.2014.0156.

The Sarah evaluation scale for children and adolescents with cerebral palsy: description and results.

Pinto KS, Carvalho CG, Nakamoto L, Nunes LG.

BACKGROUND: Assessments of motor-functional aspects in cerebral palsy are crucial to rehabilitation programs. **OBJECTIVE:** To introduce the Sarah motor-functional evaluation scale and to report the initial results of its measurement properties. This scale was created based on the experience of the Sarah Network of Rehabilitation Hospitals in the care of children and adolescents with cerebral palsy. **METHOD:** Preliminary results concerning the measurement properties of the scale were obtained via assessment of 76 children and adolescents with cerebral palsy. Experts' opinions were used to determine an expected empirical score by age group and to differentiate severity levels. **RESULTS:** The scale exhibited a high

Cronbach's alpha coefficient (0.95). Strong correlation was observed with experts' classification for severity levels (0.81 to 0.97) and with the scales Gross Motor Function Measure and Pediatric Evaluation of Disability Inventory (0.80 to 0.98). Regression analysis detected a significant relationship between the scale score and the severity of the child's motor impairment. The inter-rater reliability was also strong (intraclass correlation coefficient ranging from 0.98 to 0.99). The internal responsiveness of the scale score was confirmed by significant differences between longitudinal evaluations (paired Student's t test with $p < 0.01$; standardized response mean of 0.60). **CONCLUSION:** The Sarah scale provides a valid measure for assessing the motor skills and functional performance of children and adolescents with cerebral palsy. The preliminary results showed that the Sarah scale has potential for use in routine clinical practice and rehabilitation units.

[PMID: 27437718](#)

3. *Disabil Rehabil.* 2016 Jul 20;1-11. [Epub ahead of print]

Effects of hippotherapy on body functions, activities and participation in children with cerebral palsy based on ICF-CY assessments.

Hsieh YL, Yang CC, Sun SH, Chan SY, Wang TH, Luo HJ.

PURPOSE: To evaluate the effects of hippotherapy on body functions, activities, and participation in children with CP of various functional levels by using the International Classification of Functioning, Disability and Health-Children and Youth (ICF-CY) checklist. **METHODS:** Fourteen children with cerebral palsy (CP) (3-8 years of age) were recruited for a 36-week study composed of baseline, intervention, and withdrawal phases (12 weeks for each phase, ABA design). Hippotherapy was implemented for 30 min once weekly for 12 consecutive weeks during the intervention phase. Body Functions (b) and Activities and Participation (d) components of the ICF-CY checklist were used as outcome measures at the initial interview and at the end of each phase. **RESULTS:** Over the 12 weeks of hippotherapy, significant improvements in ICF-CY qualifiers were found in neuromusculoskeletal and movement-related functions (b7), mobility (d4) and major life areas (d8) and, in particular, mobility of joint functions (b710), muscle tone functions (b735), involuntary movement reaction functions (b755), involuntary movement functions (b765), and play (d811) (all $p < 0.05$) when compared with baseline. **CONCLUSION:** This study demonstrated the beneficial effects of hippotherapy on body functions, activities, and participation in children with CP. Implications for Rehabilitation ICF-CY provides a comprehensive overview of functioning and disability and constitutes a universal language for identifying the benefits of hippotherapy in areas of functioning and disability in children with CP. In children with CP, hippotherapy encourages a more complementary approach that extends beyond their impairments and limitations in body functions, activities, and participation. The effect of hippotherapy was distinct from GMFCS levels and the majority of improvements were present in children with GMFCS levels I-III.

[PMID: 27440177](#)

4. *J Neuroeng Rehabil.* 2016 Jul 16;13(1):64. doi: 10.1186/s12984-016-0170-5.

Neuro-musculoskeletal simulation of instrumented contracture and spasticity assessment in children with cerebral palsy.

van der Krogt MM, Bar-On L, Kindt T, Desloovere K, Harlaar J.

BACKGROUND: Increased resistance in muscles and joints is an important phenomenon in patients with cerebral palsy (CP), and is caused by a combination of neural (e.g. spasticity) and non-neural (e.g. contracture) components. The aim of this study was to simulate instrumented, clinical assessment of the hamstring muscles in CP using a conceptual model of contracture and spasticity, and to determine to what extent contracture can be explained by altered passive muscle stiffness, and spasticity by (purely) velocity-dependent stretch reflex. **METHODS:** Instrumented hamstrings spasticity assessment was performed on 11 children with CP and 9 typically developing children. In this test, the knee was passively stretched at slow and fast speed, and knee angle, applied forces and EMG were measured. A dedicated OpenSim model was created with motion and muscles around the knee only. Contracture was modeled by optimizing the passive muscle stiffness parameters of vasti and hamstrings, based on slow stretch data. Spasticity was modeled using a velocity-dependent feedback controller, with threshold values derived from experimental data and gain values optimized for individual subjects. Forward dynamic simulations were performed to predict muscle behavior during slow and fast passive stretches. **RESULTS:** Both slow and fast stretch data could be successfully simulated by including subject-specific levels of contracture and, for CP fast stretches, spasticity. The RMS errors of predicted knee motion in CP were $1.1 \pm 0.9^\circ$ for slow and $5.9 \pm 2.1^\circ$ for fast stretches. CP hamstrings were found to be stiffer compared with TD, and both hamstrings and vasti were more compliant than the original generic model, except for the

CP hamstrings. The purely velocity-dependent spasticity model could predict response during fast passive stretch in terms of predicted knee angle, muscle activity, and fiber length and velocity. Only sustained muscle activity, independent of velocity, was not predicted by our model. **CONCLUSION:** The presented individually tunable, conceptual model for contracture and spasticity could explain most of the hamstring muscle behavior during slow and fast passive stretch. Future research should attempt to apply the model to study the effects of spasticity and contracture during dynamic tasks such as gait.

[PMID: 27423898](#)

5. Dev Med Child Neurol. 2016 Jul 15. doi: 10.1111/dmcn.13205. [Epub ahead of print]

Prevalence of specific gait abnormalities in children with cerebral palsy revisited: influence of age, prior surgery, and Gross Motor Function Classification System level.

Rethlefsen SA, Blumstein G, Kay RM, Dorey F, Wren TA.

AIM: To examine the impact of age, surgery, and Gross Motor Function Classification System (GMFCS) level on the prevalence of gait problems in children with cerebral palsy (CP). **METHOD:** Gait analysis records were retrospectively reviewed for ambulatory patients with CP. Gait abnormalities were identified using physical exam and kinematic data. Relationships among age, sex, previous surgery, GMFCS level, and prevalence of gait abnormalities associated with crouch and out-toeing, and equinus and in-toeing were assessed using univariable and multivariable logistic regression. **RESULTS:** One-thousand and five records were reviewed. The most common gait problems were in-toeing, excessive knee flexion, stiff knee, hip flexion, internal rotation, adduction, and equinus (all >50%). Odds ratios (OR) for various gait problems associated with crouch and out-toeing increased (OR 1.07-1.32), and those associated with equinus and in-toeing decreased (OR 0.80-0.94) significantly with increasing age for patients in GMFCS levels I to III. The same trends were seen with prior surgery (OR for crouch and out-toeing: 1.86-7.14; OR for equinus and in-toeing: 0.16-0.59). **INTERPRETATION:** The prevalence of gait abnormalities varies by GMFCS level, but similarities exist among levels. The study results suggest that in younger children, particularly those in GMFCS levels III and IV, treatments for equinus and in-toeing should be undertaken with caution because these problems tend to decrease with age even without orthopedic intervention. Such children may end up with the 'opposite' deformities of calcaneal crouch and out-toeing, which tend to increase in prevalence with age.

[PMID: 27421715](#)

6. J Bone Joint Surg Am. 2016 Jul 20;98(14):1190-8. doi: 10.2106/JBJS.15.01063.

Effect of Hip Reconstructive Surgery on Health-Related Quality of Life of Non-Ambulatory Children with Cerebral Palsy.

DiFazio R, Shore B, Vessey JA, Miller PE, Snyder BD.

BACKGROUND: The primary aim of this study was to evaluate the relationship of the migration percentage (a radiographic metric quantifying hip displacement) in children with Gross Motor Function Classification System (GMFCS) level-IV or V cerebral palsy and spastic hip dysplasia to the acetabular index and the health-related quality of life (HRQOL) as measured with the Caregiver Priorities and Child Health Index of Life with Disabilities (CPCHILD) before and after reconstructive hip surgery. **METHODS:** In a prospective cohort study (n = 38), the migration percentage, acetabular index, and CPCHILD scores were analyzed using the Pearson correlation analysis immediately before reconstructive hip surgery and at 6 weeks and 3, 6, 12, and 24 months after the surgery. Subgroup analysis was used to compare patients who had a preoperative migration percentage of $\geq 50\%$ with those who had a preoperative migration percentage of $< 50\%$ and to compare the acetabular index between patients who had a pelvic osteotomy and those who had not. Linear mixed models were used to analyze changes in the migration percentage, acetabular index, and CPCHILD scores over time. **RESULTS:** The preoperative migration percentage negatively correlated with the preoperative CPCHILD score ($r = -0.50$; $p = 0.002$). This relationship continued throughout the follow-up period such that, for each additional 1% correction in migration percentage, the CPCHILD total score increased by 0.2 point ($p < 0.001$). There was no correlation between the acetabular index and CPCHILD total score before or after surgery ($p = 0.09$ to 0.71). The preoperative CPCHILD total scores differed between the migration-percentile groups (mean difference = 13 points; 95% confidence interval = 3.3 to 22.8; $p = 0.01$). However, after hip surgery, the CPCHILD score improved similarly for both groups. **CONCLUSIONS:** These data support the effectiveness of reconstructive hip surgery for the treatment of spastic hip dysplasia to improve the HRQOL of non-ambulatory children with severe cerebral palsy.

[PMID: 27440567](#)

7. Dev Med Child Neurol. 2016 Jul 20. doi: 10.1111/dmcn.13196. [Epub ahead of print]

Informing evidence-based clinical practice guidelines for children with cerebral palsy at risk of osteoporosis: an update.

Ozel S, Switzer L, Macintosh A, Fehlings D.

AIM: To investigate the impact of new evidence for weight-bearing, bisphosphonates, and vitamin D and calcium interventions, towards updating the systematic review and clinical practice guidelines for osteoporosis in children with cerebral palsy (CP) published in 2011. METHOD: Computer-assisted literature searches were conducted for articles published from 2010 to 2016. Searches focused on children with CP functioning at Gross Motor Function Classification System levels III to V and limited to weight-bearing activities, bisphosphonates, and vitamin D and/or calcium supplementation. Articles were classified according to the American Academy of Neurology guidelines to update the grading of the evidence for improving bone mineral density (BMD) and decreasing fragility fractures. RESULTS: Six new articles underwent full-text review and data abstraction. These included one weight-bearing, three bisphosphonate, and two mixed intervention studies (bisphosphonate and vitamin D/calcium supplementation). Overall, there continues to be 'probable' evidence for bisphosphonates, 'possible' evidence for vitamin D/calcium, and 'insufficient' evidence for weight-bearing activities as effective interventions to improve low BMD in children with CP. There is 'possible' evidence for bisphosphonates in reducing fragility fractures. INTERPRETATION: The grading of evidence to support the use of weight-bearing activities, bisphosphonates, and vitamin D and calcium supplementation in pediatric CP osteoporosis clinical practice guidelines remained the same.

[PMID: 27435427](#)

8. Disabil Rehabil Assist Technol. 2016 Jul 19:1-7. [Epub ahead of print]

Control devices for electrically powered wheelchairs: prevalence, defining characteristics and user perspectives.

Dolan MJ, Henderson GI.

PURPOSE: To determine the prevalence of control devices for electrically powered wheelchairs (EPWs), related characteristic features and users' views on their utility. METHOD: Postal survey of users of a regional NHS wheelchair service using a purpose-designed questionnaire (n = 262, ≥18 years old). RESULTS: Mean age 54.4 years, female 56.8%, mean duration EPW use 10.1 years, mean usage 6.7 days per week and 9.2 h per day. Largest diagnostic groups: Multiple Sclerosis 28.3%, Cerebral Palsy 13.8% and Spinal Cord Injury 11.7%. Control device types 94.6% hand joystick, 2.3% chin joystick, 2.7% switches and 0.4% foot control. 42.4% reported fatigue or tiredness and 38.8% pain or discomfort limited EPW use. 28.0% reported an accident or mishap. CONCLUSIONS: This is the first study of control devices on a large, general population of EPW users. The majority have control devices that meet their needs, with high levels of user satisfaction, though some might benefit from adjustments or modifications to their current provision and others might benefit by changing to a different type of control device. High proportions reported fatigue or tiredness and pain or discomfort limit their EPW use. The study provides indicators for prescribers and manufacturers of control devices for EPWs. Implications for Rehabilitation Most users have control devices that meet their needs, with high levels of satisfaction, but some would benefit from adjustments or modifications or a change of type. A high proportion reported fatigue or tiredness and pain or discomfort limit their use of their EPW and prescribers need to be mindful of these issues when determining the most suitable type of control device and where it should be positioned. The vast majority of users have a hand joystick as a control device with alternative control devices (such as chin joysticks and switches) being far less prevalent. Adverse incidents may arise due to difficulty with manoeuvring or accidental activation of the hand joystick that can lead to collisions and even entrapment.

[PMID: 27434381](#)

9. Acta Ophthalmol. 2016 Jul 16. doi: 10.1111/aos.13158. [Epub ahead of print]

Surgical responses and outcomes of bilateral lateral rectus recession in exotropia with cerebral palsy.

Ma DJ, Yang HK, Hwang JM.

PURPOSE: To determine surgical responses and outcomes of bilateral lateral rectus (BLR) recession in exotropes with cerebral palsy (CP) and to compare the results with exotropes without CP. METHODS: Forty-one exotropes with CP and 82 age- and type (intermittent or constant)-matched exotropes without CP who underwent BLR recession by one surgeon (J-M.H.) were

evaluated. Main outcome measures were surgical responses, factors affecting surgical response, success rates, cumulative probabilities of success and recurrence, and drifts of ocular alignment towards exodeviation after surgery (exodrift).

RESULTS: The surgical responses of BLR recession were not significantly different between both groups ($p = 0.136$). After a mean follow-up period of 2 years, success rates showed no significant difference between the two groups ($p = 1.000$). The cumulative probabilities of success and recurrence were not significantly different between the two groups ($p = 0.770$ and 0.754 , respectively). The rate of recurrence per person-year during follow-up was 16.7% in patients with CP and 20.2% in patients without CP. The amount of exodrift showed no significant difference between both groups ($p = 0.118$).

CONCLUSIONS: Exotropes with CP showed a similar surgical response, an amount of exodrift, cumulative success and recurrence rates after BLR recession compared to exotropes without CP.

[PMID: 27422358](#)

10. *Pediatr Phys Ther.* 2016 Jul 14. [Epub ahead of print]

Influence of External Visual Focus on Gait in Children With Bilateral Cerebral Palsy.

Bartonek A, Lidbeck CM, Gutierrez-Farewik EM.

PURPOSE: To explore whether focusing a target influenced gait in children with cerebral palsy (CP) and typical development (TD). **METHODS:** Thirty children with bilateral CP (Gross Motor Function Classification System [GMFCS] I-III) and 22 with TD looked at a light at walkway end (Gaze Target) while walking and returned (No Target). **RESULTS:** During Gaze versus No Target, children with TD reduced temporal-spatial parameters and movements in the sagittal (SPM) and transverse planes. In comparison, during Gaze Target, children in CP1 (GMFCS I) had larger trunk SPM, children in CP2 (GMFCS II) larger neck (SPM), and children in CP3 (GMFCS III) greater head and neck frontal plane movements, and reduced cadence and single support. **CONCLUSIONS:** Focusing a target altered gait in children with CP. Children in CP1 reduced movements similar to children with TD, children in CP2 behaved nearly unchanged, whereas children in CP3 reduced movements and temporal-spatial parameters, potentially as a consequence of lack of sensory information from lower limbs.

[PMID: 27428574](#)

11. *Can J Neurol Sci.* 2016 Jul 19:1-10. [Epub ahead of print]

Real-World, Long-Term Quality of Life Following Therapeutic OnabotulinumtoxinA Treatment.

Jog M, Wein T, Bhogal M, Dhani S, Miller R, Ismail F, Beauchamp R, Trentin G.

BACKGROUND: OnabotulinumtoxinA is an efficacious treatment option for patients with various conditions. Although studies have reported on the efficacy of onabotulinumtoxinA, quality of life (QoL) data are limited. This study evaluated QoL in patients treated with onabotulinumtoxinA across various therapeutic indications. **METHODS:** MDs on BOTOX Utility (MOBILITY) was a prospective, multicenter, observational Canadian study in patients initiating (naïve) or receiving ongoing (maintenance) onabotulinumtoxinA treatment. Health utility was the primary outcome measure and was obtained from the Short Form-12 Health Survey using the Short Form-6D at baseline, week 4 posttreatment, and up to five subsequent treatment visits. The safety cohort included patients who received ≥ 1 onabotulinumtoxinA treatment. **RESULTS:** The efficacy cohort included 1062 patients; the majority were Caucasian, female, and on maintenance onabotulinumtoxinA treatment. Adult focal spasticity ($n=398$), blepharospasm ($n=81$), cerebral palsy ($n=22$), cervical dystonia ($n=234$), hemifacial spasm ($n=116$), and hyperhidrosis ($n=211$) patients were included. Baseline health utility was generally higher in maintenance versus naïve patients; however, naïve patients showed the greatest improvements over time. Health utility was generally maintained or trended toward improvement across all cohorts, including maintenance patients who had been treated for up to 22 years before study entry. Eighteen of 1222 patients (2%) in the safety cohort reported 28 treatment-related adverse events; eight were serious in four patients. **CONCLUSION:** MOBILITY is the largest prospective study to date to provide QoL data over a variety of therapeutic indications following treatment with onabotulinumtoxinA. Although the QoL burden varies by disease, data suggest that long-term treatment may help improve or maintain QoL over time.

[PMID: 27430524](#)

12. Healthcare (Basel). 2016 Jul 16;4(3). pii: E46. doi: 10.3390/healthcare4030046.

Vocational Rehabilitation: Supporting Ill or Disabled Individuals in (to) Work: A UK Perspective.

Frank A.

Work is important for one's self-esteem, social standing and ability to participate in the community as well as for the material advantages it brings to individuals and their families. The evidence suggests that the benefits of employment outweigh the risks of work and are greater than the risks of long-term unemployment or sickness absence. Individuals may be born with physical or intellectual disadvantages (e.g., cerebral palsy), or they may be acquired during childhood or adult life. Some progressive conditions may present in childhood or adolescence (e.g., some muscular dystrophies) and these need to be distinguished from those presenting later in life (e.g., trauma, stroke). Vocational rehabilitation (VR) thus takes three forms: preparing those with a disability, health or mental health condition for the world of work, job retention for those in work and assisting those out of work into new work. Important components of VR consist of the attributes of the individual, the skills/knowledge of their health professionals, the knowledge and attitudes of actual or potential employers and the assistance that is provided by the state or other insurance facility. Charities are playing an increasing role.

[PMID: 27438864](#)

Prevention and Cure

13. Int J Stem Cells. 2016 May 30;9(1):90-5. doi: 10.15283/ijsc.2016.9.1.90.

Treatment of Cerebral Palsy with Stem Cells: A Report of 17 Cases.

Chahine NH, Wehbe TW, Hilal RA, Zoghbi VV, Melki AE, Habib EB.

Cerebral Palsy (CP) is a disabling condition that affects a child's life and his/her family irreversibly. It is usually a non-progressive condition but improvement over time is rarely seen. The condition can be due to prenatal hypoxia, metabolic, genetic, infectious, traumatic or other causes. It is therefore a heterogeneous group that results in functional motor disability associated with different degrees of cognitive abnormalities. There are no treatments that can cure or even improve CP and the best available approach aims at functional, social and nutritional supportive care and counseling. In this paper, we report 17 sequential patients with CP treated with intrathecal administration of Bone Marrow Mononuclear Cells (BMMC). All patients had an uneventful post-injection course with 73% of the evaluable patients treated having a good response using the Gross Motor Function Classification System (GMFCS). The average improvement was 1.3 levels on the GMFCS with cognitive improvements as well.

[PMID: 27426090](#)

14. Arch Pediatr. 2016 Jul 14. pii: S0929-693X(16)30286-X. doi: 10.1016/j.arcped.2016.06.004. [Epub ahead of print]

[Neurodevelopmental outcome at 3 years of age of infants born at less than 26 weeks].

[Article in French]

Delmas O, Garcia P, Bernard V, Fabre M, Vialet R, Boubred F, Fayol L.

OBJECTIVE: To describe the neurodevelopmental outcome and perinatal factors associated with favorable outcome among extremely preterm children at 3 years of age. **METHODS:** All infants born before 26 weeks of gestation between 2007 and 2011, admitted to intensive care units participating in a French regional network (western PACA-southern Corsica) were included. Perinatal data were collected to assess the main neonatal morbidities. At 3 years of age, the children's neurodevelopment was assessed by trained physicians participating in the follow-up network. Children were classified according to their disability: none, moderate, or severe. Using logistic regression, we determined the perinatal factors associated with the absence of disability at 3 years of age. **RESULTS:** One hundred and sixty-two very preterm newborns were admitted to neonatal intensive care units. At discharge the survival rate was 62% (101). Rates of survival increased with

gestational age (33% at 23 weeks, 57% at 24 weeks and 68% at 25 weeks). Among the 101 surviving extremely preterm children, 66 were evaluated at 3 years. The perinatal characteristics were not significantly different from those of the children lost to follow-up. Overall, 56% of extremely preterm children had no disability and 6% had severe disability. Cerebral palsy was diagnosed in 13% of children. At 3 years of age, the main perinatal factors associated with no disability were short duration of mechanical ventilation (OR=0.96 [0.93-0.99]; P=0.03) and complete course of prenatal corticosteroids (OR=4.7 [1.2-17.7]; P=0.02). CONCLUSION: As mortality rates continue to decrease for very preterm infants, concerns are rising about their long-term outcome. In this high-risk population, improving perinatal care remains a challenge to improve long-term outcome.

[PMID: 27424937](#)

15. BJOG. 2016 Jul 18. doi: 10.1111/1471-0528.14210. [Epub ahead of print]

Placental inflammation, neonatal death and cerebral palsy in preterm infants: is there a relationship?

Goldenberg RL, McClure EM.

[PMID: 27428550](#)

16. BJOG. 2016 Jul 18. doi: 10.1111/1471-0528.14177. [Epub ahead of print]

Association of severe placental inflammation with death prior to discharge and cerebral palsy in preterm infants.

Huetz N, Triau S, Leboucher B, Sentilhes L, Hanf M, Nguyen S, Flamant C, Roze JC, Gascoin G.

OBJECTIVE: The objective of our study was to identify placental patterns associated with death before discharge or cerebral palsy in a large cohort of preterm infants with a high follow-up rate at 2 years of corrected age. DESIGN: Population-based monocentric study. SETTINGS: Monocentric study in the maternity unit of the University Hospital of Angers, France between 24+0 and 33+6 weeks of gestation, between January 2008 and December 2011. POPULATION: All singleton infants born alive with a placental examination were eligible. METHODS: Clinical data (obstetric and neonatal) were collected prospectively through the LIFT cohort. Placental data were collected retrospectively from medical records. The main outcome measure was death before discharge or cerebral palsy. RESULTS: We did not find any significant association between severe inflammatory lesions on the placenta and death [odds ratio (OR) 1.49; 95% CI 0.55-4.01; P = 0.43] or cerebral palsy (OR 1.41; 95% CI 0.43-4.62; P = 0.57). This lack of significant association persisted even after adjustment (aOR 0.9; 95% CI 0.20-2.30; P = 0.54; aOR 0.98; 95% CI 0.27-3.58; P = 0.97). CONCLUSION: Our results do not provide evidence for a significant association between severe inflammatory placental lesions and either death before discharge or cerebral palsy at 2 years of corrected age in preterm infants born at <34 weeks of gestational age. Further studies remain necessary to confirm this result.

[PMID: 27428037](#)

17. Eur Rev Med Pharmacol Sci. 2016 Jul;20(13):2863-7.

aEEG monitoring analysis of lesion degree and long-term prognosis in newborns with HIE.

Liu JF, Wu HW, Li ZG, Lu GZ, Yang X.

OBJECTIVE: To conduct monitoring analysis of lesion degree and long-term prognosis using ambulatory electroencephalography (aEEG) in newborns with hypoxic-ischemic encephalopathy (HIE). PATIENTS AND METHODS: 48 cases of newborns with HIE (aged 37 to 41 weeks) as the observation group and another 50 cases of full-term infants with non-traumatic brain illness as the control group were chosen from March 2012 to March 2013. The aEEG were observed, and the continuity and sleep-wake cycle (SWC) between the two groups were compared. The relevance of aEEG monitoring results and HIE, as well as the long-term prognosis, were analyzed. RESULTS: 33.33% (16/48) of EEG results appeared to be continuous and 20.83% (10/48) of the SWC results were mature for observation group. These EEG and SWC results are conspicuously lower than the control group 100% (50/50) and differences were statistically significant (p<0.05). The maximum voltage of observation group was 56.54±19.33 LV, notably higher than the control group (37.77±2.79 LV). The minimum voltage of the observation group was 4.26±1.25 LV, markedly lower than the control group (7.75±0.67 LV) and these

differences were statistically significant ($p < 0.05$). Correlational analysis based on the Spearman approach showed that the monitoring results are positively correlated with clinical classification of HIE. After six months of follow-up, 11 of the 48 cases (22.92%) were found to be disabled (including mental retardation and cerebral palsy). CONCLUSIONS: aEEG enjoys easy operation, effective diagnosis, supports continuous monitoring and reflects the lesion degree as well as long-term prognosis of newborns with HIE and is, thus, highly recommended in clinical practices.

[PMID: 27424986](#)

18. Gynecol Obstet Fertil. 2016 Jul 14. pii: S1297-9589(16)30157-6. doi: 10.1016/j.gyobfe.2016.05.008. [Epub ahead of print]

[State of the use of magnesium sulfate for prevention of cerebral palsy in pre-term newborn in the Rouen's hospital].

[Article in French]

Millochau JC, Marret S, Oden S, Verspyck E.

OBJECTIVES: Although the benefit of magnesium sulfate to prevent cerebral palsy in antenatal on very preterm infants has been shown, there is still reluctance to use it. The aim of this study was to conduct an assessment of our practice using magnesium sulfate to prevent cerebral palsy at Rouen University Hospital to report its feasibility and safety in order to spread its use. METHODS: Unicentric and retrospective study, at the University Hospital of Rouen, between January and June 2014. All patients who delivered before 33 weeks or considered at risk of imminent delivery before 33 weeks were included (n=86). RESULTS: Among the patients who delivered before 33 weeks (n=82), a magnesium sulfate loading dose was administrated in 91.5% of cases. Treatment was mainly established and monitored by midwives (98.6%), usually in the delivery room (82.4%), and with an average duration of administration of 8.9 ± 17.5 hours. The treatment had to be stopped in a patient who presented bradypnea associated with impaired consciousness. CONCLUSION: Our study shows that magnesium sulfate can easily be prescribed in clinical practice.

[PMID: 27426688](#)

19. Med Image Anal. 2016 Jul 9;35:181-191. doi: 10.1016/j.media.2016.06.038. [Epub ahead of print]

Automatic segmentation approach to extracting neonatal cerebral ventricles from 3D ultrasound images.

Qiu W, Chen Y, Kishimoto J, de Ribaupierre S, Chiu B, Fenster A, Yuan J.

Preterm neonates with a very low birth weight of less than 1,500 g are at increased risk for developing intraventricular hemorrhage (IVH). Progressive ventricle dilatation of IVH patients may cause increased intracranial pressure, leading to neurological damage, such as neurodevelopmental delay and cerebral palsy. The technique of 3D ultrasound (US) imaging has been used to quantitatively monitor the ventricular volume in IVH neonates, which may elucidate the ambiguity surrounding the timing of interventions in these patients as 2D clinical US imaging relies on linear measurement and visual estimation of ventricular dilation from a series of 2D slices. To translate 3D US imaging into the clinical setting, a fully automated segmentation algorithm is necessary to extract the ventricular system from 3D neonatal brain US images. In this paper, an automatic segmentation approach is proposed to delineate lateral ventricles of preterm neonates from 3D US images. The proposed segmentation approach makes use of phase congruency map, multi-atlas initialization technique, atlas selection strategy, and a multiphase geodesic level-sets (MGLS) evolution combined with a spatial shape prior derived from multiple pre-segmented atlases. Experimental results using 30 IVH patient images show that the proposed GPU-implemented approach is accurate in terms of the Dice similarity coefficient (DSC), the mean absolute surface distance (MAD), and maximum absolute surface distance (MAXD). To the best of our knowledge, this paper reports the first study on automatic segmentation of the ventricular system of premature neonatal brains from 3D US images.

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