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**Professor Nadia Badawi AM**

Macquarie Group Foundation Chair of Cerebral Palsy

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## Interventions and Management

### 1. Quantifying selective elbow movements during an exergame in children with neurological disorders: a pilot study.

van Hedel HJ, Häfliger N, Gerber CN.

J Neuroeng Rehabil. 2016 Oct 21;13(1):93.

**BACKGROUND:** It is difficult to distinguish between restorative and compensatory mechanisms underlying (pediatric) neurorehabilitation, as objective measures assessing selective voluntary motor control (SVMC) are scarce. **METHODS:** We aimed to quantify SVMC of elbow movements in children with brain lesions. Children played an airplane game with the glove-based YouGrabber system. Participants were instructed to steer an airplane on a screen through a cloud-free path by correctly applying bilateral elbow flexion and extension movements. Game performance measures were (i) % time on the correct path and (ii) similarity between the ideal flight path and the actually flown path. SVMC was quantified by calculating a correlation coefficient between the derivative of the ideal path and elbow movements. A therapist scored whether the child had used compensatory movements. **RESULTS:** Thirty-three children with brain lesions (11 girls;  $12.6 \pm 3.6$  years) participated. Clinical motor and cognitive scores correlated moderately with SVMC (0.50-0.74). Receiver Operating Characteristics analyses showed that SVMC could differentiate well and better than clinical and game performance measures between compensatory and physiological movements. **CONCLUSIONS:** We conclude that a simple measure assessed while playing a game appears promising in quantifying SVMC. We propose how to improve the methodology, and how this approach can be easily extended to other joints.

[PMID: 27769301](#)

### 2. Dependence of Gait Deviation on Weight-Bearing Asymmetry and Postural Instability in Children with Unilateral Cerebral Palsy.

Domagalska-Szopa M, Szopa A, Czamara A.

PLoS One. 2016 Oct 27;11(10):e0165583. doi: 10.1371/journal.pone.0165583. eCollection 2016.

Postural control deficits have been suggested to be a major component of gait disorders in children with cerebral palsy. The purpose of this study was to investigate the relationship between postural stability and treadmill walking, in children with unilateral cerebral palsy, by defining dependence between the posturographic weight-bearing distribution and center of pressure (CoP) sway during quiet standing with Gillette Gait Index and the 16 distinct gait parameters that composed the Gillette Gait Index. Forty-five children with unilateral cerebral palsy from 7-12 years of age were included in this study. A posturographic procedure and 3-dimensional instrumented gait analysis was developed. In general, across the entire tested group, the significant correlations concerned only the asymmetry of the weight bearing and a few of the distinct gait parameters that compose the Gillette Gait Index; moreover, correlation coefficients were low. The division of subjects into two clinical subgroups: children that exhibited a tendency to overload (1) and to underload (2) the affected body side,

modified the results of the explored relationships. Our findings revealed that the difficulties experienced by children with hemiplegia while controlled in a standing position result from tendency to excessively or insufficiently load the affected lower limbs, and thus establishes a direct relationship with inadequate affected peak ankle DF in both stance and swing gait phases. Given the presented relationship between postural instability and deviation of the particular gait parameters in children with unilateral cerebral palsy, a follow-up study will be needed to determine the therapeutic approaches that will be most effective in promoting increased improvement in gait pattern, as well as the static and dynamic balance in standing.

[PMID: 27788247](#)

### **3. Proximal femur prosthetic interposition arthroplasty for painful dislocated hips in children with cerebral palsy.**

Silverio AL, Nguyen SV, Schlechter JA, Rosenfeld SR.

J Child Orthop. 2016 Oct 27. [Epub ahead of print]

**PURPOSE:** Children with cerebral palsy often have musculoskeletal disorders involving the hip. There are several procedures that are commonly used to treat these disorders. Proximal femur prosthetic interposition arthroplasty (PFIA) is an option for non-ambulatory children with cerebral palsy who have a painful, spastic dislocated hip. The purpose of our study was to evaluate the results of PFIA by examining treatment outcomes, complications, and overall effects on the child and their caregiver. **METHODS:** Charts were reviewed over a 5-year period at our institution. The focus of the data collection was pain, range of motion (ROM), and overall clinical outcome. Clinical outcome was graded as excellent, good, fair, and poor. Length of follow-up, presence of heterotopic ossification, femoral prosthesis migration, and information provided by completed caregiver questionnaires were analyzed. **RESULTS:** A total of 16 hips in 12 patients met the inclusion criteria. Average age at time of surgery was 12 years 1.2 months. Average follow-up was 40.4 months. Three hips required revision surgery. Average time before revision surgery was 16 months. Overall outcomes were excellent/good for seven hips and fair/poor for nine. Pain outcomes were excellent/good for nine hips and fair/good for seven. ROM outcomes were excellent/good for nine hips and fair/poor for seven. The majority of caregivers surveyed would recommend this procedure. **CONCLUSION:** Clinical evaluation of the effectiveness of PFIA yielded variable results with this cohort of children with regards to pain and range of motion. Despite these varied results, the majority of caregivers were satisfied with the outcome and would recommend PFIA. PFIA is a salvage option for the painful, spastic dislocated hip, but significant evidence to prove its effectiveness over other salvage procedures is lacking. Based on our results, we conclude that PFIA has the ability to benefit children with cerebral palsy with an acceptable risk profile similar to that reported in recent publications. Level of evidence IV; retrospective case-series.

[PMID: 27787761](#)

### **4. Tibial Rotation Osteotomies in a Matched Cohort of Myelodysplasia and Cerebral Palsy Children.**

Stasikelis PJ, Creek AT, Wack LI.

J Pediatr Orthop. 2016 Oct 21. [Epub ahead of print]

**BACKGROUND:** The purpose of this study is to examine the frequency of complications in children with myelodysplasia (MD) undergoing tibial rotational osteotomies with a matched cohort of children with cerebral palsy (CP). It was postulated that because of the unique health issues facing children with MD more complications would be observed. **METHODS:** A retrospective chart review was performed to identify children with MD who underwent primary tibial rotational osteotomy between 1997 and 2012 and had a minimum 2-year follow-up. The 15 children thus identified were matched for age, body mass index, and functional ability with 15 children with CP. Outcome measures were complications that occurred within a year of osteotomy or hardware removal. Major complications were defined as nonunions or malunions, hardware failures, deep infections, fractures, and stage III or IV decubiti. Recurrence of rotational deformity requiring revision osteotomy at any time was also defined as a major complication. Minor wound problems healing within 6 weeks with only local care were considered minor complications. **RESULTS:** Fifteen children with MD, who underwent 21 tibial derotational osteotomies, were available for review with a mean 7-year follow-up. The 15 children with CP underwent 22 tibial derotational osteotomies with a mean of 6 years of follow-up. In each cohort there were 3 children classified as GMFCS I, 3 children as GMFCS II, 4 children as GMFCS III, and 5 as GMFCS IV. Three (20%) of the children with MD experienced major complications (1 infected nonunion and 2 children who experienced bilateral malunions requiring revisions). One child with a major complication was classified as GMFCS II and the other 2 as GMFCS IV. None of the children with CP experienced a major complication. **CONCLUSIONS:**

The majority of children in both groups experienced good results, but children with MD have more frequent major complications. More frequent complications were seen in children with less functional ability.

[PMID: 27776050](#)

### **5. Gastrocnemius muscle-tendon interaction during walking in typically-developing adults and children, and in children with spastic cerebral palsy.**

Kalsi G, Fry NR, Shortland AP.

J Biomech. 2016 Oct 3;49(14):3194-3199. doi: 10.1016/j.jbiomech.2016.07.038. Epub 2016 Aug 8.

**BACKGROUND:** Our understanding of the interaction of muscle bellies and their tendons in individuals with muscle pathology is limited. Knowledge of these interactions may inform us of the effects of musculoskeletal pathologies on muscle-tendon dynamics and the subsequent neurological control strategies used in gait. Here, we investigate gastrocnemius muscle-tendon interaction in typically-developing (TD) adults and children, and in children with spastic cerebral palsy (SCP). **METHODS:** We recruited six TD adults (4 female; mean age: 34 yrs. (24-54)), eight TD children (5 female; mean age: 10 yrs. (6-12)) and eight independently ambulant children with SCP (5 female; mean age 9 yrs. (6-12); 3 unilaterally-affected). A combination of 3D motion capture and 2D real-time ultrasound imaging were used to compute the gastrocnemius musculotendinous unit (MTU) length and estimate muscle belly and tendon lengths during walking. For the TD subjects, the measurements were made for heel-toe walking and voluntary toe-walking. **RESULTS:** The gastrocnemius muscle bellies of children with SCP lengthened during single support ( $p = 0.003$ ). In contrast, the muscle bellies of TD subjects did not demonstrate an increase in length over the period of single support under heel-toe or toe-walking conditions. **CONCLUSION:** We observed lengthening of the gastrocnemius muscle bellies in children with SCP during single support, a phase of the gait cycle in which the muscle is reported consistently to be active. Repeated lengthening of muscle bellies while they are active may lead to muscle damage and have implications for the natural history of gait in this group.

[PMID: 27545082](#)

### **6. Gross motor function in children with spastic Cerebral Palsy and Cerebral Visual Impairment: A comparison between outcomes of the original and the Cerebral Visual Impairment adapted Gross Motor Function Measure-88 (GMFM-88-CVI).**

Salavati M, Rameckers EA, Waninge A, Krijnen WP, Steenberg B, van der Schans CP.

Res Dev Disabil. 2016 Oct 19. pii: S0891-4222(16)30227-X. doi: 10.1016/j.ridd.2016.10.007. [Epub ahead of print]

**PURPOSE:** To investigate whether the adapted version of the Gross Motor Function Measure-88 (GMFM-88) for children with Cerebral Palsy (CP) and Cerebral Visual Impairment (CVI) results in higher scores. This is most likely to be a reflection of their gross motor function, however it may be the result of a better comprehension of the instruction of the adapted version. **METHOD:** The scores of the original and adapted GMFM-88 were compared in the same group of children ( $n=21$  boys and  $n=16$  girls), mean (SD) age 113 (30) months with CP and CVI, within a time span of two weeks. A paediatric physical therapist familiar with the child assessed both tests in random order. The GMFCS level, mental development and age at testing were also collected. The Wilcoxon signed-rank test was used to compare two different measurements (the original and adapted GMFM-88) on a single sample, (the same child with CP and CVI;  $p<0.05$ ). **RESULTS:** The comparison between scores on the original and adapted GMFM-88 in all children with CP and CVI showed a positive difference in percentage score on at least one of the five dimensions and positive percentage scores for the two versions differed on all five dimensions for fourteen children. For six children a difference was seen in four dimensions and in 10 children difference was present in three dimensions (GMFM dimension A, B & C or C, D & E) ( $p<0.001$ ). **CONCLUSION:** The adapted GMFM-88 provides a better estimate of gross motor function per se in children with CP and CVI that is not adversely impacted by their visual problems. On the basis of these findings, we recommend using the adapted GMFM-88 to measure gross motor functioning in children with CP and CVI.

[PMID: 27771178](#)

### **7. Kinematic gait parameters are highly sensitive measures of motor deficits and spinal cord injury in mice subjected to experimental autoimmune encephalomyelitis.**

Fiander MD, Stifani N, Nichols M, Akay T, Robertson GS.

Behav Brain Res. 2016 Sep 14;317:95-108. doi: 10.1016/j.bbr.2016.09.034. [Epub ahead of print]

The preclinical selection of therapeutic candidates for progressive multiple sclerosis (MS) would be aided by the development of sensitive behavioural measures that accurately reflect the impact of autoimmune-mediated spinal cord damage on locomotion. Neurological deficits in mice subjected to experimental autoimmune encephalomyelitis (EAE) are typically scored using a clinical scale with 5-10 levels of increased disease severity. This ordinal scale represents a general impression of paralysis and impaired gait. By contrast, kinematic gait analyses generate ratio level data that have frequently been used to characterize walking deficits for MS patients and test the efficacy of treatments designed to improve them. Despite these advantages, kinematic gait analyses have not been systematically applied to the study of walking deficits for EAE mice. We have therefore used high speed video recordings (250 frames/s) of EAE mice walking on a treadmill to measure 8 kinematic parameters in the sagittal plane: average hip height (1), average toe height during swing (2), and average angle and range of motion for the hip (3-4), knee (5-6) and ankle (7-8). Kinematic measures of hip, knee and ankle movements were found to be early detectors of impaired locomotion for mice with mild EAE (median clinical score=1.0 at day post-immunization 26; DPI 26). These deficits occurred in the absence of reduced rotarod performance with impaired hip and knee movements observed 3 days before disease onset as determined by clinical scores. Gait deficits for mild EAE mice were minor and often recovered fully by DPI 30. By contrast, severe EAE mice (median clinical score=2.5 at DPI 26) displayed much larger movement impairments for the knee and ankle that failed to completely recover by DPI 44. Moreover, impaired ankle movement was highly correlated with white matter loss in the spinal cords of EAE mice ( $r=0.96$ ). Kinematic analyses therefore yield highly sensitive measures of motor deficits that predict spinal cord injury in EAE mice. These behavioural techniques should assist the selection of promising therapeutic candidates for clinical testing in progressive MS.

[PMID: 27639322](#)

### **8. Inflammatory markers in saliva as indicators of gingival inflammation in cerebral palsy children with and without cervical motor control.**

Santos MT, Diniz MB, Guaré RO, Ferreira MC, Gutierrez GM, Gorjão R.

Int J Paediatr Dent. 2016 Oct 26. doi: 10.1111/ipd.12270. [Epub ahead of print]

**AIM:** To evaluate the relation among gingival inflammation, salivary osmolality, levels of IL-1 $\beta$ , IL-6, IL-8, TNF- $\alpha$ , and s-IgA concentrations in children with spastic CP with or without cervical motor control in a cross-sectional study. **DESIGN:** Unstimulated whole saliva and the gingival index were collected in 37 and 34 CP children with and without cervical motor control, respectively. The data were dichotomized as follows: (=0) absence of gingival inflammation and ( $\geq 0.1$ ) presence of gingival inflammation. **RESULTS:** The group without cervical control presented statistically higher mean values of salivary osmolality, s-IgA, and cytokines. In addition, statistically positive correlation between the gingival index and salivary cytokines was observed in the group with cervical control. Salivary osmolality, salivary cytokines, and s-IgA from both groups presented a significant positive correlation. Significant differences ( $P = 0.00336$ ) in the values of salivary osmolality were observed between the CP individuals with ( $93.9 \pm 32.7$ ) and without gingival inflammation ( $74.4 \pm 16.6$ ). ROC analysis was performed, and values of salivary osmolality  $>80$  indicated a sensitivity of 0.54 and a specificity of 0.79. **CONCLUSIONS:** Children without cervical motor control presented a more pronounced oral inflammatory status that was characterized by higher levels of cytokines.

[PMID: 27785840](#)

### **9. Cerebral Palsy: how the child's age and severity of impairment affect the mother's stress and coping strategies. [Article in English, Portuguese]**

Ribeiro MF, Vandenberghe L, Prudente CO, Vila VD, Porto CC.

Cien Saude Colet. 2016 Oct;21(10):3203-3212. doi: 10.1590/1413-812320152110.17352016.

The aim of the study was to comprehend how the age group and the severity of the motor impairment of children with cerebral palsy modify the mothers' experiences of stress and to understand the coping strategies they use. A qualitative approach was used, with the method framed on Grounded Theory Analysis. Nineteen mothers of children and adolescents with different

degrees of motor impairment participated in individual semi-structured interviews. A lack of support and increased time and effort invested in parenting, at the cost of other areas of life threaten participants' physical and emotional health. Mothers of children with mild impairment suffer more from the challenge of dealing with their children's emotional problems, aggression and learning difficulties. For mothers whose children have severe impairment, the major difficulties relate to coping with health complications and functional limitations. Mothers of younger children report diverse sources of stress and scarcity of resources; while mothers of adolescents have greater experience and are able to take up their life projects again. Experience, knowledge and support received are critical for adaptation.

[PMID: 27783793](#)

#### **10. Co-sleeping in school-aged children with a motor disability: a comparative population-based study.**

Jacquier D, Newman CJ.

Dev Med Child Neurol. 2016 Oct 25. doi: 10.1111/dmcn.13300. [Epub ahead of print]

**AIM:** To determine the prevalence and determinants of co-sleeping in school-aged children with a motor disability compared with the school-aged general population. **METHOD:** A questionnaire on demographic characteristics and co-sleeping habits, along with the Sleep Disturbance Scale for Children (SDSC), was sent to parents of children aged between 4 years and 18 years followed in our tertiary paediatric neurorehabilitation clinic, and to school-aged children in a representative sample of state schools. **RESULT:** We analysed responses for 245 children with motor disability (142 males, 103 females; mean age 10y 6mo, standard deviation [SD] 3y 10mo, range 4-18y) and 2891 of the general population (1484 males, 1497 females; mean age [SD] 9y 6mo [3y 5mo], range 4-18y) (response rates 37% and 26% respectively). Cerebral palsy was the most common diagnosis among children with motor disability. Weekly co-sleeping was significantly more common in children with motor disability than in the general population (11.8% vs 7.9% respectively,  $p=0.032$ ). Special care of the child with motor disability at night, mainly addressing epilepsy, was reported as a cause of co-sleeping by two-thirds of parents. Factors associated with co-sleeping in the motor disability group were age, housing crowding, severe visual impairment, and pathological sleep according to the SDSC. **INTERPRETATION:** Co-sleeping is common among children with motor disability. It is influenced by personal and medical factors, as well as the requirements for special care at night. Therefore, health professionals should explore sleeping arrangements in families of children with motor disability.

[PMID: 27779314](#)

#### **11. Is a family-centred initiative a family-centred service? A case of a Conductive Education setting for children with cerebral palsy.**

Schenker R, Parush S, Rosenbaum P, Rigbi A, Yochman A.

Child Care Health Dev. 2016 Nov;42(6):909-917. doi: 10.1111/cch.12354. Epub 2016 Jun 9.

**BACKGROUND:** From the moment a child is diagnosed as having cerebral palsy, families have to cope on a daily basis with the multifaceted challenges of life-long disability management. Family-centred service is embraced as a 'best practice' model because of accumulating evidence supporting its positive influence on parents and children's outcomes. Nevertheless, research comparing parent and provider perspectives on family-centred practices of educational service providers in education settings is scarce. The aims of this study were to compare the extent to which parents and conductors experience the service delivery in Tsad Kadima, the Association for Conductive Education in Israel, as being family-centred, as well as comparing parents' perception of different educational settings as being family-centred. **METHODS:** Measurements of family-centeredness, the Israeli Measure of Processes of Care for families (MPOC-20) and for service providers (MPOC-SP), were administered to 38 teacher conductors and 83 families of children with cerebral palsy (aged 1-14), from different conductive educational settings. **RESULTS:** Parents and conductors perceive Conductive Education service as being highly family centred in most domains, rating respectful and supportive care the highest and providing general information the lowest, thus indicating an area where improvements should be made. Parents perceived the service they receive to be more family-centred than conductor's perception about their own activities. In addition, educational setting (day care, pre-school and school) was found to be associated with parent's scores. **CONCLUSIONS:** The current study, which is the first to examine family-centred service provision in a conductive special education setting, from the perspectives of both parents and conductors, provides significant evidence for high-quality services in these settings.

[PMID: 27283848](#)

## Prevention and Cure

### 12. Accelerated generation of oligodendrocyte progenitor cells from human induced pluripotent stem cells by forced expression of Sox10 and Olig2.

Li P, Li M, Tang X, Wang S, Zhang YA, Chen Z.

Sci China Life Sci. 2016 Oct 25. [Epub ahead of print]

Oligodendrocyte progenitor cells (OPCs) hold great promise for treatment of dysmyelinating disorders, such as multiple sclerosis and cerebral palsy. Recent studies on generation of human OPCs mainly use human embryonic stem cells (hESCs) or neural stem cells (NSCs) as starter cell sources for the differentiation process. However, NSCs are restricted in availability and the present method for generation of oligodendrocytes (OLs) from ESCs often requires a lengthy period of time. Here, we demonstrated a protocol to efficiently derive OPCs from human induced pluripotent stem cells (hiPSCs) by forced expression of two transcription factors (2TFs), Sox10 and Olig2. With this method, PDGFR $\alpha$ <sup>+</sup> OPCs can be obtained in 14 days and O4<sup>+</sup> OPCs in 56 days. Furthermore, OPCs may be able to differentiate to mature OLs that could ensheath axons when co-cultured with rat cortical neurons. The results have implications in the development of autologous cell therapies.

[PMID: 27785726](#)

### 13. Age-Specific Dynamics of Corpus Callosum Development in Children and its Peculiarities in Infantile Cerebral Palsy.

Krasnoshchekova EI, Zykin PA, Tkachenko LA, Aleksandrov TA, Sereda VM, Yalfimov AN.

Bull Exp Biol Med. 2016 Oct 25. [Epub ahead of print]

The age dynamics of corpus callosum development was studied on magnetic resonance images of the brain in children aged 2-11 years without neurological abnormalities and with infantile cerebral palsy. The areas of the total corpus callosum and its segments are compared in the midsagittal images. Analysis is carried out with the use of an original formula: proportion of areas of the anterior (genu, CC2; and anterior part, CC3) and posterior (isthmus, CC6 and splenium, CC7) segments:  $k_{CC} = (CC2+CC3) \times CC6/CC7$ . The results characterize age-specific dynamics of the corpus callosum development and can be used for differentiation, with high confidence, of the brain of children without neurological abnormalities from the brain patients with infantile cerebral palsy.

[PMID: 27783284](#)

### 14. [Prevention of preterm birth complications by antenatal corticosteroid administration].

[Article in French]

Schmitz T.

J Gynecol Obstet Biol Reprod (Paris). 2016 Oct 21. pii: S0368-2315(16)30109-0. doi: 10.1016/j.jgyn.2016.09.008. [Epub ahead of print]

**OBJECTIVE:** To evaluate short- and long-term benefits and risks associated with antenatal administration of a single course of corticosteroids and the related strategies: multiple and rescue courses. **METHODS:** The PubMed database, the Cochrane Library and the recommendations from the French and foreign obstetrical societies or colleges have been consulted. **RESULTS:** Antenatal administration of a single course of corticosteroids before 34 weeks of gestation is associated in the neonatal period with a significant reduction of respiratory distress syndrome (RDS), intraventricular hemorrhage (IVH), necrotizing enterocolitis (NEC) and death (LE1), and in possibly childhood with a reduction of cerebral palsy and increased psychomotor development index and intact survival (LE3). However, this treatment is associated with alterations of the HPA axis response persisting until 8 weeks after birth (LE2) and possibly with insulin resistance in adulthood (LE3). Antenatal corticosteroid administration after 34 weeks is associated, with high number needed to treat, with reduced respiratory morbidity (LE2), with no significant effect on neurological (LE2) or digestive (LE2) morbidities. Because of a very favourable benefit/risk balance, antenatal administration of a single course of corticosteroids is recommended for women at risk of preterm delivery before 34 weeks (grade A). The minimum gestational age for treatment will depend on the threshold chosen to start

neonatal intensive care in maternity units and perinatal networks (Professional consensus). After 34 weeks, evidences are not consistent enough to recommend systematic antenatal corticosteroid treatment (grade B), however, a course might be indicated in the clinical situations associated with the higher risk of "severe" RDS, mainly in case of planned cesarean delivery (gradeC). In case of imminent preterm birth, pre-empting the second betamethasone injection is not recommended (gradeC), because this policy might be associated with increased rates of NEC (LE3). Repeated antenatal corticosteroid administration is associated in the neonatal period with respiratory benefits (LE1) but decreased birth weight (LE1) and, in childhood, with possible neurological impairment (LE2). Therefore, this strategy is not recommended (grade A). Rescue courses are only associated with neonatal respiratory benefits (LE2). Because of the possible adverse effects associated with this strategy when delivery occurs during the 24hours following the first injection and because of the doubts raised by repeated courses, rescue courses are not recommended (Professional consensus). It is not possible to recommend one corticosteroid (betamethasone or dexamethasone) over another (Professional consensus). In case of contraindication for the intramuscular (IM) route, the intravenous route might be proposed (Professional consensus). The oral route is not recommended (grade A) because of increased rates of IVH and neonatal sepsis in comparison with the IM route (LE1). Either betamethasone as 2 injections of 12mg 24hours apart or dexamethasone as 4 injections of 6mg 12hours apart is recommended (grade A). Antenatal corticosteroid-induced alterations of fetal heart rate and movements should be recognized by the care providers of women at risk of preterm birth to avoid unjustified decision of labor induction or cesarean (Professional consensus). Gestational diabetes and pre-existing diabetes are not contraindication to antenatal corticosteroid therapy (Professional consensus). However, caution should be exercised in women with poorly controlled type 1 diabetes (Professional consensus). The apprehension to provoke maternal or neonatal infection should not delay antenatal corticosteroid administration even in case of preterm premature rupture of membranes (grade A). CONCLUSION: Antenatal corticosteroid administration is recommended to every woman at risk of preterm delivery before 34 weeks of gestation (grade A). Repeated courses of antenatal corticosteroids are not recommended (grade A). Rescue courses are not recommended (Professional consensus).

[PMID: 27776846](#)

### **15. Corticospinal Excitability in Children with Congenital Hemiparesis.**

Chen CY, Rich TL, Cassidy JM, Gillick BT.

Brain Sci. 2016 Oct 20;6(4). pii: E49.

Transcranial magnetic stimulation (TMS) can be used as an assessment or intervention to evaluate or influence brain activity in children with hemiparetic cerebral palsy (CP) commonly caused by perinatal stroke. This communication report analyzed data from two clinical trials using TMS to assess corticospinal excitability in children and young adults with hemiparetic CP. The results of this communication revealed a higher probability of finding a motor evoked potential (MEP) on the non-lesioned hemisphere compared to the lesioned hemisphere ( $p = 0.005$ ). The resting motor threshold (RMT) was lower on the non-lesioned hemisphere than the lesioned hemisphere ( $p = 0.013$ ). There was a significantly negative correlation between age and RMT ( $r_s = -0.65$ ,  $p = 0.003$ ). This communication provides information regarding MEP responses, motor thresholds (MTs) and the association with age during TMS assessment in children with hemiparetic CP. Such findings contribute to the development of future pediatric studies in neuroplasticity and neuromodulation to influence motor function and recovery after perinatal stroke.

[PMID: 27775599](#)

### **16. EphrinB3 restricts endogenous neural stem cell migration after traumatic brain injury.**

Dixon KJ, Mier J, Gajavelli S, Turbic A, Bullock R, Turnley AM, Liebl DJ.

Stem Cell Res. 2016 Sep 28;17(3):504-513. doi: 10.1016/j.scr.2016.09.029. [Epub ahead of print]

Traumatic brain injury (TBI) leads to a series of pathological events that can have profound influences on motor, sensory and cognitive functions. Conversely, TBI can also stimulate neural stem/progenitor cell proliferation leading to increased numbers of neuroblasts migrating outside their restrictive neurogenic zone to areas of damage in support of tissue integrity. Unfortunately, the factors that regulate migration are poorly understood. Here, we examine whether ephrinB3 functions to restrict neuroblasts from migrating outside the subventricular zone (SVZ) and rostral migratory stream (RMS). We have previously shown that ephrinB3 is expressed in tissues surrounding these regions, including the overlying corpus callosum (CC), and is reduced after controlled cortical impact (CCI) injury. Our current study takes advantage of ephrinB3 knockout mice to examine the influences of ephrinB3 on neuroblast migration into CC and cortex tissues after CCI injury. Both injury

and/or ephrinB3 deficiency led to increased neuroblast numbers and enhanced migration outside the SVZ/RMS zones. Application of soluble ephrinB3-Fc molecules reduced neuroblast migration into the CC after injury and limited neuroblast chain migration in cultured SVZ explants. Our findings suggest that ephrinB3 expression in tissues surrounding neurogenic regions functions to restrict neuroblast migration outside the RMS by limiting chain migration.

[PMID: 27771498](#)

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

Goldenberg RL, McClure EM.

BJOG. 2016 Nov;123(12):1964. doi: 10.1111/1471-0528.14210. Epub 2016 Jul 18.

[No abstract available]

[PMID: 27428550](#)

### **18. 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.

BJOG. 2016 Nov;123(12):1956-1963. doi: 10.1111/1471-0528.14177. Epub 2016 Jul 18.

**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](#)