

Monday 11 December 2017

**Cerebral Palsy Alliance** is delighted to bring you this free weekly bulletin of the latest published research into cerebral palsy. Our organisation is committed to supporting cerebral palsy research worldwide - through information, education, collaboration and funding. Find out more at [research.cerebralpalsy.org.au](http://research.cerebralpalsy.org.au)

**Professor Nadia Badawi AM**

Macquarie Group Foundation Chair of Cerebral Palsy

[Subscribe to CP Research News](#)

*Please note: This research bulletin represents only the search results for cerebral palsy and related neurological research as provided by the PubCrawler service. The articles listed below do not represent the views of Cerebral Palsy Alliance.*

## Interventions and Management

### 1. The Effect of Kinesio Taping on Handgrip and Active Range of Motion of Hand in Children with Cerebral Palsy.

Allah RASTII Z, Shamsoddini A, Dalvand H, Labaf S.

Iran J Child Neurol. 2017 Fall;11(4):43-51.

**OBJECTIVE:** Kinesio taping is a relatively new technique, which uses in rehabilitation of neurologic diseases. The aim of this study was to investigate the effects of Kinesio taping on hand grip and active range of motion of hand in children with cerebral palsy (CP). **MATERIALS AND METHODS:** In this experimental study with pre-test and three post-tests, 32 children with CP randomly were placed in experimental (n=17) and control group (n=15). Kinesio taping was applied on dorsum of forearm and hand. Evaluation was performed initially, two days after taping and two days after tape removal. Goniometer was used to evaluate active range of motion of wrist extension. In addition, vigorimeter was used to evaluate of grip strength. **RESULTS:** In pre-test, there was no difference between groups but in post-tests; initially after application of taping with  $P<0.05$ , two days after application of taping with  $P<0.05$  and follow-up (two days after removed taping) with  $P<0.05$  were significant differences between trial and control group. **CONCLUSION:** Kinesio taping in neurorehabilitation of children with CP can be a useful option to promote power or grip strength and active range of motion of wrist and thumb.

[PMID: 29201123](#)

### 2. Flexion Deformities of the Wrist and Fingers in Spastic Cerebral Palsy: A Protocol of Management.

Abdelaziz TH, Elbeshry SS, Mahran M, Aly AS.

Indian J Orthop. 2017 Nov-Dec;51(6):704-708. doi: 10.4103/ortho.IJOrtho\_160\_16.

**BACKGROUND:** Literature is confusing regarding grading and treatment of flexion deformities of wrist and fingers in spastic cerebral palsy (CP). The most established classification is that described by Zancolli; unfortunately, it has its shortcomings which we experienced in the beginning of our approach to manage this rather difficult deformity. We thus modified Zancolli's classification and developed a classification system and treatment protocol. **MATERIALS AND METHODS:** Thirty patients with spastic CP were operated upon due to flexion deformity of the wrist and fingers and were included in this study. Age ranged from 4 to 14 years, average 7 years. There were twenty boys and ten girls. **RESULTS:** The average followup was 18 months (range 9 months - 3 years). The power of wrist dorsiflexion, the "House's classification of upper extremity functional use" and the clinical assessment of hand function were used for evaluation; they improved in all patients and this improvement was statistically significant. In all patients, cosmetic appearance improved without any residual flexion deformity. **CONCLUSION:** This study introduces a new grading system for flexion deformity of wrist and fingers in spastic CP that correlates with severity of the condition and allows a treatment protocol to be established.

[PMID: 29200489](#)

### 3. The effects of uninvolved side epiphysiodesis for limb length equalization in children with unilateral cerebral palsy: clinical evaluation with the Edinburgh visual gait score.

Corradin M, Schiavon R, Borgo A, Deslandes J, Cersosimo A, Canavese F.

Eur J Orthop Surg Traumatol. 2017 Dec 6. doi: 10.1007/s00590-017-2097-3. [Epub ahead of print]

**PURPOSE:** Hemiplegic cerebral palsy patient may present a shorten leg on the hemiplegic side that afflicts negatively the kinematic of the uninvolved limb. Thus, the aim of this study was to investigate the modification of gait kinematic after epiphysiodesis for limb equalization and secondary to verify the prediction of correction. **METHODS:** Skeletally immature hemiplegic patients with a minimum limb leg discrepancy (LLD) of 2.5 cm were treated with epiphysiodesis of the unaffected knee and clinically evaluated with Edinburgh visual gait score (EVGS). Green-Anderson curve was used to predict time decision for correction. **RESULTS:** Ten LLD patients were evaluated with the Edinburgh visual gait score (EVGS) before and after surgery. Mean age was 12.7 years, mean follow-up was 6.7 years, and mean LLD was 3.4 cm before surgery and 1.2 cm at final follow-up. After lower limb equalization surgery, improvement in gait kinematics was observed on both the uninvolved and hemiplegic limb of hemiplegic cerebral palsy patients ( $p < 0.001$ ). Final correction did not reach expected correction (2.3 vs. 2.8 cm). However, the difference was not statistically significant ( $p = 0.058$ ). **CONCLUSION:** This is the first study to report improvement on both the uninvolved and hemiplegic limb gait kinematics after limb equalization surgery. Due to the impaired dorsiflexion of the hemiplegic foot, LLD target at the end of growth should range between 0.5 and 1.5 cm.

[PMID: 29214458](#)

### 4. Relationship Between Trunk Control and Balance in Children with Spastic Cerebral Palsy: A Cross-Sectional Study.

Panibatla S, Kumar V, Narayan A.

J Clin Diagn Res. 2017 Sep;11(9):YC05-YC08. doi: 10.7860/JCDR/2017/28388.10649. Epub 2017 Sep 1.

**INTRODUCTION:** Trunk control is impaired in children with Cerebral Palsy (CP) thus influencing their functional balance. However, there is a paucity of literature determining the relationship between trunk control and balance in children with CP. **AIM:** To find the relationship between trunk control and balance by means of Trunk Control Measurement Scale (TCMS) and Paediatric Balance Scale (PBS). **MATERIALS AND METHODS:** Twenty four children {age range 8-14 years, Gross Motor Function Classification System (GMFCS) Level I-III} with spastic CP were recruited and evaluated using TCMS and PBS. The results were expressed as summary measures median (M) and Inter-Quartile Range (IQR). The correlation of TCMS and PBS were done using Spearman's correlation coefficient. A p-value  $< 0.05$  was considered statistically significant. **RESULTS:** The children obtained a median score of 52 out of 58 on the TCMS and 50 out of 56 on PBS. There was a significantly strong correlation with  $rs=0.77$  and  $p<0.01$ . A strong correlation ( $p<0.01$ ) was seen between static, dynamic and total components of TCMS and PBS. The median scores of TCMS and PBS had a strong correlation for boys with  $rs=0.74$  and very strong correlation for girls with  $rs=0.84$ . Based on the type of spastic CP, diplegics had a very strong correlation with  $rs=0.85$ . While based on GMFCS levels, Level II and Level III had a very strong correlation (For level II  $rs=0.81$  and level III  $rs=0.86$ ) and weak correlation for level I ( $rs=0.27$ ). **CONCLUSION:** Based on gender, topography and severity of the motor impairment both trunk control and balance are impaired to a different degree in children with CP. The findings of this study showed a high positive correlation between trunk control and balance in children with spastic CP.

[PMID: 29207820](#)

### 5. Effects of antagonistic and synergistic muscles' co-activation on mechanics of activated spastic semitendinosus in children with cerebral palsy.

Ateş F, Temelli Y, Yucesoy CA.

Hum Mov Sci. 2017 Nov 30;57:103-110. doi: 10.1016/j.humov.2017.11.011. [Epub ahead of print]

**OBJECTIVES:** Most activities involve co-activation of several muscles and epimuscular myofascial force transmission (EMFT) can affect their mechanics. This can be relevant for spastic muscles of cerebral palsy (CP) patients. Isometric spastic semitendinosus (ST) forces vs. knee angle (KA-FST) data were collected intra-operatively to test the following hypotheses: (i) Inter-antagonistic EMFT elevates FST, (ii) changes the shape of KA-FST characteristics, (iii) reduces the muscle's joint range of force exertion (Range-FST) and (iv) combined inter-antagonistic and synergistic EMFT further changes those effects. **METHODS:** 11 limbs of 6 patients with CP (mean (SD) = 7.7 (4.7) years; GMFCS levels = II-IV) were tested in 3 conditions from 120° to full extension: ST activated (I) exclusively, (II) simultaneously with an antagonist, and (III) with added activation of synergists. **RESULTS:** Condition II increased FST (e.g., peak force = 87.6 N (30.5 N)) significantly (by 33.6%), but condition III caused no further change. No condition changed the muscle's wide Range-FST (100.7° (15.9°)) significantly. Therefore, only the first hypothesis was confirmed. **CONCLUSIONS:** Co-activating its antagonist elevates forces of activated

spastic ST substantially, but does not change its joint range of force exertion. Added activation of its synergists causes no further effects. Therefore, EMFT effects in CP can be relevant and need to be tested in other knee flexors.

[PMID: 29197788](#)

## **6. Combined therapy involving electroacupuncture and treadmill exercise attenuates demyelination in the corpus callosum by stimulating oligodendrogenesis in a rat model of neonatal hypoxia-ischemia.**

Pak ME, Jung DH, Lee HJ, Shin MJ, Kim SY, Shin YB, Yun YJ, Shin HK, Choi BT.

Exp Neurol. 2017 Dec 2;300:222-231. doi: 10.1016/j.expneurol.2017.11.014. [Epub ahead of print]

We investigated whether electroacupuncture (EA) and treadmill (TM) exercise improve behaviors related to motor and memory dysfunction in a cerebral palsy-like rat model via activation of oligodendrogenesis. A neonatal hypoxia-ischemia model was created using Sprague-Dawley rats (P7), and these underwent EA stimulation and treadmill training from 3 to 5 weeks after hypoxia-ischemia induction. EA treatment was delivered via electrical stimulation (2Hz, 1mA) at two acupoints, Baihui (GV20) and Zusanli (ST36). Behavioral tests showed that EA alleviated motor dysfunction caused by hypoxia-ischemia on a rotarod test, and TM exercise alleviated motor and memory dysfunction seen on cylinder and passive avoidance tests. Combined therapy with EA and TM exercise showed synergistic effects on the cylinder, rotarod, and catwalk tests. TM exercise significantly restored corpus callosum thickness, and combined therapy with EA and TM restored myelin basic protein (MBP) levels in this region. While EA stimulation only increased activation of cAMP-response element binding protein (CREB) in oligodendrocytes of the corpus callosum, TM exercise increased newly generated oligodendrocyte progenitor cells or oligodendrocytes via activation of CREB. Synergistic effects on oligodendrogenesis were also observed by the combined therapy. Furthermore, the combined therapy induced mature brain-derived neurotrophic factor (BDNF) expression in the cerebral cortex. These results demonstrate that combined therapy with EA and TM exercise may restore myelin components following neonatal hypoxia-ischemia via upregulation of oligodendrogenesis involving CREB/BDNF signaling, which subsequently improves motor and memory function. Therefore, combined therapy with EA and TM exercise offers another treatment option for functional recovery from injuries caused by neonatal hypoxia-ischemia, such as cerebral palsy.

[PMID: 29199131](#)

## **7. Influence of modified muscle morphology and activity pattern on the results of musculoskeletal system modelling in cerebral palsy patient.**

Ogrodnik J, Piszczatowski S.

Acta Bioeng Biomech. 2017;19(3):63-75.

**PURPOSE:** The aim of the present study was to evaluate the influence of modified morphological parameters of the muscle model and excitation pattern on the results of musculoskeletal system numerical simulation in a cerebral palsy patient. **METHODS:** The modelling of the musculoskeletal system was performed in the AnyBody Modelling System. The standard model (MoCap) was subjected to modifications consisting of changes in morphological parameters and excitation patterns of selected muscles. The research was conducted with the use of data of a 14-year-old cerebral palsy patient. **RESULTS:** A reduction of morphological parameters (variant MI) caused a decrease in the value of active force generated by the muscle with changed geometry, and as a consequence the changes in active force generated by other muscles. A simulation of the abnormal excitation pattern (variant MII) resulted in the muscle's additional activity during its lengthening. The simultaneous modification of the muscle morphology and excitation pattern (variant MIII) points to the interdependence of both types of muscle model changes. A significant increase in the value of the reaction force in the hip joint was observed as a consequence of modification of the hip abductor activity. **CONCLUSIONS:** The morphological parameters and the excitation pattern of modelled muscles have a significant influence on the results of numerical simulation of the musculoskeletal system functioning.

[PMID: 29205220](#)

## 8. Interventions to Improve or Maintain Lower-Limb Function Among Ambulatory Adolescents with Cerebral Palsy: A Cross-Sectional Survey of Current Practice in the UK.

Taflampas G, Kilbride C, Levin W, Lavelle G, Ryan JM.

Phys Occup Ther Pediatr. 2017 Dec 8;1-15. doi: 10.1080/01942638.2017.1400490. [Epub ahead of print]

**OBJECTIVES:** To describe physiotherapy management to improve or maintain lower-limb function among adolescents with cerebral palsy, classified in Gross Motor Function Classification System levels I-III, in the United Kingdom (UK). **METHODS:** A list of interventions was identified using a nominal group technique and developed into a survey, which was distributed to approximately 2,100 pediatric physiotherapists in the UK through the Association of Pediatric Chartered Physiotherapists and a private physiotherapy clinic in London between April and June 2015. One-hundred and thirty-five physiotherapists completed the survey. Survey respondents indicated how frequently they used each intervention (i.e., "frequently," "sometimes," "rarely," and "never") in the past year. **RESULTS:** Provision of explanations to the child, liaison with families, liaison with health professionals, provision of advice to schools, and stretching were the most frequently used interventions with 90%, 90%, 86%, 79%, and 76% of respondents, respectively, reporting that they frequently used each. The interventions most commonly reported as "never" used were conductive education (88%), MOVE programme (85%), functional electrical stimulation (82%), body-weight supported treadmill training (80%), and rebound therapy (71%). **CONCLUSIONS:** This study suggests that a large number of interventions are used by physiotherapists in the United Kingdom to improve or maintain lower-limb function among adolescents with CP, not all of which are evidence-based.

[PMID: 29220616](#)

## 9. (in vivo Gastrocnemius Muscle) Tendon Ratio in Patients with Cerebral Palsy.

Choudhry MN, Naseem H, Mahmood I, Aqil A, Khan T.

Open Orthop J. 2017 Jul 28;11:577-582. doi: 10.2174/1874325001711010577. eCollection 2017.

**BACKGROUND:** The position of the gastrocnemius tendon in relation to the leg length may be different in children with cerebral palsy as compared to normal children. The palpation of muscle bellies or previous experience of the operating surgeon is employed to place the surgical incision for lengthening of the gastrocnemius aponeurosis. Inaccurate localisation may cause incorrect incisions and a risk of iatrogenic damage to the vital structures (i.e. sural nerve). **OBJECTIVES:** The aim of our study is to compare gastrocnemius length in-vivo between paretic and unaffected children and create a formula to localise the muscle-tendon junction accurately. **METHODS:** 10 children with di/hemiplegia (range 2-14y) were recruited. None of them had received any conventional medical treatment. An equal number of age/sex matched, typically developing children (range 4-14y) were recruited. Ultrasound scanning of the gastrocnemius muscle at rest was performed to measure the length of gastrocnemius bellies. We also measured the heights and leg lengths in all the children. **RESULTS:** The gastrocnemius medial muscles were shorter in Cerebral Palsy children when compared to similar aged normal children. In cerebral palsy children, the gastrocnemius muscle and leg ratio ranged between 35 to 50% (average ratio of 45%). **CONCLUSION:** Using these figures, we created an average percentage for gastrocnemius muscle length that may be used clinically to identify the tendon for open/endoscopic lengthening and also to make simple and accurate localisation of gastrocnemius muscle-tendon junction for surgical access. This decreases the length of the surgical incision and may reduce the risk of iatrogenic injuries.

[PMID: 29204225](#)

## 10. Effect of weight bearing exercise to improve bone mineral density in children with cerebral palsy: a meta-analysis.

Kim SJ, Kim SN, Yang YN, Lee IS, Koh SE.

J Musculoskelet Neuronal Interact. 2017 Dec 1;17(4):334-340.

**BACKGROUND:** Despite widespread clinical use of weight bearing exercises to manage low bone mineral density (BMD) in children and adolescents with cerebral palsy (CP), previous studies have reported heterogeneous results on the effect of weight bearing exercise on BMD. **PURPOSE:** We performed the current meta-analysis to assess the effects of weight bearing exercise on increasing BMD in children who have CP with low BMD. **MATERIALS AND METHODS:** We searched PubMed, Cochrane, and Embase from inception through to October 2016 for studies that aims to investigate the effect of weight bearing exercise on BMD in children with CP. Following the searching result, the 118 relevant studies were reviewed and undergone selection process. Standardized mean difference (SMD), 95% confidence intervals (CIs) and p-values were calculated for analysis. **RESULTS:** Three studies were ultimately included in the meta-analysis: one randomized-controlled study and two case-controlled studies. No significant difference was observed in the BMD of the lumbar spine between before treatment and after treatment (SMD,0.341; 95% CI,-0.647-1.330; p=0.449) but the BMD of the femur significantly improved after applying

weight bearing exercise compared to pre-treatment values (SMD, 0.916; 95% CI, 0.382-1.114; p(0.001). CONCLUSIONS: Weight bearing exercise has a significant effect on improving BMD of the femur in children with CP.

[PMID: 29199195](#)

### **11. Multicentre prospective randomised single-blind controlled study protocol of the effect of an additional parent-administered sensorimotor stimulation on neurological development of preterm infants: Primebrain.**

Pelc K, Daniel I, Wenderickx B, Dan B; Primebrain group.

BMJ Open. 2017 Dec 3;7(12):e018084. doi: 10.1136/bmjopen-2017-018084.

**INTRODUCTION:** Preterm and very low birthweight infants are at increased risk for neurodevelopmental disorders, including cerebral palsy, sensory impairment and intellectual disability. Several early intervention approaches have been designed in the hope of optimising neurological development in this context. It seems important that the intervention takes into account parental mental health, focuses on parent-child interactions and lasts sufficiently long. This study aims to evaluate the effects of a stimulation programme administered by parents until 6 months post-term on motor and neurophysiological development of infants born preterm. **METHODS AND ANALYSIS:** Participants will be infants born <32 weeks' gestation and/or with a birth weight <1500 g recruited prospectively from two tertiary neonatal intensive care units. They will be randomly assigned to receive nationally recommended follow-up only (control group) or also a stimulation programme between 37 weeks' gestation and 6 months' corrected age. Perinatal, clinical neurodevelopmental, socio-demographic and neuroimaging (ultrasonography or MRI) data will be collected. Bayley Scales of Infant Development will be used up to 24 months' corrected age and Parental Stress Index at 6, 12, 18 and 24 months' corrected age. High-density (64 or 128 electrodes) EEG, visual, somatosensory and long latency auditory evoked potentials will be recorded at term age, 3, 6, 12, 18 and 24 months' corrected age. They will be analysed for spatiotemporal frequency bands contents and source localisation. **ETHICS AND DISSEMINATION:** The study was approved by the Ethics Committees of the Hôpital Universitaire des Enfants Reine Fabiola and CHU Saint-Pierre. Results dissemination will be made for stakeholders and families, reports will be written for parents, healthcare providers and policymakers, and scientific papers will be published.

[PMID: 29203503](#)

### **12. Does Parent Report Gross Motor Function Level of Cerebral Palsy Children Impact on the Quality of Life in these Children?**

Pashmdarfard M, Amini M, Badv RS, Ghaffarzade Namazi N, Rassafiani M.

Iran J Child Neurol. 2017 Fall;11(4):52-57.

**OBJECTIVE:** The aim of this study was to assess the effect of parent report gross motor function level of cerebral palsy (CP) children on the parent report quality of life of CP children. **MATERIALS & METHODS:** Sampling of this cross-sectional study was done in occupational therapy clinics and CP children's schools in 2016 in Zanzan, Iran. Samples size was 60 CP children aged 6-12 yr and for sampling method, a non-probability convenience was used. For assessing the quality of life of CP children the cerebral palsy quality of life (CP QOL) questionnaire and for assessing the level of gross motor function of CP children the Gross Motor Function Classification System Family Report Questionnaire (GMFCSFRQ) were used. **RESULTS:** The average age of children (22 males and 30 females) was 8.92 yr old (minimum 6 yr and maximum 12 yr). The relationship between the level of gross motor function and participation and physical health was direct and significant ( $r=0.65$ ). The relationship between functioning, access to services and family health with the level of gross motor function was direct but was not significant ( $P>0.05$ ) and the relationship between pain and impact of disability and emotional well-being with the level of gross motor function was significant ( $P<0.05$ ). **CONCLUSION:** There was no strong correlation between the level of gross motor function and quality of life of children with cerebral palsy. It means that the level of gross motor function cannot be used as a predictor of quality of life for children with cerebral palsy alone.

[PMID: 29201124](#)

### 13. Caregiver Perceptions and Health-Related Quality-of-Life Changes in Cerebral Palsy Patients After Spinal Arthrodesis.

Jain A, Sullivan B, Shah SA, Samdani AF, Yaszay B, Marks MC, Sponseller PD.

Spine (Phila Pa 1976). 2017 Dec 5. doi: 10.1097/BRS.0000000000002508. [Epub ahead of print]

**STUDY DESIGN:** Retrospective analysis of a prospective registry **Objective:** Our objective was to prospectively assess caregivers' perceptions regarding changes in the health-related quality of life (HRQL) of patients with cerebral palsy (CP) after spinal arthrodesis. We assessed caregiver perceptions from 3 perspectives: 1) qualitative assessment of changes in global quality of life, comfort, and health; 2) relative valuation of spine surgery versus other common interventions in CP patients; and 3) quantitative changes in HRQL scores. **SUMMARY OF BACKGROUND DATA:** Studies of children with CP who undergo surgical treatment of spinal deformity have focused largely on radiographic changes. **METHODS:** We queried a multicenter prospective registry of CP patients with level IV or V motor function according to the Gross Motor Function Classification System who were treated with spinal arthrodesis, and whose caregivers completed preoperative and 2-year postoperative qualitative and quantitative HRQL surveys. A total of 212 caregivers and their patients were included in the study. **RESULTS:** At 2-year follow-up, most caregivers reported that patients' global quality of life, comfort, and health were "a lot better" after spinal arthrodesis. Spinal arthrodesis was ranked as the most beneficial intervention in the patients' lives by 74% of caregivers, ahead of hip, knee, and foot surgeries and baclofen pump insertion. Gastrostomy tube insertion was the only intervention ranked superior to spinal arthrodesis in terms of impact. Quantitative HRQL scores improved significantly during 2-year follow-up across various domains. **CONCLUSIONS:** In qualitative and quantitative HRQL assessments, caregivers reported overall improvement patients' lives after spinal arthrodesis. Caregivers ranked spine surgery as the most beneficial intervention in the patients' lives, secondary only to gastrostomy tube insertion.

[PMID: 29215495](#)

### 14. Quality of Life in Indian Children with Cerebral Palsy Using Cerebral Palsy-quality of Life Questionnaire.

Das S, Aggarwal A, Roy S, Kumar P.

J Pediatr Neurosci. 2017 Jul-Sep;12(3):251-254. doi: 10.4103/jpn.JPN\_127\_16.

**BACKGROUND:** Quality of life (QOL) in children with cerebral palsy (CP) needs to be measure by CP-specific questionnaire. CP-QOL questionnaire is being used for this purpose. **OBJECTIVES:** The aim is to determine the QOL in Indian children with CP using CP-QOL questionnaire and to correlate QOL scores with demographic details of the patient. **MATERIALS AND METHODS:** Subjects were parents of 50 children (4-12 years) attending child development center of Guru Teg Bahadur Hospital were enrolled. The parent-proxy version of the CP-QOL questionnaire translated into Hindi was administered by one author. Scoring and analysis were performed as per specified method. Cronbach's alpha was calculated for each domain for validation. Effect of clinical and demographic profile on QOL was analyzed. **RESULTS:** CP-QOL questionnaire was administered to 50 parents of CP children (32 males, 18 females). The overall QOL score of the children studied was computed to be  $38.29 \pm 5.2$ . Age and maternal education had a significant bearing on the QOL of the children ( $P < 0.05$ ). Type of CP, gender, and epilepsy did not affect the QOL significantly ( $P > 0.05$ ). Good internal consistency and reliability were found in the domains of social well-being and acceptance, functioning, participation, and physical health (Cronbach's alpha  $> 0.7$ ). Access to services, pain, and impact of disability and family health showed a weak correlation with Cronbach's alpha  $< 0.7$ . **CONCLUSION:** QOL in children with CP was compromised. The CP-QOL questionnaire can be used to measure QOL in Indian children with CP.

[PMID: 29204200](#)

### 15. Mini-mental state exam for children (MMC) in children with hemiplegic cerebral palsy.

Moura R, Andrade PMO, Fontes PLB, Ferreira FO, Salvador LS, Carvalho MRS, Haase VG.

Dement Neuropsychol. 2017 Jul-Sep;11(3):287-296. doi: 10.1590/1980-57642016dn11-030011.

Cognitive impairment is frequent in cerebral palsy (CP) and there is a lack of multiprofessional screening instruments. **OBJECTIVE:** The aim of this study was to investigate the utility of the Mini-Mental State Examination for Children (MMC), an adapted version of the Mini-Mental State Examination, in screening for cognitive impairments in children with CP. **METHODS:** We assessed 397 Brazilian children, 310 with typical development and 87 with CP (hemiplegic and quadriplegic forms), aged 5-16 years. Association between the MMC and general intelligence was assessed by the Colored Progressive Matrices instrument. **RESULTS:** Psychometric indexes for the MMC were adequate. ROC analyses revealed effective diagnostic accuracy in all ages assessed. Cut-off values are reported. Major difficulties on the MMC were observed in children with CP, particularly individuals with the quadriplegic form. Moreover, the MMC showed moderate correlation with the intelligence test, and was reliable in discriminating, among clinical cases, those with poorer cognitive abilities.

**CONCLUSION:** The MMC could be useful as a multiprofessional screening instrument for cognitive impairment in children with hemiplegic CP. Results of the MMC in quadriplegic CP children should be interpreted with caution. Diagnosis should be confirmed by further psychological testing.

[PMID: 29213526](#)

#### **16. Coaching parents to assess and treat self-injurious behaviour via telehealth.**

Benson SS, Dimian AF, Elmquist M, Simacek J, McComas JJ, Symons FJ.

J Intellect Disabil Res. 2017 Dec 5. doi: 10.1111/jir.12456. [Epub ahead of print]

The application of telehealth technology to conduct functional analysis (FA) and functional communication training (FCT) is emerging for children with developmental disabilities and behaviour support needs. The current study was designed to extend FA + FCT for self-injurious behaviour by using telehealth in home with parents as interventionists receiving real-time remote coaching. Two families with school-aged boys with developmental disabilities associated with intellectual disability participated, one with cerebral palsy and the other with autism spectrum disorder. Results indicated that parent-implemented FA + FCT via telehealth was effective for reducing self-injurious behaviour and increasing mands (communication requests) for both children. Both families successfully implemented the FA + FCT protocol with 95% overall fidelity via telehealth-supported coaching. Results are discussed in terms of their relationship to previous research, limitations and future directions.

[PMID: 29205605](#)

#### **17. Psychometric Properties of Multi-Dimensional Scale of Perceived Social Support in Chinese Parents of Children with Cerebral Palsy.**

Wang Y, Wan Q, Huang Z, Huang L, Kong F.

Front Psychol. 2017 Nov 21;8:2020. doi: 10.3389/fpsyg.2017.02020. eCollection 2017.

The Multi-dimensional Scale of Perceived Social Support (MSPSS) is one of the most extensively used instruments to assess social support. The purpose of this research was to test the reliability, factorial validity, concurrent validity and measurement invariance across gender groups of the MSPSS in Chinese parents of children with cerebral palsy. A total of 487 participants aged 21-55 years were recruited to complete the Chinese MSPSS and Parenting Stress Index-Short Form (PSI-SF). Composite reliability was calculated as the internal consistency of the Chinese MSPSS and a (multi-group) confirmatory factor analysis (CFA) was conducted to test the factorial validity and measurement invariance across gender. And Pearson correlations were calculated to test the relationships between MSPSS and PSI-SF. The Chinese MSPSS had satisfactory internal reliability with composite reliability values of more than 0.7. The CFA indicated that the original three-factor model was replicated in this specific population. Importantly, the results of the multi-group CFA demonstrated that configural, metric, and scalar invariance across gender groups was supported. In addition, all the three subscales of MSPSS were significant related with PSI-SF. These findings suggest that the Chinese MSPSS is a reliable and valid tool for assessing social support and can generally be utilized across sex in the parents of children with cerebral palsy.

[PMID: 29209254](#)

## **Prevention and Cure**

#### **18. Growth and neurodevelopment in very preterm infants receiving a high enteral volume-feeding regimen - A population-based cohort study.**

Klingenberg C, Kragh Muraas F, Elde Isaksen C, Nilsen T, Torgersen M, Melum-Hansen C.

J Matern Fetal Neonatal Med. 2017 Dec 6:1-221. doi: 10.1080/14767058.2017.1414796. [Epub ahead of print]

**AIM:** To evaluate a feeding regimen routinely providing > 180 ml/kg/d fortified human milk to very preterm infants and impact on in-hospital growth, osteopenia and neurodevelopment. **METHOD:** Retrospective population-based descriptive study of infants < 30-week gestation admitted within 24 h of birth and discharged during the 6-year period 2005 to 2010. Growth and neurodevelopment was assessed until 2 years corrected age, and cerebral palsy up to 4 years corrected age **Results:** Ninety-nine infants below 30-week gestation were admitted within 24 h of birth during the 6-year period, of which 84 (85%) survived to

discharge. Two infants had surgical necrotizing enterocolitis, both survived to 2 years follow up. Seventy-eight infants (mean 27 weeks) had complete growth data until discharge. Full enteral feeds were tolerated after mean 10 days. Average milk volumes were 193 ml/kg/d from 15-42 days of life. Rates of weight below 10th centile were 10% at birth and 14% at discharge. Head circumference Z-scores were stable from birth to discharge. Blood values did not indicate osteopenia. Increasing head circumference Z-scores were associated with improved language development. **CONCLUSION:** This high enteral feeding volume regimen was associated with low rates of in-hospital growth restriction and good head growth. High enteral volume intake seems safe and may improve nutritional status of very preterm infants.

[PMID: 29212397](#)

### **19. A half century of electronic fetal monitoring and bioethics: silence speaks louder than words.**

Sartwelle TP, Johnston JC, Arda B.

Matern Health Neonatol Perinatol. 2017 Nov 21;3:21. doi: 10.1186/s40748-017-0060-2. eCollection 2017.

Bioethics abolished the prevailing Hippocratic tenet instructing physicians to make treatment decisions, replacing it with autonomy through informed consent. Informed consent allows the patient to choose treatment after options are explained by the physician. The appearance of bioethics in 1970 coincided with the introduction of electronic fetal monitoring (EFM), which evolved to become the fetal surveillance modality of choice for virtually all women in labor. Autonomy rapidly pervaded all medical procedures, but there was a clear exemption for EFM. Even today, EFM remains immune to the doctrine of informed consent despite continually mounting evidence which proves the procedure is nothing more than myth, illusion and junk science that subjects mothers and babies alike to increased risks of morbidity and mortality. And ethicists have remained utterly silent through a half century of EFM misuse. Our article explores this egregious ethical failure by reviewing EFM's lack of clinical efficacy, discussing the EFM related harm to mothers and babies, and focusing on the reasons that this obstetrical procedure eluded the revolutionary change from the Hippocratic tradition to autonomy through informed consent.

[PMID: 29201387](#)