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Interventions and Management

1. Hand (N Y). 2014 Dec;9(4):471-477.

Surgical management of the wrist in children with cerebral palsy and traumatic brain injury.

Koman LA, Smith BP.

[PMID: 25414607](#) [PubMed - as supplied by publisher] PMID: PMC4235908 [Available on 2015/12/1]

2. Dev Med Child Neurol. 2014 Nov 20. doi: 10.1111/dmcn.12641. [Epub ahead of print]

The central role of trunk control in the gross motor function of children with cerebral palsy: a retrospective cross-sectional study.

Curtis DJ1, Butler P, Saavedra S, Bencke J, Kallelose T, Sonne-Holm S, Woollacott M.

AIM: Improvement of gross motor function and mobility are primary goals of physical therapy in children with cerebral palsy (CP). The purpose of this study was to investigate the relationship between segmental control of the trunk and the corresponding gross motor function in children with CP. METHOD: This retrospective cross-sectional study was based on 92 consecutive referrals of children with CP in Gross Motor Function Classification System (GMFCS) levels I to V, 39 females, 53 males (median age 4y [range 1-14y]), and 77, 12, and 3 with spastic, dyskinetic, and ataxic CP respectively. The participants were tested using the Gross Motor Function Measure (GMFM), the Pediatric Evaluation of Disability Inventory (PEDI), and the Segmental Assessment of Trunk Control (SATCo). RESULTS: Linear regression analysis showed a positive relationship between the segmental level of trunk control and age, with both gross motor function and mobility. Segmental trunk control measured using the SATCo could explain between 38% and 40% of variation in GMFM and between 32% and 37% of variation in PEDI. INTERPRETATION: This study suggests a strong association between segmental trunk postural control and gross motor function and mobility with significant clinical implications for the treatment of children with CP.

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3. Dev Med Child Neurol. 2014 Nov 20. doi: 10.1111/dmcn.12628. [Epub ahead of print]**The relationship between trunk control in sitting and during gait in children and adolescents with cerebral palsy.**

Saether R1, Helbostad JL, Adde L, Braendvik S, Lydersen S, Vik T.

AIM: To assess the relationship between trunk control in sitting and trunk control during gait in children and adolescents with cerebral palsy (CP). METHOD: Twenty-six children (17 males, nine females) with spastic CP (Gross Motor Function Classification System I-III [15 unilateral, 11 bilateral], mean age 13.5y), were included. Trunk control in sitting was assessed with the Trunk Impairment Scale (TIS) and the Trunk Control Measurement Scale (TCMS), and trunk control during gait by a trunk-worn acceleromenter. The Pearson's rank correlation coefficient, partial correlation (r_p), and linear regression analysis were applied to assess the relationship between trunk control in sitting and during gait. RESULTS: Trunk control in sitting assessed with the TCMS and the TIS total scores both correlated with trunk accelerations during gait ($r_p = 0.67$ and 0.60 respectively). Moreover, some subscale scores correlated equally well with trunk control during gait (the TCMS dynamic sitting balance-reaching subscale score [DSB-R]; $r_p = 0.61$) or even higher (TIS dynamic sitting balance subscale [DSB]; $r_p = 0.66$). INTERPRETATION: Trunk control in sitting has a moderate to good correlation with trunk control during gait. Our results suggest that the subscale DSB-R of the TCMS, being less time consuming, may be applied in clinical assessment to gain information on trunk control during gait. Future studies are needed to explore how this information may be applied in the planning of 'gait interventions'.

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[PMID: 25412837](#) [PubMed - as supplied by publisher]

4. Dev Med Child Neurol. 2014 Nov 20. doi: 10.1111/dmcn.12614. [Epub ahead of print]**Trunk control in cerebral palsy: are we ready to address the elephant in the room?**

Saavedra S.

[PMID: 25412796](#) [PubMed - as supplied by publisher]

5. Pediatr Phys Ther. 2014 Nov 14. [Epub ahead of print]**Sitting Postural Control Affects the Development of Focused Attention in Children With Cerebral Palsy.**

Surkar SM1, Edelbrock C, Stergiou N, Berger S, Harbourne R.

PURPOSE: To investigate whether focused attention (FA) changes over time as sitting postural control improves and whether an impairment in sitting postural control affects the development of FA in children with cerebral palsy (CP). METHODS: Nineteen children with CP, mean ages 21.47 months, were assessed for FA and sitting scores pre- and postintervention. RESULTS: Longest, total, and global FA increased and frequency of FA decreased in children who achieved independent sitting. However, children who achieved mobility postintervention exhibited a decrease in longest FA and an increase in frequency of FA. CONCLUSION: Sitting postural control and the development of FA appear associated in children with CP. The increase in FA may signal a key opportunity for learning and attending to objects. However, the time of early mobility may interrupt these long periods of attention, resulting in less sustained attention to objects.

[PMID: 25401455](#) [PubMed - as supplied by publisher]

6. Pediatr Phys Ther. 2014 Nov 14. [Epub ahead of print]**Commentary on "Sitting Postural Control Affects the Development of Focused Attention in Children With Cerebral Palsy"**

Saavedra S1, Bellows D.

[PMID: 25401457](#) [PubMed - as supplied by publisher]**7. Int J Prev Med. 2014 Oct;5(10):1308-13.****Combination of citicoline and physiotherapy in children with cerebral palsy.**

Nasiri J, Kargar M.

BACKGROUND: The most common cause of physical disability in children is cerebral palsy. This study was aimed to evaluate the effect of citicoline in combination to physiotherapy versus physiotherapy alone, to improve the functional outcome in pediatric cerebral palsy. **METHODS:** The clinical trial was performed on 50 pediatric patients aged 18-75 months with spastic diplegia or quadriplegic cerebral palsy. Patients were assessed in two groups: case group, under treatment, using injection of citicoline (10 mg/kg) every other day for 3 months and physiotherapy. Gross motor function classification system (GMFCS) levels were assessed in all patients before and after treatment. **RESULTS:** Patient's mean age was 38.7 ± 17.2 months, and 52% were girls. Differences in the frequency of GMFCS levels between groups were not statistically significant, before ($P = 0.09$) and after ($P = 0.47$) treatment. In case group improving in GMFCS, level was occurred in 9/11 with level 2 to level 1, 3/5 with level 3 to other levels and 3/7 with level 4 to other levels. In the control group improving in GMFCS, level was occurred in 3/9 with level 2 to level 1, 3/10 with level 3 to other levels, and 2/4 with level 4 other levels. GMFCS level in 64% of cases was improved, whereas in control group, 32% was improved ($P = 0.02$). **CONCLUSIONS:** Results demonstrated that citicoline in combination to physiotherapy appears to be a promising agent to improve gross motor function in patients with cerebral palsy versus physiotherapy alone. Although, further studies are need to be done.

[PMID: 25400890](#) [PubMed] [PMCID: PMC4223951](#)**8. Neurocrit Care. 2014 Nov 18. [Epub ahead of print]****Dexmedetomidine for Acute Baclofen Withdrawal.**

Morr S1, Heard CM, Li V, Reynolds RM.

BACKGROUND: Intrathecal baclofen is widely accepted as a treatment option for severe spasticity through its γ -Aminobutyric acid-B (GABAB) agonist properties. Abrupt cessation can lead to severe and life-threatening withdrawal characterized by altered mental status, autonomic dysreflexia, rigidity, and seizures. This symptomatic presentation is similar to alcohol withdrawal, which is mediated by modification of GABAA expression. Use of the α_2 -adrenergic agonist dexmedetomidine for the treatment of ethanol withdrawal has been widely reported, raising the question of its potential role in baclofen withdrawal. We present a case of the successful treatment of acute severe baclofen withdrawal with a dexmedetomidine infusion. **METHODS:** A 15-year-old patient with spastic quadriplegia and cerebral palsy underwent unexpected removal of his baclofen pump due to an infection that was encountered during a planned pump revision. Following removal, he was placed on high dose enteral baclofen every 6 h. Despite further benzodiazepine supplementation, he had progressive hemodynamic instability, severe rebound spasticity, and intermittent spontaneous clonus consistent with baclofen withdrawal. A dexmedetomidine infusion was titrated to a peak dose of 16 mcg per hour with successful treatment of withdrawal symptoms. **RESULTS:** The patient became normotensive without tachycardia. Tone and agitation improved. **CONCLUSION:** Dexmedetomidine is to our knowledge a previously unreported option for treatment of acute severe baclofen withdrawal. We report a case of safe and efficacious use in a patient with spastic quadriplegia on chronic intrathecal baclofen. Scientifically rigorous comparison with other options remains to be performed.

[PMID: 25403764](#) [PubMed - as supplied by publisher]

9. Am J Phys Med Rehabil. 2014 Nov 20. [Epub ahead of print]**Short-Term Effects of Neuromuscular Electrical Stimulation on Muscle Architecture of the Tibialis Anterior and Gastrocnemius in Children with Cerebral Palsy: Preliminary Results of a Prospective Controlled Study.**

Karabay I1, Oztürk GT, Malas FU, Kara M, Tiftik T, Ersöz M, Ozçakar L.

OBJECTIVE: The aim of this study was to explore the short-term effects of neuromuscular electrical stimulation application on tibialis anterior (stimulated muscle) and gastrocnemius (antagonist) muscles' size and architecture in children with cerebral palsy by using ultrasound. **DESIGN:** This prospective, controlled study included 28 children diagnosed with spastic diplegic cerebral palsy. Participants were treated either with neuromuscular electrical stimulation application and conventional physiotherapy (group A) or with conventional physiotherapy alone (group B). Outcome was evaluated by clinical (gross motor function, selective motor control, range of motion, spasticity) and ultrasonographic (cross-sectional area, pennation angle, fascicle length of tibialis anterior and gastrocnemius muscles) measurements before and after treatment in both groups. **RESULTS:** Cross-sectional area values of tibialis anterior (238.7 ± 61.5 vs. 282.0 ± 67.1 mm) and gastrocnemius (207.9 ± 48.0 vs. 229.5 ± 52.4 mm) ($P < 0.001$ and $P = 0.008$, respectively) muscles were increased after treatment in group A. Cross-sectional area values of tibialis anterior muscle were decreased (257.3 ± 64.7 vs. 239.7 ± 60.0 mm) after treatment in group B ($P < 0.001$), and the rest of the measurements were found not to have changed significantly in either group. **CONCLUSIONS:** These results have shown that cross-sectional area of both the agonist and antagonist muscles increased after 20 sessions of neuromuscular electrical stimulation treatment. Future studies with larger samples and longer follow-up are definitely awaited for better evaluation of neuromuscular electrical stimulation application on muscle architecture and its possible correlates in clinical/functional outcome.

[PMID: 25415393](#) [PubMed - as supplied by publisher]

10. Clin Rehabil. 2014 Nov 20. pii: 0269215514556299. [Epub ahead of print]**The safety and feasibility of an intervention to improve balance dysfunction in ambulant adults with cerebral palsy: A pilot randomized controlled trial.**

Morgan P1, Murphy A2, Opheim A3, Pogrebnoy D4, Kravtsov S2, McGinley J5.

OBJECTIVE: To investigate the safety, feasibility and potential efficacy of balance training in adults with cerebral palsy. **DESIGN:** Phase 2, assessor-blinded randomized controlled trial. **SETTING:** Outpatient rehabilitation facility. **SUBJECTS:** A total of 17 ambulatory adults with cerebral palsy. **INTERVENTIONS:** Participants were randomly allocated to an eight-week, once-weekly, small group programme of balance training, or seated attention control activity. Balance training was individually tailored using the Balance Evaluation Systems test. **MAIN MEASURES:** Primary focus was feasibility, addressed by recruitment, retention, adherence, and safety. Efficacy was primarily evaluated with the Ambulatory Self-Confidence Questionnaire and the Balance Evaluation Systems test, at intervention conclusion and Week 24. Secondary outcomes included gait speed, walking distance, falls efficacy, fatigue, quality of life, and global impression of change. **RESULTS:** Interventions were safe and feasible with no major adverse events. Adherence was high. At eight and 24 weeks, there were negligible between-group differences in Balance Evaluation systems test total. At 24 weeks, there was a small, non-significant between-group difference in favour of the balance group with effect sizes of 0.14 for ambulatory self-confidence, 0.10 for falls efficacy, and 0.12 for fatigue. There were significant between-group differences for self-reported walking confidence and balance change, in favour of the balance group at Weeks 8 and 24 ($p < 0.05$). **CONCLUSION:** A customised balance programme is feasible and safe for ambulant adults with cerebral palsy. Small effects from balance training in selected outcomes occurred. Study replication with at least 38 participants per group to confirm efficacy is warranted.

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[PMID: 25413169](#) [PubMed - as supplied by publisher]

11. Physiother Theory Pract. 2014 Nov 21:1-7. [Epub ahead of print]**Examination of the use of a dual-channel functional electrical stimulation system on gait, balance and balance confidence of an adult with spastic diplegic cerebral palsy.**

Robinson BS1, Williamson EM, Cook JL, Harrison KS, Lord EM.

The purpose of this case report is to determine the effects of a dual-channel functional electrical stimulation (FES) system on gait and balance of a 57-year-old male diagnosed with spastic diplegic cerebral palsy (CP). Outcome measures included the: Activities-specific Balance Confidence Scale (ABC); Dynamic Gait Index (DGI); Observational Gait Scale (OGS) and Tinetti Performance Oriented Mobility Assessment (POMA). Assessments were completed with and without use of FES during the initial examination and after two, four and six weeks of intervention with FES. ABC Scale scores improved from 32.8 to 48.1% during the 6-week intervention. Scores on the DGI improved from 6/24 to 9/24 without FES and from 9/24 to 14/24 with FES. OGS scores improved on both legs with and without FES. Tinetti POMA scores improved from 12/28 to 15/28 without FES and decreased from 16/28 to 15/28 with FES. The patient demonstrated improvement in both objective and subjective measures. The use of FES facilitated improved gait and balance; however, the patient was still at increased risk for falls after the 6-week intervention despite improved scores on the ABC Scale, DGI, OGS and Tinetti POMA.

[PMID: 25412562](#) [PubMed - as supplied by publisher]

12. Comput Speech Lang. 2015 Oct;29(1):132-144.**Automatic intelligibility classification of sentence-level pathological speech.**

Kim J1, Kumar N1, Tsiartas A1, Li M1, Narayanan SS2.

Pathological speech usually refers to the condition of speech distortion resulting from atypicalities in voice and/or in the articulatory mechanisms owing to disease, illness or other physical or biological insult to the production system. Although automatic evaluation of speech intelligibility and quality could come in handy in these scenarios to assist experts in diagnosis and treatment design, the many sources and types of variability often make it a very challenging computational processing problem. In this work we propose novel sentence-level features to capture abnormal variation in the prosodic, voice quality and pronunciation aspects in pathological speech. In addition, we propose a post-classification posterior smoothing scheme which refines the posterior of a test sample based on the posteriors of other test samples. Finally, we perform feature-level fusions and subsystem decision fusion for arriving at a final intelligibility decision. The performances are tested on two pathological speech datasets, the NKI CCRT Speech Corpus (advanced head and neck cancer) and the TORGO database (cerebral palsy or amyotrophic lateral sclerosis), by evaluating classification accuracy without overlapping subjects' data among training and test partitions. Results show that the feature sets of each of the voice quality subsystem, prosodic subsystem, and pronunciation subsystem, offer significant discriminating power for binary intelligibility classification. We observe that the proposed posterior smoothing in the acoustic space can further reduce classification errors. The smoothed posterior score fusion of subsystems shows the best classification performance (73.5% for unweighted, and 72.8% for weighted, average recalls of the binary classes).

[PMID: 25414544](#) [PubMed] [PMCID: PMC4233325](#) [Available on 2016/10/1]

13. Dev Med Child Neurol. 2014 Nov 19. doi: 10.1111/dmcn.12612. [Epub ahead of print]**Support for identifying predictors of functional communication in children with cerebral palsy.**

Washington KN.

[PMID: 25407501](#) [PubMed - as supplied by publisher]

14. Am J Health Syst Pharm. 2014 Dec 1;71(23):2038-41. doi: 10.2146/ajhp130572.**Amisulpride-associated mania in a young adult with schizophrenia and cerebral disease.**

Chuang WC1, Chen CY1, Kuo SC1, Chen TY1, Yeh YW2.

PURPOSE: A case of rapid-onset mania after initiating amisulpride in a patient with schizophrenia and cerebral disease is reported. **SUMMARY:** A 19-year-old Taiwanese man had a 1-year history of schizophrenia, paranoid type, and cerebral palsy. His only medication was a 12-week course of risperidone 6 mg orally daily. His positive symptoms of auditory hallucinations and paranoid delusions improved markedly, but negative symptoms of inattention, avolition, and anhedonia continued. His motor disability and athetosis of the hand related to cerebral palsy also worsened during risperidone therapy. After a discussion with the patient's guardian, conversion of antipsychotic therapy from risperidone to amisulpride was commenced. On days 1-8 of the conversion, amisulpride 400 mg was given orally daily. The daily risperidone dose on days 1, 2, and 3 was 6, 4, and 2 mg, respectively; risperidone was discontinued after day 3. On day 4, the patient exhibited a euphoric mood, with persistent laughing, expansive self-esteem, extreme talkativeness, flight of ideas, distractibility, and psychomotor agitation. On day 8, the amisulpride dosage was increased to 800 mg orally daily and his manic symptoms worsened. On day 17, amisulpride was withheld and risperidone 4 mg daily was resumed. The manic symptoms subsided within three days after the cessation of amisulpride. The patient was maintained on risperidone 4 mg daily for six months without any further hypomanic or manic symptoms. **CONCLUSION:** A 19-year-old man with schizophrenia and underlying cerebral disease developed rapid-onset mania after risperidone was replaced with amisulpride. The reaction resolved soon after amisulpride was discontinued and treatment with risperidone was reinstated.

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[PMID: 25404595](#) [PubMed - in process]**15. Ortop Traumatol Rehabil. 2014 Oct 3;16(5):497-505. doi: 10.5604/15093492.1128840.****Back pain in mothers of cerebral palsied children.**

Czupryna K1, Nowotny-Czupryna O1, Nowotny J2.

Background. Cerebral palsy (CP) leads to varying degrees of movement restrictions, imposing on the parents (especially mothers) a number of additional responsibilities. The burden of long-term care for a disabled child can lead to severe pain in various locations and of various intensity. Therefore, it is important to identify their risk factors and provide training for parents of CP children to educate them how to offer care not only to aid rehabilitation of their child, but also to avoid hazards to their own health. The aim of this study was to evaluate the prevalence of back pain and its underlying causes in mothers of children with cerebral palsy. **Material and methods.** The study enrolled 179 mothers of CP children aged 3-18 years. The intensity, frequency and functional consequences of the pain were described according to the criteria formulated by Jackson and Moskowitz. The children's functional status was assessed on the basis of their medical records, the GMFCS (Gross Motor Function Classification System) scale and an interview with their mothers. Pain intensity in the mother was compared with the functional status of the child and the level of his/her independence as well as other factors related to the daily care of a child with cerebral palsy. The nonparametric chi-square (χ^2) test was used for the statistical analyses, with the level of significance at $p < 0.05$. **Results.** Most of the mothers caring for a CP child on a daily basis suffered from back pain of various location and intensity. The intensity of the pain was determined by the child's locomotor skills and independence level, the necessity of lifting the child several times a day, the number of additional tasks performed by the mother and the age and body weight of the child. At the same time, pain intensity was independent of maternal age, the possibility of having a replacement caregiver and (lack of) prior instruction on appropriate behaviours in their daily care for the disabled child. **Conclusions.** 1. Long-term daily care of children with cerebral palsy promotes the development of back pain in their mothers. 2. The incidence and intensity of pain depends primarily on the child's functional status and independence level, body weight, age, the need for repeatedly lifting the disabled child throughout the day and the number of additional tasks performed by the mother.

[PMID: 25406923](#) [PubMed - in process]

Prevention and Cure

16. Minerva Ginecol. 2014 Nov 21. [Epub ahead of print]

Risk factors for cerebral palsy in premature infants identified during the pre and perinatal periods: a case-control study.

Andrade E1, Araujo E, Rolo LC, Da Silva Costa F.

AIM: To assess the pre and perinatal risk factors for cerebral palsy in premature infants, comparing them with full-term infants. **METHODS:** This was a prospective cross-sectional cohort study on 48 infants between four and eight months of life, of whom 20 were born prematurely (< 37 weeks of gestational age) and 28 at full term (37 to 42 weeks). A questionnaire was used, which investigated maternal reproductive, obstetric and neonatal factors, along with an evaluation scale for neurosensory-motor development of infants at risk of neuromotor alterations. For the statistical analysis, the Student's t, chi-square, Fisher's exact and Cramer's V tests were used. **RESULTS:** All the newborns that were small for their gestational age (35%) were in the premature group ($p = 0.001$). Hyperbilirubinemia ($p = 0.000$), anemia ($p = 0.009$), respiratory distress syndrome ($p = 0.000$) and periventricular hemorrhage ($p = 0.025$) were more frequent in the premature newborn group. Phototherapy and blood transfusion were more frequent among the premature infants: 70.0% vs. 25.0% ($p = 0.002$) and 20.0% vs. 0.0% ($p = 0.025$), respectively. Among the premature infants, 50.0% presented neuromotor development alterations, against only 14.3% of the full-term infants. **CONCLUSION:** Prematurity is an important risk factor for the development of neurosensory-motor alterations that are suggestive of cerebral palsy.

[PMID: 25415488](#) [PubMed - as supplied by publisher]

17. Minerva Ginecol. 2014 Nov 20. [Epub ahead of print]

Intrapartum fetal heart monitoring interpretation in labour: a critical appraisal.

Maso G1, Piccoli M, De Seta F, Parolin S, Banco R, Camacho Mattos L, Bogatti P, Alberico S.

Electronic fetal monitoring (EFM) has been introduced in the obstetrics practice as a test to identify the first signs of fetal deterioration, allowing a prompt intervention to reduce neonatal morbidity and mortality. However, results from clinical trials fail to demonstrate a clear benefit with the use of EFM. No decrease in the incidence of cerebral palsy due to intrapartum asphyxia has been achieved and a significant increase in the rate of operative deliveries and in medico-legal litigations has been observed instead. Despite the lack of evidence supporting its safety and effectiveness, this method is routinely used in the clinical practice and periodical updated guidelines to standardize the method of interpretation and proper actions are proposed. However limitations still exist and the unavoidable consequences are the increasing rate of caesarean delivery, partly due to a defensive attitude in medical choices, and medico-legal litigations for presumed inappropriate evaluation in case of perinatal adverse event. While Obstetrics Societies are trying to "fight" the rise in caesarean section rates, intrapartum EFM tracings are taken in the court proceedings as one of the main evidences in case of adverse event. The aim of this review is to discuss the limitations of guidelines dealing with intrapartum EFM and the pathophysiological basis to assess the suspicious tracings which represent the most observed and critical issue of EFM interpretation.

[PMID: 25411863](#) [PubMed - as supplied by publisher]

18. BJOG. 2014 Dec;121(13):1728. doi: 10.1111/1471-0528.12917.

Cerebral palsy: intrapartum causal criteria used in courts.

Burrell C.

[PMID: 25413747](#) [PubMed - in process]