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Interventions and Management

1. Spasticity and movement disorders in cerebral palsy

A Leland Albright

Review Childs Nerv Syst. 2023 Jul 6. doi: 10.1007/s00381-023-06045-5. Online ahead of print.

Purpose: To review the neurosurgical treatments of children with movement disorders associated with cerebral palsy (CP) during the previous decades, up to the present day. **Methods:** An extensive literature review was undertaken to identify important publications about this subject. My experience treating children with these disorders over the past three decades was included in the individual sections. **Results:** Peripheral neurotomies have been developed for children with focal spasticity. For those with spastic paraparesis, selective lumbar rhizotomies were developed, and for those with spastic quadriplegia, intrathecal baclofen infusions were developed. Both effectively alleviate spasticity in the affected extremities. Generalized dystonia associated with CP has been treated with deep brain stimulation with mild improvement, but treatment with intrathecal baclofen and intraventricular baclofen improve those movements markedly. No effective treatment has been reported for children with athetoid CP. For those with choreiform CP, deep brain stimulation may be effective but intrathecal baclofen does not appear to be. **Conclusion:** Treatment of children with movement disorders associated with CP increased slowly in the 1970s and 1980s but accelerated rapidly in the 1990s with the introduction of lumbar dorsal rhizotomies and intrathecal baclofen. In the last 30 years, tens of thousands of children with spasticity and movement disorders associated with CP have been treated by pediatric neurosurgeons, and their care has become an integral component of current pediatric neurosurgical practice.

PMID: [37410128](#)

2. Could cremaster muscle spasticity cause retractile or undescended testis in cerebral palsy? Implications for assessment and management

Erik Van Laecke

Dev Med Child Neurol. 2023 Jul 5. doi: 10.1111/dmcn.15696. Online ahead of print.

No abstract available

PMID: [37408102](#)

3. Normative dataset selection affects gait profile scores of children with cerebral palsy

Wilshaw Stevens, Justine Borchard, Kelly A Jeans, Kirsten Tulchin-Francis, Robert L Wimberly

Gait Posture. 2023 May 6;104:126-128. doi: 10.1016/j.gaitpost.2023.05.007. Online ahead of print.

Introduction: The Gait Profile Score (GPS) requires a comparative dataset, to identify altered mechanics in persons with a gait

abnormality. This gait index has been shown to be useful for identifying gait pathology prior to the assessment of treatment outcomes. Though studies have shown differences in kinematic normative datasets between different testing sites, there is limited information available on the changes in GPS score based on normative dataset selection. The aim of this study was to quantify the influence of normative reference data from two institutions, on the GPS and Gait Variable Scores (GVS), calculated on the same group of patients with Cerebral Palsy. Methods: Seventy patients (Avg. age: 12.1 ± 2.9) diagnosed with CP underwent gait analysis during walking at a self-selected speed at Scottish Rite for Children (SRC). GPS and GVS scores were determined using normative kinematic data at a self-selected speed from, 83 typically developing children ages 4-17 from Gillette, and the same age range of children from SRC's normative dataset. Average normalized speed was compared between institutions. Signed rank tests were performed on the GPS and GVS scores using each institution's dataset. Spearman's correlations between scores using SRC and Gillette were determined within GMFCS level. Results: Normalized speed was comparable between each institution's datasets. Within each GMFCS level, significant differences when using SRC vs. Gillette were found in most scores ($p < 0.05$). Scores were moderately to strongly correlated within each GMFCS level (range $\rho = 0.448-0.998$). Conclusions: Significant statistical differences were found in GPS and GVS scores but were within the range of previously reported variation across multiple sites. Caution and consideration may need to be taken when reporting GPS and GVS scores that are calculated utilizing different normative datasets as these scores may not be equivalent.

PMID: [37399635](#)

4. Physical activity is associated with walking and balance ability but not fatigue, knee extension strength, or body composition in adults with cerebral palsy: a pilot cross-sectional study

Yui Sato, Hideyuki Tashiro, Kanta Fukumoto, Sota Hirosaki, Megumi Toki, Naoki Kozuka

Int J Rehabil Res. 2023 Jul 7. doi: 10.1097/MRR.0000000000000593. Online ahead of print.

Common secondary impairments associated with aging in adults with cerebral palsy (CP) decrease physical functions, including walking and balance ability, and increase the sense of fatigue. This motor dysfunction results in decreased physical activity (PA) and could be associated with obesity and sarcopenia. This study examined the association of daily PA levels with fatigue, physical function, and body composition in 22 adults with CP (age, 37.4 ± 14.7 years; Gross Motor Function Classification System level, I: 6, II: 16). The level of daily PA was divided into percent of sedentary behavior, light PA, and moderate-to-vigorous PA (%MVPA) per day. These outcomes were examined for correlation with the Fatigue Severity Scale, knee extension strength, comfortable and maximum walking speed, Timed-Up-and-Go-Test (TUG), and body fat percentage and skeletal muscle mass using Spearman's rank correlation coefficient. An additional partial correlation analysis with sex and age adjustment was performed. The %MVPA correlated positively with comfortable walking speed ($r_s = 0.424$, $P = 0.049$) and negatively with TUG ($r_s = -0.493$, $P = 0.020$). The partial correlation revealed associations of %MVPA with maximum walking speed ($r = 0.604$, $P = 0.022$) and TUG ($r = -0.604$, $P = 0.022$). The results show that among adults with CP, increased PA is associated with improvements in mobility but not in perceived fatigue or body composition, regardless of sex and age. Maintaining and improving %MVPA and walking and balance ability in adults with CP have a positive impact on each other, and potentially on overall health management.

PMID: [37417810](#)

5. The Effectiveness of Rapid Syllable Transition Treatment in Improving Communication in Children with Cerebral Palsy: A Randomized Controlled Trial

Johanna Korkalainen, Patricia McCabe, Andy Smidt, Catherine Morgan

Dev Neurorehabil. 2023 Jul 4;1-11. doi: 10.1080/17518423.2023.2218485. Online ahead of print.

Cerebral palsy (CP) is a movement disorder and majority of children with CP have communication impairments which impact participation with this population. Rapid Syllable Transition Treatment (ReST) is a motor speech intervention primarily for children with Childhood Apraxia of Speech (CAS). A recent pilot study in which ReST was trialed with children with CP showed improved speech performance. Therefore, a single blind randomized controlled trial to compare ReST to usual care with 14 children with moderate-to-severe CP and dysarthria was conducted. ReST was provided on telehealth. ANCOVA with 95% confidence intervals indicated significant group differences in favor of ReST in speech accuracy ($F = 5.1$, $p = .001$), intelligibility ($F = 2.8$, $p = .02$) and communicative participation on both the FOCUS ($F = 2$, $p = .02$) and Intelligibility in Context Scale ($F = 2.4$, $p = .04$). ReST was found to be more effective than usual care.

PMID: [37401894](#)

6. COMPARATIVE STUDY OF THE PAIN, FUNCTION AND BIOMARKERS OF JOINT DISEASE IN THE TRANSITION TO ADULTHOOD IN INDIVIDUALS WITH AND WITHOUT CEREBRAL PALSY

Chad Hanaoka, Deborah Gaebler-Spira, Rajeswari Pichika, Prakash Jayabalan

Am J Phys Med Rehabil. 2023 Jul 5. doi: 10.1097/PHM.0000000000002310. Online ahead of print.

Background: Biomarkers have potential to identify early signs of joint disease. This study compared joint pain and function in adolescents and young adults with CP compared to individuals without. **Methods:** Cross-sectional study compared individuals with CP (n = 20), aged 13-30 with Gross Motor Function Classification System (GMFCS) I-III and age-matched individuals without CP (n = 20). Knee and hip joint pain measured using Numeric Pain Rating Scale (NPRS) and Knee injury and Osteoarthritis Outcome Score (KOOS) and Hip dysfunction and Osteoarthritis Outcome Score (HOOS) surveys. Objective strength and function were also measured. Biomarkers for tissue turnover (serum COMP, urinary CTX-II) and cartilage degradation (serum MMP-1, MMP-3) were measured in blood and urinary samples. **Findings:** Individuals with CP had increased knee and hip joint pain, reduced leg strength, reduced walking and standing speeds, and ability to carry out activities of daily living (p < 0.005) compared to controls. They also had higher serum MMP-1 (p < 0.001) and urinary CTX-II levels (p < 0.05). Individuals with CP who were GMFCS I and II demonstrated reduced hip joint pain (p = 0.02) and higher MMP-1 levels (p = 0.02) compared to GMFCS III. **Interpretation:** Individuals with CP with less severe mobility deficits had higher MMP-1 levels likely due to more prolonged exposure to abnormal joint loading forces but experienced less joint pain.

PMID: [37405958](#)

7. Physiotherapy management of children with cerebral palsy in low- and middle-income countries: a scoping review protocol

Noxolo E Duma, Mbuzeleni Hlongwa, Natalie Benjamin-Damons, Khumbulani W Hlongwana

Syst Rev. 2023 Jul 1;12(1):110. doi: 10.1186/s13643-023-02280-8.

Introduction: Cerebral Palsy (CP) is the most common childhood physical disability worldwide. Approximately 1.5 to 4 children per live births live with CP, globally. There have been no specific treatments that can reverse the brain damage responsible for the complex clinical dysfunctions of CP. There are, however, several interventions that are currently being used by physiotherapists, most of which are deemed to be ineffective and unnecessary. We will conduct a scoping review aimed at mapping evidence on the physiotherapy management of children living with CP in low- and middle-income countries (LMICs). **Methods:** The scoping review will be guided by the Arksey and O'Malley and Levac et al. frameworks. The databases that will be used to search for literature include PubMed, MEDLINE, CINAHL, EBSCOhost, Web of Science, and ProQuest One Academic and Scopus. Gray literature articles will also be included in this review, provided they meet our inclusion criteria. The Preferred Reporting Items for Systematic Reviews and Meta-Analysis: Extension for Scoping Reviews (PRISMA-ScR) guideline will be used to report the results of the scoping review. The screened results will be reported using the PRISMA flow diagram guidelines, and the results will be charted using an electronic data charting form and analyzed using thematic analysis. **Discussion:** Understanding how physiotherapists manage children with CP in LMICs is essential for the development of internationally sound, yet locally relevant, intervention strategy for physiotherapists. It is anticipated that the results of the scoping review will inform the thinking geared towards the development of a contextualised evidence-based framework for physiotherapists to effectively manage CP in children.

PMID: [37393357](#)

8. The activity levels and quality of life of physically disabled children who continued or did not continue rehabilitation during the COVID-19 pandemic

Fulya Senem Karaahmetoğlu, Esra Pehlivan, Zeynep Betül Özcan

Work. 2023 Jun 24. doi: 10.3233/WOR-220705. Online ahead of print.

Background: Social isolation during the COVID-19 pandemic had a harmful impact on the psychological and physical health of children and teenagers. It is known that interruptions in rehabilitation can cause soft tissue contractures, bone deformities and a decline in motor functions among other complications. **Objective:** The aim of this study was to compare the quality of life and physical activity levels of physically disabled children who continued and did not continue rehabilitation during the COVID-19 pandemic. **Method:** The gross motor levels of 18 children who continued special education and rehabilitation during the COVID-19 pandemic and 18 children who did not continue were determined with the Gross Motor Function Classification System (GMFCS). The International Physical Activity Questionnaire Short Form (IPAQ) and Children's Quality of Life Scale (PedsQL) questionnaires were administered. **Results:** The study participants comprised 54.1% females and 45.9% males with a mean age of 9.02 years. No significant differences were detected between the two groups in respect of demographic, clinical and functional characteristics (p > 0.05). The walking parameters of PedsQL (p = 0.02) and IPAQ-SF scores (p = 0.03) were determined to be statistically significantly better in the group that continued rehabilitation. **Conclusion:** The results of this study demonstrated that the quality of life and walking capacity of children who continued rehabilitation during the COVID-19 pandemic were better. Methods should be developed to ensure that rehabilitation is not interrupted during isolation periods of any future pandemic.

PMID: [37393478](#)

9. [Degree of implementation in Spain of the therapeutic recommendations for hypotonia of central origin according to the consensus of experts of the American Academy for Cerebral Palsy and Developmental Medicine] [Article in Spanish]

A Corral-Parcet, M L Macias-Merlo, C Bagur-Calafat, C Cardó-Olmo

Rev Neurol. 2023 Jul 16;77(2):35-40. doi: 10.33588/rn.7702.2023104.

Introduction: In early childhood, there are a number of different neurological conditions and syndromes that present with hypotonia of central origin. In 2019, the American Academy for Cerebral Palsy and Developmental Medicine (AAPDM) drew up a set of guidelines on therapeutic recommendations for the population aged from 0 to 6 years, based on the consensus of experts and on scientific evidence. The aim of this study is to determine how those therapeutic recommendations are being implemented in Spain. **Subjects and methods:** A survey of paediatric physiotherapists treating 0-6-year-old children with central hypotonia was carried out by means of a questionnaire consisting of 31 questions: 10 questions on sociodemographic and practice-related data, and the remaining 21 related to the use of the therapeutic recommendations based on the AAPDM guidelines for children with hypotonia of central origin. **Results:** From a sample of 199 physiotherapists, it was found that familiarity with the AAPDM guidelines was significantly associated with the number of years of clinical experience, level of qualification and the community in which the professionals practise. **Conclusion:** These guidelines can serve to raise awareness and unify criteria regarding the therapeutic approach to children with central hypotonia. The results indicate that, with the exception of a few techniques, in our country most of the therapeutic strategies are being implemented within the framework of early care.

PMID: [37403241](#)

10. National Health Insurance Data Analysis for the Second-Wave Development of Korean Medicine Clinical Practice Guidelines in South Korea

Chan-Young Kwon, Seungwon Shin, O-Jin Kwon, Wonkyung Moon, Namkwen Kim, Minjung Park

J Pharmacopuncture. 2023 Jun 30;26(2):198-209. doi: 10.3831/KPI.2023.26.2.198.

Objectives: After the evidence-based Korean medicine clinical practice guidelines (KM-CPGs) for 30 targeted diseases were developed in 2021, 34 diseases have been proposed for the second-wave development of the KM-CPGs. The purpose of this study was to investigate the development priorities of the candidate diseases into the second-wave development of KM-CPGs in south Korea. **Methods:** In this study, we analyzed the Health Insurance Review and Assessment Service National Patient Sample data from 2017 to 2018 to determine the demand and economic importance of the candidates for the second-wave development of KM-CPGs in real-world clinical settings in Korea. **Results:** The annual number of visits and patients, annual healthcare expenditure per patient, and healthcare expenditure per institution were analyzed. Musculoskeletal disorders, including sciatica and adhesive capsulitis of the shoulder, were the most important topics regarding the number of visits and patients and annual healthcare expenditure per institution. Specifically, sciatica (52.05% of the total number of visits, 48.34% of the total number of patients, and 42.12% of the total treatment expenditure per institution) showed overwhelmingly high proportions. However, cerebral palsy (36.03% of the total number of inpatient visits and 24.55% of the total number of inpatient patients) was a more important topic in inpatient clinical settings than musculoskeletal conditions or cancer, and healthcare expenditure per patient in this topic had the highest ranking. Furthermore, fractures were found to be highly important in inpatient clinical settings. No patients had influenza A virus infection or posttraumatic stress disorders who visited the KM medical institution of interest. **Conclusion:** This study highlights the gap between the real-world clinical setting and the research field in some topics. The results of this study can provide guidance for the second-wave development of KM-CPGs in the future.

PMID: [37405112](#)

11. Family caregivers' experience of care with a child with cerebral palsy: the lived experiences and challenges of caregivers in a resource-limited setting in northern Ghana

Mavis Mallory Mwinbam, Joseph Ngmenesegre Suglo, Yaa Nyarko Agyeman, Margaret Wekem Kukeba

BMJ Paediatr Open. 2023 Jul;7(1):e001807. doi: 10.1136/bmjpo-2022-001807.

Introduction: Caring for a child with cerebral palsy may be more emotionally and physically exhausting than caring for a typical growing child. The family caregivers' perspective of this phenomenon needs exploring to facilitate the development of services. Our study explored the challenges family caregivers face with children with cerebral palsy in a resource-limited context in northern Ghana. **Methods:** We conducted a qualitative study underpinned by phenomenological principles where it is believed that the reality of a phenomenon is tied to caregivers' perspectives of their own experiences. In this study, we unearthed caregivers' experiences/challenges from their own perspectives. The method of data analysis used was to allow the issues to emerge from the data (inductive process) using the content analysis approach. We recruited 13 caregivers of children

with cerebral palsy from the physiotherapy unit at Tamale Teaching Hospital, and conducted individual in-depth interviews supported by an open-ended topic guide. Interviews were audio recorded, transcribed, and translated and coded inductively before conducting a content analysis of the data when grouped into themes. Results: We have identified barriers to managing a child with cerebral palsy, including sociocultural barriers (values, attitudes and belief systems within society), economic challenges and immediate physical care burdens. Specific barriers included discrimination and isolation, lack of family and societal support, with poor access to health information and formal education. Others were lack of information on the cause and course of cerebral palsy, caregivers' loss of jobs, increased healthcare expenditure and struggles in lifting and moving children, which resonate with evidence-based multidimensional model of caregiving process and caregiver burden. Conclusion: Caregivers have the arduous task of caring for a child with cerebral palsy. Social support interventions and policy initiatives that seek to ameliorate caregivers' finances and make formal education accessible to this marginalised child population may be beneficial in this context.

PMID: [37407248](#)

12. Comorbidities associated with 2-year mortality in adults with cerebral palsy in Japan

Yoh Fujimoto, Eiji Nakatani, Yasuharu Tabara

Dev Med Child Neurol. 2023 Jul 5. doi: 10.1111/dmcn.15705. Online ahead of print.

Aim: To clarify whether the Whitney Comorbidity Index (WCI) is useful in Asian adults with cerebral palsy (CP) and whether aspiration pneumonia and pressure ulcers improved the prognostic significance of the WCI. Method: This cohort study evaluated individuals aged at least 18 years with CP in Japan. We used Cox proportional hazards regression to analyse 2-year mortality rates. The predictive performance of the Charlson Comorbidity Index, Elixhauser Comorbidity Index, and WCI were compared as comorbidity assessment criteria. Aspiration pneumonia and pressure ulcers were added to the Cox models, and their impact on hazard ratios was determined. Results: Of the 2232 adults with CP, 72 died during the 2 years. The model with a previously reported weighted WCI with aspiration pneumonia and pressure ulcers produced the best fit. Additionally, the hazard risk of 2-year mortality for an unweighted WCI score of at least 4 was 2.56; when CP-specific comorbidities were added, it increased to 8.94. Interpretation: This study showed that the WCI can be used in Asian adults with CP. Furthermore, assessing patient age, aspiration pneumonia, and pressure ulcers in addition to the WCI increased the predictive value for mortality. Our findings indicate that the WCI can promote valid comparisons between international populations.

PMID: [37408168](#)

13. CTNNB1-related neurodevelopmental disorder mimics cerebral palsy: case report

Jaewoong Lee, Jaeeun Yoo, Seungok Lee, Dae-Hyun Jang

Case Reports Front Pediatr. 2023 Jun 16;11:1201080. doi: 10.3389/fped.2023.1201080. eCollection 2023.

While somatic gain-of-function mutations in the CTNNB1 gene cause diverse malignancies, germline loss-of-function mutations cause neurodevelopmental disorders or familial exudative vitreoretinopathy. In particular, CTNNB1-related neurodevelopmental disorders have various phenotypes, and a genotype-phenotype relationship has not been established. We report two patients with CTNNB1-related neurodevelopmental disorder whose clinical features were similar to those of cerebral palsy, hindering diagnosis.

PMID: [37416820](#)

14. Causation in cerebral palsy: Parental beliefs and associated emotions

Renée Smyth, Susan M Reid, Kate Paton, Angela T Guzys, Claire E Wakefield, David J Amor

Dev Med Child Neurol. 2023 Jul 6. doi: 10.1111/dmcn.15708. Online ahead of print.

Aim: To better understand parents' beliefs about causation in cerebral palsy (CP) and the emotions related to those beliefs. Method: We surveyed 226 parents of children with CP aged 1 to 18 years, recruited from the Victorian Cerebral Palsy Register, to evaluate their beliefs about the causes of CP, including genetic causes, causes specific to their own child, and their attitudes and emotions in relation to these. Results: Although 92% of participants reported that understanding the causes of their child's CP was important, uncertainty about the cause was expressed by 13%. The most frequently endorsed causal factors, in general and in their own child respectively, were intrapartum hypoxia (81%, 36%) or brain damage (69%, 22%), brain damage during pregnancy (73%, 28%), and preterm birth (66%, 28%). Genetic causes were deemed relevant by 13% of participants and hospital or professional error by 16%. Parents shared related feelings of anger (59%), sadness (80%), guilt (61%), and confusion (53%); parental anger was more likely when their child's CP was attributed to intrapartum events. Interpretation: Substantial parental interest in understanding the causes of CP, together with uncertainty about the causes, parents' causal

attributions, and significant emotional sequelae, highlight a strong need for provision of information and support for families of children recently diagnosed with CP.

PMID: [37415350](#)

15. Editorial: Functioning of individuals with cerebral palsy in the 21st century

Paula Silva de Carvalho Chagas, Hércules Ribeiro Leite

Editorial Front Rehabil Sci. 2023 Jun 20;4:1205450. doi: 10.3389/fresc.2023.1205450. eCollection 2023.

No abstract available

PMID: [37408613](#)

16. The perception of disability in cerebral palsy: a cross-sectional study using the WHODAS 2.0

Silvia Pizzighello, Alberto Raggi, Marinela Vavla, Marianna Uliana, Alda Pellegri, Michela Martinuzzi, Andrea Martinuzzi

Dev Neurorehabil. 2023 Jul 4;1-7. doi: 10.1080/17518423.2023.2232002. Online ahead of print.

This observational study aims to describe the level of perceived disability in Cerebral Palsy (CP). We described the perception of adults by using the interviewer-administered version of the WHO disability assessment schedule (WHODAS 2.0). In case of intellectual disability (ID), the proxy-administered version was used, and a caregiver was asked to report the difficulties experienced by the patient; 199 patients were enrolled. The level of perceived disability was higher when referred to patients with ID (proxy report) than when referred to patients without ID ($p < .001$). For all patients, the level of perceived disability varied depending on the severity and the localization of motor impairment (both $p < .001$). No differences were observed based on the type of motor impairment. The perceived disability was correlated with age only for patients with no ID ($p < .05$). The WHODAS 2.0 may be a useful tool to explore the perception of disability in CP.

PMID: [37403444](#)

17. The Impact of Intraventricular Hemorrhage and Periventricular Leukomalacia on Mortality and Neurodevelopmental Outcome in Very Preterm and Very-low-birthweight Infants: A Prospective Population-based Cohort Study

Aurelie Pascal, Nelede Bruyn, Gunnar Naulaers, Els Ortibus, Britta Hanssen, Ann Oostra, Krisde Coen, Michel Sannaert, Eva Cloet, Alexandra Casaer, James D'Haese, Sabine Laroche, An Jonckheere, Katleen Plaskie, Christinevan Mol, Els Bruneel, Marie-Rosevan Hoestenbergh, Bieke Samijn, Paul Govaert, Christine Van Den Broeck

J Pediatr. 2023 Jul 2;113600. doi: 10.1016/j.jpeds.2023.113600. Online ahead of print.

Objective: To survey the incidence of intraventricular hemorrhage (IVH) and periventricular leukomalacia (PVL) by gestational age (GA) and to report the impact on mortality and neurodevelopmental outcome in very preterm (VPT)/very low birthweight (VLBW) infants. Study design: This was a population-based cohort study of 1927 VPT/VLBW infants born in 2014-2016 and admitted to Flemish neonatal intensive care units (NICUs). Infants underwent standard follow-up assessment until two years corrected age (CA) with the Bayley-III and neurological assessments. Results: No brain lesion was present in 31% of infants born <26 weeks GA and 75.8% in infants born 29-32 weeks GA. Prevalence of low-grade IVH/PVL (grade I and II) was 16.8% and 12.7%, respectively. Low-grade IVH/PVL was not significantly related to increased likelihood for mortality, motor delay, or cognitive delay, except for PVL grade II which was associated with a fourfold increase in developing cerebral palsy (CP) (OR=4.1; 95%CI=1.2-14.6). High-grade lesions (III-IV) were present in 22.0% of the infants born <26 weeks GA and 3.1% at 29-32 weeks GA, and odds of death were ≥ 14.0 (IVH OR=14.0; 95%CI=9.0-21.9; PVL OR=14.1; 95%CI=6.6-29.9). PVL grade III-IV showed increased odds of 17.2 for motor delay and 12.3 for CP, but not found to be significantly associated with cognitive delay (OR=2.9; 95%CI: 0.5-17.5; $p=0.24$). Conclusions: Both prevalence and severity of IVH/PVL decreased significantly with increasing GA. More than 75% of all infants with low-grades IVH/PVL showed normal motor and cognitive outcome at two years CA. High grade PVL/IVH has become less common and is associated with adverse outcomes.

PMID: [37402440](#)

18. An evaluation of factors contributing to employment in adults with cerebral palsy

Nele Bertels, Guy Molenaers, Anja Van Campenhout, Karen Craenen, Inge Franki

Disabil Rehabil. 2023 Jul 3;1-7. doi: 10.1080/09638288.2023.2227094. Online ahead of print.

Purpose: To explore the impact of a selection of contributing factors on employment in adults with cerebral palsy (CP).
Method: Eighty adults with CP (39 male, median age 31, IQ > 70) were evaluated using standardized tests and questionnaires for hand function, gross motor function, pain, depressive symptoms, fatigue, social participation, performing daily activities, supportive materials, and mobility aids. Two separate analyses were performed. Firstly, differences between three subgroups were investigated: employee (n = 43), volunteer/sheltered (n = 14), and unemployed (n = 23). Secondly, multivariable regression analysis was applied to investigate the association between functional factors and employment hours. Results: Compared to employees, volunteer/sheltered workers performed significantly slower hand function tasks ($p < 0.001$). Participants in the employee group had primarily MACS I (55.8%) or MACS II (44.9%) scores. The employee group showed significantly ($p < 0.001$) higher social participation and performance in daily activities. Thirty-eight percent of the variance in working hours could be explained by social participation, daily activities, fatigue, and gross motor function. Interpretation: Employees are more likely adults with CP with better manual abilities. Sheltered/volunteer workers showed slower execution in hand function and higher limitations in fine motor skills. Social participation, performing daily activities, fatigue, and gross motor function are functional factors associated with hours of employment. **IMPLICATIONS FOR REHABILITATION** Upper limb evaluation on ability and speed gives valuable information to decide whether to work on the regular labour market or choose for volunteer or sheltered work. The use of supportive materials on the work floor is low; however, they may compensate for less manual abilities of adults with cerebral palsy compared to their healthy peers. Improving social participation and daily activities, fatigue, and gross motor function may lead to higher working hours.

PMID: [37399533](#)

19. Commentary on "Predictors of Risk for Cerebral Palsy: A Review"

Ashleigh Hines, Cathy Morgan, Alex Griffin

Comment Pediatr Phys Ther. 2023 Jul 1;35(3):358. doi: 10.1097/PEP.0000000000001032.

No abstract available

PMID: [37399305](#)

20. Commentary on "Clinical Outcomes of an Intensity Program for Children With Movement Challenges"

Danielle M Bellows, Catie Christensen, Deborah Welch

Comment Pediatr Phys Ther. 2023 Jul 1;35(3):329. doi: 10.1097/PEP.0000000000001025.

No abstract available

PMID: [37399302](#)

Prevention and Cure

21. Lipidomics reveal the cognitive improvement effects of *Acer truncatum* Bunge seed oil on hypoxic-ischemic encephalopathy rats

Xianyang Chen, Wangting Song, Yige Song, Hongli Cao, Xiao Xu, Shujia Li, Yanmin Fu, Teng Xue, Chunguang Ding, Feng Lin, Yuan Shi, Jijun Li

Food Funct. 2023 Jul 3. doi: 10.1039/d3fo01583a. Online ahead of print.

Hypoxic-ischemic encephalopathy (HIE) is one of the leading causes of acute neonatal death and chronic neurological damage, and severe HIE can have secondary sequelae such as cognitive impairment and cerebral palsy, for which effective interventions are lacking. In this study, we found that continuous 30-day intake of *Acer truncatum* Bunge seed oil (ASO) reduced brain damage and improved cognitive ability in HIE rats. Using lipidomic strategies, we observed that HIE rats had decreased unsaturated fatty acids and increased lysophospholipids in the brain. However, after 30 days of ASO treatment, phospholipids, plasmalogens, and unsaturated fatty acids increased, while lysophospholipids and oxidized glycerophospholipids decreased in both serum and the brain. Enrichment analysis showed that ASO intake mainly affected sphingolipid metabolism, fat digestion and absorption, glycerolipid metabolism and glycerophospholipid metabolic pathways in serum and the brain. Cluster, correlation, and confirmatory factor analyses showed that cognitive improvement after ASO administration was attributed to

increased essential phospholipids and ω 3/6/9 fatty acids, coupled with decreased oxidized glycerophospholipids in HIE rats. Our findings indicate that ASO has the potential to be developed as an effective food supplement for ischemic hypoxic newborns.

PMID: [37395364](#)

22. Timing of antenatal corticosteroids and survival without neurological disabilities at 5½ years in children born before 35 weeks of gestation

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Background: The efficacy of antenatal corticosteroids on neonatal preterm complications wanes beyond 7 days after treatment. The neurodevelopmental effects of longer treatment-to-birth intervals have not been adequately evaluated. **Objective:** To study the impact of antenatal corticosteroid timing on survival without moderate or severe neurological disabilities at 5½ years. **Study design:** Secondary analysis of the EPIPAGE-2 study, a national population-based cohort (France) that recruited neonates in 2011 and followed them up at 5½ years (results first reported in 2021). Participants were children born alive between 24+0 and 34+6 weeks, with a complete corticosteroid course, delivery more than 48 hours after the first injection, and neither limitation of care decided before birth nor severe congenital malformation. The study included 2613 children, 2427 alive at 5½ years; 71.9% (1739/2427) had a neurological assessment at this age; 1537 had a clinical examination (complete for 1532), and 202 were assessed with a postal questionnaire. Exposure was defined as the interval between the first injection of the last antenatal corticosteroid course and delivery in days, studied in 2 categories (day 3 (D3) to D7 and after D7), in 4 categories (D3-D7, D8-D14, D15-D21 and after D21), and continuously in days. The main outcome was survival at 5½ years without moderate/severe neurological disabilities, defined as moderate/severe cerebral palsy, or unilateral or bilateral blindness or deafness, or full-scale intelligence quotient two standard deviations below the mean. A multivariate analysis with a generalized estimated equation logistic regression model assessed the statistical association between the main outcomes and the interval from the first corticosteroid injection of the last course to birth. Multivariate analyses were adjusted for potential confounders, defined with a directed acyclic graph: gestational age in days, number of corticosteroid courses, multiple pregnancy, and cause of prematurity in five categories. As neurological follow-up was complete in only 63.2% cases (1532/2427), the analyses used imputed data. **Results:** Among 2613 children, 186 died between birth and 5½ years. Overall survival was 96.6% (95% confidence interval [CI], 95.9-97.0), and survival without moderate or severe neurological disabilities 86.0% (95% CI, 84.7-87.0). Survival without moderate or severe neurological disabilities was lower after D7 (85.0%) than during the D3-D7 interval (87.0%) (adjusted odds ratio, 0.70; 95% confidence interval, 0.54-0.89). **Conclusions:** The association between an interval between antenatal corticosteroid administration and birth exceeding 7 days and a lower rate of survival without moderate or severe neurological disabilities among 5½-year-old children emphasizes the importance of better targeting women at risk of preterm delivery to optimize the timing and thus benefits of treatment.

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