Cerebral palsy research news

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Interventions and Management

1. Perceived Experiences of Families of Children with Unilateral Cerebral Palsy in the Implementation of a Task-Specific Intervention in the Home Environment with an Upper Limb Splint: A Qualitative Study

Patricia Roldán-Pérez, Vanesa Abuín-Porras, Isabel Rodríguez-Costa, María Ortiz-Lucas, Pablo Bellosta-López, Almudena Buesa-Estéllez

Children (Basel). 2024 Oct 15;11(10):1242. doi: 10.3390/children11101242.

Introduction: Specific home tasks and the use of splints seem to positively affect altered structures and functions, as well as the activities and participation, of children with unilateral cerebral palsy (UCP). However, how did families experience the implementation of these therapies? Objective: To describe the experiences as they were perceived by the families of children with UCP before, during, and after a specific task intervention in the home environment, either with or without upper limb splinting. Methods: A qualitative, descriptive, phenomenological study was conducted in a natural environment. Fourteen families caring for children with UCP who participated in a previous randomized controlled trial were included. Data from unstructured and semi-structured interviews were analyzed through a thematic analysis. Results: Fourteen families (17 parents, age 37-47 years) caring for children with UCP (14 children, ages 6-10 years, 64% female) were interviewed. The following three themes emerged: "The project itself", in which families explained that they enrolled because of their trust in therapists; "Results obtained", where the main improvement was the integration of the assisting hand in the body schema; and "Lights and shadows", where families showed what they learned as positive points and some negative aspects related to the assessments and splints. Conclusions: The perceptions of the parents after the specific task intervention in the home environment showed a greater integration of the most affected side. Nevertheless, although the support of a splint on the hand can have beneficial results in terms of performance, other drawbacks leading to the disuse of the splint were highlighted.

PMID: 39457207

2. Randomized Comparison Trial of Rehabilitation Very Early for Infants with Congenital Hemiplegia

Roslyn N Boyd, Susan Greaves, Jenny Ziviani, Iona Novak, Nadia Badawi, Kerstin Pannek, Catherine Elliott, Margaret Wallen, Catherine Morgan, Jane Valentine, Lisa Findlay, Andrea Guzzetta, Koa Whittingham, Robert S Ware, Simona Fiori, Nathalie L Maitre, Jill Heathcock, Kym Scott, Ann-Christin Eliasson, Leanne Sakzewski

J Pediatr. 2024 Oct 28:114381. doi: 10.1016/j.jpeds.2024.114381. Online ahead of print.

Objective: To compare efficacy of constraint-induced movement therapy (Baby-CIMT) with bimanual therapy (Baby-BIM) in infants at high risk of unilateral cerebral palsy (UCP). Study design: Single-blind, randomized-comparison-trial that had the following inclusion criteria: (i) asymmetric brain lesion (ii) absent fidgety General Movements, (iii) Hammersmith Infant Neurological Examination below cerebral palsy cut-points, (iv) entry at 3 to 9 months corrected age (CA), and (v) >3 point difference between hands on Hand Assessment Infants (HAI). Infants were randomized to Baby-CIMT or Baby-BIM, which comprised 6 to 9 months of home-based intervention. Daily dose varied from 20 to 40-minutes according to age (total 70-89.2 hours). Primary outcome measure was the HAI post intervention, with secondary outcomes Mini-Assisting Hand Assessment and Bayley III cognition at 24-months CA. Results: 96 infants (51 male, 52 right hemiplegia) born median at 37-weeks'

gestation were randomized to Baby-CIMT (n=46) or Baby-BIM (n=50) and commenced intervention at a mean 6.5 (SD 1.6) months CA. There were no between group differences immediately post-intervention on HAI (mean difference [MD] 0.98 HAI units, 95% confidence interval [CI] 0.94-2.91; p=0.31). Both groups demonstrated significant clinically important improvements from baseline to post-intervention (Baby-BIM MD 3.48, 95%CI 2.09-4.87; Baby-CIMT MD 4.42, 95% CI 3.07-5.77). At 24 months, 64 infants were diagnosed with UCP (35 Baby-CIMT, 29 Baby-BIM). Infants who entered the study between 3 and 6-months CA had greater change in HAI Both Hands Sum Score compared with those who entered at ≥6-months CA (MD 7.17, 95% CI 2.93, 11.41, p=0.001). Conclusion: Baby-CIMT was not superior to Baby-BIM, and both interventions improved hand development. Infants commencing intervention at <6 months CA had greater improvements in hand function.

PMID: 39477009

3. Vertebral Body Morphology in Neuromuscular Scoliosis with Spastic Quadriplegic Cerebral Palsy

Göker Utku Değer, Heon Jung Park, Kyeong-Hyeon Park, Hoon Park, Mohammed Salman Alhassan, Hyun Woo Kim, Kun-Bo Park

J Clin Med. 2024 Oct 21;13(20):6289. doi: 10.3390/jcm13206289.

Background/Objectives: The distorted vertebral body has been studied in scoliosis; however, there is little knowledge about the difference between neuromuscular and idiopathic scoliosis. This study aimed to investigate the vertebral body morphology in patients with spastic quadriplegic cerebral palsy and scoliosis (CP scoliosis) and compare them with those of apex- and Cobb angle-matched patients with adolescent idiopathic scoliosis (AIS). Methods: Thirty-four patients with CP scoliosis and thirty-two patients with AIS were included. The pedicle diameter, chord length, and vertebral body rotation were evaluated at one level above the apex, one level below the apex, and at the apex using a reconstructed computed tomography scan. The apex of the curve and Cobb angle were too diverse between patients with CP scoliosis or AIS. Eighteen patients were matched in each group according to the apex and Cobb angle (within 5-degree differences) of the major curve, and compared between matched groups (mCPscoliosis vs. mAIS). Results: In the comparison of the apex and Cobb angle-matched groups, there was no statistical difference in the Cobb angle between mCPscoliosis (80.7 ± 13.8 degrees) and mAIS (78.6 ± 13.6 degrees, p = 0.426), and the vertebral body rotation (25.4 ± 15.4° in mCPscoliosis vs. 24.4 ± 6.5° in mAIS, p = 0.594). There was no difference in the pedicle diameters of either the convex (3.6 ± 1.1 mm in mCPscoliosis vs. 3.3 ± 1.2 mm in mAIS, p = 0.24) or concave side (3.1 ± 1.2 mm in mCPscoliosis vs. 2.7 ± 1.6 mm in mAIS, p = 0.127). However, the patients in the mCPscoliosis group were younger (12.7 ± 2.5 years vs. 14.6 ± 2.4 years, p = 0.001), and the chord length was shorter on the convex (38.0 ± 5.0 mm vs. 40.4 ± 4.9 mm, p = 0.025) and concave (37.7 ± 5.2 mm vs. 40.3 ± 4.7 mm, p = 0.014) sides compared with those of the mAIS group. Conclusions: With a similar apex and Cobb angle, the vertebral body rotation and pedicle diameter in patients with CP scoliosis were comparable to those with AIS; however, the chord length was shorter in CP scoliosis. For the selection of the pedicle screw in CP scoliosis, the length of the pedicle screw should be more considered than the diameter.

PMID: 39458238

4. Kinematic Changes throughout Childhood in Youth with Cerebral Palsy: Influence of Age and Orthopaedic Surgery

Nancy Lennon, Chris Church, Daniel Wagner, Tim Niiler, John Henley, Freeman Miller, Michael Wade Shrader, Jason J Howard

Children (Basel). 2024 Oct 15;11(10):1240. doi: 10.3390/children11101240.

Background: Abnormal gait kinematics are common in youth with cerebral palsy (CP), but prior studies have not analyzed their longitudinal change throughout childhood. This study examines how age and orthopaedic surgery influence gait kinematics throughout childhood in those with ambulatory CP. Methods: In this institutional review board-approved prospective cohort study, children with spastic CP (GMFCS I-III) were recruited at age 17-40 months. Instrumented gait analysis was performed at 3-year intervals from age 4 to 21 years, collecting longitudinal kinematic data in bare feet at a self-selected speed. The change in Gait Profile Score (ΔGPS) between each pair of gait analyses (intervals) was analyzed by age distribution (<10, 10-15, ≥15 years) and by presence/absence of orthopaedic surgery. Results: The study included 31 children (GMFCS: I [13], II [14], III [4]). A baseline instrumented gait analysis was performed at age 5.8 ± 1.6 years with subsequent analysis at 2.5 ± 1.3-year intervals. Examining ΔGPS from baseline to final outcome, 87% of limbs were improved/unchanged; 298 intervals of ΔGPS were analyzed and classified as nonsurgical or surgical. Analysis revealed greater GPS improvement in intervals with surgery versus intervals without (p = 0.0004). Surgical intervals had significantly greater GPS improvement in the <10- vs. >15 -year-old groups, p = 0.0063. Conclusions: Improvement in gait kinematics in children with CP is significantly influenced by age and timing of orthopaedic surgical intervention for gait correction, and was most pronounced for children <10 years old. Although surgery was associated with improved outcomes in all age groups, these improvements were significantly less for children >10 years old. These results reinforce the importance of considering the timing of orthopaedic surgery.

PMID: 39457205

5. High-Intensity Gait Training Intervention for Children With Cerebral Palsy: A Case Series

Megha Sanjiv, Martha H Bloyer, Cheryl Gimenez, James G Moore

Pediatr Phys Ther. 2024 Oct 29. doi: 10.1097/PEP.0000000000001163. Online ahead of print.

Purpose: The purpose of this pilot case series was to describe participation in high-intensity gait training (HIGT) and changes in (1) gait speed/endurance, (2) aerobic capacity, and (3) walking ability in children diagnosed with cerebral palsy (CP). Methods: Three children with CP participated in HIGT for 5 weeks in lieu of their routine physical therapy. Outcome measures were collected at baseline and post-intervention. Results: Post-intervention, all had at or above the minimal clinically important difference for 10-m walk test speed and 6-minute walk test distance. Two participants performed above the minimal clinically important difference in 7.5-m shuttle run test level and Gross Motor Function Measure-88 Dimension E score. Conclusion: This case series demonstrates short-term improvements in the walking outcome measures with participation in HIGT. Further research is needed with a larger and more diverse randomized controlled trial to determine parameters and long-term effects of HIGT in this population.

PMID: 39465982

6. F-words ingredients of non-invasive interventions for young ambulant children with cerebral palsy: A scoping review

No authors listed

Dev Med Child Neurol. 2024 Dec;66(12):e245. doi: 10.1111/dmcn.16144. Epub 2024 Oct 26.

No abstract available

PMID: 39460527

7. Functional outcomes in children and adolescents with neurodisability accessing music therapy: A scoping review

Karen Twyford, Susan Taylor, Jane Valentine, Jonathan Pool, Annette Baron, Ashleigh Thornton

Review Dev Med Child Neurol. 2024 Oct 29. doi: 10.1111/dmcn.16135. Online ahead of print.

Aim: To determine the evidence for functional outcomes experienced by a population with paediatric neurodisability (such as acquired brain injury, cerebral palsy, spinal cord injury, and other neurological disorders), who access music therapy through neurorehabilitation services across the rehabilitation spectrum. Method: Using scoping review methodology of the JBI and the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR), a systematic search was conducted across eight databases and expert knowledge users were consulted. Articles were screened by title and abstract, and data from eligible studies were categorized using the International Classification of Functioning, Disability and Health: Children and Youth version (ICF-CY). Results: From 1726 records identified, 53 eligible primary sources were included in the synthesis. Most literature (n = 30) related to children and adolescents with an acquired or traumatic brain injury. Physical function was the most frequently reported outcome across sources (n = 27), followed by communication (n = 25), social (n = 22), cognitive (n = 17), emotional (n = 13), psychological (n = 13), behavioural (n = 8), and sensory (n = 5). Interpretation: Evidence for functional outcomes experienced by children and adolescents accessing music therapy as part of their neurorehabilitation is limited. More than half of the included sources were clinical descriptions with small samples. High-quality studies involving children, adolescents, families, and interprofessional teams are needed to identify the most effective music therapy methods and techniques for functional outcomes in paediatric neurodisability.

PMID: 39469827

8. e-EARLY TOGETHER Intervention for Infants at High Risk of Cerebral Palsy: Randomized Controlled Trial Protocol

Agnes F S Cunha, Hércules R Leite, Adriana N Santos, Ana C Campos, Ashleigh Hines, Ana C R Camargos

Pediatr Phys Ther. 2024 Oct 29. doi: 10.1097/PEP.0000000000001164. Online ahead of print.

Purpose: The purpose of this study is to evaluate the effectiveness of an early intervention program, e-EARLY TOGETHER, that combines goal-oriented training, parental coaching, environmental enrichment in a telehealth approach in a low- and middle-income country. Methods: Protocol for a randomized controlled clinical trial to evaluate the effectiveness of e-EARLY TOGETHER intervention compared to standard guidelines on outcomes related to development and performance in infants at high risk of cerebral palsy. Discussion: This protocol will inform and enrich clinical practice related to early intervention in low - and middle-income countries. It is expected that the data obtained will contribute to the implementation of effective early

intervention programs with positive and lasting results for the child, their family, and the community.

PMID: 39467253

9. Efficacy and threshold dose of intensive training targeting mobility for children with cerebral palsy: A systematic review and meta-analysis

No authors listed

Dev Med Child Neurol. 2024 Dec;66(12):e250. doi: 10.1111/dmcn.16149. Epub 2024 Oct 26.

No abstract available

PMID: 39460524

10. Effects of a 12-Week Mixed-Method Physical Exercise Program on Physical Fitness, Stress, Anxiety, and Quality of Life in Adolescents with Cerebral Palsy: A Case Series Study

Alexandrina Cavalcante Rodrigues Nitz, José Pedro Ferreira, Elaine Maria Ribeiro, Juliana Albuquerque da Rocha, Chrystiane Vasconcelos Andrade Toscano, Maria João Campos

Children (Basel). 2024 Oct 18;11(10):1257. doi: 10.3390/children11101257.

Background/objectives: Although the health benefits related to physical exercise for adolescents with cerebral palsy (CP) have been recognized, studies indicate that individuals with CP at school age are less involved in physical activities than their typical peers and are twice as likely to engage in sedentary behaviors. Therefore, our study aims to investigate the effects of a physical exercise program on physical fitness, stress, anxiety, and quality-of-life variables. Methods: A total of 15 teenagers with ambulatory CP (n = 8 boys, n = 7 girls, between 12 and 18 years old; M = 14.35; SD = 1.76) completed a 12-week program based on a mixed-method approach with face-to-face and live online activities. The outcome measures were physical fitness, stress, anxiety, and quality of life. Results: The 12-week exercise program resulted in gains in muscular strength, flexibility, and aerobic endurance tests, characterized by an increase in average walking speed and average VO2 max. There was also a significant change in the perception of emotional states of depression, anxiety, and stress reported by the participants. Conclusions: The program proved to be effective in physical fitness tests and perception of emotional states. Given the positive effects produced by the program, its design appears to meet the demands of adolescents with cerebral palsy.

PMID: 39457222

11. Narrative Review of the Theoretical-Methodological Foundations of the TREINI Program

Renato Guimarães Loffi, Deisiane Oliveira Souto, Thalita Karla Flores Cruz, Arthur Felipe Barroso de Lima, Fabiana Rachel Martins Costa Rocha, Simone Rosa Barreto, Patrícia Aparecida Neves Santana, Amanda Aparecida Alves Cunha Nascimento, Vitor Geraldi Haase

Review Children (Basel). 2024 Sep 27;11(10):1181. doi: 10.3390/children11101181.

Scientific knowledge has advanced in the implementation of safe and beneficial interventions for children and adolescents with cerebral palsy (CP). Although the importance of interdisciplinary interventions that integrate all components of the International Classification of Functioning, Disability and Health (ICF) into family-centered practices is widely recognized, this approach is not yet widely adopted. Instead, many programs remain focused on isolated domains. This study presents the theoretical and methodological foundation of TREINI, an interdisciplinary and family-centered program developed for children and youth with CP and other neurodevelopmental disorders. TREINI incorporates intervention strategies that address all ICF domains. It is grounded in the biopsychosocial model of health and utilizes principles based on the best evidence in pediatric rehabilitation, including intensive training, task-oriented training, and a naturalistic learning environment. Unlike traditional rehabilitation approaches, the care provided by the TREINI program is delivered through an intensive and interdisciplinary approach, by a team working collaboratively in a single location. In addition to including evidence-based interventions, the TREINI program features two innovative components: the "City of Tomorrow", a naturalistic learning environment, and the "TREINI Exoflex" therapeutic suit, specifically designed to address deficiencies in the body functions and structures of children with CP and other neurodevelopmental disorders. This program has been carefully designed to support the process of neurological re-education and rehabilitation for children and adolescents with neuropsychomotor developmental delays.

PMID: 39457146

12. Transferability of an executive function intervention in children with cerebral palsy: A randomized controlled trial

No authors listed

Dev Med Child Neurol. 2024 Dec;66(12):e248. doi: 10.1111/dmcn.16147. Epub 2024 Oct 26.

No abstract available

PMID: 39460525

13. Quantifying Parental Perceptions of Their Experiences With Their Young Children's Use of Power Mobility Devices

Naomi J Aldrich, Lisa K Kenyon, Rachel Lambert, Kristen Marsman, Malorie Vasseur, Bethany Sloane, Samuel W Logan, Heather A Feldner

Pediatr Phys Ther. 2024 Oct 29. doi: 10.1097/PEP.0000000000001158. Online ahead of print.

Purpose: To quantify and explore parental perceptions of their experiences with their child's use of the Explorer Mini (EM) and a modified ride-on car (mROC) in young children with cerebral palsy. Method: Data were gathered throughout a multisite, randomized, counterbalanced AB crossover 16-week clinical trial, wherein all participants used device A (EM) and device B (mROC) for 8-weeks each. Semistructured parent interviews were conducted at baseline (T0), post-intervention period 1 (T1), and post-intervention period 2 (T2). The Linguistic Inquiry and Word Count program was used to objectively analyze the transcribed interviews. Results: Twenty-four child-parent dyads participated in the study. Parental perceptions were related to children's gross motor abilities, cognitive development scores, and device use order (EM-mROC or mROC-EM). Conclusions: Parents were positive about a potential means of helping their children. While most preferred the EM, opinions were contingent on the PM device, device use order, and child-centered factors.

PMID: 39465983

14. Predictors of school attendance among children with cerebral palsy in Bangladesh

Mahmudul Hassan Al Imam, Israt Jahan, Genevieve Perrins, Mohammad Muhit, Nadia Badawi, Gulam Khandaker

Dev Med Child Neurol. 2024 Oct 27. doi: 10.1111/dmcn.16136. Online ahead of print.

Aim: To determine school attendance and its predictors among children with cerebral palsy (CP) in Bangladesh using population-based data. Method: This study utilized data from the Bangladesh Cerebral Palsy Register (BCPR), a population-based register of children with CP aged less than 18 years in Bangladesh. Sociodemographic, clinical, and educational data were documented, and descriptive statistics and multivariate regression analyses were used to identify potential predictors of school attendance. Results: Between January 2015 and January 2019, 2725 children with CP were registered into BCPR of which 1582 were school-aged children (i.e. aged 6-18 years). The majority of those children had not attended school (73.9%); 50% (n = 239) children in Gross Motor Function Classification System (GMFCS) levels I to II did not attend schools. Adjusted odds ratios (OR) showed significantly higher odds of school attendance among children whose mothers had completed secondary education or higher (adjusted OR: 2.2; 95% confidence interval [CI]: 1.2-4.0) and received rehabilitation (adjusted OR: 2.1; 95% CI: 1.4-3.1). Conversely, lower odds of school attendance were observed among children aged 15 to 18 years (adjusted OR: 0.4; 95% CI: 0.2-0.8), those with bilateral CP (adjusted OR: 0.5; 95% CI: 0.3-0.8), GMFCS levels III to V (adjusted OR: 0.3; 95% CI: 0.2-0.5), Manual Ability Classification System levels III to V (adjusted OR: 0.5; 95% CI: 0.4-0.8), and speech impairment (adjusted OR: 0.3; 95% CI: 0.2-0.6). Interpretation: A large number of children with CP in Bangladesh, including half of those with milder forms, do not attend schools. These findings underscore a deficiency in awareness and support, encompassing the provision of resources and trained teachers, highlighting the necessity for policy-level changes. Sociodemographic and clinical predictors should be taken into account when devising educational programmes to enhance school attendance for children with CP in Bangladesh.

PMID: 39462437

15. Genetic investigations in cerebral palsy

No authors listed

Dev Med Child Neurol. 2024 Dec;66(12):e251. doi: 10.1111/dmcn.16151. Epub 2024 Oct 27.

No abstract available

PMID: 39462267

16. Associated impairments among children with cerebral palsy: findings from a cross-sectional hospital-based study in Vietnam

Thi Hong Hanh Khuc, Tasneem Karim, Van Anh Thi Nguyen, Nguyen Thi Huong Giang, Trịnh Quang Dũng, Rachael Dossetor, Chau Cao Minh, Nguyen Van Bang, Nadia Badawi, Gulam Khandaker, Elizabeth Elliott

BMJ Open. 2024 Oct 26;14(10):e075820. doi: 10.1136/bmjopen-2023-075820.

Objective: This study aims to explore the associated impairments of cerebral palsy (CP) and their correlates among children with CP in Vietnam. Design: Descriptive cross-sectional study using hospital-based surveillance. Setting: National Children's Hospital, Hanoi, Vietnam between June and November 2017. Participants: 765 children with CP were recruited. Outcome measures: We assessed clinical characteristics of CP, associated impairments (epilepsy, intellectual, visual, hearing, speech impairments) and their correlates. We performed descriptive analyses (median, IQR and proportion). $\chi 2$ test and Fisher's exact test were used for categorical variables. Univariate logistic regression and multivariate logistic regression models were established and associated impairments were included as independent variables. Results: The median age of children was 1.7 years (IQR=2.7). Quadriplegia was the predominant subtype (69.5%) and 46.5% were at Gross Motor Function Classification System level IV-V. Of children, 76.3% had ≥one associated impairment, most commonly speech or intellectual impairments (59.1% and 57.8%, respectively). Severity of motor impairment, type of CP, maternal and perinatal factors (eg, gestational age, perinatal asphyxia, timing of injury causing CP) were associated with greater risk of associated impairments. Conclusion: Children with CP have a high burden of associated impairments. Findings from our study will inform the development and implementation of appropriate screening and interventions and reduce the long-term adverse effects of these impairments on individuals with CP and their socioeconomic impact.

PMID: 39461866

17. Cerebral palsy characteristics in term-born children with and without detectable perinatal risk factors: A cross-sectional study

No authors listed

Dev Med Child Neurol. 2024 Dec;66(12):e255. doi: 10.1111/dmcn.16154. Epub 2024 Oct 26.

No abstract available

PMID: 39460988

18. Cerebral palsy: potential risk factors and functional status among children under three years, a case-control study in northwest Iran

Morteza Haramshahi, Vahideh Toopchizadeh, Samira Pourzeinali, Neda Nikkhesal, Tahereh Sefidi Heris, Azizeh Farshbaf-Khalili, Shirin Osouli-Tabrizi

BMC Pediatr. 2024 Oct 31;24(1):695. doi: 10.1186/s12887-024-05164-5.

Background: Cerebral palsy (CP) is one of the most common motor-postural disorders in childhood. It occurs due to impairment in the developing brain-before, during, or after birth-and has a significant burden on the public health system. This study aimed to investigate the potential risk factors and detect the associated CP-related disorders. Methods: This case-control study was conducted on 46 children with CP and 175 matched healthy children less than three years old who referred to the Children's Hospital, Tabriz, Iran in 2022. Then, a checklist related to the mother's medical history during current and previous pregnancies, a questionnaire related to perinatal factors of the newborn, types of CP, concurrent disorders, the Gross Motor Function Classification System (GMFCS), and Age and Stage Questionaire (ASQ) were completed. Data was analyzed using Statistical Package for the Social Sciences) SPSS(-21 software by descriptive and analytical statistics consisted of Chi-square, Independent t-test, and Binary logistic regression. Results: Finally, 35 children with CP and 122 healthy children completed the study and were analyzed. The mean (standard deviation: SD) age of children in the CP group was 15.3 (6.2) and in the healthy group was 14.4 (6.6) months ($p = 0.635$). Spastic CP (82.9%) was the common type, and the most common prevailing form of the involved limb was quadriplegia (54.3%). The severity of the functional disorder in 39.3% of CP cases was at levels 4 and 5 (severe form). The most prevalent comorbidities were inability to walk (31.4%), speech delay (22.9%), epilepsy (11.4), and strabismus (8.6%). Children with CP had abnormal development in gross motor (82.9%), problem-solving (68.6%), personal-social (65.7%), fine motor (60%), and communication (54.3%). Moreover, duration of pregnancy ($p = 0.023$), birth weight lower than 2500 g ($p = 0.002$), problems in the current pregnancy [adjusted odds ratio (aOR) [95% CI]: 3.06 (1.87 to 8.54); $p = 0.013$] and problems in previous pregnancy ([aOR (95% CI): 4.8 (1.6 to 14.2); $p = 0.005$) were potential risk factors. Conclusion: Due to accompanying movement, vision, and speech problems, especially high developmental disorders in children with CP, necessary measures to prevent the identified risk factors are very important.

PMID: 39482607

19. Neonatal Morbidities, Neurodevelopmental Impairments, and Positive Health among Children Surviving Birth Before 32 Weeks of Gestation

J Wells Logan, Xiaodan Tang, Rachel G Greenberg, Brian Smith, Lisa Jacobson, Courtney K Blackwell, Mark Hudak, Judy L Aschner, Barry Lester, T Michael O'Shea; program collaborators for Environmental influences on Child Health Outcomes

J Pediatr. 2024 Oct 29:114376. doi: 10.1016/j.jpeds.2024.114376. Online ahead of print.

Objectives: To evaluate positive health outcomes among children born at < 32 weeks of gestation, and to determine whether children with three common neonatal morbidities and two neurodevelopmental impairments would have similar positive health outcomes to children and adolescents without these exposures and impairments. Study design: In this secondary analysis of prospectively acquired data derived from three multi-center cohorts of children born very preterm (the ELGAN cohort [birth years 2001 to 2004], the NOVI cohort [birth years 2014 to 2016], and the DINE cohort [birth years 2010 to 2020]), we examined associations between the three common neonatal morbidities (bronchopulmonary dysplasia, necrotizing enterocolitis, and intraventricular hemorrhage, diagnosed before hospital discharge), two neurodevelopmental impairments (developmental delays and cerebral palsy, diagnosed at preschool age follow-up), and perceptions of physical, mental, and social well-being (in either early childhood or adolescence), using the Patient-Reported Outcomes Measurement Information System (PROMIS®) scales for positive health. Results: After adjusting for confounders, bronchopulmonary dysplasia, intraventricular hemorrhage, and cerebral palsy were associated with lower positive health scores, reported by parent-proxy during early childhood. None of the exposures or impairments were associated with lower positive health scores at adolescence, reported by the children themselves. Conclusion: Parents of children born very preterm with bronchopulmonary dysplasia, intraventricular hemorrhage, or cerebral palsy rated their children's positive health lower than did parents of children without these morbidities. However, adolescents' own reports of positive health outcomes were not associated with either neonatal pre-discharge morbidities or preschool neurodevelopmental impairments.

PMID: 39481800

20. Clinical Profile, Etiological Factors and Comorbidities of Hemiparetic Cerebral Palsy

Arushi Gahlot Saini, Pradeep Kumar Gunasekaran, Niranjan Khandelwal, Prahbhjot Malhi, Pratibha Singhi

Indian J Pediatr. 2024 Oct 31. doi: 10.1007/s12098-024-05312-w. Online ahead of print.

No abstract available

PMID: 39480615

21. Cerebral palsy in Australia: optimism and challenges

Rod W Hunt

Editorial Med J Aust. 2024 Oct 31. doi: 10.5694/mja2.52492. Online ahead of print.

No abstract available

PMID: 39478678

22. Cerebral palsy in Australia: birth prevalence, 1995-2016, and differences by residential remoteness: a population-based register study

Hayley Smithers-Sheedy, Emma Waight, Shona Goldsmith, Sue Reid, Catherine Gibson, Heather Scott, Linda Watson, Megan Auld, Fiona Kay, Clare Wiltshire, Gina Hinwood, Annabel Webb, Tanya Martin, Nadia Badawi, Sarah McIntyre; ACPR Group

Med J Aust. 2024 Oct 30. doi: 10.5694/mja2.52487. Online ahead of print.

Objective: To examine recent changes in the birth prevalence of cerebral palsy in Australia; to examine the functional mobility of children with cerebral palsy by residential remoteness. Study design: Population-based register study; analysis of Australian Cerebral Palsy Register (ACPR) data. Setting, participants: Children with cerebral palsy born in Australia, 1995-2016, and included in the ACPR at the time of the most recent state/territory data provision (31 July 2022). Main outcome measures: Change in birth prevalence of cerebral palsy, of cerebral palsy acquired pre- or perinatally (in utero to day 28 after birth), both overall and by gestational age group (less than 28, 28-31, 32-36, 37 or more weeks), and of cerebral palsy acquired post-neonatally (day 29 to two years of age); gross motor function classification by residential remoteness. Results: Data for 10 855 children with cerebral palsy born during 1995-2016 were available, 6258 of whom were boys (57.7%). The birth prevalence of cerebral palsy in the three states with complete case ascertainment (South Australia, Victoria, Western Australia) declined from

2.1 (95% confidence interval [CI], 1.9-2.4) cases per 1000 live births in 1995-1996 to 1.5 (95% CI, 1.3-1.7) cases per 1000 live births in 2015-2016. The birth prevalence of pre- or perinatally acquired cerebral palsy declined from 2.0 (95% CI, 1.7-2.3) to 1.4 (95% CI, 1.2-1.6) cases per 1000 live births; statistically significant declines were noted for all gestational ages except 32-36 weeks. The decline in birth prevalence of post-neonatally acquired cerebral palsy, from 0.15 (95% CI, 0.11-0.21) to 0.08 (95% CI, 0.05-0.12) cases per 1000 live births, was not statistically significant. Overall, 3.4% of children with cerebral palsy (307 children) lived in remote or very remote areas, a larger proportion than for all Australians (2.0%); the proportion of children in these areas who required wheelchairs for mobility was larger (31.3%) than that of children with cerebral palsy in major cities or regional areas (each 26.1%). Conclusions: The birth prevalence of cerebral palsy declined markedly in Australia during 1995-2016, reflecting the effects of advances in maternal and perinatal care. Our findings highlight the need to provide equitable, culturally safe access to antenatal services for women, and to health and disability services for people with cerebral palsy, across Australia.

PMID: 39478298

23. Is it now possible to identify all newborn infants at risk of cerebral palsy?

Christina Engel Hoei-Hansen, Gija Rackauskaite, Mads Langager Larsen

Dev Med Child Neurol. 2024 Oct 30. doi: 10.1111/dmcn.16159. Online ahead of print.

No abstract available

PMID: 39474870

24. Novel GNB1 Variant and the Development of Spastic Diplegic Cerebral Palsy

Johanie Victoria Piché, Michael Shevell

Can J Neurol Sci. 2024 Oct 30:1-2. doi: 10.1017/cjn.2024.318. Online ahead of print.

No abstract available

PMID: 39473170

25. Caregiver-reported satisfaction with pediatric movement disorder surgery

Mahalia Dalmage, Celeste Lai, Jennifer Misasi, Isabel Lehmann, Jeffrey S Raskin

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Objective: Patient- and surrogate-reported outcomes are increasingly recognized as important and historically limited dimensions of satisfaction with medical care. Evaluating caregiver satisfaction for cerebral palsy (CP) patients with pediatric movement disorders (PMDs) remains undefined, limited by a lack of appropriate tools and the heterogeneity of the patient population. The authors identified caregiver satisfaction with the neurosurgical management of PMDs as a key quality metric and report their results across an institutional experience. Methods: A retrospective single-institution survey study was performed on caregivers of consecutive children who underwent PMD surgery from March 2022 to December 2023. The authors designed a brief 4-question satisfaction survey with dichotomous yes/no answers. The telephone survey solicited answers from primary caregivers, and contact attempts were made 3 times before labeling a nonresponder. Non-English speakers were included. The survey answers were correlated with demographic characteristics, clinical data, and complications. Descriptive statistics were performed using Excel. Results: Seventy patients were identified in the study period with 50 associated caregivers voluntarily responding to the questionnaire (50/70 [71.4%]). Forty-six male and 24 female patients with a mean (range) age of 13.1 (2-34) years and a follow-up range of 3-20 months were included. All 50 caregivers reported satisfaction with the surgical care their child received: 100% confirmed they would refer others to the program and 94% confirmed that they would have the surgery again in retrospect. Ten caregivers (10/50 [20%]) recalled complications, but only 5 (5/50 [10%]) surgical complications resulted in hospital readmission. Conclusions: Caregivers were overwhelmingly satisfied with the neurosurgical care for PMDs and would recommend the functional pediatric neurosurgery program to others. A large percentage would again submit to the surgery. There is a perception disparity between caregiver- and hospital-identified complications; it may be beneficial to emphasize expected adverse effects with caregivers prior to surgery. Caregiver satisfaction remains an important quality dimension and future research may benefit from more objective metrics.

PMID: 39486079

26. Three consecutive pregnancies in a woman with spastic cerebral palsy being treated with intrathecal baclofen therapy

Kim D D Barker, M Imran Murtuza, Ellen V Sloan

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Baclofen is a commonly used medication for spasticity in patients with an injury to the central nervous system. For some, intrathecal delivery of baclofen provides better treatment with fewer systemic side effects. Baclofen is a category C medication during pregnancy based on animal studies. This narrative review presents the three consecutive pregnancies of a woman with spastic quadriparesis due to cerebral palsy that was being treated with an intrathecal baclofen (ITB) pump. Her spasticity care occurred at a large academic institution. Her prenatal and perinatal care occurred at the adjacent county hospital. There is limited literature on the safety of the use of an ITB pump for the treatment of spasticity in pregnant women, and this patient presentation aims to describe the course for the mother and her infants as she received treatment for her spasticity with an ITB pump.

PMID: 39475435

Prevention and Cure

27. Impacts of Maternal Preeclampsia Exposure on Offspring Neuronal Development: Recent Insights and Interventional Approaches

He Zhang, Jinju Lin, Huashan Zhao

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Preeclampsia, a hypertensive disorder during pregnancy, frequently correlates with adverse neurological outcomes in offspring, including cognitive impairments, autism spectrum disorder, depressive disorder, attention deficit hyperactivity disorder, and cerebral palsy. Despite these known consequences, the understanding of neuronal damage in the offspring of preeclamptic mothers remains insufficient. Here, we review the neuronal abnormalities resulting from maternal preeclampsia exposure, which include disrupted neurogenesis, loss of neuronal cell integrity, accumulation of cellular debris, decreased synaptogenesis and myelination, and increased neurite growth stimulated by maternal preeclampsia serum. The underlying mechanisms potentially driving these effects involve microglial activation, inflammatory responses, and reduced angiogenesis. Intervention strategies aimed at improving fetal neuronal outcomes are also discussed, encompassing pharmacological treatments such as pravastatin, tadalafil, and melatonin, as well as non-pharmacological approaches like dietary modifications, maternal exercise, and standard care for children. These interventions hold promise for clinical application, offering avenues to address early neuronal abnormalities and prevent the onset of long-term neurological disorders.

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