Cerebral palsy research news

Monday 09 February 2026

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Interventions and Management

1.Both Hands Assessment for children and adolescents with bilateral cerebral palsy: Content and construct validity

No authors listed

Dev Med Child Neurol. 2026 Feb 5. Online ahead of print.

Abstract
No abstract available.
PMID: 41645039

2.Validation of the Hand Assessment for Infants for bilateral and unilateral cerebral palsy

No authors listed

Dev Med Child Neurol. 2026 Feb 5. Online ahead of print.

Abstract
No abstract available.
PMID: 41645025

3.Effects of exercise combined with brain stimulation on hand function in children with cerebral palsy: a meta-analysis of randomized controlled trials

Shuoqi Li, Shenhao Guo, Ruihan Wang, Jiayuan Ma, Hu Lou

PeerJ. 2026 Jan 29;14:e20670. eCollection 2026.

Background: Cerebral palsy (CP) is a paediatric condition generally characterized by persistent motor disabilities in hand function. This review examined the impact of exercise with and without brain stimulation on hand function in children with CP.
Methodology: A systematic literature search was conducted from January 2010 to June 2025 across four electronic databases: Web of Science, Scopus, PubMed, and EBSCO. This review established the inclusion criteria as follows: 1. Children with CP; 2. Randomised controlled trial; 3. Exercise with and without brain stimulation; 4. Measurements included gross motor function (GMF), fine manual control (FMC) and grip strength (GS) evaluated at pre- and post-intervention. The quality of the included studies was assessed using the Cochrane Risk of Bias tool. For data analysis, the standardized mean difference (SMD) was selected as the appropriate effect size index, and RevMan 5.4 software was employed to analyze the mean differences in the data extracted from the included articles.
Results: The results showed that exercise with brain stimulation comprising more than 16 sessions could notably improve GS (SMD 1.38 (0.88, 1.88), $p < 0.05$, $I2 = 0\%$), whereas that comprising fewer than 10 sessions did not demonstrate a statistically significant effect (SMD 0.19 (-0.29, 0.67), $p = 0.44$, $I2 = 0\%$). Consequently, brain stimulation intervention could substantially enhance FMC (SMD 0.46 (0.15, 0.76), $p < 0.05$, $I2 = 47\%$). Subgroup analysis also presented that exercise with transcranial direct current stimulation (tDCS) resulted in a significant improvement in FMC (SMD 0.71 (0.29, 1.14), $p < 0.05$, $I2 = 49\%$) compared to exercise with repetitive transcranial magnetic stimulation (SMD 0.19 (-0.25, 0.63), $p = 0.09$, $I2 = 47\%$).
Conclusion: This review demonstrated that exercise with brain stimulation could significantly enhance hand function in children with CP. Specifically, more than 16 sessions has greater benefits for GS, and tDCS may confer benefits for FMC.
PMID: 41630846

4.Impact on Families of Upper Extremity Surgical Treatment for Children with Cerebral Palsy

Sarah Romans, Adam Mosa, Lindley B Wall

J Hand Surg Glob Online. 2026 Jan 24;8(2):100943. eCollection 2026 Mar.

Purpose: Upper-extremity surgery for children with cerebral palsy (CP) aims to address spasticity, improve function, and enhance quality of life. Although previous research has focused on functional outcomes, limited data exist regarding the broader impact of these surgeries on families. This study examines the psychosocial, functional, and familial impacts of upper-extremity surgery in CP patients, which in turn would inform preoperative education and postoperative support strategies.
Methods: Parents/guardians of children with CP who underwent upper-extremity surgery at least 6 months prior were recruited. Participants completed the validated Impact on Family Scale survey and participated in semistructured interviews exploring family experiences. Thematic analysis of interview transcripts was performed, with intercoder reliability achieved through independent coding. Survey data were analyzed to identify common family impacts.
Results: Thirteen interviews were conducted (11 parents, two patients). Thematic analysis identified six overarching themes: (1) functional and mobility improvements, including range of motion; (2) independence in activities of daily living; (3) positive cosmetic impacts; (4) patient psychosocial outcomes, such as increased confidence and social engagement; (5) family-level psychosocial outcomes, including stress during recovery and the importance of external family support systems; and (6) interactions with the care team. Impact on Family Scale survey results had a mean score of 55.1 and revealed that psychosocial and financial burdens varied, with the highest agreement for statements emphasizing normalization of the child's condition.
Conclusions: Upper-extremity surgery for CP has profound physical and psychosocial impacts on both patients and their families. Improvements in functional independence, confidence, and aesthetics were commonly observed; however, emotional challenges during recovery were notable. The findings underscore the importance of setting realistic expectations, providing robust preoperative education, and ensuring access to psychosocial support systems. Future studies should investigate longitudinal outcomes and interventions to better support families during the surgical journey.
PMID: 41624975

5.Functional motor performance and reliability of the Dubousset Functional Test in ambulatory children with spastic cerebral palsy

Betül Ergün, Müge Baykan, Özge Baykan Çopuroğlu, Hanife Abakay, Ayşe Güç, Rıdvan Karabulut

Dev Neurorehabil. 2026 Feb 7:1-7. Online ahead of print.

Background: Cerebral palsy (CP) causes permanent motor impairments, limiting postural control and mobility. The Dubousset Functional Test (DFT) was developed to assess daily activity performance, but its reliability and validity in pediatric CP are unclear. This study aimed to evaluate its reliability, convergent and discriminative validity, and clinical utility in children with spastic CP at GMFCS Levels I - II.
Methods: Thirty-three children aged 6–15 years with spastic CP (GMFCS I–II) participated in this cross-sectional methodological study. The DFT (Rise-and-Walk, Step, Sit-to-Stand, and Dual Task subtests) was administered along with the Timed Up and Go (TUG), Dual-task TUG, 3-Meter Backward Walk Test (3MBWT), Functional Reach Test (FRT), and Pediatric Balance Scale (PBS). All assessments were conducted twice, seven days apart, by a single experienced physiotherapist.
Results: The DFT demonstrated excellent reliability, with ICC(3,2) values ranging from 0.91 to 0.95 and minimal measurement bias (–0.61 to 0.36 s). The smallest detectable change (SDC) ranged from 2.1 to 13.0 s, confirming high measurement precision. Strong correlations were observed between the DFT Dual Task and both TUG ($r = 0.95$, $p < .001$) and Dual-task TUG ($r = 0.95$, $p < .001$), supporting convergent validity. ROC analysis indicated excellent discriminative accuracy for identifying children with balance limitations (PBS < 45) (AUC = 0.82, sensitivity = 0.81, specificity = 0.78).
Conclusion: The DFT is a reliable, valid, and clinically feasible tool for assessing balance and mobility in ambulatory children with spastic CP at GMFCS I–II, supporting routine rehabilitation use.
Plain language summary
The Dubousset Functional Test (DFT) demonstrates strong reliability and convergent and discriminative validity in ambulatory children with spastic cerebral palsy (GMFCS Levels I – II), supporting its use as a standardized measure of functional mobility.• DFT offers a time-efficient and clinically feasible method for assessing dynamic balance and postural control, making it suitable for routine use in pediatric neurorehabilitation settings.• The test provides sensitive performance-based metrics that can assist clinicians in monitoring response to therapy, identifying subtle functional changes, and guiding individualized rehabilitation planning.• Integrating the DFT into regular assessment batteries may enhance the accuracy of functional profiling in children with mild to moderate motor impairments and support data-driven clinical decision-making.
PMID: 41653057

6.Development of a set of core outcome measures for ambulant children with cerebral palsy after lower limb orthopaedic surgery

No authors listed

Dev Med Child Neurol. 2026 Feb 5. Online ahead of print.

Abstract
No abstract available.
PMID: 41645011

7.Exploring the alignment between occupational therapy using Ayres Sensory Integration® with children and occupation-centred practice: An observational study

Carolina Acuña, Sebastian Gallegos-Berrios, Jacqui Barfoot, Pamela Meredith, Jessica Hill

Aust Occup Ther J. 2026 Feb;73(1):e70076.

Introduction: There is a longstanding debate about using Ayres Sensory Integration® (ASI) as an occupational therapy approach, fuelled partly by queries about its alignment with the current occupation-centred paradigm. Despite many voicing their opinions, no studies have considered the extent to which occupational therapy using ASI with children might be implemented in a way that aligns with occupation-centred practice. This study was designed to explore that alignment.
Methods: This mixed-methods study involved eight occupational therapists certified to implement ASI. Data collection involved (1) an online survey to gather demographic data and rate structural fidelity elements; (2) a review and rating of a video-recorded session using process fidelity elements and the occupation-centred practice checklist for observable items (e.g. therapist–child collaboration); and (3) a review and rating of semi-structured interview data using the same checklist for non-observable items (e.g. child- or family-chosen goals). Two coders independently analysed the data.
Consumer and community involvement: No consumers were involved in this study.
Findings: The extent to which interventions aligned with occupation-centred practice varied among the participants, with partial uptake of several components observed across therapists. Some occupation-centred practice components were more consistently met, including identifying client concerns, developing trust with the child, and considering the child's unique features when planning interventions. Other components were more consistently missed, such as collaborating with caregivers, co-creating and reviewing goals, establishing occupational outcome measures, considering the client's broader context, and drawing on multiple theories and approaches to guide practice.
Conclusion: Some participants' therapeutic approach was more closely aligned with occupation-centred practice, evidencing the potential for occupation-centred implementation of ASI. Nevertheless, findings underscore the need to strengthen the occupational focus. Therapists may benefit from occupation-centred practice training and using the checklist presented in this study to self-monitor alignment with the profession's paradigm.
Plain language summary
Occupational therapists are encouraged to listen to both the child and their caregivers and focus on what matters to them in daily life. How well therapists using Ayres Sensory Integration® did that was explored by observing a small group of therapists working with children in Australia and New Zealand. We used: (1) an online survey to gather basic information about the therapists, their client, and the intervention; (2) to watch a video-recorded session to check for key elements, such as if the therapist and child worked together; and (3) to review an interview we did with the therapists to look for elements that were not always visible in a session, such as whether goals were chosen by the child or family. Results showed that therapists used some key elements of an occupational focus, but none used all. Some elements were used often, such as identifying child or family concerns, building trust, and considering the child's unique needs. Other elements were less often used. These included working with caregivers, creating and reviewing goals together, focussing on daily activities when measuring results, thinking about the child's everyday contexts, and using more than one theory. These results suggest the need to strengthen the occupational focus in specific areas. Some therapists were closer to meeting all elements of an occupational focus, showing that the approach being studied can be used that way. The checklist used in this study can help therapists reflect on how well they do this.
PMID: 41644501

8.Conceptual framework for creative dance-based practice in cerebral palsy rehabilitation: mini review

Hee Joung Joung

Front Rehabil Sci. 2026 Jan 16;6:1758651. eCollection 2025.

Abstract
In recent years, shifting paradigms in cerebral palsy (CP) rehabilitation have highlighted approaches that promote autonomous movement through active participation, including goal-directed training, task-specific training, context-focused therapy, and constraint-induced movement therapy. Dance has increasingly been recognized in neurorehabilitation as a promising intervention capable of supporting physical, cognitive, and social functioning. Among various dance practices, this mini review focuses on the conceptual framework of creative dance. Creative dance centers on the process of generating movement, which aligns with contemporary paradigms in cerebral palsy rehabilitation. Additionally, because creative dance values the discovery and development of new and unique movements, it provides a setting in which movements, whether with or without disabilities, are respected and accepted as having equal value. These values play a crucial role in fostering a sense of achievement, interest, motivation, and sustained engagement, all of which are emphasized in rehabilitation for individuals with cerebral palsy. However, despite its potential, creative dance remains in the early stages of development as a rehabilitation modality. Establishing a solid evidence base will require a clearer understanding of the movement methodology underlying creative dance. In this mini review, I examine the movement methodology embedded in creative dance-based practice (CBP) and propose a conceptual framework to support its implementation within rehabilitation contexts for individuals with CP.
PMID: 41626287

9.Examining links between somatosensation and cognition in children with hemiplegic cerebral palsy

Kassandra M Hewitt, Donna M Bayliss, Belinda A McLean, Ashleigh L Thornton, Jonson J Moyle

Child Neuropsychol. 2026 Feb 3:1-26. Online ahead of print.

Abstract
Children with cerebral palsy (CP) are at increased risk of impaired somatosensation and cognition. Among children with hemiplegia, approximately three-quarters have impaired somatosensation and one-third have intellectual impairment. While somatosensation may relate to cognitive functioning in CP, this relationship has not previously been investigated. This cross-sectional study examined the relationship between somatosensation and cognition in children with hemiplegic CP, and whether the pattern of brain injury, classified using an established MRI classification system, moderates this relationship. Forty-seven children (26 females) with hemiplegic CP participated (mean age = 11.0 years; SD = 3.6; range: 6–16 years). Parent questionnaires provided demographic, educational, and medical history. Cognition was assessed using Index scores from the Wechsler Intelligence Scale for Children-Fifth Edition (WISC-V). Somatosensation in the affected and less-affected hands was measured using subtests from Sense© Assess Kids. Wrist position sense and haptic ability of the affected hand significantly correlated with most WISC-V Index scores. Somatosensory functioning of the less-affected hand showed inconsistent associations with cognition. Multiple regressions indicated that wrist position sense of the affected hand predicted visuospatial ability, fluid reasoning, and overall intelligence. Haptic ability of the affected hand predicted verbal comprehension and overall intelligence. For the less-affected hand, wrist position sense predicted visuospatial ability, but haptic ability did not predict any cognitive outcomes. Multicategorical moderation showed that the pattern of brain injury did not consistently moderate somatosensation–cognition relationships. Identifying somatosensory difficulties may provide early insight into cognitive performance in children with hemiplegic CP. Further research is needed to understand the direction and mechanisms of this relationship.
PMID: 41634536

10.Rapunzel Syndrome Complicated by Cholecystoduodenal Fistula Secondary to Biliary Compression: A Case Report of a Patient With Cerebral Palsy

José Serafio-Gómez, Ian-Arfaxad Saldaña-Badillo, Dana Karina Mauleon-Tiscareño, Juan Pablo Pérez Bucio, Angela Márquez Romero, Yozgart Aldahir Hornedo García

Cureus. 2026 Jan 29;18(1):e102568. eCollection 2026 Jan.

Abstract
Rapunzel syndrome is a rare form of gastric trichobezoar that extends into the small intestine, leading to intestinal obstruction. Biliary-enteric fistulas are abnormal communications between the biliary system and the gastrointestinal tract, generally occurring spontaneously. We report the case of a 26-year-old female patient with a history of cerebral palsy who presented to the emergency department with an acute abdomen. Computed tomography revealed a mass occupying the stomach and intestine. A laparotomy was performed, identifying a gastric and duodenal trichobezoar complicated by an acute perforated gastric ulcer, in addition to a vesicoduodenal fistula secondary to extrinsic compression of the gallbladder. This fistula clinically mimicked a type V Mirizzi syndrome. A Roux-en-Y hepaticojejunostomy was carried out. The patient died from nosocomial pneumonia 30 days later. This case highlights the importance of a multidisciplinary approach in patients with underlying neurological conditions and underscores the surgical feasibility of hepaticojejunostomy in complex scenarios of secondary biliary involvement.
PMID: 41625038

11.Outcomes and Multimorbidity among Children and Youth with Chronic Neurologic Disorders Hospitalized for COVID-19: A Canadian Immunization Monitoring Program, ACTive Study

Daniel S Farrar, Ryan S Huang, Elizabeth J Donner, Julie A Bettinger, Aaron J Campigotto, Costanza Di Chiara, Olivier Drouin, Joanne E Embree, Scott A Halperin, Tajdin Jadavji, Kescha Kazmi, Charlotte Moore Hepburn, Jesse Papenburg, Rupeena Purewal, Manish Sadarangani, Laura Sauvé, Karina A Top, Fatima Kakkar, Shaun K Morris; Canadian Immunization Monitoring Program, Active (IMPACT) Investigators

J Pediatr. 2026 Jan 29:115012. Online ahead of print.

Objective: To estimate the association between chronic neurologic disorders (NDs) and severe COVID-19 among hospitalized children and youth, and assess how multimorbidity (≥2 chronic comorbidities) modifies this association.
Study design: A national surveillance study was conducted at 13 children's hospitals in Canada from April 2020–December 2022 via the Canadian Paediatric Surveillance Program and Canadian Immunization Monitoring Program, ACTive. Eligible cases were <17 years old and hospitalized for COVID-19. Chronic comorbidities were classified using the Medical Dictionary for Regulatory Activities. Severe COVID-19 included intensive care admission, ventilatory/hemodynamic support, systemic complication, and/or death. Mixed-effects robust Poisson regression estimated adjusted prevalence ratios (aPR) between NDs and severe COVID-19, with interaction terms for multimorbidity.
Results: Among 3218 hospitalized cases, 601 (18.7%) had NDs. Most ND cases (476/601, 79.2%) had ≥2 chronic comorbidities. Severe COVID-19 was more common among cases with cerebral palsy (aPR 1.30, 95% CI 1.08–1.57), epilepsy (aPR 1.50, 95% CI 1.14–1.96), genetic disorders with neurologic abnormalities (aPR 1.41, 95% CI 1.18–1.67), and neuromuscular disorders (aPR 1.37, 95% CI 1.08–1.75). A dose-response relationship was observed where additional comorbidities strengthened associations with severe disease (eg, aPR 1.29 [95% CI 1.03–1.62] for one comorbidity; aPR 2.86 [95% CI 2.11–3.87] for ≥4 comorbidities).
Conclusions: Children and youth with NDs were disproportionately affected by severe COVID-19, with the highest risk among those with multimorbidity. Many ND cases remained unvaccinated and may benefit from targeted vaccine-uptake efforts.
PMID: 41620077

12.Access technologies for people with significant motor impairment with potential to impact speed and/or accuracy of communication: a scoping review

Annemarie Murphy, Sabrina Schaly, Darryl Chiu, Amelia Mitchell, Christina Shen, Geetika Maddirala, Tarkeshwar Singh, Alistair McEwan, Petra Karlsson

Augment Altern Commun. 2026 Feb 6:1-13. Online ahead of print.

Abstract
Individuals with significant communication and physical impairments often rely on augmentative and alternative communication (AAC) to facilitate independent communication across a range of communication partners and settings. Due to physical impairments, many individuals require alternate methods to access AAC systems, known as access technologies. While access technologies have advanced, they remain considerably slower than verbal communication. This scoping review explored recent advances in access technologies published between 2019 and 2024, focusing on technologies that facilitate communication speed and/or accuracy for individuals of any age with physical disabilities. Forty-six studies met inclusion criteria, covering a range of technologies such as brain-computer interfaces (BCIs), eye-tracking technology, and novel applications, such as a mixed reality AAC environment and multimodal access approaches (e.g., integrated eye-tracking with switch scanning, hybrid BCI eye-tracking). Despite technological progress, fewer than one-third of studies addressed the role of communication partners in setup and support, highlighting a gap in user-centred design. Findings are discussed in terms of practical applications and emerging directions for technology development. Implications for clinical practice and future research include the need for inclusive design, improved usability, and greater consideration of communication partner involvement in AAC access solutions.
PMID: 41649064

13.MightyU – A portable sensor-based video game application for exercise training of children and adolescents with cerebral palsy

Lynn Eitner, Lennart Lücke, Elnaz Farshadfar, Christian Grüneberg, Christoph Maier, Almut Weitkämper, Bettina Menzen, Anja Burmann, Roman von Gehlen, Peter Konrad, Thomas Immich, Britta Karn, Patrick Filipowicz, Maximilian Pilk, Thomas Lücke

PLoS One. 2026 Feb 4;21(2):e0339704. eCollection 2026.

Introduction: To prevent therapy fatigue and maintain motivation for daily home muscle training is important for children with cerebral palsy (CP). Therefore, we developed the computer-based motion-controlled training tool MightyU. Its feasibility, short-term effectiveness and acceptance of the game in daily muscle training at home was now tested in children with varying degrees of motor impairment.
Methods: A surface electromyography sensor detects muscle activation, which is translated into in-game actions. Targeted muscle activity is used to collect coins during gameplay. Nineteen children with CP tested MightyU at home for a week on a predetermined muscle group of the upper or lower limbs. Feasibility analysis considered refusals to participate, voluntary home use, and feedback using the Game Experience Questionnaire. Usability evaluation was based on a modified System Usability Scale. Training effect was assessed by analyzing the difference in coins collected before and after one week.
Results: MightyU was refused by 2 of 21 children; 19 children (9 female, 11.3 ± 2.9 years, GMFCS I–IV) used it at home without adverse effects. All children and families showed strong interest regardless of age, IQ, disability severity, targeted movement, or gaming experience. Game Experience Questionnaire results were positive, with children rating the game more favorably than parents. Median System Usability Scale score was 83.3% for children and 79.2% for parents. Training led to a 41% increase in collected coins.
Conclusion: Children with CP and their families demonstrated strong interest in MightyU. High usability and user satisfaction suggest its potential to support patient autonomy and therapy adherence.
PMID: 41637429

14.Directions for inclusive AAC research: a scoping review focused on adults with cerebral palsy

Kelsey Steffen, Janice Light, Lateef McLeod, Tracy Rackensperger, David McNaughton

Augment Altern Commun. 2026 Feb 2:1-12. Online ahead of print.

Abstract
Traditionally, alternative and augmentative communication (AAC) research has been led by researchers without lived experience using AAC. However, it is important to include AAC users as equitable partners to ensure that research addresses their priorities. This scoping review aimed to identify the extent and nature of AAC user involvement in research focused on adults with cerebral palsy (CP) who use AAC. A systematic search identified 57 data-based studies from the last 22 years that focused on adults with CP who used AAC. Seven (12%) of those studies involved at least one AAC user in at least one research process (conceptualization of the problem, design of study materials and procedures, implementation of the study, data analysis, or dissemination of results). The studies provided examples of advisory, collaborative group, and people-led approaches to involve AAC users in these research processes. Most of the studies utilized qualitative methods (n = 5), although there were also examples of survey (n = 1) and intervention (n = 1) research. Strategies from these studies, along with supporting literature, offer practical guidance for involving AAC users in all stages of future research. Building on these insights, this review outlines future directions for advancing inclusive research.
PMID: 41627439

15.Using digital play to help alleviate distress with painful procedures in cerebral palsy

Susan Biffl

Dev Med Child Neurol. 2026 Jan 31. Online ahead of print.

Abstract
No abstract available
PMID: 41618663

16.Relationship between gestational age and neurodevelopmental disorders: A nationwide longitudinal retrospective cohort study

Yu-Jung Chang, Grace Hao, Jing-Yang Huang, Shiuan-Chih Chen, Meng-Che Wu

Early Hum Dev. 2026 Jan 30:106505. Online ahead of print.

Objective: To investigate neurodevelopmental disorders (NDDs) risks across different gestational ages (GAs) and associated characteristics in infants followed to age 10.
Study design: This nationwide, longitudinal, retrospective cohort study analyzed 1,288,347 live births in Taiwan from 2009 to 2016 by using national health databases. Infants were categorized by GA (extremely preterm, very preterm, moderate to late preterm, full term, and late term) and monitored for seven NDDs through 2019. Demographic characteristics were compared using the standardized mean difference. Multivariable Cox regression models were used to estimate hazard ratios with 95% confidence intervals, and the Kaplan–Meier method with log-rank tests was used to determine cumulative NDD probabilities.
Results: Preterm infants had significantly higher incidence rates of all NDDs (log-rank $P < .001$), except for tics and Tourette disorders, compared with the full-term group. Disorders exhibited distinct temporal patterns: cerebral palsy, epilepsy, and developmental delay emerged predominantly before 24 months, whereas autism spectrum disorder, attention-deficit/hyperactivity disorder, and intellectual disability risks peaked during the preschool years. Tics and Tourette disorders followed a distinct trajectory, with minimal variation among GA groups. Advanced parental age (≥40 years) was associated with shorter gestation.
Conclusion: Preterm birth is associated with an increased risk of most NDDs, with phase-specific onset patterns. These findings support the need for GA-stratified and age-tailored monitoring. Early motor and cognitive interventions, along with preschool neurobehavioral support, are essential. Tics and Tourette disorders may require distinct etiological frameworks.
PMID: 41638949

17.Neurodevelopmental Outcomes 12 Years After Extremely Preterm Birth in Sweden

Fredrik Serenius, Thomas Abrahamsson, Ulrika Ådén, Kerstin Hellgren, Karin Sävman, Andreas Ohlin, David Ley, Lena Hellström Westas, Aijaz Farooqi, Karin Källén, Lisa B Thorell

Pediatrics. 2026 Feb 6:e2025073742. Online ahead of print.

Objectives: We assessed the prevalence of neurodevelopmental disabilities (NDDs; cognition, cerebral palsy, vision/hearing, epilepsy), attention-deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), developmental coordination disorder (DCD), behavior problems, and multimorbidity in a national cohort of children born extremely preterm (EPT; <27-week gestation) to provide a comprehensive understanding of the challenges faced by children born EPT in early adolescence.
Methods: All infants born EPT in Sweden from April 2004 through March 2007 were enrolled in the Extremely Preterm Infants in Sweden Study. Of 492 survivors at age 12 years, 462 were assessed alongside 373 term-born controls. Standard instruments were used to assess cognition, motor function, and behavior. Parents completed a structured health questionnaire. Diagnoses were obtained from national health registers.
Results: Compared with controls, children born EPT exhibited significantly higher rates of moderate/severe NDD (37.4% vs 4.6%), ASD (14.9% vs 2.41%), ADHD (21.2% vs 8.9%), DCD (29.4% vs 5.7%), and behavioral problems (35.3% vs 8.13%; all $P < .001$). Of children born EPT with no/mild NDD, 8.3% were diagnosed with ASD and 14.5% with ADHD; among those with moderate/severe NDD, 26.0% were diagnosed with ASD and 32.4% with ADHD. Moderate/severe NDD was associated with high comorbidity (59% with ≥2 co-occurring conditions). In the total EPT cohort, 57.4% were free from moderate/severe NDD and ASD, and 42.0% were free from ASD, ADHD, and DCD.
Conclusions: By age 12 years, a large proportion of children born EPT faced challenges because of NDD, ASD, ADHD, DCD, multimorbidity, and behavioral problems, necessitating multidisciplinary follow-up.
PMID: 41638598

18.Epidemiology of cerebral palsy on Tanna Island, Vanuatu: A population-based register study

Andrea Burgess, Lolyne Jeremiah, Steven Moiteau, Mahmudul Hassan Al Imam, Israt Jahan, Manik Das, Eunice Lubbe, Orion Sigley, Jeannie Barton, Nadia Badawi, Roslyn N Boyd, Gulam Khandaker

Dev Med Child Neurol. 2026 Feb 4. Online ahead of print.

Aim: To describe the epidemiology of cerebral palsy (CP) and access to related services on Tanna Island, Vanuatu, a low-income Pacific country with limited data on childhood disability.
Method: A population-based register of children aged 0–18 years with CP was established. Children with suspected CP were identified using the key informant method and assessed by a multidisciplinary team. Data were collected on demographics, aetiology, clinical characteristics, rehabilitation, and education using a culturally adapted case record form from the Global Low- and Middle-Income Country CP Register.
Results: Of 98 children assessed, 52 had CP and two had acquired brain injury. Observed CP prevalence was 3.4 per 1000 children. Mean age at diagnosis was 8 years 1 month. Sixty-three percent had spastic motor type, 43% were classified in GMFCS levels III–V, 43% were severely underweight, 83% had never received rehabilitation, and 79% of school-aged children did not attend school.
Interpretation: CP prevalence and severity are alarmingly high on Tanna Island. Delayed diagnosis and limited access to rehabilitation and education highlight the urgent need for early diagnosis, intervention, and services for children with CP in Vanuatu.
PMID: 41636314

19.Hypernatremia during the first week of life in very preterm infants and neurodevelopmental outcomes at 3 to 4 years of age: a cohort study

Michiko Murakami, Kei Tamai, Naomi Matsumoto, Akihito Takeuchi, Makoto Nakamura, Takashi Yorifuji, Misao Kageyama

BMC Pediatr. 2026 Feb 3. Online ahead of print.

Abstract
No abstract available
PMID: 41634656

20.Significant reduction in intrapartum-related perinatal brain injury in infants born at ≥35 weeks' gestation: A regional population-based study over 15 years

Koutarou Doi, Yuki Kodama, Satoshi Matsuzawa, Tomoko Goto, Junsuke Muraoka, Midori Fujisaki, Naoshi Yamada, Hajime Taniguchi, Ken Furuta, Yasuyuki Kawagoe, Masatoki Kaneko, Shinji Katsuragi, Tsuyomu Ikenoue, Hiroshi Sameshima

Early Hum Dev. 2026 Jan 30;216:106495. Online ahead of print.

Objective: The ultimate goal of perinatal care is to ensure that infants survive without neurological impairment. Despite advances in medical technology and healthcare systems that have markedly decreased perinatal mortality, cerebral palsy has shown only a gradual decline in recent population-based studies. The aim of this study was to use a pathway classification system to analyze brain injury cases detected at or beyond 35 weeks' gestation and to clarify temporal changes in the incidence and causal pathways of intrapartum brain injury and its contributing factors in Miyazaki Prefecture, Japan.
Methods: Of 151,558 births recorded in Miyazaki Prefecture from 2001 to 2015, 303 cases of brain injury were registered in the regional perinatal case-review system. Of these, 134 were detected at ≥35 weeks. Brain injury was categorized as congenital anomalies, antepartum, intrapartum, or neonatal onset. Each case was further classified using a pathway system that considered distal and proximal risk factors. Temporal trend analysis was performed across three consecutive 5-year intervals (2001–2005, 2006–2010, and 2011–2015).
Results: Of the 134 cases, 25% were classified as intrapartum-related, 23% as antepartum-related, and 5% as neonatal-related. Overall, the incidence of brain injury at ≥35 weeks decreased significantly over time. Significant downward trends were observed in total cases and intrapartum-related brain injury, with the reduction in intrapartum cases being especially pronounced. Antepartum-related brain injury declined more gradually. Further analysis revealed that the incidence of hypoxia-related intrapartum brain injuries decreased over time, whereas bacterial infection-related intrapartum cases were observed only in the earliest epoch.
Conclusions: This population-based study identified temporal changes in perinatal brain injury detected at or beyond 35 weeks' gestation over 15 years. The incidence of perinatal brain injury declined significantly, particularly intrapartum-related cases with hypoxia-related injury. These improvements might reflect advances in regionalized perinatal care, the establishment of perinatal centers, or multidisciplinary education and training. Further efforts to optimize intrapartum assessment and management would contribute to continued reductions in severe perinatal brain injury.
PMID: 41633003

21.Plasma neurofilament light chain in pediatric hereditary spastic paraplegia

Jacopo Sartorelli, Sara Petrillo, Giacomo De Luca, Irene Mizzoni, Gessica Vasco, Viola Ceccatelli, Andrea Sancesario, Lorena Travaglini, Adele D'Amico, Enrico Bertini, Fiorella Piemonte, Francesco Nicita

J Neurol Sci. 2026 Feb 3;482:125788. Online ahead of print.

Background: Plasma neurofilament light chain (pNfL) is increasingly investigated as a biomarker of axonal damage in several neurological disorders, including hereditary spastic paraplegias (HSPs). Currently, very few studies are focused on pediatric HSPs.
Methods: Plasma NfL levels were measured in 40 pediatric (<18 years) subjects affected by genetically solved or unsolved HSPs. For 31 subjects, longitudinal NfL evaluation was also available. Potential correlation between pNfL and disease-specific or non-specific features were explored.
Results: Median age at enrollment was 11.53 years, with a median disease duration of 9 years and a median NfL level of 8.5 pg/mL. At baseline, pNfL did not differ across SPG vs. non-SPG HSPs, GMFCS levels, pure vs. complex phenotype (with a non-statistically significant increase in the latter) and early- vs. childhood-onset forms. Higher levels were observed in subjects with shorter disease duration from onset. Genetically unsolved individuals exhibited non-significant reduced levels compared with genetically confirmed cases. Plasma NfL presented a similar age-related trajectory as in the healthy pediatric population, with a possible trend of increase in younger children. Finally, no differences were observed at longitudinal NfL evaluation after a median period of 9 months.
Conclusions: This study is the first pediatric-focused work exploring utility of pNfL in HSPs. NfL levels showed a tendency of increase especially in complex forms, in younger subjects and with shorter disease duration from onset. Lower levels were observed in genetically unsolved individuals. Larger and longer studies are warranted to further define NfL utility as a clinically relevant biomarker in pediatric HSPs.
PMID: 41650577

22.A Phenotypic Paradigm for Cerebral Palsy Genetics

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medRxiv. Preprint. 2026 Jan 18.

Abstract
Disease-causing genetic variants can be found in a subset of individuals with cerebral palsy (CP), with variants deemed causal of CP having been published for at least 515 genes. We develop a statistical approach that treats CP as a phenotypic feature for which some genetic disorders confer an increased risk. Based on comprehensive literature curation we show that the null hypothesis of no CP association can be rejected for only 89 of the 515 genes. We applied these findings to the analysis of a cohort of 460 children diagnosed with CP in the Shriner Children's network. We identified pathogenic or likely pathogenic (P/LP) variants in 60 genes in 15.8% of the children. Only 16 of the 60 genes had significant evidence for CP association in our literature analysis. Our results suggest that a stratified approach to attributing causality to genetic variants in CP could support precision genomic medicine for affected individuals.
PMID: 41646824

23.Unfolding Participation in Everyday Activities of Siblings of Children With Cerebral Palsy

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OTJR. 2026 Feb 3:15394492251411773. Online ahead of print.

Abstract
Sibling relationships are central to family life, and siblings of children with disabilities often play major caregiving roles. Yet, little is known about how a child's cerebral palsy (CP) affects siblings' everyday experiences. This study used a qualitative descriptive design with semi-structured interviews involving 16 families (25 siblings, 16 children with CP, 29 parents) in Switzerland, followed by qualitative content analysis. Siblings' participation experiences encompassed (a) varied meaningful activities; (b) distinct support needs, challenges, and feelings of being overlooked; and (c) tensions and ambivalent feelings during activities. Siblings' experiences included both joyful and challenging aspects. Tensions arose as siblings navigated roles, family dynamics, and societal expectations. Findings highlight the need to prioritize siblings' perspectives in clinical practice and research to support their agency, inclusion, and well-being.
Plain language summary
Study Using Interviews With Families to Better Understand the Daily Life Experiences of Siblings of Children With Cerebral Palsy Why was the study done? Siblings of children with disabilities play an important role, but little is known about their everyday experiences. We need to know more about how children experience everyday activities when growing up with a sibling with a childhood-onset disability, such as cerebral palsy (CP). We want to know what supports or challenges them. What did the researchers do? The researchers studied the everyday activities of siblings by interviewing siblings of children with CP and their families. They visited 16 families in Switzerland and asked about their experiences in daily life. What did the researchers find? There were three main findings: (a) Siblings do many different types of activities. Experiencing excitement, family connection, and personal independence were key motivations for doing activities. (b) Siblings described different types of support facilitating their activities, challenges hindering their activities, and feelings of being overlooked within family life. (c) Siblings experience tensions resulting from competing needs within their family and ambivalent feelings when doing activities in different social contexts. What do the findings mean? This study has identified the activities, experiences, resources, and challenges of siblings of children with CP. The findings show concrete activities that matter to siblings, relevant support strategies, and difficulties. However, their everyday activities can be complex. Siblings can be sensitive to the needs of their sibling with CP. They need to balance their own and their family's needs. Professionals should acknowledge these complex situations. They should support the involvement of siblings in their services. They should also encourage parents to talk about siblings' needs and involve their perspectives in decision-making, for example, about family activities. Future research needs to find out more about the factors influencing siblings' participation and support strategies.
PMID: 41635141

24.EPIC-ND: a multi-site, randomised controlled trial evaluating the effectiveness of social prescribing for the unmet social needs of children with a neurodisability and their parent/carers - a study protocol

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BMJ Paediatr Open. 2026 Feb 3;10(1):e003847.

Background: The social determinants of health contribute to health inequities experienced by children with neurodisability and pose barriers to engaging with healthcare systems. At an individual level, adverse social determinants of health are experienced as unmet social needs (USNs), for example, housing insecurity and financial hardship. Emerging evidence supports social prescribing interventions that systematically identify USNs and refer families to services to address these needs. This study aims to evaluate the effectiveness of a co-designed social prescribing programme to address the USNs of children with neurodisability and their parents/carers, its cost-effectiveness and cost-utility, and implementation and translation across the healthcare system. Methods and analysis: The study will be conducted at the tertiary Paediatric Rehabilitation Services in New South Wales, Australia. A standardised screening tool will identify parents/carers experiencing USNs. Parents/carers who report one or more USN and consent will be eligible to participate in the randomised controlled trial. Participants will be randomised to an active control group or social prescribing intervention group (total sample size = 392). The active control group will receive self-navigation via a resource pack containing information about services that can address USNs. The social prescribing intervention group will receive in-person Community Linker support, in addition to the resource pack. The screening tool, resource pack, and social prescribing intervention were co-designed with parents/carers of children with cerebral palsy and their healthcare professionals. The primary outcome is the effectiveness of interventions in reducing USNs. Secondary outcomes include parent/carer referrals to and engagement with support services, out-of-pocket expenses, child/young person and parent/carer health-related quality of life, parent/carer psychological distress, and child/young person hospital service use and emergency department presentations.
PMID: 41633762

25.Parents' perceived benefits, barriers, and facilitators of conventional physiotherapy for children with cerebral palsy: A qualitative study

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Medicine (Baltimore). 2026 Jan 30;105(5):e44842.

Abstract
This study aimed to explore parents' perceptions on the benefits, facilitators and barriers to conventional physiotherapy for children with cerebral palsy (CP). A qualitative, in-depth interview was conducted with 16 parents of children with CP through an online video conference. Semi-structured questions related to physical functions, social well-being, facilitators, and barriers to participation in conventional physiotherapy were recorded. Interviews were transcribed verbatim, and data were analyzed thematically to generate significant themes. The majority of participants (94%) agreed that their children had shown improvements in physical strength and function. Ten participants reported that their children are expressive and responsive when communicating with other people following physiotherapy. Six themes emerged during the analysis: physical function progression, social well-being progression, child's internal barriers, external barriers, enhancing engagement and support in physiotherapy, and expectations for self-independence. The study identified six core dimensions influencing the perceived benefits, barriers, and facilitators of conventional physiotherapy for parents of children with CP. The findings highlighted a need for physiotherapists to refine treatment strategies, emphasizing individualized care tailored to each child's unique needs.
PMID: 41630211

Prevention and Cure

26.Characteristics of Pregnancy Course in an Infant With Cerebral Palsy Showing Decreased Fetal Movement

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Obstet Gynecol Int. 2026 Jan 29;2026:1079227. eCollection 2026.

Objective: To clarify the characteristics of patients with cerebral palsy (CP) showing decreased fetal movement (DFM).
Methods: Among patients with CP between January 2009 and February 2021, cases of DFM were collected from causal analysis reports. The clinical course and the causes of CP were retrieved.
Results: Of 2834 cases of CP, 225 (8%) patients were included in this study. Some form of hypoxia was the most common cause (117 cases, 52%) followed by placental abruption (45 cases, 20%) and fetomaternal hemorrhage (FMH) (32 cases, 14%). The duration from DFM to delivery was longer in cases of FMH than in placental abruption ($p < 0.001$). A duration of less than 6 hours was observed in only one (4%) FMH case, whereas it was observed in 32 (73%) cases of placental abruption. Conversely, durations greater than 24 hours accounted for 36% (10/28) of FMH cases. Among hypoxia cases, marginal or velamentous insertion accounted for 21% (22/106). Umbilical artery pH and base excess were worse in cases with normal site insertion than in cases with marginal or velamentous insertion.
Conclusion: DFM was seen in 8% of patients with CP. FMH required more time from DFM to delivery than placental abruption. Fetuses with velamentous or marginal cord insertion may have a higher risk of CP.
PMID: 41624261

27.Neonatal arterial ischemic stroke: an imaging overview

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Pediatr Radiol. 2026 Jan 31. Online ahead of print.

Abstract
Perinatal stroke (PS) is a heterogeneous group of cerebrovascular diseases occurring between 20 weeks of gestation and 28 days of post-natal life. PS may be due to arterial or venous compromise resulting in an ischemic or hemorrhagic injury to the brain. Arterial ischemic stroke (AIS) is the most common form of PS, with neonates (between 0–28 days) being at a particularly increased risk. Several risk factors have been implicated in the development of neonatal AIS (NAIS), including but not limited to complicated labor, infection, poor Apgar score, and metabolic derangements. Seizures are the most common presentation of NAIS. MRI is the investigation of choice in cases of suspected NAIS, enabling identification of the injury, detection of vascular changes, and associated downstream network injury. Even though treatment is primarily supportive, various MRI techniques have played a key role in understanding functional and microstructural changes following NAIS as well as predicting outcomes, thereby empowering clinicians and parents to make informed decisions about future care and rehabilitation.
PMID: 41619013