Cerebral palsy research news

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Professor Nadia Badawi AM
CP Alliance Chair of Cerebral Palsy Research

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Interventions and Management

1.Variability of motor imagery in children with cerebral palsy examined using the Hand Laterality Test

No authors listed

Dev Med Child Neurol. 2026 Apr 3. Online ahead of print.
PMID: 41931398

2.Variability in selective dorsal rhizotomy surgery: an analysis of the Cerebral Palsy Research Network registry

Brandon G Rocque, H Caroline Davies, Jeffrey S Raskin, Jeffrey R Leonard, Virendra R Desai, Robert J Bollo, Joyce Oleszek, C Corbett Wilkinson, Sophia R Blasco, Charles B Stevenson, Patrick G McPhee, Neena I Marupudi, Joyce P Trost, Paul Gross

J Neurosurg Pediatr. 2026 Apr 3. Online ahead of print.

Objective: Selective dorsal rhizotomy (SDR) is a surgical procedure to reduce spasticity and improve function in children with cerebral palsy (CP). Randomized trials have shown that SDR is superior to physical therapy alone for reduction of spasticity and improvement in gait, but there is wide variation in surgical technique. The purpose of this study was to describe the scope of patient factors and surgical technique of SDR performed for the management of spasticity in children with CP.
Methods: This study is a cross-sectional analysis of data included in the Cerebral Palsy Research Network (CPRN) registry from all subjects who underwent SDR at a CPRN member site. Data from consecutive cases were collected at each site and submitted to the CPRN registry. All cases of SDR submitted to the registry were included. Descriptive statistics were used to summarize data. When possible, results were compared across CPRN centers and patients using descriptive and inferential statistics.
Results: A total of 564 patients underwent SDR and had data in the CPRN registry. Most children were male and White. GMFCS levels ranged from I to V. Dystonia was present in a minority of children. SDR techniques varied by surgical level, laminotomy approach, monitoring practices, number of rootlets tested, and proportion of rootlets cut. A higher GMFCS level was associated with a greater proportion of rootlets cut.
Conclusions: There are many variations in SDR technique for the management of spasticity in CP. Detailed outcome data are needed to compare these variations and determine whether an optimal technique is associated with improved treatment results.
PMID: 41931847

3.Prognostic factors of GMFCS class improvement after selective dorsal rhizotomy in children with cerebral palsy

K V Sysoev, A A Kulaeva, A Yu Smirnova, A V Kim

Zh Vopr Neirokhir Im N N Burdenko. 2026;90(2):54–61.

Abstract
Selective dorsal rhizotomy (SDR) is a surgical method for children with spastic cerebral palsy (CP). In addition to reducing spasticity, some patients experience significant improvement of functional status after surgery.
Objective: To identify additional prognostic factors of GMFCS functional class improvement following SDR in children with spastic CP.
Material and methods: A retrospective analysis included 71 patients aged 2–16 years who underwent SDR between 2022 and 2024. Muscle tone, GMFCS class, brain MRI data, and long-term outcomes were analyzed using in-hospital examinations and telephone surveys.
Results: No significant association was found between functional improvement and age, baseline GMFCS class, preoperative socialization, botulinum toxin therapy, motor rehabilitation, orthopedic interventions, or severity of structural brain changes on MRI.
Conclusion: These findings support the need for intermediate functional classes, detailed functional assessment scales, and individualized rehabilitation monitoring with subsequent outcome analysis.
PMID: 41930428

4.Intraoperative traction does not improve curve correction or pelvic obliquity within a matched cohort of patients with neuromuscular scoliosis

Ian Fletcher, Alastair W Sterns, Jacquelyn N Valenzuela-Moss, Tyler A Tetreault, Tiffany Phan, Efrain Amaro, Gerard K Williams, Lindsay M Andras, Michael J Heffernan

Spine Deform. 2026 Apr 2. Online ahead of print.

Purpose: Evaluate the utility of intraoperative traction (IOT) during posterior spinal fusion (PSF) in a matched cohort at a high-volume neuromuscular scoliosis center.
Methods: A nested case-control study was performed on a single-center retrospective database of neuromuscular scoliosis patients with cerebral palsy. Patients were pair-matched by age, preoperative curve magnitude, preoperative traction curve magnitude, and flexibility index. Statistical tests were used to compare continuous and categorical variables between groups.
Results: Thirty-one matched case-control pairs were identified. There were no significant differences between IOT and non-IOT groups in blood loss, ICU stay, BMI, sex distribution, neuromonitoring changes, complication rates, surgical time, or anesthesia time. Postoperative curve magnitude, percent curve correction, and percent correction of pelvic obliquity were also similar between groups.
Conclusion: Intraoperative traction did not improve postoperative curve correction or pelvic obliquity compared with posterior spinal fusion without traction.
PMID: 41926074

5.Effectiveness of selective dorsal rhizotomy for spastic cerebral palsy: a systematic review and single-arm meta-analysis

Maria Antônia Pereira, Victor G Soares, Hilária S Faria, Filipe V Ribeiro, João V Andrade Fernandes, Altair P de Melo Neto, Izabely Dos Reis de Paula, Helvécio N Feitosa Filho, Vitor E Ribeiro, Matheus S Ferreira, João Paulo Teles, Gustavo S Noleto

J Neurosurg Sci. 2026 Apr 1. Online ahead of print.

Introduction: Selective dorsal rhizotomy is used to treat spastic cerebral palsy, but its effectiveness remains debated due to heterogeneous evidence.
Evidence acquisition: This systematic review and single-arm meta-analysis was registered in PROSPERO and conducted according to PRISMA guidelines. Studies evaluating selective dorsal rhizotomy in pediatric cerebral palsy were identified, and changes in gross motor function and spasticity were pooled using random-effects models.
Evidence synthesis: Sixteen studies including 756 children were analyzed. Selective dorsal rhizotomy was associated with significant improvements in gross motor function at both short- and long-term follow-up and significant reductions in spasticity. Sensitivity analyses confirmed result stability despite moderate risk of bias.
Conclusions: Selective dorsal rhizotomy is associated with clinically meaningful and durable improvements in gross motor function and reductions in spasticity in children with spastic cerebral palsy.
PMID: 41920161

6.A scoping review of the application scope of digital technologies in lower limb rehabilitation and balance training for children with cerebral palsy

Yang Wang, Yinhu Tan, Xiaoli Zheng, Mengyao Wang, Hang Li, Xiuling Zhou

Front Pediatr. 2026 Mar 18. eCollection 2026.

Objective: This study aims to systematically review the application scope of digital technologies in lower limb rehabilitation and balance training for children with cerebral palsy (CP), identify the intervention effects and barriers associated with various types of technologies, and provide evidence-based guidance for clinical practice and home-based rehabilitation.
Methods: Following the Joanna Briggs Institute scoping review framework, a comprehensive literature search was conducted in PubMed, Embase, Web of Science, and the Cochrane Library for studies published between 2008 and 2024. Eligible studies included children with CP aged 18 years or younger using digital technologies for lower limb or balance-related assessment, intervention, validation, or prediction. Two reviewers independently screened and extracted data, and study quality was assessed using the Mixed Methods Appraisal Tool.
Results: Eighty-five studies were included across five categories of digital technologies: robotics and exoskeletons, virtual reality, sensors with real-time feedback, internet-based telerehabilitation, and game-based technologies. Robotics and exoskeletons improved gait and balance. Virtual reality and game-based interventions enhanced postural control, engagement, and motivation. Sensor technologies supported real-time monitoring and personalized correction, while internet platforms showed potential for home-based rehabilitation. High costs, technical complexity, and cultural adaptability limitations were key barriers.
Conclusion: Digital technologies show promise for improving gait, balance, and training engagement in children with CP. Future research should improve methodological rigor, assess cost-effectiveness, and include long-term follow-up to support equitable implementation.
PMID: 41929922

7.Clinical gait analysis use in management of children with cerebral palsy: Qualitative study

No authors listed

Dev Med Child Neurol. 2026 Apr 3. Online ahead of print.
PMID: 41931310

8.The characteristics of cortical activation during gait in children with spastic diplegic cerebral palsy

Jin Wang, Jinmei Zhu, Haiying Zhu, Chuan Guo, Tong Wang, Jijiang Zhou, Jun He, Shizhe Zhu, Tongbo Lu

Front Pediatr. 2026 Mar 12. eCollection 2026.

Introduction: Cerebral palsy is a common movement disorder associated with impairments in balance and gait, particularly in children with spastic diplegic cerebral palsy. This study examined differences in cortical activation during walking between children with spastic diplegic cerebral palsy and children with typical development, and explored associations between cortical activation and motor performance.
Methods: Functional near-infrared spectroscopy was used to assess cortical activity during self-paced walking in 15 children with spastic diplegic cerebral palsy and 15 age-matched typically developing children. Group differences in cortical activation were analysed, and correlations with gross motor function and walking speed were examined.
Results: Children with spastic diplegic cerebral palsy demonstrated greater activation in bilateral prefrontal cortices and the right premotor cortex during walking compared with typically developing controls. Increased right premotor cortex activation was negatively correlated with gross motor function and walking speed.
Discussion: The findings suggest that children with spastic diplegic cerebral palsy rely on increased cortical recruitment during walking, reflecting compensatory demands for motor planning and gait control. Greater cortical activation may indicate inefficient neural control mechanisms underlying reduced motor performance.
PMID: 41908524

9.Changes in body composition and safety of exercise for individuals with severe cerebral palsy: single-group pre-post observational study

Tadashi Matsuda, Yoshiteru Akezaki, Yoko Tsuji

J Phys Ther Sci. 2026 Apr;38(4):152–156.

Purpose: This pilot study examined short-term longitudinal changes in limb skeletal muscle mass and water content and evaluated the safety of an exercise intervention in individuals with severe cerebral palsy.
Participants and Methods: Eleven individuals were observed over six months. Body composition was assessed using skeletal muscle mass index and extracellular water/total body water ratio. The first three months involved no intervention, followed by three months of passive stretching and postural changes.
Results: Extracellular water/total body water significantly increased in the trunk and right lower limb at three and six months compared with baseline. Skeletal muscle mass index showed no significant change and remained very low. Edema progression was detectable, but measurable declines in muscle mass were not observed within the study period.
Conclusion: The exercise intervention showed no significant impact on body composition. Longer follow-up may be required to detect skeletal muscle changes in individuals with severe cerebral palsy.
PMID: 41924116

10.Motor developmental tui na method with comprehensive rehabilitation in children with spastic cerebral palsy: A randomized controlled trial

Wen-Sheng Song, Ping Lu, Qi-Long Hu, Qi Zhang, Zhi-Yang Yin, Xiao-Bin Fan, Li-Yuan Chen

Complement Ther Med. 2026 Mar 30. Online ahead of print.

Objectives: This study evaluated the effects of comprehensive rehabilitation combined with motor developmental tui na therapy on foot and ankle dysfunction in children with spastic cerebral palsy.
Methods: Fifty-six children with spastic diplegia cerebral palsy were randomly assigned to a control group receiving standard comprehensive rehabilitation or an experimental group receiving additional motor developmental treatment. Interventions were administered three times per week for twelve weeks. Outcomes included muscle tone, ankle range of motion, tibial torsion angle, and surface electromyography of lower-limb muscles.
Results: Both groups demonstrated improvements in ankle range of motion and reduced gastrocnemius strain, with significantly greater improvements observed in the experimental group. Surface electromyography results showed enhanced muscle activation and coordination following combined intervention.
Conclusion: Motor developmental tui na therapy combined with comprehensive rehabilitation may enhance muscle activation, reduce spasticity, and improve motor function in children with spastic cerebral palsy.
PMID: 41921917

11.Understanding how motor function and lifestyle factors shape problematic media use in adolescents with cerebral palsy

Sinem Asena Sel, Doğa Yılmaz, Begüm Meyvecioğlu, Emre İlhan, Seval Küçükbayrak, Hasan Kahveci

BMC Pediatr. 2026 Apr 1. Online ahead of print.
PMID: 41917907

12.Motivation to Move in Toddlers With Cerebral Palsy

Tracy Kornafel, Athylia C Paremski, Julie A Skorup, Morgan M Alcott, Laura A Prosser

Pediatr Phys Ther. 2026 Apr 1. Online ahead of print.

Purpose: Motivation to move has been linked to motor development in typically developing children, but has not been well studied in children with disabilities.
Methods: A secondary analysis was conducted using data from 37 toddlers with cerebral palsy enrolled in a clinical trial. Stability of motivation to move over time and relationships with motor function, cognition, sex, and age were examined.
Results: Greater motivation to move at baseline was associated with higher gross motor function and cognition. Motivation to move remained stable over time despite improvements in motor function. Baseline motivation to move and cognition predicted later motor outcomes.
Conclusions: Motivation to move may develop through early successful movement experiences. Understanding its development in children with cerebral palsy could inform interventions aimed at enhancing motivation and optimising motor development.
PMID: 41915854

13.Exercise-induced fatigability is exacerbated amongst older adults with cerebral palsy compared to younger counterparts

Anders Emil Ejskjaer Gravholt, Bruno Fernandez, Louis Chauvet, Narimane Zeghoudi, Guillaume Y Millet, Annemieke I Buizer, Thomas Lapole

Eur J Appl Physiol. 2026 Mar 31. Online ahead of print.
PMID: 41915059

14.Non-pharmacological interventions for gait rehabilitation in children with neurodisability – A bibliometric and visualization analysis

Guoping Qian, Piotr Aschenbrenner, Jinwei Zhao, Tong Han, Yu Wu, Hongli Yu, Zbigniew Ossowski

Ann Agric Environ Med. 2026 Mar 25;33(1):12–23.

Introduction and objective: Gait impairments restrict participation and quality of life in children with neurodisabilities. Although non-pharmacological interventions have shown benefit, comprehensive analyses of global research trends are limited. This bibliometric review aimed to map research trends, identify hotspots, and highlight emerging themes related to gait rehabilitation in children with neurodisability.
Review methods: Publications from 1993 to 2024 were retrieved from the Web of Science Core Collection using predefined gait rehabilitation and cerebral palsy terms and analysed using bibliometric visualization techniques.
Brief description of the state of knowledge: A total of 455 relevant publications were identified, with steady growth in research output over time. The United States led in publication volume and citation impact, and Developmental Medicine & Child Neurology was the most prolific journal. Emerging technologies such as exoskeletons, virtual reality, and robot-assisted gait training were identified as research hotspots.
Results: The analysis provides a structured overview of the evolution, current focus areas, and future directions of research on non-pharmacological gait rehabilitation for children with neurodisability.
PMID: 41906502

15.Electrical stimulation as a promising strategy to enhance feeding development in children with severe cerebral palsy

Aleksandra Kaczyńska, Piotr Socha

J Pediatr Gastroenterol Nutr. 2026 Mar 30. Online ahead of print.

Objectives: To evaluate whether transcutaneous and neuromuscular electrical stimulation combined with speech-language therapy improves orofacial function and feeding texture acceptance in children with severe cerebral palsy.
Methods: Fifty children with severe cerebral palsy and neurogenic dysphagia were allocated to receive speech-language therapy alone or combined with electrical stimulation. Interventions were delivered in repeated treatment cycles, and feeding outcomes were assessed using the International Dysphagia Diet Standardization Initiative scale.
Results: Children receiving combined therapy demonstrated significantly greater improvements in texture acceptance compared with controls, with a higher proportion achieving advancement by two or more diet levels.
Conclusions: Electrical stimulation combined with speech-language therapy significantly improves feeding performance in children with severe cerebral palsy and may be a promising adjunct intervention.
PMID: 41913514

16.Parent-reported engagement in a home-based, parent-delivered early intervention for infants with unilateral cerebral palsy

Kimberley S Scott, Leanne Sakzewski, Jenny Ziviani, Madison Hyer, Jill C Heathcock, Roslyn N Boyd

Disabil Rehabil. 2026 Mar 28. Online ahead of print.

Purpose: To quantify parent-reported engagement over time in a randomized intervention trial for infants with unilateral cerebral palsy and identify factors influencing engagement.
Materials and methods: This secondary analysis included 90 infants enrolled in a trial comparing infant-friendly constraint-induced movement therapy and bimanual therapy. Parent engagement was measured at multiple time points using a standardized engagement scale.
Results: Parent engagement was high at intervention onset and remained stable over time, with no differences between intervention groups. Some parents reported increasing difficulty integrating therapy into family life.
Conclusions: Parent engagement was consistently high across interventions, supporting the feasibility of parent-delivered early intervention. Additional supports may help families sustain engagement within daily routines.
Plain language summary: Parents report experiencing high levels of engagement in interventions which were based on family-centered care principles, parent-delivered in the home environment with supportive coaching from a trained therapist, and specifically designed for their infant with or at risk for unilateral cerebral palsy.A decrease in parent engagement in their child's rehabilitation may reflect changes in perceived feasibility of implementing an intervention within the context of family life over time.
PMID: 41902669

17.Weight measurements and disease-specific growth charts to predict clinical outcomes in children with cerebral palsy

No authors listed

Dev Med Child Neurol. 2026 Apr 3. Online ahead of print.
PMID: 41931304

18.Sleep disorders in children/adolescents with neurodevelopmental and neurological disorders: what evidences do we have with the use of non-pharmacological interventions?

Magda Lahorgue Nunes, Camila Dos Santos El Halal

Front Sleep. 2026 Mar 18. eCollection 2026.

Background: Sleep disturbances are highly prevalent across neurological and neurodevelopmental disorders and can worsen symptoms, impair daytime functioning, and increase caregiver burden. Evidence supporting non-pharmacological interventions remains limited.
Data source: This narrative review analyzed behavioral and educational sleep interventions used in children and adolescents with epilepsy, autism spectrum disorder, attention-deficit/hyperactivity disorder, cerebral palsy, and rare genetic neurodevelopmental conditions.
Results: Insomnia and circadian disturbances were common across conditions. Behavioral and parent-led interventions improved parent-reported sleep and daytime behavior, though objective sleep improvements were smaller. Tailored behavioral-educational programs were effective in epilepsy and autism spectrum disorder. Evidence for cerebral palsy and rare genetic conditions was limited but supported individualized, multimodal approaches.
Conclusions: Behavioral and educational sleep interventions are safe and clinically useful across neurodevelopmental disorders, especially within multidisciplinary care. Larger, standardized, syndrome-specific randomized studies are needed to guide evidence-based practice.
PMID: 41929654

19.The Burden of Paediatric Chronic Wounds: A Nationwide Analysis

Ayesha A Qureshi, Catherine C Kennedy, Seraph Han-Yin Lin, Alexander Vasko, Jingzhen Yang, Richard E Kirschner, Jenny C Barker

Wound Repair Regen. 2026 Mar–Apr;34(2).

Abstract
Chronic wounds are well characterized in adults but understudied in pediatric populations. This retrospective cohort analysis of U.S. inpatient data from 2017–2020 characterized the epidemiology and economic burden of pediatric chronic wounds. Outcomes included wound prevalence, length of stay, inpatient costs, and comorbidities. Osteomyelitis was the most common diagnosis, with cerebral palsy frequently identified as a comorbidity. Hospitalizations were associated with prolonged length of stay, substantial costs, and notable care needs after discharge. These findings highlight the significant healthcare burden of pediatric chronic wounds and support the need for targeted prevention and management strategies.
PMID: 41918265

20.Parent-Reported Chronic Pain in Children With and Without Developmental Disabilities

Wenming Shi, Lena Kan, Tongshuai Wang, Yongzhen Li, Xingyun Wang

JAMA Pediatr. 2026 Mar 30. Online ahead of print.

Importance: Chronic pain can impair healthy development, yet its prevalence among US children with developmental disabilities is not well defined.
Objective: To evaluate parent-reported chronic pain prevalence and its association with developmental disabilities in US children and adolescents.
Design, setting, and participants: This national survey study analysed data from 263168 children aged 3–17 years participating in the 2016–2023 National Survey of Children's Health.
Exposures: Parent report of developmental disabilities including seizure, cerebral palsy, autism, attention-deficit/hyperactivity disorder, sensory impairments, intellectual or learning disability, and developmental delay.
Main outcomes and measures: Weighted prevalence of parent-reported chronic pain and associations between disability categories, pain, and sociodemographic factors.
Results: Chronic pain prevalence was higher among children with developmental disabilities compared with those without. Significant associations were observed across all disability categories, particularly seizure disorders and cerebral palsy, with additional disparities linked to socioeconomic factors and adverse childhood experiences.
Conclusion and relevance: Children with developmental disabilities are more likely to experience chronic pain, highlighting the importance of targeted screening and interventions in this population.
PMID: 41910968

21.Predictive utility of a simple cranial magnetic resonance imaging score at term-equivalent age for cerebral palsy

No authors listed

Dev Med Child Neurol. 2026 Apr 3. Online ahead of print.
PMID: 41931388

22.Use of natural language processing tools in musculoskeletal disability assessment: generating reports and calculating impairment percentages in Turkish health commission settings

Zehra Duman Şahin, Vedat Altuntaş, Selkin Yılmaz Muluk

Disabil Rehabil Assist Technol. 2026 Apr 3. Online ahead of print.

Purpose: This study explored the potential of natural language processing tools, specifically ChatGPT-4o and Data Analyst, to support health commissions with disability assessments.
Methods: Nine realistic patient scenarios reflecting common disability evaluation cases, including cerebral palsy and other neurological and musculoskeletal conditions, were analyzed using both tools. Outputs were evaluated for guideline alignment, completeness, and accuracy using a five-point Likert scale.
Results: Both models generated high-quality narrative reports, with ChatGPT-4o rated very good and Data Analyst rated good. However, ChatGPT-4o failed to calculate correct disability percentages in over half of cases, and Data Analyst failed in most scenarios.
Conclusions: Natural language processing tools may assist in generating structured disability reports but currently lack sufficient precision for reliable impairment percentage calculations, requiring expert oversight.
Plain language summary
Natural Language Processing (NLP) tools like ChatGPT-4o can reduce physician burden by generating narrative disability reports.These models currently lack the reliability for unsupervised use in calculating disability percentages.NLP-assisted documentation may streamline multidisciplinary commission work but requires expert validation.
PMID: 41928636

23.Enhanced terminal sliding mode control for gait exoskeleton device: experimental investigation and validation

Jyotindra Narayan, Mohamed Abbas, Princy Randhawa, Krishna Kant Pandey, Santosha K Dwivedy

Sci Rep. 2026 Apr 1. Online ahead of print.

Abstract
The design of pediatric lower-limb exoskeleton devices demands advanced control strategies that ensure safe, stable, and accurate real-time gait tracking despite model uncertainties and external disturbances. This study introduces an improved fast terminal sliding mode control framework incorporating an adjustable exponential reaching law to enhance reaching-phase dynamics. The proposed formulation accelerates attraction to the sliding surface for large tracking errors while ensuring smoother finite-time convergence near equilibrium. Lyapunov-based analysis establishes finite-time stability and bounded tracking performance of the coupled subject–exoskeleton system. The controller was implemented on a pediatric lower-limb exoskeleton and evaluated under passive-assist operation with one healthy child and one child with spastic cerebral palsy. Comparative experiments demonstrated superior real-time tracking, improved convergence, reduced control effort, and consistent within-subject reductions in tracking error for the cerebral palsy participant over a 25-day protocol.
PMID: 41922541

24.Quantitative comparison of explainable AI methods for interpreting deep learning-based classification of 3D gait kinematics

Zhengyang Lan, Mathieu Lempereur, Abdeldjalil Aïssa-El-Bey, Sylvain Brochard, François Rousseau

Sci Rep. 2026 Mar 31. Online ahead of print.

Abstract
Deep learning models combined with three-dimensional gait analysis have demonstrated high diagnostic accuracy for childhood gait disorders, including cerebral palsy, but limited interpretability restricts clinical adoption. This study applied multiple explainable artificial intelligence methods to identify features driving model predictions across different datasets and architectures. The results showed that highlighted features were clinically relevant and reproducible, with Integrated Gradients providing the most consistent explanations. Using subsets of critical features improved diagnostic accuracy compared with full feature sets. These findings enhance transparency, clinician trust, and performance of deep learning–based gait diagnostic tools.
PMID: 41917155

25.Stand-on ride-on power mobility devices for children with cerebral palsy: pilot study protocol for waitlist-control pre-post biomechanical changes

Guilherme Manna Cesar, Ligia Yumi Mochida, Kira Flanagan, Kevin McDonald, Jasper Xu, Debra Depto-Hoffman, Juan Aceros

Front Pediatr. 2026 Mar 12. eCollection 2026.

Background: Many children with cerebral palsy experience limited participation in life activities due to impaired postural control and walking ability. Ride-on power mobility devices allow active self-generated movement, and a novel stand-on device may provide additional postural support to improve balance and lower extremity strength. This pilot trial primarily aims to assess the feasibility of a future randomized controlled trial by evaluating recruitment, retention, adherence, and outcome variability, and secondarily to explore biomechanical factors associated with changes in balance and mobility following stand-on device use.
Methods: Ten children aged 4–6 years with spastic diplegia cerebral palsy (GMFCS level III) will participate in a single-arm waitlist-controlled pre-post feasibility trial. Participants will use individually adapted stand-on power mobility devices for three months in natural environments. Biomechanical assessments will be conducted at baseline, pre-intervention, and post-intervention, including center of pressure measures, full-body kinematics, and lower extremity muscle co-contraction during functional tasks.
Discussion: This pilot study is the first to evaluate biomechanical mechanisms underlying balance and mobility changes following stand-on power mobility device use. The findings will inform the design of a future adequately powered trial and support further investigation of mobility interventions aimed at reducing secondary health complications associated with impaired balance and mobility in children with cerebral palsy.
PMID: 41908530

26.Magnetoelectric Nanoparticle-Based Wireless Brain-Computer Interface: Underlying Physics and Projected Technology Pathway

Elric Zhang, Max Shotbolt, Mostafa Abdel-Mottaleb, Shawnus Chen, Victoria Andre, Jieyuan Tian, Jonathan Shulgach, Max Murphy, Brian Noga, Ping Liang, Darcy Griffin, Douglas Weber, Marta Pardo, Salvador Pane, Sakhrat Khizroev

Adv Sci (Weinh). 2026 Mar 28. Online ahead of print.

Abstract
Magnetoelectric nanoparticles provide a fully wireless and minimally invasive approach to bidirectional brain–computer interfaces by transducing magnetic fields into electric fields. This study presents a comprehensive theoretical framework incorporating nonlinear effects governing nanoparticle operation and neural interaction. Key determinants of performance include nanoparticle properties and magnetic field parameters. Properly engineered systems are predicted to enable deep and cortical neuromodulation with high spatial and temporal precision, supporting the future development of clinically viable, non-implanted brain–computer interfaces.
PMID: 41903116

27.Hammersmith Infant Neurological Examination for early detection of cerebral palsy in Ethiopia: A feasibility and knowledge translation study

No authors listed

Dev Med Child Neurol. 2026 Apr 3. Online ahead of print.
PMID: 41931386

28.Understanding barriers to rehabilitation: child and family determinants of service utilisation in the Enabling Inclusion programme in rural South India

Franzina Coutinho, Gauri Saxena, Marie Brien, Deepalaxmi Poojari, Selvam Ramachandran, Nisha Bhrasadiya, Sankara Raman Srinivasan, Navamani Venkatachalapathy, Noemi Dahan-Oliel, Dinesh Krishna

BMJ Paediatr Open. 2026 Mar 31;10(1).

Background: Early identification and consistent intervention are essential to optimise developmental outcomes in children with neurodevelopmental disabilities, yet service utilisation patterns in low-resource settings are poorly understood. This study examined demographic characteristics and rehabilitation service use among children enrolled in an early intervention programme in rural South India.
Methods: A retrospective analysis of 6069 children receiving services between 2015 and 2024 was conducted. Adequate therapy utilisation was defined as receipt of at least 42 therapy sessions over six months. Relationships between demographic factors and service utilisation were examined using descriptive and inferential analyses.
Results: The mean age at enrolment was 8 years 7 months, with a male predominance. Cerebral palsy and speech and language disorders were the most common diagnoses. Younger children received more specialist visits, while older children relied more on community rehabilitation workers. Children with intellectual disability, autism, and cerebral palsy were more likely to meet adequate therapy thresholds, whereas children with hearing impairment and specific learning disabilities showed lower utilisation.
Conclusion: Rehabilitation utilisation varied by age and diagnosis, highlighting the need for flexible, community-based approaches to support equitable access to early intervention services in resource-limited rural settings.
PMID: 41916659

29.Barriers and facilitators in physical activity among youth with cerebral palsy in Sweden: A qualitative study

Frida Degerstedt, Britt-Inger Keisu, Martin Björklund, Birgit Enberg

PLoS One. 2026 Mar 31;21(3).

Abstract
This qualitative study explored experiences of physical education and leisure-time physical activity among Swedish youth with cerebral palsy. Individual interviews with adolescents aged 15–18 years were analysed using qualitative content analysis. A main theme emerged describing participation as a continuum between exclusion and empowerment, supported by categories reflecting lack of support, resistance to prejudice, and empowerment through appropriate support. Participants frequently reported unequal opportunities in physical education and leisure activities, shaped by norms related to gender and functional ability. Respect, norm-consciousness, and involvement in decision-making were identified as key factors for promoting participation and empowerment.
PMID: 41915640

30.Oral Health of Children With Disabilities in India: An Integrative Review Mirrored to a Global Perspective

Giorgi Dugashvili, Luc Marks

Spec Care Dentist. 2026 Mar–Apr;46(2).

Purpose: This integrative review synthesised evidence on the oral health status of children with disabilities in India and contextualised these findings using global systematic reviews and meta-analyses of oral health interventions.
Methods: Literature published between 2000 and 2025 was identified using PRISMA-guided searches. Indian observational studies and global systematic reviews and meta-analyses involving children with physical, intellectual, or developmental disabilities were included. Outcomes included caries prevalence, periodontal indices, oral hygiene status, and intervention effects.
Results: Twenty-three studies were included. Indian observational studies reported high prevalence of dental caries, poor oral hygiene, and elevated periodontal disease among children with disabilities, particularly those with cerebral palsy. Global reviews were used for contextual comparison only and demonstrated similar international trends.
Conclusion: Children with disabilities in India experience disproportionately poor oral health. Targeted, inclusive, and context-specific oral health interventions are urgently required, particularly in low-resource settings.
PMID: 41914549

31.Global trends in rehabilitation needs for individuals with neurological disorders across 204 countries: data analysis from the global burden of disease study 2021

Chengcheng Zhang, Yuqi Xiu, Chun Zhang, Hui Liu, Wenjuan Ying, Jingjing Yan

Ann Phys Rehabil Med. 2026 Mar 27. Online ahead of print.

Background: Neurological disorders are major contributors to global disability, yet rehabilitation needs remain insufficiently quantified. Accurate estimates are essential to inform health policy amid population ageing and epidemiological transition.
Method: Data from the Global Burden of Disease Study 2021 were analysed to estimate rehabilitation needs for 10 neurological disorders across 204 countries from 1990 to 2021. Outcomes included age-standardised prevalence rates, years lived with disability, and absolute case numbers by sex, age, region, and socio-demographic index.
Results: In 2021, an estimated 225.4 million individuals worldwide required rehabilitation for neurological disorders, almost doubling since 1990. Cerebral palsy accounted for the largest share of rehabilitation needs. South Asia and Sub-Saharan Africa had the highest burden, while high-income regions showed the fastest growth over time.
Conclusions: Global rehabilitation needs for neurological disorders have increased markedly, with large regional and socio-demographic disparities. These findings highlight the need for targeted investment in rehabilitation services and integration into universal health coverage.
PMID: 41903281

32.Transition readiness assessment in cerebral palsy: A qualitative descriptive study

No authors listed

Dev Med Child Neurol. 2026 Apr 1. Online ahead of print.
PMID: 41923437

33.Development of an evidence-based knowledge translation intervention to promote behavioral change in cerebral palsy diagnosis

Vivian W Y Wong, Stephanie M Glegg, Olivia Scoten, Chetna Jetha, Anamaria Richardson, Jill G Zwicker, Mor Cohen-Eilig, Ram A Mishaal

Front Public Health. 2026 Mar 16. eCollection 2026.

Abstract
This article describes the development of an intervention designed to change community pediatricians' practice of diagnosing cerebral palsy for low-risk term-born infants and children in British Columbia, Canada. A multidisciplinary team co-designed a knowledge translation intervention using implementation science frameworks to support earlier detection and diagnosis aligned with current clinical guidelines. Barriers and facilitators were mapped to evidence-based behavior change strategies, which were operationalized into accredited continuing medical education workshops for community pediatricians. The intervention was iteratively tailored to local healthcare contexts to enhance adoption of targeted diagnostic behaviors. Evaluation of behavioral intention, uptake, and acceptability will be reported separately.
PMID: 41919281

34.Spanish consensus statement on the diagnosis and treatment of sialorrhoea in children with cerebral palsy

A Garcia Ron, E Arias Vivas, G Arriola Pereda, L Cuesta, A Garcia Ribes

Neurologia (Engl Ed). 2026 Mar 28. Online ahead of print.

Introduction: Anterior sialorrhoea, or drooling, is common in children with cerebral palsy and results from oral motor dysfunction, negatively affecting quality of life for patients and caregivers. Despite its impact, clinical management remains poorly defined.
Objectives: To provide evidence-based guidance for the evaluation and management of sialorrhoea in children with cerebral palsy and to identify future research needs.
Methodology: A working group of paediatric neurologists conducted a systematic literature review prioritising randomised trials and systematic reviews. Where higher-level evidence was lacking, recommendations were developed through expert consensus.
Consensus and discussion: Management should be multidisciplinary and follow a stepwise approach, beginning with non-pharmacological interventions and progressing to pharmacological treatments or botulinum toxin injections when needed. Surgical and radiotherapy options are reserved for refractory cases.
Conclusion: Sialorrhoea in children with cerebral palsy requires an individualised, evidence-based approach. This consensus statement provides practical guidance and highlights areas for further study.
PMID: 41911963

Prevention and Cure

35.Relationship between insulin therapy for hyperglycemia and neurodevelopmental outcome in extremely preterm infants

Kazusa Nakajima, Yohei Minamitani, Takeshi Fujimoto, Koji Hirohata, Tomohisa Akamatsu, Fumihiko Namba

Early Hum Dev. 2026 Mar 27. Online ahead of print.

Objective: This study aimed to examine whether insulin treatment for hyperglycemia in extremely preterm infants was associated with an increased risk of mortality or poor neurological prognosis.
Method: This study included extremely preterm infants admitted to the neonatal intensive care unit from January 2019 to May 2022. Hyperglycemia was defined as a blood glucose level of greater than 15 mmol/L (270 mg/dL) within the first 28 days of age. The primary outcome includes death or neurodevelopmental impairment at 18 months postmenstrual age. Neurodevelopmental impairment was defined as a Kyoto Scale of Psychological Development test score of <70 or cerebral palsy.
Results: Among the 136 extremely preterm infants, five exhibited congenital abnormalities, and two had missing data. Hyperglycemia was observed in 68 infants, comprising 35 treated with insulin and 33 who remained untreated. The insulin -treated group had lower gestational age and birth weight, higher maximum blood glucose levels, longer hyperglycemia duration, and hypoglycemia after insulin therapy in 17% of infants. Logistic regression analysis showed no significant association between insulin treatment and death or neurodevelopmental impairment.
Conclusion: Insulin therapy administration is not associated with death or neurodevelopmental impairment at 18 months of postmenstrual age among extremely preterm infants with hyperglycemia.
PMID: 41930709

36.Short- and Long-Term Outcomes of Offspring According to Cerclage Placement in Twin Pregnancy: A National Cohort Study Over 15 Years

Ji-Hee Sung, Sooji Ham, Youri Lee, Danbee Kang, Hyejeong Park, Juhee Cho, Suk-Joo Choi, Cheong-Rae Roh, Soo-Young Oh

Yonsei Med J. 2026 Apr;67(4):341–348.

Purpose: To evaluate short- and long-term outcomes of offspring following cerclage placement in twin pregnancies.
Materials and methods: A national cohort of primigravid women with twin pregnancies was identified using health insurance data from 2005 to 2019. Offspring outcomes were analysed according to gestational age at cerclage placement, adjusting for maternal and clinical factors.
Results: Cerclage was associated with increased odds of preterm birth across all timing groups, with the highest neonatal morbidity observed when cerclage was placed after 24 weeks. Late cerclage was also associated with increased risks of neurodevelopmental outcomes, including autism, attention-deficit/hyperactivity disorder, and cerebral palsy.
Conclusion: Cerclage performed after 24 weeks' gestation in twin pregnancies is associated with adverse short- and long-term offspring outcomes and should be avoided when possible.
PMID: 41914318

37.Brain intraparenchymal hemorrhage following urgent cesarean section: a case report

Simone Di Filippo, Roberta Galli, Silvia Agrati, Alessia Palluotto, Antonella Cromi, Andrea Luigi Ambrosoli

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Background: Intracerebral hemorrhage in the postpartum period is an uncommon but potentially life-threatening condition. Hypertensive disorders of pregnancy remain the most frequent cause. Rare case reports have described intracranial bleeding after neuraxial anesthesia, but interpretation is complicated by confounding factors such as hypertensive crises, cerebrovascular vulnerability, and family history, making causation difficult to establish.
Case presentation: A healthy 34-year-old woman at 36 + 5 weeks of a twin pregnancy underwent an urgent cesarean section under spinal anesthesia with stable intraoperative findings. Six hours postoperatively, she developed sudden transient loss of consciousness. Brain imaging revealed a large left basal ganglia hematoma with mass effect, without vascular malformations. Despite treatment and emergent evacuation, she developed severe neurological deficits and required neurointensive care and rehabilitation.
Conclusion: This case illustrates severe postpartum intraparenchymal hemorrhage occurring even in the absence of identifiable risk factors. Early recognition, prompt neuroimaging, and timely surgical intervention are essential to improve outcomes, underscoring the need for vigilant postpartum monitoring and further research into underlying mechanisms.
PMID: 41913297