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Interventions and Management

Interventions and Management

1.Outcomes of selective dorsal rhizotomy in ambulatory children and young people with cerebral palsy: A scoping review

No authors listed

Dev Med Child Neurol. 2025 Oct 23. Online ahead of print

Abstract

No abstract available.

PMID: [41129270](#)

2.Answer to the Letter to the Editor of S. Zhou, et al. concerning "Bipolar spinal correction reduces transfusion rate and hospital stay compared with traditional posterior spinal fusion in children with scoliosis secondary to cerebral palsy" by Lundine K, et al. (Eur Spine J [2025]; doi:10.1007/s00586-025-09282-1) **Kristopher Lundine**

Eur Spine J. 2025 Oct 22. Online ahead of print

Abstract

No abstract available.

PMID: [41123608](#)

3. Discharge From the Acute Hospital Setting on Postoperative Day One Following Selective Dorsal Rhizotomy: An Illustrative Pediatric Case and Literature Review

Lisa B Shields, Ian S Mutchnick

Cureus. 2025 Sep 19;17(9):e92695. eCollection 2025 Sep

Abstract

A selective dorsal rhizotomy (SDR) is a neurosurgical procedure aimed at improving lower extremity spasticity in children. The traditional postoperative course involves strict bed rest for 24–48 hours and an acute hospital length of stay usually ranging between three and five days. We present the case of a seven-year-old male with cerebral palsy and right-sided spasticity secondary to a perinatal ischemic infarction in the left hemisphere. The patient underwent a right-sided SDR consisting of a one-level laminectomy at the conus medullaris. The medium-sized Anastoclip GC Closure System was used to close the dura. The patient was admitted to the intensive care unit postoperatively for one night and was not required to lie flat postoperatively. He was out of bed on postoperative day (POD) zero and engaged in physical therapy on POD one. This patient is the first post-SDR reported to be discharged from the acute hospital setting on POD one to inpatient rehabilitation. The patient was able to stand flat-footed bilaterally within four weeks of the SDR, although he reported continued balance issues with running and jumping. This case illustrates the potential to minimize the postoperative stay of SDR patients safely using Anastoclips, replenishing the cerebrospinal fluid volume after rhizotomy with lactated Ringer's, and eliminating the postoperative bed rest. PMID: [41116932](#)

4. Confident and Trustworthy Model for Fidgety Movement Classification

Romero Morais, Thao Minh Le, Truyen Tran, Caroline Alexander, Natasha Amery, Catherine Morgan, Alicia Spittle, Vuong Le, Nadia Badawi, Alison Salt, Jane Valentine, Catherine Elliott, Elizabeth M Hurron, Paul A Dawson, Svetha Venkatesh

IEEE J Biomed Health Inform. 2025 Oct 23:PP. Online ahead of print

Abstract

General movements (GMs) are part of the spontaneous movement repertoire and are present from early fetal life onwards up to age five months. GMs are connected to infants' neurological development and can be qualitatively assessed via the General Movement Assessment (GMA). In particular, between the age of three to five months, typically developing infants produce Fidgety Movements (FM) and their absence provides strong evidence for the presence of cerebral palsy (CP). To improve accessibility to the GMA, automated GMA solutions have been a key research area with proposed models becoming increasingly more accurate and interpretable. However, current models cannot gauge their ability to make decisions, which may lead to overconfident mistakes. To address this issue, we propose a Deep learning-based approach that not only classifies movements as fidgety or non-fidgety but also selectively abstains from classification when uncertain. Through two novel regularization losses, our model maintains a balanced coverage across the two movement types, which prevents bias toward an easy-to-classify subset of movements. We show that our proposed model learns to gauge its own confidence on movement classification, and our proposed regularization losses effectively ensure that the model maintains a similar confidence across movement types. We also show that the local movement abstentions have little impact on the video-level coverage and that relying on the most confident predictions improves the video-level performance. PMID: [41129439](#)

5. Reimers Migration Percentage in Cerebral Palsy Hip Displacement: A Literature-Based Rationale and Statistical Optimization From a Retrospective Cohort

Ana L Arenas-Díaz, Geovanny Oleas-Santillán, Fausto Sánchez-Muñoz, Rafael Bojalil, Thania Ordaz-Robles, Silvestre Fuentes-Figueroa, Erika A Barrón-Torres, Clemente Hernández-Gómez, Carlos A Guzmán-Martín Sr

Cureus. 2025 Sep 20;17(9):e92795. eCollection 2025 Sep

Background: Hip redislocation after reconstructive surgery remains a major challenge in children with cerebral palsy (CP), particularly those with severe motor impairment. The Reimers migration percentage (RMP) has long been used empirically to guide surgical decision-making, but the optimal cutoff for predicting redislocation has not been statistically validated.

Objective: This study aimed to determine the most accurate RMP threshold for predicting postoperative redislocation using statistical methods in a retrospective cohort of children with CP.

Methods: We retrospectively analyzed 116 hips from 95 children with CP (Gross Motor Function Classification System (GMFCS) Level IV–V) who underwent reconstructive hip surgery. Preoperative RMP was evaluated using receiver-operating characteristic (ROC) analysis, and the Youden index was applied to identify the optimal cutoff. Hierarchical, block-wise logistic regression analysis that incorporated relevant confounders and surgical variables was performed to assess redislocation.

Results: To statistically determine the optimal RMP cutoff, we first observed that the median preoperative RMP was significantly higher in the Redislocation Group 72.5 (IQR 50–100) compared to the non-redislocation group 50 (IQR 42.25–70, $p=0.002$). ROC analysis yielded an area under the curve (AUC) of 0.66, with 70% identified as the optimal threshold. In the fully adjusted model, $RMP \geq 70\%$ remained independently associated with redislocation (adjusted odds ratio (OR) = 3.59, 95% CI 1.45–8.85, $p=0.006$).

Conclusion: This study provides the first statistical validation of the empirically suggested 70% RMP cutoff for predicting redislocation after reconstructive hip surgery in CP. Although discrimination was modest, the threshold offers a practical tool for risk stratification. Clinically, $RMP \geq 70\%$ should prompt closer postoperative surveillance and may support consideration of earlier or more extensive reconstructive strategies in high-risk patients.

PMID: [41122583](#)

6. Intramuscular hemangioma presenting as ankle equinus deformity in a pediatric patient: a case report and literature review

Khalid Bakarman, Mishari Alanezi, Nouf Alabdulkarim, Abdullah S Alzaid, Aref A Altawair

Case Reports J Surg Case Rep. 2025 Oct 23;2025(10):rjaf847. eCollection 2025 Oct

Abstract

Ankle equinus deformity is characterized by limited ankle dorsiflexion, causing gait disturbance, pain, and functional limitations. Common causes include congenital anomalies, cerebral palsy, and muscular dystrophy, while intramuscular hemangiomas (IMHs) are extremely rare. The patient, a 7-year-old girl, presented with right ankle equinus and toe-walking, first noted at age 5, as a persistent, non-tender swelling in the posterior leg. Examination showed fixed ankle equinus, asymmetric calf circumference, and a 1 cm leg length discrepancy. Magnetic resonance imaging (MRI) revealed a large IMH involving the gastrocnemius muscle. She underwent five sessions of sclerotherapy over 18 months, followed by open Achilles tendon Z-lengthening. At 2-year follow-up, she had a painless plantigrade foot with 20° dorsiflexion and was independently ambulating, indicating successful functional recovery. This case highlights the rare presentation of ankle equinus due to IMH. MRI is essential for diagnosis, and combined sclerotherapy with tendon lengthening can achieve excellent outcomes.

PMID: [41132621](#)

7. The effect of inaccurate initial contact events on kinematics in healthy and pathological gait

Bernhard Dumphart, Djordje Slijepcevic, Fabian Unglaube, Andreas Kranzl, Arnold Baca, Brian Horsak

Gait Posture. 2025 Oct 16;123:110012. Online ahead of print

Background: Clinical gait analysis (CGA) is the established gold standard for clinical decision-making. While previous research has identified error sources that affect the quality of CGA (e.g., marker placement and soft tissue artifacts), the impact of inaccurately identified initial contact (IC) events has not been systematically investigated. As IC events define the beginning and end of the stance phase, they directly impact spatiotemporal, kinematic, and kinetic parameters.

Research question: To what extent do inaccurately detected IC events affect sagittal hip, knee, and ankle kinematics at IC across different cohorts?

Methods: The impact of inaccurately detected IC events on sagittal hip, knee, and ankle kinematics at IC was investigated in healthy individuals ($n = 28$) and two patient populations, patients with cerebral palsy (CP, $n = 208$) and patients with malrotation deformities and/or frontal malalignments of the lower extremities (MD, $n = 1122$). IC events were incrementally shifted by ± 1 to ± 6 frames to systematically simulate inaccuracies. The mean absolute error (MAE) was calculated for the hip, knee, and ankle kinematics between the waveforms based on the original IC and each shifted IC.

Results: Kinematics of the sagittal knee and ankle are highly sensitive to inaccurate ICs, with a median MAE exceeding 2° within two frames for MD and healthy participants and three frames for patients with CP. The hip kinematics showed a lower sensitivity to IC inaccuracies.

Significance: These results highlight the importance of accurately identified IC events in CGA to ensure reliable data. Based on our results, we recommend adopting stricter error tolerance thresholds of 13.3 ms to 20.0 ms (i.e., two to three frames at 150 Hz) for gait event detection algorithms to reduce potential errors in clinical assessments.

PMID: [41110193](#)

8. Natural history versus intervention in growing children with cerebral palsy

Kerr Graham

Dev Med Child Neurol. 2025 Oct 23. Online ahead of print

Abstract

No abstract available.

PMID: [41126631](#)

9. Scaling success: parental perceptions of the benefits of a 20-week football living-lab approach for children living with cerebral palsy

Ricardo Martins, Will Pattison, Lara Vella, Ruth Postlethwaite, David Broom, Eileen Africa, Michael Duncan

BMJ Paediatr Open. 2025 Oct 21;9(1):e003895

Background: Living-lab approaches have effectively connected academic research with community needs but have not yet been applied to promote physical activity for children with cerebral palsy (CP). This study evaluated a 20-week football-based living-lab programme for children aged 5–10 years with CP, grounded in the principles of Football is Medicine and physical literacy.

Methods: A qualitative design was employed, involving seven one-to-one semistructured interviews with parents or legal guardians of programme participants. A deductive thematic analysis was conducted, and pen profile diagrams were developed to represent key themes related to physical literacy outcomes.

Results: Parents reported benefits across multiple dimensions of their children's physical literacy, including improved competence, confidence, motivation and enjoyment. All parents observed enhanced social interaction. Six described the sessions as inclusive and community-oriented, while five felt the programme was personalised to their child's needs. Three parents perceived the football activities as complementary to physical therapy, supporting physical rehabilitation. Participation also enabled parents to exchange strategies and engage more meaningfully in their child's well-being.

Conclusion: The football-based living-lab supported the holistic development of children with CP, enhancing physical, psychological and social domains of physical literacy. Parental involvement further reinforced perceived therapeutic and community benefits.

PMID: [41125260](#)

10. Efficacy of functional training on cardiorespiratory fitness in individuals with cerebral palsy: A systematic review

Melek Volkan-Yazici, Gokhan Yazici, Sarah Reedman, Shaneen J Leishman, Leanne Sakzewski, Roslyn N Boyd

Dev Med Child Neurol. 2025 Oct 22. Online ahead of print

Aim: To determine the efficacy of functional training on cardiorespiratory fitness in individuals with cerebral palsy (CP). **Method:** Randomized controlled trials involving individuals with CP who had functional training interventions, which also reported cardiorespiratory fitness outcomes, were included in this systematic review. Two independent reviewers searched PubMed, MEDLINE, Embase, CENTRAL, Web of Science, and CINAHL up to February 2025, and selected studies and extracted data. Study quality was assessed using the Cochrane Risk of Bias 2 tool. Certainty of evidence was assessed using the Grading of Recommendations Assessment, Development, and Evaluation system. Mean differences and standard mean differences with 95% confidence intervals (CIs) were calculated.

Results: From 594 papers, 11 randomized controlled trials ($n = 387$, mean ages 5 years 10 months–20 years 6 months, Gross Motor Function Classification Systems levels I–IV) were included. Functional training had statistically and clinically significant effects on the 6-minute walk test (mean difference = 30.91; 95% CI = 28.34–33.48; $p < 0.001$) and Physiological Cost Index (mean difference = -0.16; 95% CI = -0.20 to -0.13; $p < 0.001$). No effect was found for gait speed or the timed stair test.

Interpretation: Functional training has the potential to improve functional exercise capacity in individuals with CP. Given the significant impact of cardiorespiratory problems on the morbidity and mortality of individuals with CP, integrating cardiorespiratory parameters into functional training programmes may contribute to long-term health benefits.

PMID: [41124362](#)

11. Effects of an adapted dance exercise program on trunk control, balance and functional mobility in children and adolescents with cerebral palsy: randomized controlled study

Asena Yekdanesh, Nilay Arman

Physiother Theory Pract. 2025 Oct 20:1–10. Online ahead of print

Aims: The study aimed to investigate whether an 8-week adapted dance exercise program (ADEP), delivered in addition to conventional physiotherapy, would improve trunk control, balance, functional mobility, and quality of life (QoL) in children and adolescents with cerebral palsy (CP) compared with conventional physiotherapy alone.

Methods: Thirty participants with CP (Gross Motor Function Classification System Level I–II) were randomly assigned to the ADEP group ($n = 15$) or the control group ($n = 15$). Both groups received conventional physiotherapy, while the ADEP group additionally performed physiotherapist-choreographed dance exercises accompanied by music, twice a week for 8 weeks.

Outcomes included the Trunk Control Measurement Scale (TCMS) for trunk control, the Pediatric Balance Scale (PBS) for balance, the Timed Up and Go (TUG) for functional mobility, and the Pediatric Outcomes Data Collection Instrument (PODCI) for QoL.

Results: The ADEP group showed significantly greater improvements than the control group in TCMS-Total ($\Delta = 10.53$ vs 3.50, $p < .001$), TCMS-selective motor control ($\Delta = 6.00$ vs 1.42, $p < .001$), TCMS-dynamic sitting balance ($\Delta = 7.53$ vs 2.28, $p < .001$), and PODCI-Global scores ($\Delta = 4.61$ vs -1.71, $p < .001$). Both groups improved in PBS and TUG, but between-group differences were not significant. Effect sizes indicated large improvements in trunk control in favor of the ADEP group.

Conclusions: An 8-week ADEP program, when combined with conventional physiotherapy, produced clinically meaningful gains in trunk control and QoL in children and adolescents with CP. These findings support the use of dance-based rehabilitation as a feasible and engaging adjunct to physiotherapy.

PMID: [41115042](#)

12. Using climbing to quantify motor asymmetry in children with cerebral palsy: a pilot study

Cecilia Monoli, Greta Simoni, Manuela Galli, Alessandro Colombo

Front Sports Act Living. 2025 Oct 3;7:1541106. eCollection 2025

Introduction: Adapted sports complement traditional rehabilitation for children with cerebral palsy (CP), who require continuous intervention to maintain motor function. This pilot study investigates the feasibility of using a climbing game combined with force sensors to quantify motor asymmetries in children with hemiplegic CP.

Methods: Eight children with hemiplegic CP participated in climbing games for three consecutive days. Force sensors embedded in the holds measured reaction forces, while marker-less motion capture linked these forces to specific limbs. Two indices, maximum force (Fmax) and mean force (Fmean), were calculated for each limb as potential proxies for motor asymmetry. Statistical analysis using repeated measures ANOVA assessed the ability of these indices to differentiate between the more and less affected limbs.

Results: The maximum force index (Farmmax) successfully identified significant differences between the more affected and less affected arms in all activities ($p \leq 0.023$), with stronger results during structured tasks ($p = 0.002$). However, neither the maximum nor the mean force indices demonstrated significant discriminatory power for the legs, likely reflecting compensatory strategies or reduced asymmetry in the lower limbs.

Discussion: This pilot study supports the potential of Farmmax as a robust index to quantify upper limb motor asymmetry. Such an index could be used by therapists to track the evolution of a child's motor abilities through a game, rather than through less pleasant clinical evaluations. The findings highlight the need for further research to validate these indices in larger cohorts, investigate their longitudinal evolution during rehabilitation, and explore correlations with clinical motor assessments.

Conclusion: The results confirm the feasibility of using climbing-based force indices to detect motor asymmetries in children with hemiplegic CP. Future studies could leverage this methodology to provide quantitative feedback on the efficacy of rehabilitation interventions, fostering personalized and engaging therapeutic approaches.

PMID: [41113464](#)

13. Inclusive orchestral music therapy according to the Euterpe Method: a multimodal framework for neurodevelopmental disorders

Tommaso Liuzzi, Fiammetta D'Arienzo, Susanna Staccioli, Rita Faraj Slaiby, Maroun Bou Sleiman Harb, Miled Tarabay, Roberto Giuliani, Teresa Chirico, Donatella Lettori, Enrico Castelli

Front Neurol. 2025 Oct 2;16:1612955. eCollection 2025

Abstract

Neurodevelopmental disorders (NDD), as defined by DSM-5-TR and CDDR, comprise heterogeneous early-onset conditions involving executive dysfunction, motor planning deficits, language impairments, and socio-emotional dysregulation. Evidence from neuroimaging and clinical studies suggests that music-based interventions may engage distributed neural networks—including fronto-striatal, temporo-parietal, limbic, and brainstem circuits—through predictive timing, cross-modal synchronization, and adaptive plasticity. However, clinical translation has been hindered by methodological heterogeneity, insufficient standardization, and reduced reproducibility, together with limited integration of clinical, functional, and neurophysiological indicators, absence of unified protocols combining individualized and orchestral modules with explicit transfer mechanisms, and insufficient monitoring of fidelity and multisite feasibility. This perspective proposes the IncluSive Orchestral mUsic therapy accordiNg to the euterpe methoD (I-SOUND), a clinically adapted orchestral framework structured to integrate three complementary modules: Individual Music Therapy (IMT), an Orchestral Music Therapy module (OMT), and a Multidirectional and Iterative Transfer Process (MIT-P). Developed from the progressive refinement of the Euterpe Method and the pediatric EM Active algorithm, the model is intended to target specific neurofunctional domains and to explore generalization to everyday contexts. A two-phase evaluation—comprising an observational study followed by a randomized controlled trial—is planned to assess feasibility, fidelity, sustainability, and clinical applicability in heterogeneous NDD populations. Particular attention is given to the methodological challenge of balancing ethical inclusion with internal validity. No efficacy claims are advanced, as the framework requires empirical verification before clinical conclusions can be drawn.

PMID: [41111961](#)

14. Validity of acoustic speech measures obtained through videoconferencing with children with dysarthria

Kyunghae Hwang, Frits van Brenk, Megan J McAuliffe, Jiyoung Choi, Jan G Švec, Young Hwa M Chang, Bryan Keller, Erika S Levy

Int J Speech Lang Pathol. 2025 Oct 24;1–17. Online ahead of print

Purpose: Children with dysarthria due to cerebral palsy often face barriers to receiving speech-language pathology services. Using online videoconferencing from home could be an appropriate solution if audio-recordings from such technology yield valid measures of the children's speech. This study assessed the validity of acoustic measures obtained from online recordings of children with dysarthria from their homes.

Method: Speech of 17 children with dysarthria was recorded from their homes simultaneously via two methods: 1) Online via Zoom and 2) offline via an audio-recording device. Nine commonly-assessed acoustic measures were obtained by each method and compared. Correlations and agreements between measures extracted from online and audio-device recordings were evaluated for whether they met predetermined criteria for validity.

Result: Second-formant range of diphthongs, fricative-affricate duration difference, word duration/articulation rate, mean fundamental frequency, and sound-pressure-level range met the criteria for validity. In contrast, fundamental frequency range, signal-to-noise ratio, and cepstral peak prominence did not meet validity criteria.

Conclusion: Findings support the validity of most commonly-analysed acoustic measures extracted from online recordings of children with dysarthria, suggesting that commercially-available videoconferencing technology could be an alternative to in-person evaluation. However, for perturbation- and noise-based measures, in-person recordings may still be necessary.

PMID: [41134594](#)

15. Caregivers' experiences of feeding children with cerebral palsy

No authors listed

Nurs Health Sci. 2025 Dec;27(4):e70244

Abstract

No abstract available.

PMID: [41130747](#)

16. Mitigating Feeding Disorders and Malnutrition in Children with Developmental Disabilities: A Narrative Review

Aradhana Rohil, Prashant Jauhari, Rohan Malik, Biswaroop Charabarty, Sheffali Gulati

Indian Pediatr. 2025 Oct 21. Online ahead of print

Context: Pediatric feeding disorder (PFD) is characterized by age-inappropriate oral intake associated with dysfunction in feeding skills, medical, nutritional, or psychosocial domains. Children with developmental disabilities (DD), such as cerebral palsy (CP), often meet the criteria for PFD due to underlying neurological, motor, and sensory impairments, compounded by psychosocial stressors. These challenges contribute to undernutrition, poor growth, and adverse developmental outcomes, but remain undiagnosed. This review evaluates the burden and spectrum of feeding problems in children with developmental disabilities and aims to bridge gaps in clinical awareness, assessment, and intervention.

Evidence acquisition: A literature search was conducted using PubMed, Scopus, and Google Scholar for studies published between January 2015 and January 2025. Keywords included: "children" OR "childhood" AND "feeding problems" OR "feeding disorders" OR "malnutrition" OR "dysphagia" OR "drooling" OR "food aversion" OR "oral sensory processing disorders" AND "cerebral palsy" OR "developmental disabilities" OR "neurological impairment."

Results: Forty studies were included wherein feeding disorders were observed in 33–80% of these children. Physical anomalies, swallowing dysfunction, restricted diets, and socio-cultural factors were observed to be responsible for feeding difficulties which ranged from dysphagia, swallowing dysfunction, gastroesophageal reflux disease, constipation, sensory issues and food aversions. A systematic approach—objective assessment of nutritional status, calculating dietary needs, evaluating safety and efficiency of oral feeding, optimizing intake, considering enteral nutrition when indicated—can improve outcomes.

Conclusion: Feeding disorders are a significant yet modifiable source of morbidity in children with DD. Early recognition and multidisciplinary, evidence-based approach are critical to improving their quality of life.

PMID: [41117863](#)

17. Communication about sexuality with adolescents with cerebral palsy and complex communication needs: A scoping review with framework synthesis

No authors listed

Dev Med Child Neurol. 2025 Oct 23. Online ahead of print

Abstract

No abstract available.

PMID: [41129271](#)

18. A Successful Use of Electromyography-Based Neuromuscular Monitoring in a Patient With Cerebral Palsy: A Case Report

Tsukasa Uesaka, Hajime Iwasaki

A A Pract. 2025 Oct 20;19(10):e02074. eCollection 2025 Oct 1

Abstract

Neuromuscular monitoring in patients with cerebral palsy (CP) is technically challenging due to limb contractures and muscle atrophy. We report a case of a 28-year-old male with CP who underwent surgery under general anesthesia. Intraoperative recovery from neuromuscular block was successfully monitored using an electromyography-based neuromuscular monitor. Due to finger deformities, the abductor digiti minimi muscle was selected for monitoring. The onset of rocuronium 0.65 mg/kg was delayed and its duration markedly prolonged. Adequate recovery of neuromuscular function was confirmed with a train-of-four ratio ≥ 0.9 , demonstrating the feasibility and clinical utility of TetraGraph in CP patients.

PMID: [41118604](#)

19. Neurological Development in Very Low Birth Weight Infants with Congenital Heart Disease at 3 Years of Age: A Japanese Multicenter Study

Yoshiki Mori, Yasumi Nakashima, Hiroshi Sugiura, Etsuko Hirose, Satoshi Masutani, Yasuhiko Tanaka, Hitoshi Yoda, Katsuaki Toyoshima

Pediatr Cardiol. 2025 Oct 19. Online ahead of print

Abstract

Neurodevelopmental impairment is an increasing concern in very low birth weight (VLBW) infants with congenital heart disease (CHD). However, their prevalence and associated risk factors remain poorly defined. We aimed to investigate the neurodevelopmental outcomes and identify risk factors for impairment in this vulnerable population. This multicenter cohort study included VLBW infants born between 2006 and 2014 without genetic or known anomalies. Neurodevelopment was assessed at three years of age using the Kyoto Scale of Psychological Developmental (KSPD). Poor neurodevelopment was defined as a total developmental quotient (DQ) < 70 , a diagnosis of cerebral palsy, or clinical judgment in cases where the KSPD was not administered. Among 52 infants with CHD and 189 without, poor neurodevelopment outcomes were significantly more frequent in the CHD group (36.5% vs. 16.4%, $p = 0.003$), particularly in those with serious CHD (54.9%). Multivariate logistic regression identified serious CHD and prolonged hospitalization (> 13 weeks) as independent risk factors. These findings highlight the need for early identification and multidisciplinary follow-up in this high-risk population.

PMID: [41109872](#)

20. Reviewer Comment on Kazemi et al. "Assessment of Clinical and Demographic Factors Influencing the Severity of Levodopa-Induced Dyskinesia"

Maziar Emamikhah, Susan H Fox

Can J Neurol Sci. 2025 Oct 24;1. Online ahead of print

Abstract

No abstract available.

PMID: [41133897](#)

21. Use of Computational Phenotypes for Predicting Genetic Subgroups of Cerebral Palsy

Imen Alkuraya, Alexandra Santana Almansa, Azubuike Eleonu, Paul Avillach, Annapurna Poduri, Siddharth Srivastava

Pediatr Neurol. 2025 Sep 25;173:149–155. Online ahead of print

Background: Emerging evidence suggests that 20%–30% of cases of cerebral palsy (CP) may have a genetic cause. Our group previously identified subsets of patients with CP or CP-masquerading conditions who warrant genetic testing, including those with regression or progressive neurological symptoms (CP masqueraders) and those without any known risk factors for CP (cryptogenic CP). Recognition of these subgroups in clinical settings remains challenging.

Methods: To address this challenge, we developed and evaluated a computational phenotyping approach using international classification of diseases (ICD)-9/ICD-10 billing codes to automatically identify patients with unexplained CP or CP-masquerading conditions who may benefit from genetic testing. We applied this computational phenotyping approach to a cohort of 250 participants from the Boston Children's Hospital CP Sequencing Study, aimed at identifying genetic causes in CP and CP-masquerading conditions.

Results: Manual review served as the gold standard, identifying 8% as CP masqueraders, 42% as cryptogenic CP, and 50% as noncryptogenic CP. Computational phenotyping based on ICD-9/ICD-10 codes achieved a sensitivity of 95%, specificity of 72%, positive predictive value of 77%, and negative predictive value of 94% in identifying cases warranting genetic testing.

Conclusions: Our findings demonstrate the feasibility of using computational phenotyping to identify patients with CP or CP-masquerading conditions who warrant genetic testing. Further studies are needed to evaluate the effectiveness and real-world application of this tool in larger health care systems. Nevertheless, the computational phenotyping approach holds promise as a possible clinical decision support that could be integrated into electronic health record systems, enhancing clinical workflows and facilitating actionable genetic diagnoses.

PMID: [41129986](#)

22. Elucidating the Genetic Landscape of Cerebral Palsy Following Perinatal Cerebrovascular Events

Liene Thys, Diane Beysen, Sandra Kenis, Lieve Verstraete, Sabine Laroche, Sven Dekeyzer, Katrien Janssens, Marije Meuwissen

Pediatr Neurol. 2025 Oct 7;174:1–7. Online ahead of print

Background: Cerebral palsy (CP) is a heterogeneous neurodevelopmental disorder resulting from damage to the developing brain. While perinatal ischemic and hemorrhagic cerebrovascular events are well-established causes, the potential genetic contribution to these injuries remains underexplored. This study investigated the role of genetic factors in a selected CP cohort secondary to perinatal cerebrovascular injury and explored helpful clinical characteristics that may guide genetic evaluation.

Methods: Chromosomal microarray and exome sequencing were performed in 61 individuals diagnosed with CP secondary to perinatal cerebrovascular injury, of which 37 with ischemic and 24 with hemorrhagic brain injury.

Results: A genetic diagnosis was established in five out of 61 cases (8.2%) with a striking difference between the hemorrhagic and ischemic groups: four out of 24 cases (16.7%) with hemorrhagic injury had a confirmed genetic diagnosis compared to only one out of 37 (2.7%) in the ischemic group. Three hemorrhagic cases carried (likely) pathogenic variants in COL4A1. One additional case carried a de novo 12pter duplication, a previously unreported association with perinatal brain hemorrhage. The single diagnosis in the ischemic group was a mosaic JAG1 variant related to Alagille syndrome.

Conclusions: Our findings underscore the value of genetic testing in children with CP due to perinatal hemorrhagic brain injury, with a seemingly important role for COL4A1. Less diagnoses were made in the ischemic group, suggesting a potential multifactorial underlying pathophysiology. Further research in larger cohorts and by using genome-wide technologies is essential in further elucidating the genetic architecture of perinatal cerebrovascular injury.

PMID: [41138497](#)

23. Mother-infant interactions in infants at high risk of cerebral palsy compared to a low-risk group: A longitudinal study of the first 15 months

Julie Enkebølle Hansen, Carlo Schuengel, Agnes Willemen, Anne Stuart, Mette Skovgaard Væver, Katrine Røhder

Res Dev Disabil. 2025 Oct 22;166:105131. Online ahead of print

Aim: To examine group differences and longitudinal trajectories in mother-infant interactions following an interim clinical diagnosis of high risk of CP up to 15 months corrected age.

Method: This prospective observational study followed infants born in Denmark with ($n = 23$) or without ($n = 36$) identified high risk of cerebral palsy and their parents over time. Mother-infant interactions were assessed at 15 weeks, 9 months, and 15 months using the Coding Interactive Behavior manual. Group differences and trajectories in mother-infant interactions were analyzed using Generalized Estimating Equations (GEE) with bootstrapping to obtain robust estimates. **RESULTS:** At 15 weeks (T1), the high-risk CP group differed significantly from the comparison group on all observed interactional dimensions, showing lower levels of maternal acknowledging ($b = -0.93$, $p < .001$), infant social initiation ($b = -0.54$, $p = .007$), and dyadic reciprocity ($b = -0.58$, $p = .041$), and higher levels of maternal intrusiveness ($b = 1.04$, $p < .001$) and dyadic constriction ($b = 0.73$, $p = .018$). While differences in maternal acknowledging and dyadic reciprocity were only present at 15 weeks, maternal intrusiveness and infant social initiation differences were present at 15 weeks and 15 months. Dyadic constriction differences were present across all time points.

Conclusion: Early differences in mother-infant interaction between dyads with and without infant CP risk underscore the importance of tailoring interventions to read and respond to subtle infant cues. Supporting the parent-infant relationship from early infancy might enhance the effectiveness of early intervention and promote more optimal socio-emotional development.

PMID: [41129962](#)

24. How do people with disability and complex needs experience the built environment in apartments designed for people with disability?

Stacey Oliver, Rebecca Jamwal, Kate DCruz, Naismith Jacqui, Di Winkler, Jacinta Douglas

Aust Occup Ther J. 2025 Oct;72(5):e70051

Introduction: Despite evidence supporting the benefits of individualised disability housing, the extent to which the built environment in these housing models meets the needs of tenants with disability and complex needs remains unclear. One form of individualised housing includes apartments designed for people with disability peppered throughout larger apartment complexes. In this study, we aimed to explore the experience of the built environment for people living in these apartments.

Methods: Thirteen adults with disabilities and complex needs (Ehlers-Danlos syndrome = 3; cerebral palsy = 1; spinal cord injury = 1; neuromuscular disorder = 1; multiple sclerosis = 2; other neurological = 4; and other = 1) who had been residing in apartments for 6 months undertook semi-structured interviews. Interviews were guided by the residential interview component of the Residential Environment Impact Scale, Version 4.0. Using grounded theory principles, the interview transcripts were analysed through a process of data-driven open and focussed coding.

Findings: The analysis revealed four overarching themes: (1) having adequate space to meet needs; (2) requiring accessible design; (3) integrating technology into the built environment; and (4) regulating the sensory space. Central to experiences was participants' sense of autonomy within the built environment. Moreover, participants emphasised the importance of design elements and social systems within which these apartments are situated.

Conclusion: The findings underscore the pivotal role the built environment plays in shaping the lives of tenants with disabilities and complex needs. They also highlight early challenges and opportunities to improve the adaptability and functionality of apartments designed for people with disabilities. Recommendations include enhancing the integration of home automation and assistive technologies and ensuring prospective tenants have clear information about their tenancy, including constraints specific to the built environment of apartment living.

Plain language summary

This study looked at whether apartments designed for people with disabilities and complex needs are working well for the people who live in them. We talked with 13 adults with disabilities who had lived in their apartments for 6 months. We asked them about their experiences with the design of the apartment. Four main aspects of the apartment design were important to their daily lives: having enough space; having accessible design features; being able to use technology easily in their homes; and managing the sensory environment, like noise and lighting. A key finding was that good design can help people feel more in control and independent at home. People also said that the social environment made a difference to their experience, including having clear information, before moving into their home, about costs, what support is available, and any rules or limits that come with apartment living. Overall, our findings show that apartment design has a big impact on daily life. People with disabilities living in these apartments have valuable insights into how apartments designed for people with disabilities can be improved. For example, making sure technology and equipment fit better into the space and training and support for people to use the technology. It is also important that people are given clear information before they move in. Adaptable and accessible design, along with good information and support, is important to help people with disability settle in and live well.

PMID: [41121500](#)

25. Priapism as the initial presentation of chronic myeloid leukemia in a patient with cerebral palsy: A case report

Emre Hepşen, Kubilay Sarıkaya

Ulus Travma Acil Cerrahi Derg. 2025 Oct;31(10):1065–1067

Abstract

Priapism is defined as a penile erection lasting more than four hours without stimulation. The majority of cases involve ischemic priapism, in which there is partial or complete absence of cavernosal arterial flow. Priapism is uncommon, with an estimated annual incidence of approximately 1.5 cases per 100,000 men. In chronic myeloid leukemia (CML) patients, leukostasis may occur, which can lead to priapism in 1–2% of cases. We present the case of a 21-year-old patient with a history of cerebral palsy who was brought to the emergency department by his family with priapism persisting for 13 hours. It was noted that the patient had experienced one prior episode of priapism a month earlier, which had resolved spontaneously. He had no history of trauma. On physical examination, extremity contractures related to cerebral palsy were noted, and the penis was observed to be erect. A venous catheter was inserted into the corpus cavernosum, dark-colored blood was aspirated, and blood gas analysis confirmed the diagnosis of ischemic priapism. The corpus cavernosum was irrigated with normal saline, and epinephrine was administered into both corpora cavernosa; however, priapism did not resolve. Laboratory tests revealed a white blood cell count of 581,760 /mm³. The patient was referred to the hematology department. Peripheral blood smear analysis confirmed the diagnosis of CML, and leukapheresis was performed three times within two days. Following normalization of the peripheral white blood cell count, penile detumescence was achieved, and no further episodes of priapism occurred. In conclusion, early diagnosis and a multidisciplinary approach improve the success of priapism treatment and reduce the risk of complications.

PMID: [41767811](#)

26. Promoting Collaboration Among Pediatrics, Education, and Law in a Preschooler With Co-occurring Attention-deficit Hyperactivity Disorder and Cerebral Palsy

Irene Loe, Adiaha Spinks-Franklin, Daney Espiritu, William S Koski, Elizabeth A Diekroger, Jason M Fogler

J Dev Behav Pediatr. 2025 Oct 20. Online ahead of print

Abstract

Marcus is a 4-year-old African-American boy with cerebral palsy, Gross Motor Function Classification System level 1, and attention-deficit hyperactivity disorder (ADHD), Combined Presentation who presents to Developmental-Behavioral Pediatrics clinic for evaluation because of preschool difficulties. He is very active, jumping up and down at circle time, bumping into classmates, and impulsively hitting other children when they take his toys. As a toddler, his cognitive and social-emotional skills were on track, and he received early intervention for language and motor delays. He qualified for an IEP and transitioned to a district-based inclusive preschool setting with speech therapy and adaptive physical education. Marcus spends the week with his grandparents, and they live in a school district that is well-resourced and has inclusive school and therapy settings. The teachers call parents or grandparents frequently to pick him up. In response to misbehavior, they also put him in a separate timeout area, away from the other children, with a 1:1 aide for the rest of the day. On 2 occasions, he was strapped into a therapy chair for nonambulatory children after biting or hitting another child. Because he does well with 1:1 support, the school has switched him to a special day class with smaller class size, comprised primarily of autistic preschoolers who are minimally verbal. Marcus' parents have just started parent training in behavior management for ADHD after struggling to find a therapist that was covered by their insurance. His mother noticed while volunteering in his original class that other children with similar behavior were not sent home or transferred to a special education class. They are upset with the transfer to the more restrictive environment, but they are worried if they speak up that the district will send him to a less resourced school in the district where the family, rather than grandparents, reside. How would you advise the family to proceed?

PMID: [41114658](#)

Prevention and Cure

27. Bioinspired sodium alginate/silk fibroin dual-crosslinked conductive injectable hydrogel for neural stem cell therapy in cerebral palsy

Simiao Yu, Chenyu Liu, Yongxin Pan, Geliang Tang, Weihong Qiao

J Mater Chem B. 2025 Oct 21. Online ahead of print

Abstract

Cerebral palsy (CP), the leading cause of lifelong motor disability in children, lacks effective neural regeneration therapies. Current treatments only alleviate symptoms, and while neural stem cell (NSC) transplantation shows promise, its efficacy is hindered by poor post-transplant cell survival and differentiation. To overcome this, we developed an injectable, conductive hydrogel (MS-gel) mimicking the brain's electroactive extracellular matrix. The MS-gel integrates oxidized alginate and silk fibroin (MOA/TOA/SF) through dual-crosslinking (Schiff-base and photopolymerization), enabling rapid in situ gelation (<60 s) and stable conductivity ($1.19 \pm 0.02 \text{ mS cm}^{-1}$) matching neural tissue properties. In vitro, the MS-gel maintained >90% NSC viability and enhanced neuronal differentiation (1.67-fold increase in β -III tubulin). In CP rat models, NSC-loaded MS-gel implantation improved motor function (88% longer rotarod latency) and cognition (80% shorter Morris water maze escape time). Proteomics revealed that NSCs@MS-gel promotes neural circuit repair via enhanced cellular clearance, ion homeostasis, cytoskeletal reorganization, synaptic restoration, and myelin integrity. This study presents the first integrated platform combining light-controlled gelation, tissue-matched electroactivity, and cytoprotection, offering significant potential for CP and other neurological disorder therapies.

PMID: [41117194](#)

28. Predicting cerebral palsy and 18-month neurodevelopmental outcome in infants with presumed hypoxic ischaemic encephalopathy: role of general movements assessment and early neurological examination

Gugulabatem bunamahlubi T J Kali, Jacomina C F du Preez, Jeanetta I van Zyl, Marlette Burger, Hillary Katsabola, Michael S Pepper

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Introduction: General movements assessment (GMA), including the Motor Optimality Score-Revised (MOS-R) and the Hammersmith Infant Neurological Examination (HINE), has been shown in different settings to predict cerebral palsy (CP) and delayed neurodevelopment with high accuracy. However, their combined predictive ability has not been fully evaluated in infants with presumed hypoxic-ischaemic encephalopathy (HIE).

Objective: This study aimed to assess the predictive ability of combined GMA, MOS-R, and HINE at 3 months in term or near-term infants diagnosed with presumed HIE, for neurodevelopmental outcome at 18 months.

Methods: A cohort of presumed HIE infants treated with therapeutic hypothermia (TH) underwent GMA, MOS-R, and HINE at 12–15 weeks, and neurodevelopmental assessments using the Bayley Scales of Infant and Toddler Development Third Edition (BSID-III) at 9–12 and at 18–24 months of age. Combined early assessments were analysed for their predictive ability across different domains on the BSID-III.

Results: Twenty-four infants were included; 7 (29%) had both 12-month and 18-month BSID-III assessments, 12 (50%) were seen only at 12 months, and 5 (21%) only at 18 months. Two infants with absent fidgety movements (FMs) and poor motor repertoire were later diagnosed with CP or showed delays in two domains on the BSID-III assessment at 18 months. While most infants had some abnormality in the MOS-R categories, only absent FMs and abnormal finger variability showed some association with the 18-month BSID-III assessment on univariate analysis. Of the four infants classified as at risk for CP on the HINE at 3 months, two had some motor abnormalities at 18 months. Combining the GMA, MOS-R, and HINE had high sensitivity and negative predictive value (100%), but low specificity (0–17.6%) and positive predictive value (6.2%–25%) for the BSID-III outcome.

Conclusion: Combining GMA, MOS-R, and HINE was highly sensitive in this cohort, but had low specificity. This may lead to overdiagnosis, but it may be a useful screening tool for identifying typically developing infants who do not need intensive follow-up.

PMID: [41113569](#)

