# Cerebral palsy research news

Monday 26 January 2026

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## Interventions and Management

**1.Electroencephalography differences in children with and without bilateral cerebral palsy during unimanual and bimanual drumming tasks**

Arjun Mathur, Thomas C Bulea, Julia Kline, Diane L Damiano

Front Hum Neurosci. 2026 Jan 5;19:1694812. eCollection 2025.

Background: Multiple studies have examined bimanual coordination in children with unilateral cerebral palsy (CP), with few in bilateral CP and none using electroencephalography (EEG). This study investigates brain activation underlying bimanual performance in individuals with bilateral CP and typical development (TD).
Methods: Twenty-six participants (13 CP; 13 TD) completed the Box and Block Test (BBT) and visually cued drumming tasks with each hand (unimanual) and then both hands synchronously and asynchronously (bimanual). EEG and motion data were recorded during drumming tasks.
Results: Children with CP demonstrated bilateral impairments in drumming cadence and BBT, increased alpha and beta and decreased gamma EEG band activation in mainly non-dominant brain regions compared with TD. Bimanual tasks tended to show decreased performance and greater alpha and beta band activation than unimanual tasks for both groups. EEG activity and BBT correlations were positive in TD but negative in CP.
Discussion: Children with CP showed worse bilateral motor performance and EEG activation differences compared with TD. A more complex bimanual task may reveal greater differences between groups.
Conclusion: Evidence of bimanual deficits and EEG differences reinforces the need for greater research and clinical attention on upper limb function in bilateral CP.
PMID: 41561195

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

Ann-Kristin Gunnes Elvrum, Lena Krumlinde-Sundholm, Marika Wenemark, Ann-Christin Eliasson

Dev Med Child Neurol. 2026 Jan 18. Online ahead of print.

Aim: To expand the scope of the Hand Assessment for Infants (HAI) by validating its internal scale structure and reliability in infants aged 3–12 months at risk of bilateral or unilateral cerebral palsy (CP).
Method: This test-validation study included 274 HAI assessments from 221 infants (mean age 7 months, SD 2.4; 132 male) at risk of unilateral (n = 123) or bilateral (n = 98) CP. Seventeen HAI items (12 unimanual, five bimanual) were scored and analyzed using the Rasch measurement model.
Results: Strong internal scale validity and high person and item reliability were demonstrated for infants at risk of unilateral and bilateral CP. Logit measures for both scales were linked to a common reference frame, enabling comparable overall bimanual performance measures (HAI unit) while maintaining distinct item difficulty hierarchies.
Interpretation: The HAI provides valid and reliable measurement of hand use in infants at risk of unilateral and bilateral CP regardless of impairment severity. Linking scales supports comparable bimanual performance metrics across CP subtypes, eliminating the need to determine subtype before data collection.
PMID: 41549354

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

Gøril Okkenhaug Johansen, Annoek Louwers, Melanie Hessenauer, Kari Anne Indredavik Evensen, Guro Lillemoen Andersen, Ann-Kristin Gunnes Elvrum

Dev Med Child Neurol. 2026 Jan 18. Online ahead of print.

Aim: To investigate content and construct validity of the Both Hands Assessment (BoHA) for children and adolescents with bilateral cerebral palsy (CP), MACS levels I–III, aged 18 months to 18 years.
Method: Sixty-one adolescents (mean age 15 years 6 months) completed the BoHA for content validity assessment. These data were combined with 210 BoHA assessments from children (mean age 6 years 4 months), totaling 271 assessments for Rasch analyses examining construct validity.
Results: After revising the bimanual item “orients objects,” BoHA items were suitable for scoring bimanual performance in adolescents. Strong internal scale validity and reliable person and item measures were demonstrated for individuals with asymmetric (n = 94) and symmetric (n = 177) hand use. Linking BoHA logit measures to a common reference frame allowed comparable bimanual performance measures while maintaining separate item difficulty hierarchies.
Interpretation: The BoHA is valid for assessing bimanual performance in individuals with bilateral CP aged 18 months to 18 years, enabling developmental monitoring and evaluating intervention effects across childhood and adolescence.
PMID: 41548110

**4.The influence of intrathecal baclofen pumps on outcomes following spinal fusion in non-ambulatory patients with cerebral palsy**

Lexi M Larson, Daniel J Miller, Luis Torres-Gonzalez, Tenner J Guillaume, Walter H Truong, Joseph H Perra, Linda E Krach, Maykala J Williams, Sara J Morgan

Spine Deform. 2026 Jan 17. Online ahead of print.

Purpose: Children with non-ambulatory cerebral palsy (CP) often require spinal fusion for neuromuscular scoliosis. Many also receive intrathecal baclofen (ITB) therapy. ITB pumps may complicate spine surgery, but existing evidence is inconsistent. This study compared surgical outcomes and complications between children with and without ITB pumps.
Methods: This retrospective study included 334 children with CP who underwent spinal fusion between 2001 and 2021 (ITBP: n = 163; no ITBP: n = 171). Complications and outcomes were compared using Fisher’s exact tests or Mann–Whitney U tests.
Results: Overall complication rates were similar between groups ($p = 0.19$). However, children with ITB pumps had greater odds of surgical site infection (OR 3.11; $p = 0.03$), longer surgery duration ($p < 0.001$), and higher percentage blood loss ($p = 0.01$). ITB-related complications occurred in 11% of those with pumps.
Conclusions: ITB presence did not increase overall complication risk but was associated with higher infection rates, longer surgical duration, and increased blood loss. These findings support improved preoperative counseling for families and surgical planning when ITB pumps are present.
PMID: 41547712

**5.Variety is Not the Spice of Life: Inconsistent Definitions of Failure After Hip Reconstruction in Cerebral Palsy**

Eden N VanderHoek, Yash Tarkunde, Jeremy P Bauer, Natalie L Zusman

J Pediatr Orthop. 2026 Jan 23. Online ahead of print.

Background: Hip displacement (subluxation or dislocation) is common in children with cerebral palsy (CP), especially those who are nonambulatory. If unaddressed, this can cause pain, stiffness, hygiene difficulties, and seating imbalance. Progressive hip subluxation or dislocation often requires surgery, and further displacement after reconstruction may be described as "failure." There is currently no standardized definition of failure after the index procedure. This review aimed to identify published failure definitions and compile reported failure rates after index bony hip reconstruction.
Materials and methods: Following PRISMA guidelines, a systematic review was performed using PubMed, SCOPUS, and OVID databases (1990 to 2023). Exclusion criteria included soft tissue-only procedures, gait analysis-based outcomes, adults, non-CP syndromes, salvage or arthroplasty procedures, nonoperative management, unavailable full-text, non-English articles, novel techniques, radiographic or morphologic studies, or procedures without osteotomy. Studies without a definition of "failure" were excluded. Abstract review, full-text screening, and data extraction were performed by 2 authors, with a third adjudicating disagreements. Patient demographics, failure definitions and rates, and study quality were collected. Bias was assessed, and data were considered for pooled analysis.
Results: Of 630 abstracts, 27 studies were included. Failure rates ranged from 1.8% to 74% (mean 26.3%±17.4%). Definitions varied: Reimer Migration Percentage (MP) (63%) and revision surgery (48%) were most common. Other definitions included arthritis/hip pain (18.5%) and lateral center edge angle (18.5%). Significant heterogeneity in definitions, inclusion criteria, and follow-up, plus overlapping patient cohorts, precluded meta-analysis. The lowest rate (1.8%) reflected a single revision for painful instability. The highest (74%) came from a study defining failure as reoperation without MP. Two institutions contributed 6 publications.
Conclusions: There is no consistent definition of failure after bony hip reconstruction in CP, impeding comparison of techniques and outcomes. Children with CP are medically complex, and revision surgeries have significant implications. We advocate for a more uniform definition of failure following hip reconstruction in children with CP.
Level of evidence: Level III-systematic review of studies.
PMID: 41572909

**6.Relationship Between Postural Control, Quality of Upper Limb Skills, and Functional Independence in Children with Cerebral Palsy: A Cross-Sectional Study**

Shruti Krishna, Amitesh Narayan, Shreekanth D Karnad, Mohammed Alsulaimani

Phys Occup Ther Pediatr. 2026 Jan 22:1-14. Online ahead of print.

Aim: To evaluate the relationship between postural control, quality of upper limb skills, and functional independence in children with cerebral palsy (CP).
Methods: This cross-sectional study included 36 children (aged 3–8 years; GMFCS I–V and MACS I–V) with CP. Postural control was assessed using the Early Clinical Assessment of Balance (ECAB), upper limb (UL) skills by Quality of Upper Extremity Skills Test (QUEST), and functional independence through Pediatric Evaluation of Disability Inventory-Computer Adaptive Test (PEDI-CAT, DA domain). Spearman's correlation and multiple linear regression were used for analysis ($\alpha = 0.05$).
Results: Strong positive correlations were found between ECAB and QUEST ($\rho = 0.823$, $p < 0.001$), ECAB and PEDI-CAT ($\rho = 0.781$, $p < 0.01$), and QUEST and PEDI-CAT ($\rho = 0.872$, $p < 0.001$). Regression models explained 69.3% of the variance in PEDI-CAT and 73.6% in QUEST scores. Multiple linear regression was significant only for the MACS to predict the functional independence (PEDI-CAT) and upper limb skills (QUEST).
Conclusion: Postural control significantly correlates with both the UL skills and functional independence in children with CP.
PMID: 41571315

**7.The radiographic metaphyseal migration index: a new proposed radiographic landmark for correct quantification of femoral head extrusion in preschool children**

Austin McCullough, Rida Salman, Kathryn Milks, Collin Troester, Andy Sher, Edward Wright, J Herman Kan

Pediatr Radiol. 2026 Jan 22. Online ahead of print.

Background: The migration index (MI) is a quantitative measurement of femoral head extrusion used to help risk stratify neuromuscular hip dysplasia. However, MI relies upon the radiographically visible ossified capital femoral epiphysis which is only partially ossified in young children and therefore may potentially underestimate hip extrusion.
Objective: To compare proof-of-concept accuracy of using a metaphyseal and traditional MI to measure femoral head extrusion in children compared with an MRI-based anatomic reference standard.
Materials and methods: We reviewed 205 normal hips, each by MRI and x-ray, in patients aged 6 months–6 years old. Three femoral head MI measurements were performed: (1) MRI-MI: percentage of the cartilaginous femoral head uncovered by the osseous acetabulum (anatomic reference standard); (2) traditional MI (TMI) x-ray: percentage of osseous capital femoral head uncovered by the osseous acetabulum; (3) metaphyseal MI x-ray (MeMI): percentage of the femoral head uncovered by the osseous acetabulum, using the metaphyseal vertex as a surrogate for the lateral margin of the cartilaginous femoral head. Statistical analysis of the three measurement techniques was performed using paired t-tests. Intraclass correlation coefficient was calculated.
Results: There was a statistically significant underestimation of femoral head extrusion using TMI and MeMI ($P < 0.05$) when compared with MRI-MI, but MeMI more closely approximated the MRI-MI. Inter-reader reliability showed excellent agreement.
Conclusion: The MeMI better approximates the MRI anatomic landmarks for measuring the true degree of femoral head extrusion in children 6 months–5 years of age. Its usage should be considered in lieu of the TMI in children under 5 years of age for radiographically determining MI.
PMID: 41569329

**8.Immediate Effect of Digital Game Use and Verbal Encouragement on Lower Limb Activity and Psychological Enjoyment During Motor Task in Children with Motor Disorders**

Daiki Asano, Hikaru Sakai, Haruka Monden, Yusuke Shimazaki, Kanako Nakamura, Satoko Ohmatsu

Phys Occup Ther Pediatr. 2026 Jan 22:1-16. Online ahead of print.

Aims: The effects of interventions using digital games in the rehabilitation of children with motor disorders have been well-documented. This study examined the immediate effects of games and verbal encouragement from others on lower limb activity and psychological enjoyment during lower limb motor tasks in children with motor disorders.
Methods: Participants' sample included 14 children, aged 4–13 years, with motor disorders, including cerebral palsy and developmental coordination disorder. The motor task was a 30-s foot-stomping activity. Participants first completed the task under a baseline condition with no stimuli, followed by a game condition in which they performed foot-stomping while engaging in a game. Finally, a game plus verbal encouragement condition was introduced.
Results: The results revealed that game use increased lower limb activity and enhanced enjoyment levels. The additional effect of verbal encouragement was observed only in the enjoyment levels. The percentage increase in lower limb activity due to game use was negatively correlated with age and positively correlated with the level of motor impairment.
Conclusions: In the rehabilitation of children with motor disorders, incorporating digital games into motor tasks and adding positive engagement from others can increase lower limb activity and enjoyment during challenging motor tasks.
PMID: 41572559

**9.Using Expert-Cited Features to Detect Leg Dystonia in Cerebral Palsy**

Rishabh Bajpai, Alyssa Rust, Emma Lott, Susie Kim, Sushma Gandham, Keerthana Chintalapati, Joanna Blackburn, Rose Gelineau-Morel, Michael C Kruer, Dararat Mingbunjerdsuk, Jennifer O'Malley, Laura Tochen, Jeff L Waugh, Steve Wu, Timothy Feyma, Joel S Perlmutter, Bhooma R Aravamuthan

Ann Neurol. 2026 Jan 18. Online ahead of print.

Objectives: Leg dystonia in cerebral palsy (CP) is debilitating but underdiagnosed; routine clinical evaluation detects it with only 12% accuracy compared with expert consensus. This study evaluated whether expert-cited dystonia features could be quantified to train machine-learning (ML) models to detect leg dystonia in videos of children with CP.
Methods: Eight pediatric movement disorder physicians assessed 298 videos of children with CP performing a seated task. Sixty-nine quantifiable features corresponding to 12 expert-cited dystonia characteristics were extracted. A total of 4,664 ML models were trained on 163 videos from one center and tested on 135 videos from both centers.
Results: ML models achieved 88% sensitivity, 74% specificity, 82% positive predictive value, 84% negative predictive value, and 82% overall accuracy. Of the 25 most influential features, 17 (68%) quantified leg movement variability. The final output was used to develop DxTonia, open-source software for leg dystonia detection.
Interpretation: DxTonia primarily leverages leg movement variability to achieve 82% accuracy, a substantial improvement over routine clinical diagnostic accuracy (12%). Quantifying or observing leg movement variability during a seated task can meaningfully aid leg dystonia detection in CP.
PMID: 41549584

**10.Telehealth during the COVID-19 pandemic: A positive hybrid model of therapeutic intervention in cerebral palsy**

Lynne Fogel

Dev Med Child Neurol. 2026 Jan 20. Online ahead of print.

Abstract
No abstract available.
PMID: 41559859

**11.Assessing infant motor development from afar: reflections on remote assessment of infant motor development**

Maria Mc Namara, Kristian Budini, Esther Norfolk, Iona Novak

Pediatr Res. 2026 Jan 19. Online ahead of print.

Abstract
The COVID-19 pandemic accelerated global shifts toward digital healthcare, increasing demand for valid and reliable tools for remote assessment. The Alberta Infant Motor Scale (AIMS) is widely used to evaluate infant gross motor development, yet evidence for telehealth administration remains sparse. This study evaluated remote AIMS administration across three digital modalities compared with traditional in-person assessment. Results demonstrated excellent agreement between remote and face-to-face scores, confirming that virtual assessment provides clinically reliable information about infant motor development. Remote AIMS administration reduces travel, costs, and logistical barriers, improving access for families in rural, remote, or low-socioeconomic contexts. It also supports broader research participation and hybrid clinical models that maintain continuity when in-person visits are not feasible. These findings strengthen confidence in digital developmental surveillance and demonstrate that remote AIMS is a viable, scalable approach with particular benefit for infants facing the greatest barriers to timely evaluation.
IMPACT: Confirms telehealth as a legitimate and scalable model for early motor surveillance; expands accessible assessment opportunities; supports decentralised and inclusive research models.
PMID: 41554860

**12.Association of Hearing Loss in Children with Cerebral Palsy**

Vinay Prakash Agarwal, Ambrish Kumar Mishra, Abhishek Bahadur Singh, Himani More

Ann Afr Med. 2026 Jan 21. Online ahead of print.

Background: The disease cerebral palsy (CP) primarily impacts muscle control and movement, potentially resulting in numerous associated disorders in early childhood. One notable complication that may arise in individuals with CP is hearing loss, which can develop due to various underlying factors related to the condition.
Objectives: To assess hearing impairment in CP children by using brainstem evoked response audiometry (BERA).
Materials and methods: There were 110 confirmed cases of CP between the ages of 6 months and 10 years. Audiologic assessment using BERA was performed. Demographic, otologic, and audiologic information were collected systematically, along with records detailing other otologic and medical conditions.
Results: The prevalence of hearing loss in children aged ≤4 years with CP was high. Males were more commonly affected. Prematurity was significantly higher (62%) in the group with hearing loss. Maternal infections were significantly higher in the hearing loss group (58.33%). Low birth weight (<2500 g) was more frequent among those with hearing loss (79.17%). Neonatal seizure was also significantly associated with hearing loss (54.17%) compared with those without hearing loss (24.42%).
Conclusion: Preterm birth and maternal infections were significantly more common in the group with hearing loss. Low birth weight (<2500 g) and neonatal seizures were also significantly associated with hearing loss.
PMID: 41568720

**13.Disproportional ventilatory response to incremental exercise in individuals with cerebral palsy**

Linnéa Corell, Emma Hjalmarsson, Rodrigo Fernandez-Gonzalo, Annika Kruse, Sebastian Edman, Asta Kizyte, Rouli Wang, Arnoud Edelman Bos, Peder Sörensson, Eva Pontén, Petra E M van Schie, Annemieke I Buizer, Jessica Norrbom, Daniele A Cardinale, Ferdinand von Walden

Dev Med Child Neurol. 2026 Jan 18. Online ahead of print.

Aim: To explore the integrated cardiopulmonary, metabolic, and muscular response to incremental exercise in individuals with cerebral palsy (CP) compared with typically developing participants.
Method: This prospective cross-sectional study included 16 individuals with CP (seven male; GMFCS II–V) and 30 typically developing participants (15 male). Participants performed a treadmill-based incremental submaximal test and an exercise test to task failure, using running frames (CP) or traditional running (controls). Metabolic and cardiopulmonary parameters were recorded during both tests. Electromyography of the vastus lateralis and gastrocnemius medialis was recorded during the test to task failure.
Results: Compared with typically developing participants, individuals with CP exhibited decreased minute ventilation ($p < 0.05$), increased respiratory frequency at comparable intensity ($p < 0.05$), and altered metabolic responses based on carbon dioxide partial pressure ($p < 0.05$) and lactate levels ($p < 0.001$). Ventilatory efficiency was lower during the task-failure test ($p < 0.01$). Electromyography indicated greater peripheral skeletal muscle fatigue in participants with CP ($p < 0.05$).
Interpretation: Individuals with CP show a disproportional ventilatory response to incremental exercise not driven by metabolic perturbations. Increased breathing frequency contributed to higher perceived exertion and peripheral muscle fatigue. Ventilatory-focused interventions may be beneficial for individuals with CP.
PMID: 41549373

**14.Feeding Infants Born Moderate-to-Late Preterm: 2-Year Follow-Up of the DIAMOND Randomized Trial**

Subhasish Das, Frank H Bloomfield, Tanith Alexander, Yannan Jiang, Greg Gamble, Luling Lin, Jane E Harding

J Pediatr. 2026 Jan 16:114989. Online ahead of print.

Objective: To determine the impact of different feeding strategies in children born moderate- and late-preterm (MLPT) on neurosensory impairment at 2 years of corrected age.
Study design: Children born MLPT (32+0–35+6 weeks) in New Zealand neonatal units were randomized to intravenous amino acids vs dextrose, exclusive maternal breastmilk vs milk supplement, and taste/smell of milk before gastric tube feeds or not. Neurosensory impairment (blindness, deafness, cerebral palsy, or developmental delay defined as Bayley III composite scores < 85) was assessed at 2 years of corrected age. Outcomes were analyzed using generalized linear mixed models.
Results: Of 529 eligible children, 425 were assessed at a mean age of 25.6 (SD 1.9) months. Rates of neurosensory impairment or developmental delay were similar between amino acids vs dextrose and milk supplement vs maternal breastmilk groups. Impairments were less frequent among children exposed to taste/smell of milk (21% vs 31%; adjusted RR 0.7; 95% CI 0.5–0.9; p = 0.02). Differences were driven primarily by mild developmental delay, especially language delay (18% vs 28%; adjusted RR 0.6; 95% CI 0.4–0.9; p = 0.01). Growth, general health, and behavior were similar between groups.
Conclusions: Early parenteral or enteral nutrition strategies did not alter outcomes at 2 years. However, exposure to taste/smell of milk before tube feeds was associated with lower neurosensory impairment, warranting further investigation.
PMID: 41548742

**15.Exploring white matter abnormalities in different subtypes of spastic cerebral palsy using fixel-based analysis**

Chih-Chien Tsai, Chia-Ling Chen, Chih-Hua Yeh, Yao-Liang Chen, Yu-Chun Lin, Jur-Shan Cheng, Jiun-Jie Wang

Eur J Radiol. 2026 Jan 7;196:112636. Online ahead of print.

Purpose: To examine the white matter integrity in participants with cerebral palsy (CP) and among its different subtypes through diffusion MRI.
Methods: Thirty-four participants with CP (19 boys, 15 girls; mean age 13.9 ± 3.6 years) and 27 typically developing participants (14 boys, 13 girls; mean age 14.5 ± 3.2 years) were enrolled. Diffusion-weighted and T2-weighted images were obtained. Clinical assessments included Gross Motor Function Classification System, Manual Ability Classification System, and Bimanual Fine Motor Function test. Diffusion-weighted images were analyzed by fixel-based analysis and tract-based spatial statistics. Lesion maps were calculated from T2-weighted images. Differences in fixel-based metrics were evaluated through connectivity-based fixel enhancement and non-parametric permutation testing. Associations with clinical scores were examined using general linear models.
Results: White matter damage was observed in individuals with CP, including the corpus callosum, corticospinal tract, thalamic radiation, and optic radiation, compared with typically developing participants. Fixel-based analysis detected additional regions in the genu of the corpus callosum. Fixel-based metrics in thalamic radiation and corticospinal tract were related to severity of motor impairment. Participants with diplegia demonstrated damage in the body of the corpus callosum and optic radiation compared with those with hemiplegia.
Conclusion: Fixel-based analysis is sensitive to detecting subtle white matter alterations that vary by CP subtype. Microstructural and macrostructural integrity of the corticospinal tract and thalamic radiation may serve as useful imaging biomarkers to enhance clinical assessment.
PMID: 41564523

**16.Robot-Assisted Gait Training and Changes in Motor Function and Brain Activation in Children With Cerebral Palsy: Preliminary Findings From a Pilot Study**

Alessandro Picelli, Antonella Vangelista, Carlo Cacciatori, Stefano Tamburin, Paola Bonetti, Mirko Filippetti, Valentina Varalta, Nicola Smania

NeuroRehabilitation. 2026 Jan 21. Online ahead of print.

Objective: To investigate the effects of a two-week robot-assisted gait training (RAGT) program on walking performance and brain activation in children with spastic hemiplegic cerebral palsy (CP).
Design: Single-group, pre–post pilot study.
Methods: Eight children with CP were enrolled; six completed the protocol and provided usable gait and fMRI data. Participants received 10 RAGT sessions over two weeks. Walking performance (6-minute walk test [6MWT], 10-meter walk test [10MWT], GAITRite gait speed and cadence) was assessed at baseline, immediately after intervention, and at one-month follow-up. Pre- and post-intervention fMRI during a lower-limb motor task quantified activated voxels in motor and cerebellar regions.
Results: Significant improvements were observed in 6MWT distance, 10MWT speed, and GAITRite gait speed and cadence (all $p \leq 0.009$) post-intervention and at follow-up. In children with isolated subcortical lesions ($n = 4$), activated voxels increased in the lesioned motor cortex (from 363 to 1,075; $p = 0.02$), with similar increases in ipsilesional cerebellar hemispheres ($p = 0.02$). No significant changes occurred in children with additional hydrocephalus ($n = 2$). Change in cadence correlated positively with change in lesioned motor cortex activation (Spearman's $\rho = 0.83$, $p = 0.03$).
Conclusions: In this small cohort, a two-week RAGT program was associated with short-term improvements in walking performance and increased fMRI activation in motor-related regions, particularly in children with subcortical lesions. These preliminary results suggest lesion-type-specific neuroplastic responses to RAGT, warranting confirmation in larger controlled studies.
PMID: 41564283

**17.A preregistered, open pipeline for early cerebral palsy risk assessment from Infant Videos**

Melanie Segado, Laura A Prosser, Andrea F Duncan, Michelle J Johnson, Konrad P Kording

Gigascience. 2026 Jan 20:giag003. Online ahead of print.

Abstract
Cerebral palsy (CP), affecting approximately 1 in 500 children due to abnormal brain development, impacts movement control. Early risk assessment via the General Movements Assessment (GMA) at 3–4 months is highly predictive for CP but relies on trained clinicians. Machine-learning-based approaches for predicting GMA score from video have shown considerable promise, but typically rely on dataset-specific preprocessing, custom feature sets, and manually designed model pipelines, which hinder external benchmarking. Strict privacy constraints further limit cross-dataset training and evaluation. To address this, we developed an end-to-end pipeline using off-the-shelf pose estimation, general-purpose feature extraction, and automated machine learning, none of which are tuned to a specific dataset. This pipeline was applied to a newly generated dataset of 1053 infants (10–12% positive class for adverse GMA outcome) within a preregistered study design. Model performance was evaluated on a strict "lock-box" test set untouched during model development. The final model achieved moderate predictive accuracy for clinician-assessed GMA scores (ROC-AUC = 0.77; PR-AUC = 0.41). This accuracy is notable given the low prevalence of positive cases and power-law scaling of ROC-AUC with dataset size. By releasing de-identified feature data and open-source code and simplifying training via AutoML, this work establishes groundwork for future robust, globally relevant CP screening tools suitable for low-resource settings.
PMID: 41556563

**18.The Effects of Pressure Garments on Sensorimotor Function in Patients with Neurological Disorders: A Scoping Review**

Zhenkun Xu, Wentao Jiang, Yan Peng, Nan Wang, Jun Song, Shin Ying Chu, Siaw Chui Chai, Kuicheng Li

NeuroRehabilitation. 2026 Jan 19. Online ahead of print.

Background: Neurological disorders such as stroke, cerebral palsy, Parkinson's disease, and multiple sclerosis frequently cause sensorimotor impairments that reduce independence and quality of life. Pressure garments (PGs), originally designed for burn and vascular conditions, have gained interest in neurorehabilitation for enhancing proprioceptive input and neuromuscular modulation, but their effectiveness remains unclear.
Objective: To map current literature on the application of PGs in neurological disorders and evaluate their effects on sensorimotor function.
Methods: A scoping review following Arksey and O'Malley and PRISMA-ScR guidelines was conducted. Five databases and grey literature were searched up to February 2025. Studies involving pressure garments in neurological conditions and reporting sensory or motor outcomes were included.
Results: Twenty-three studies were included: stroke (n = 7), cerebral palsy (n = 12), multiple sclerosis (n = 3), and Parkinson's disease (n = 1). PGs demonstrated potential benefits in improving proprioception, motor control, and postural stability, particularly in stroke and cerebral palsy. Evidence regarding spasticity reduction and long-term outcomes was inconsistent. Considerable variability existed in garment type, intervention protocols, and outcome measures, and many studies had methodological limitations.
Conclusion: PGs may serve as adjuncts in neurorehabilitation to enhance sensorimotor function. However, higher-quality research with standardized protocols is required to determine their clinical utility.
Registration: OSF https://doi.org/10.17605/OSF.IO/H9B27.
PMID: 41549650

**19.Augmented reality and pain during botulinum neurotoxin A injections in children with cerebral palsy: A randomized controlled trial**

Emmanuelle Chaléat-Valayer, Aurélie Lucet, Angélique Denis, Sandrine Touzet, Isabelle Rouch, Rachel Bard-Pondarré, Amélie Zelmar, Olivia Febvey-Combes

Dev Med Child Neurol. 2026 Jan 18. Online ahead of print.

Aim: To assess the effect of the augmented reality application Minidocs on pain reduction during botulinum neurotoxin A (BoNT-A) injections in children with cerebral palsy (CP).
Method: Children aged 3–8 years undergoing BoNT-A injections were randomized to usual pain management alone (n = 41) or usual management plus Minidocs (n = 39). Minidocs is an augmented reality tool offering active distraction, hypnotic suggestion, and counter-aggression games. Primary outcomes were child-reported (Faces Pain Scale) and observer-reported (FLACC scale) pain. Secondary outcomes included child anxiety, parental anxiety, and satisfaction.
Results: Pain scores ≥4 occurred in 34.1% of the control group and 17.9% of the Minidocs group; the difference was not statistically significant (odds ratio 0.36; 95% CI 0.11–1.16; p = 0.087). No between-group differences were found for anxiety outcomes. Satisfaction with Minidocs was high.
Interpretation: Augmented reality did not significantly reduce procedural pain in this study. The innovative counter-aggression feature merits further investigation. Additional research is needed to identify children most likely to benefit from non-pharmacological interventions.
PMID: 41549339

**20.Trends in the annual incidence and risk factors of cerebral palsy**

Jooyoung Lee, Yoonjeong Choi, Miji Kim, Woo Hyung Lee, Ja-Ho Leigh, Moon Suk Bang

Pediatr Res. 2026 Jan 23. Online ahead of print.

Background: Cerebral palsy (CP) arises from non-progressive brain damage occurring during the prenatal, perinatal, or postnatal period. We analyzed CP incidence and risk factors in South Korea over a 20-year period.
Methods: We included children newly diagnosed with CP between the first year of life and 5 years from 2005 to 2024 and examined their CP risk factors. Annual incidence rates were calculated by dividing the number of new cases each year by the population of children aged ≤5 years, with age- and sex-standardization. The CP cumulative incidence at the 5-year follow-up was analyzed by birth year. Temporal incidence trends were assessed using Joinpoint regression.
Results: The annual age- and sex-standardized CP incidence rate decreased from 6.6 to 3.6/10,000 between 2005 and 2024. The 5-year cumulative CP incidence also declined from 4.26/1000 live births in 2005 to 2.51/1000 live births in 2020. The most prevalent risk factors were birth-related complications, prematurity/low birth weight, and metabolic diseases, all showing increasing trends.
Conclusion: From 2005 to 2024, the CP incidence in South Korea declined, possibly reflecting perinatal-care improvements, particularly among children aged ≤2 years. Nationwide developmental-screening programs may have also enhanced milder-case detection, perhaps increasing the relative proportion diagnosed at ages 4–5 years.
Impact: Over the past 20 years, the annual incidence of cerebral palsy diagnosis in children between the first year of life and 5 years old has gradually decreased in South Korea. Cerebral palsy was the most frequently diagnosed at 1 year of age, and birth-related conditions, prematurity or low birth weight, and metabolic diseases were the most prevalent risk factors showing an increasing trend. This study suggests that advances in perinatal care might have contributed to the decline in CP incidence and the developmental screening test for infants and children implemented in South Korea may have contributed to reduction of missed diagnoses.
PMID: 41577851

**21.Prevalence of oral pathologies in children and adolescents with cerebral palsy: a cross-sectional study in specialised care settings in Cameroon**

D Enyama, W Messina Ebogo, A M Guidioum Noubouowo, S B Amadou, D Noukeu Njinkui, A M Agbor

Eur Arch Paediatr Dent. 2026 Jan 22. Online ahead of print.

Purpose: The aim of the present study was to determine the prevalence and identify factors associated with oral pathologies amongst children and adolescents with cerebral palsy (CP) in Cameroon.
Methods: A descriptive cross-sectional study with an analytical component was conducted between December 2023 and June 2024 in four specialised institutions. A structured questionnaire, developed specifically for the present study and adapted from WHO oral health survey protocols, was the tool used to collect three types of data from participants: their sociodemographic profile, their oral hygiene practices, and the results of their clinical examinations for oral pathologies. Comorbidities were assessed to identify potential risk factors associated with oral pathologies in this population. Binary logistic regression was performed to identify risk factors, with odds ratios (OR) and p values calculated to assess associations, considering a p value < 0.05 as statistically significant.
Results: 126 children and adolescents with CP (54.8% boys) aged 2–17 years, with a mean age of 6.3 ± 3.6 years were recruited. Spastic CP was the most common type (88.9%). The prevalence of dental caries was 55.5% (95% CI 46.8, 63.9%), with a mean DMFT index of 2.96 ± 2.5. The prevalence of periodontal diseases was 81% (95% CI 73.5, 87.3%). Common comorbidities included drooling (53.2%), epilepsy (17.5%), visual impairment (10.3%), and hearing impairment (7.1%). Regarding oral health, 17.5% of caregivers received prior oral health education, 84.1% of children had never had a dental consultation, and 21.4% lacked a toothbrush. Multivariate analysis revealed visual impairment as an independent risk factor for dental trauma (aOR = 3.33, p = 0.033), MACS level 4 for orthodontic anomalies (aOR = 0.346, p = 0.02), and GMFCS level 2 for dental dyschromia (aOR = 0.268, p = 0.007).
Conclusion: Oral pathologies are highly prevalent amongst Cameroonian children with CP. Improving oral health requires caregiver education, regular dental visits, and incorporating functional motor assessments into oral health screening protocols.
PMID: 41571861

**22.Patterns of Neonatal and Neurodevelopmental Co-morbidities in Neonates of <29 weeks' Gestation**

Prakesh S Shah, Thuy Mai Luu, Marc Beltempo, Jill G Zwicker, Jehier Afifi, Amuchou S Soraisham, Sandesh Shivananda

Neonatology. 2026 Jan 22:1–16. Online ahead of print.

Introduction: Multi-morbidity is a known cause of adverse outcomes and resource utilization in adults. Our objective was to describe the co-occurrence of neonatal morbidities and their association with neurodevelopmental outcomes in preterm neonates.
Methods: We included 17,438 preterm neonates of <29 weeks' gestation admitted to Canadian NICU between 2010 and 2020, of whom 7,943 children had neurodevelopmental information. Neonatal outcomes were mortality, late-onset sepsis, necrotizing enterocolitis, and severe neurological injury. The outcomes were neurodevelopmental impairments, with significant impairment defined as any of: Bayley-III score <70, cerebral palsy with GMFCS ≥3, hearing amplification, or bilateral visual impairment; and severe impairment defined as any of: Bayley-III score <55, cerebral palsy with GMFCS 4–5, or bilateral blindness.
Results: The mean (SD) gestational age was 26.1 (1.6) weeks and 54.5% were male. Any neonatal mortality/morbidity occurred in 40.1% of children. Among survivors, 16.3% had significant neurodevelopmental impairment and 5.8% had severe neurodevelopmental impairment. However, 51% of children with significant impairment and 43% with severe neurodevelopmental impairment had no neonatal morbidities. Late-onset sepsis (aOR 1.60, 95% CI 1.36, 1.88), necrotizing enterocolitis (aOR 1.91, 95% CI 1.36, 2.69), and severe neurological injury (aOR 3.54, 95% CI 2.85, 4.38) were associated with significant neurodevelopmental impairment among survivors. An increase in the count of neonatal morbidities correlated with a rise in the count of neurodevelopmental impairments.
Conclusions: Sixty percent of infants <29 weeks' gestation experienced no adverse neonatal outcomes and the majority were free of significant neurodevelopmental impairment. Neonatal morbidities had a direct and combined association with neurodevelopmental impairment.
PMID: 41569950

**23.A Qualitative Study of Medical and Rehabilitation Needs of Primary Caregivers of Children with Developmental Disabilities in India: Implications for Health Service Interventions**

Charuta Gokhale, Anita Kar

Indian J Community Med. 2025 Dec;50(Suppl 3):S522–S526.

Abstract
Children with developmental disabilities require medical care, rehabilitation therapies, and social welfare support. While district early intervention centers offer some services, the private sector remains unorganized. This study aimed to qualitatively assess caregivers' needs, identify gaps in referral linkages, and suggest health systems interventions to support transitions from medical to rehabilitation services. In-depth interviews were conducted with 28 caregivers of children with cerebral palsy, intellectual disability, and autism spectrum disorder. Content analysis revealed three themes: inadequate information at diagnosis (including limited guidance about complications or delayed milestones), challenges in doctor–caregiver communication (including perceived limited doctor knowledge about developmental disabilities and rehabilitation services), and barriers to rehabilitation (including limited caregiver understanding of therapy benefits and lack of coordination between doctors and therapists). Findings highlight the importance of strengthening early childhood development knowledge, improving awareness of early intervention, and improving referral pathways to ensure coordinated care and continuity of services.
PMID: 41561713

**24.Estimates of Global Needs for Neurorehabilitation: A Systematic Analysis Based on the GBD-WHO Rehabilitation Database 2021**

Yaqiong Fang, Kejia Cao

Neuroepidemiology. 2026 Jan 19:1–32. Online ahead of print.

Background: Neurological disorders affect an estimated 3.4 billion people worldwide and are the leading cause of disability. This study examined global neurorehabilitation needs and projected trends from 2022 to 2036.
Methods: Data on health conditions requiring neurorehabilitation were drawn from the WHO Rehabilitation Need Estimator. Prevalence and years lived with disability (YLDs) were analyzed by sex, age, region, country, and condition. Estimated annual percentage changes (EAPCs) quantified trends in age-standardized rates. Decomposition analysis identified contributors to changes, while Bayesian age-period-cohort modelling projected needs to 2036.
Results: In 2021, neurological disorders requiring rehabilitation affected 225.38 million people (95% UI 215.84–235.21) and accounted for 52.35 million YLDs (95% UI 37.57–67.46). Age-standardized prevalence (ASPR) and YLD rates (ASYR) were 2758.37 and 640.5 per 100,000, respectively. From 1990 to 2021, prevalent cases and YLDs increased by 97.5% and 96.4%. EAPCs for ASPR and ASYR were 0.17 and 0.13, respectively, with continued increases projected through 2036. Population growth and aging were the major contributors to rising rehabilitation needs. Most neurorehabilitation needs occurred in low- and middle-income countries. From 2021 to 2036, the leading contributors to global neurorehabilitation need will remain stroke, cerebral palsy, and Alzheimer's disease and dementia.
Conclusions: There is a large and growing global burden of neurological disorders requiring rehabilitation, driven by population aging and growth. Scaling rehabilitation capacity and integrating services into primary health systems, particularly in LMICs, is urgently needed.
PMID: 41553948

**25.An interdisciplinary fetal neonatal neurology collaborative promotes integrative life-course brain health**

Mark S Scher, Harris Eyre, Steven Donn, James M Roberts, Michael E Msall, Carolyn M Salafia, Richard Towbin, Peter Robinson, Ken Loparo, Michael Berk, Elena Moro, Valerie Smith, Susan Ludington, Nadia Badawi, Rod W Hunt, Alistair Gunn, Harvey B Sarnat, Kirthana Kunikullaya, Betsy Pilon

Front Neurol. 2026 Jan 7;16:1725289.

Abstract
A proposed interdisciplinary fetal neonatal neurology collaborative offers life-course brain health training across three time-sensitive teaching opportunities. The educational organization includes a broad representation of inter-related fields. Formal training will re-enforce career-long learning that fosters creative thinking. Acquiring a life-course perspective of brain health can contribute solutions to the global public health crisis involving neurological and mental health disorders across the lifespan. Teaching transdisciplinary interventions begins with parental childhood and reproductive health which will influence the maternal-placental-fetal triad throughout pregnancy into labor and delivery. The second teaching opportunity focuses on the symptomatic minority who receive neonatal neurocritical care and convalescent care. The third educational cluster focuses on improving clinical skills as the unrecognized majority of children present over the preschool years with continued development through the school years. Teaching preventive neurology and mental health introduce proactive interventions that more effectively support rescue and reparative choices into adulthood. The science of uncertainty will be taught to all stakeholders that integrates information to improve critical thinking skills. This tripartite interdisciplinary educational program will help trainees distinguish adverse effects from neurodegeneration on primary fetal neuroplasticity mechanisms from secondary pathways based on systems-science. Supervised clinical experiences during each rotation will supplement didactic teaching with input from each trainee's mentoring committee. Future providers will learn to anticipate adaptive from maladaptive disease pathways to prepare for career-long experiences. Curriculum topics will focus on brain health strategies that differentiate resilience from vulnerability based on time-dependent gene-environment interactions. Attention to structural, social and environmental drivers of health will incorporate intersectionality perspectives into equitable neuroprotective plans. Training will engage, educate and empower women to improve brain health for themselves and their children. This interdisciplinary collaborative program will apply real-world situations to encourage research development that will narrow the knowledge-practice gap. Continuity of brain care bundles will enable providers, women, and their families to achieve brain health across each and successive generations. A lower global burden of neurologic and mental health disorders will contribute to an improved quality of life with greater economic prosperity.
PMID: 41573402

**26.Individuals with cerebral palsy and health access: Met or unmet need?**

Mark T Carew, Hannah Kuper

Dev Med Child Neurol. 2026 Jan 21. Online ahead of print.

Abstract
No abstract available.
PMID: 41566142

**27.Visual bibliometric analysis of cytokines in the pathogenesis of cerebral palsy**

Zhiliang Cao, Yan Yang

Medicine (Baltimore). 2026 Jan 16;105(3):e46283.

Background: Cerebral palsy (CP) is the most common movement disorder in childhood. Its pathogenesis is complex, and cytokines play a key role, yet existing studies are scattered and lack systematic synthesis.
Objective: To identify research hotspots and emerging trends regarding cytokines in the pathogenesis of CP.
Methods: A systematic search of the Web of Science Core Collection was conducted. CiteSpace and VOSviewer software were used to generate visual maps of authors, institutions, countries, and keywords.
Results: Thirty-nine countries, 420 institutions, and 1323 authors contributed to the literature. The United States produced the highest number of publications and was central to international collaboration, although overall collaboration remained limited. A total of 1527 keywords were identified. High-frequency keywords included “inflammation,” “periventricular leukomalacia,” and “necrosis-factor-alpha.” Cluster analysis identified four research domains: inflammation and immune response, perinatal injury, genetic regulation, and additional associated factors. Research focus has evolved from early infection and birth weight to cytokine-linked mechanisms and pediatric inflammation studies.
Conclusions: Cytokine research in CP centers on inflammation, immune response, and perinatal injury. Future directions include tracking dynamic evolution of these research areas, refining methodologies, and building integrated research frameworks to support early prevention, targeted therapy, and precision rehabilitation in CP.
PMID: 41560069

**28.Chronotype and eating behavior patterns in mothers of children with disabilities: a case-control study on sleep and nutritional tendencies**

Hakan Toğuç, Hakan Aydın, Zehra Fidan

Sleep Biol Rhythms. 2025 Sep 28;24(1):59–66. eCollection 2026 Jan.

Purpose: The increasing burden of caring for children with disabilities brings about various psychological and physiological difficulties for mothers. The objective of this study was to investigate the relationship between chronotype characteristics, eating disorders, and intuitive eating behavior tendencies of mothers with disabled children.
Methods: This case–control study, conducted in a private rehabilitation center in Turkey, included 50 mothers of children with cerebral palsy and 56 mothers of healthy children. Socio-demographic information, Morningness–Eveningness Scale scores, Pittsburgh Sleep Quality Index, Eating Disorder Examination Questionnaire-13, Intuitive Eating Scale-2, and anthropometric measurements were collected.
Results: Mothers of children with disabilities had significantly lower chronotype scores (47.20 ± 4.65) compared with mothers of healthy children (53.66 ± 5.31) ($p < 0.001$), with a lower proportion of morningness ($p = 0.004$). Eating disorder scores were higher among mothers of disabled children (1.72 ± 1.08) compared with controls (1.32 ± 0.97) ($p = 0.046$). Mothers of disabled children also showed significantly higher rates of binge eating and purging behaviors ($p = 0.001$ and $p < 0.001$, respectively) and more frequent sleep medication use ($p = 0.002$).
Conclusions: Mothers of disabled children exhibited a stronger evening chronotype, higher eating disorder scores, and increased sleep medication use. These findings highlight the need for specialized nutritional and health monitoring programs to mitigate elevated risks of conditions such as obesity, cardiovascular disease, type 2 diabetes, and metabolic syndrome.
PMID: 41551890

# Prevention and Cure

**29.Novel stem cell therapy for cerebral palsy using stem cells from human exfoliated deciduous teeth**

Takahiro Kanzawa, Atsuto Onoda, Azusa Okamoto, Xu Yue, Ryoko Shimode, Yukina Takamoto, Sakiko Suzuki, Kazuto Ueda, Ryosuke Miura, Toshihiko Suzuki, Naoki Tajiri, Shinobu Shimizu, Saho Morita, Hiroshi Yukawa, Hiroshi Kohara, Noritaka Fukuda, Yasuyuki Mitani, Hideki Hida, Yoshiyuki Takahashi, Yoshiaki Sato

Stem Cell Res Ther. 2026 Jan 23;17(1):44.

Background: Effective treatments for cerebral palsy caused by Hypoxic-ischemic encephalopathy are urgently needed. Current therapies primarily include prevention or acute intervention, leaving a major gap in the options for reversing established neurologic damage. Because of their ease of collection and unique trophic factor profile, stem cells from human exfoliated deciduous teeth (SHED) are promising candidates for cell-based therapy targeting neurological disorders. In this study, we examined the therapeutic potential of SHED in a rat model of cerebral palsy, focusing on neurogenic and functional recovery.
Methods: Hypoxic-ischemic encephalopathy was induced in neonatal rats using the Rice-Vannucci method. Rats with motor impairments received intravenous SHED injections, whereas the control group received a vehicle solution. Behavioral tests assessed motor coordination and cognitive performance. Proteomic analyses and immunohistochemistry were performed to examine the underlying mechanisms. The migration and biodistribution of SHED were tracked using quantum dot-labeled SHED with in vivo imaging. Neural stem cells were cocultured with SHED to evaluate neurogenesis, followed by RNA sequencing and the analysis of trophic factors in the conditioned media.
Results: SHED treatment significantly ameliorated motor coordination, memory, and learning. Proteomic analysis revealed increased expression of proteins associated with neurogenesis in the SHED group. Histopathologic evaluations revealed enhanced neurogenesis in the hippocampal dentate gyrus and subventricular zone 2 weeks posttreatment, with increased NeuN-positive cells in the hippocampus and cortex at ten weeks. In vivo imaging revealed the migration of quantum dot-labeled SHED to the brain. Neural stem cells co-cultured with SHED in vitro exhibited higher proliferation rates. The SHED-conditioned medium contained increased levels of hepatocyte growth factor (HGF), and HGF-neutralizing antibodies suppressed the enhanced cell proliferation. RNA sequencing revealed significant alterations in genes associated with the PI3K-Akt signaling pathway.
Conclusions: SHED treatment ameliorated motor, memory, and learning impairment in a rat model of cerebral palsy. These improvements were accompanied by enhanced neurogenesis, likely mediated by HGF secretion and activation of the PI3K-Akt signaling pathway. SHED is a promising candidate for postsymptom-onset treatment of cerebral palsy. Further studies to confirm these findings and examine the clinical utility of SHED are warranted.
PMID: 41578408

**30.Under Pressure: Increased Intracranial Pressure in Infants and Children. Presented at the 2024 AOC/AACO/AAO Sunday Symposium**

Tiffany Yuen, Aarti Vyas, Sameea Tahir, Melinda Chang

J Binocul Vis Ocul Motil. 2025 Oct–Dec;75(4):95–107. Epub 2026 Jan 22.

Abstract
Intracranial hypertension (ICH) in children refers to increased pressure within the skull. The skull normally contains the brain, blood vessels, meninges, and cerebrospinal fluid (CSF). Abnormalities in any of these intracranial structures may cause ICH. The differential diagnosis for pediatric ICH includes brain tumors; intracranial hemorrhages; intracranial infections; craniosynostosis; disorders of CSF production, clearance, or abnormal CSF contents; and pseudotumor cerebri syndrome (PTCS), which may be primary (also known as idiopathic intracranial hypertension [IIH]) or secondary. Children with suspected ICH should undergo a thorough history and examination, focused on determining whether the child has papilledema and/or abducens nerve palsy. The differential diagnosis of papilledema includes other causes of optic disc edema, such as optic neuritis, as well as pseudopapilledema. The differential diagnosis of abducens nerve palsy includes Duane syndrome and other causes of childhood esotropia. In children with suspected papilledema, ancillary ophthalmic testing including visual fields, optical coherence tomography (OCT), fundus photography, autofluorescence, fluorescein angiography, and ultrasonography may be indicated. The systemic workup for children with suspected ICH includes neuroimaging and lumbar puncture in certain cases. Management of children with ICH is focused on treating any underlying cause and lowering intracranial pressure with medications or surgery.
PMID: 41570854

**31.Amniotic fluid neutrophil gelatinase-associated lipocalin and L-type fatty acid-binding protein levels in predicting long-term prognosis in fetal growth restriction and preterm birth: a preliminary study**

Daisuke Katsura, Shunichiro Tsuji, Shinsuke Tokoro, Ayako Inatomi, Nobuyuki Kita, Takashi Murakami

Front Pediatr. 2026 Jan 6;13:1712312. eCollection 2025.

Introduction: The fetal intrauterine environment, including inflammation and fetal hypoxia, influences both short- and long-term prognoses. Urinary neutrophil gelatinase-associated lipocalin (NGAL) and L-type fatty acid-binding protein (L-FABP) levels are associated with inflammation and organ hypoperfusion, respectively. In this study, we evaluated the association between amniotic fluid NGAL and L-FABP levels measured at delivery and long-term outcomes.
Methods: Adverse outcomes were defined as hearing loss, neurodevelopmental impairment, and cerebral palsy. Thirty-one singleton pregnancies were categorized into groups with (AD group, n = 10) and without (non-AD group, n = 21) adverse outcomes. Patient characteristics, clinical outcomes, and NGAL and L-FABP levels were compared between groups.
Results: Significant differences in the prevalence of fetal blood flow abnormalities ($p = 0.003$) and gestational age at delivery ($p = 0.004$) were observed between groups. NGAL and L-FABP levels were significantly higher in the AD group than in the non-AD group ($p = 0.015$ and $p = 0.001$, respectively). The areas under the curve for NGAL and L-FABP were 0.771 (cut-off: 26,700 μg/gCr) and 0.848 (cut-off: 1,250 μg/gCr), respectively.
Discussion: Amniotic fluid NGAL and L-FABP levels were associated with adverse long-term outcomes, providing preliminary, proof-of-concept evidence of their potential prognostic relevance. Further prospective studies with larger cohorts are needed to validate these findings and clarify their clinical applicability.
PMID: 41567428

**32.Intrapartum Sildenafil to Improve Perinatal Outcomes: A Randomized Clinical Trial**

Sailesh Kumar, William Tarnow-Mordi, Ben W Mol, Vicki Flenady, Helen G Liley, Nadia Badawi, Susan Walker, Jonathan Hyett, Anna Seidler, Emily Callander, John Simes, Rachel L O'Connell; iSEARCH Investigators

Obstet Gynecol Surv. 2026 Jan 1;81(1):4–5.

Abstract
Uterine contractions during labor reduce placental perfusion, limiting fetal oxygenation. Intrapartum fetal hypoxia and acidemia occur when insufficient reperfusion time or placental dysfunction restricts oxygen transfer. Risks include intrapartum stillbirth, neonatal death, and neonatal encephalopathy. Emergency cesarean or instrumental delivery may be required, though these carry maternal and neonatal risks. Despite widespread fetal heart rate monitoring, outcomes such as cerebral palsy and perinatal mortality have not improved, highlighting the need for better preventive strategies. Sildenafil citrate, a PDE5 inhibitor, may improve uteroplacental perfusion. A previous phase II trial found reduced operative birth for fetal distress but was underpowered for perinatal outcomes.
The iSEARCH trial, a placebo-controlled, double-blind randomized clinical trial across 14 Australian hospitals (2021–2024), enrolled 3257 women with singleton or dichorionic twin pregnancies at term. Participants received oral sildenafil 50 mg or placebo every 8 hours for up to 3 doses. The primary outcome was a composite of 10 intrapartum or neonatal adverse events.
Results showed no difference in the primary composite outcome between sildenafil (5.1%) and placebo (5.2%) groups. No infant deaths occurred. No secondary outcomes differed significantly, including emergency operative birth for fetal distress.
Conclusion: Oral sildenafil during labor did not reduce adverse perinatal outcomes or emergency operative birth compared with placebo.
PMID: 41557917