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## Interventions and Management

### 1. Comparison of two modeling approaches for the identification of predictors of complications in children with cerebral palsy following spine surgery

Rachel L Difazio, Tania D Strout, Judith A Vessey, Jay G Berry, Daniel G Whitney

Comparative Study BMC Med Res Methodol. 2024 Oct 11;24(1):236. doi: 10.1186/s12874-024-02360-w.

Background: Children with non-ambulatory cerebral palsy (CP) frequently develop progressive neuromuscular scoliosis and require surgical intervention. Due to their comorbidities, they are at high risk for developing peri- and post-operative complications. The objectives of this study were to compare stepwise and LASSO variable selection techniques for consistency in identifying predictors when modelling these post-operative complications and to identify potential predictors of respiratory complications and infections following spine surgery among children with CP. Methods: In this retrospective cohort study, a large administrative claims database was queried to identify children who met the following criteria: 1)  $\leq 25$  years old, 2) diagnosis of CP, 3) underwent surgery during the study period, 4) had  $\geq 12$ -months pre-operative, and 5)  $\geq 3$ -months post-operative continuous health plan enrollment. Outcome measures included the development of a post-operative respiratory complication (e.g., pneumonia, aspiration pneumonia, atelectasis, pleural effusion, pneumothorax, pulmonary edema) or an infection (e.g., surgical site infection, urinary tract infection, meningitis, peritonitis, sepsis, or septicemia) within 3 months of surgery. Codes were used to identify CP, surgical procedures, medical comorbidities and the development of post-operative respiratory complications and infections. Two approaches to variable selection, stepwise and LASSO, were compared to determine which potential predictors of respiratory complications and infection development would be identified using each approach. Results: The sample included 220 children. During the 3-month follow-up, 21.8% (n = 48) developed a respiratory complication and 12.7% (n = 28) developed an infection. The prevalence of 11 variables including age, sex and 9 comorbidities were initially considered to be potential predictors based on the intended outcome of interest. Model discrimination utilizing LASSO for variable selection was slightly improved over the stepwise regression approach. LASSO resulted in retention of additional comorbidities that may have meaningful associations to consider for future studies, including gastrointestinal issues, bladder dysfunction, epilepsy, anemia and coagulation deficiency. Conclusions: Potential predictors of the development of post-operative complications were identified in this study and while identified predictors were similar using stepwise and LASSO regression approaches, model discrimination was slightly improved with LASSO. Findings will be used to inform future research processes determining which variables to consider for developing risk prediction models.

PMID: [39394575](#)

### 2. The Effect of Video-Based Action Observation Training and Live Action Observation Training on Motor Function, Activity Participation, and Secondary Outcome Measures in Children With Spastic Diparetic Cerebral Palsy: A Randomized Controlled Study

Dilan Demirtas Karaoba, Burcu Talu

J Child Neurol. 2024 Oct 8;8830738241280838. doi: 10.1177/08830738241280838. Online ahead of print.

**Background:** This study aimed to investigate the effects of Video-Based Action Observation Training and Live Action Observation Training on motor function, activity participation, and secondary outcome measures in children with spastic diparetic cerebral palsy (CP). **Materials and methods:** Thirty-nine children with spastic diparetic cerebral palsy, aged 5-14 years, with Gross Motor Function Classification System I-III, were distributed in equal numbers to any of the Video-Based Action Observation Training (conventional physiotherapy + Video-Based Action Observation Training), Live Action Observation Training (conventional physiotherapy + Live Action Observation Training), and control (conventional physiotherapy) groups through stratified randomization. For 8 weeks, action observation training groups received 20 minutes of conventional physiotherapy followed by 20 minutes of action observation training, and the control group received 40 minutes of conventional physiotherapy. Primary outcome measures were Gross Motor Function Measurement and Child and Adolescent Scale of Participation, secondary outcome measures were Pediatric Berg Balance Scale, timed-up-and-go test, five times sit-to-stand test (FTSST), Gillette Functional Assessment Questionnaire (GFAQ), and 1-minute walk test (1MWT). **Results:** Improvements were observed in all other evaluation parameters of the groups except Gross Motor Function Measurement-lying and rolling ( $P = .066$ ) in the Live Action Observation Training Group, and lying and rolling ( $P = .317$ ) and crawling and kneeling ( $P = .063$ ) motor subtests and Gillette Functional Assessment Questionnaire-walking scale ( $P = .513$ ) in the control group. Comparisons of the increases in all other measurements between the groups, except for the dimensions of Gross Motor Function Measurement-lying and rolling ( $P = .172$ ), were statistically significant ( $P < .05$ ) and this difference was in favor of action observation training. **Conclusion:** It was found that 2 different AOTs applied in addition to conventional physiotherapy in children with spastic diparetic cerebral palsy were more effective on all outcomes than was conventional physiotherapy alone.

PMID: [39376091](#)

### **3. High-density EMG reveals atypical spatial activation of the gastrocnemius during walking in adolescents with Cerebral Palsy**

Maxwell Thurston, Mika Peltoniemi, Alessandra Giangrande, Ivan Vujaklija, Alberto Botter, Juha-Pekka Kulmala, Harri Piitulainen

J Electromyogr Kinesiol. 2024 Sep 20:79:102934. doi: 10.1016/j.jelekin.2024.102934. Online ahead of print.

Children with Cerebral Palsy (CP) exhibit less-selective, simplified muscle activation during gait due to injury of the developing brain. Abnormal motor unit recruitment, altered excitation-inhibition balance, and muscle morphological changes all affect the CP electromyogram. High-density surface electromyography (HDsEMG) has potential to reveal novel manifestations of CP neuromuscular pathology and functional deficits by assessing spatiotemporal details of myoelectric activity. We used HDsEMG to investigate spatial-EMG distribution and temporal-EMG complexity of gastrocnemius medialis (GM) muscle during treadmill walking in 11 adolescents with CP and 11 typically developed (TD) adolescents. Our results reveal more-uniform spatial-EMG amplitude distribution across the GM in adolescents with CP, compared to distal emphasis in TD adolescents. More-uniform spatial-EMG was associated with stronger ankle co-contraction and spasticity. CP adolescents exhibited a non-significant trend towards elevated EMG-temporal complexity. Homogenous spatial distribution and disordered temporal evolution of myoelectric activity in CP suggests less-structured and desynchronized recruitment of GM motor units, in combination with muscle morphological changes. Using HDsEMG, we uncovered novel evidence of atypical spatiotemporal activation during gait in CP, opening paths towards deeper understanding of motor control deficits and better characterization of changes in muscular activation from interventions.

PMID: [39378587](#)

### **4. COULD BOTOX MAKE WALKING EASIER IN CHILDREN WITH CEREBRAL PALSY?**

No authors listed

Neurosciences (Riyadh). 2024 Oct;29(4):296.

No abstract available

PMID: [39379082](#)

### **5. Impact of International Classification of Functioning, Disability and Health personal factors on outcomes following lower limb orthopaedic surgery in children with cerebral palsy: a systematic review**

Jennifer Armstrong, Verity Pacey, Jacqueline Dalby-Payne, Paula Bray, Emre Ilhan

Disabil Rehabil. 2024 Oct 9:1-10. doi: 10.1080/09638288.2024.2410980. Online ahead of print.

**Purpose:** To investigate impact of International Classification of Functioning, Disability and Health (ICF) personal factors on

pain, function, or quality of life following lower limb orthopaedic surgery in children with cerebral palsy (CP). Materials and methods: Systematic review of prospective studies of lower limb orthopaedic surgery in children with CP reporting relationships between ICF personal factors, and pain, function, or quality of life. Results: Eight prospective studies reporting various orthopaedic procedures (median follow-up 2.1 years) were eligible, but not sufficiently homogenous for meta-analysis. Functional outcomes most reported (n = 6), then pain (n = 3) and quality of life (n = 1). Personal factors were age (n = 3), sex (n = 4), child education (n = 1), and co-morbidities (n = 1). Older children had lower function ( $p < 0.01$ ), and children in "special education" greater improvement in function compared to those in "regular" education ( $p = 0.001$ ) post-single-event multi-level surgery (SEMLS). Age and sex not associated with function, pain, or quality of life post-single-joint procedures ( $p > 0.05$ ), except females with higher pain intensity ( $p = 0.019$ ) and lower function ( $p = 0.018$ ) post-Schanz procedure. No association between sex and function post-SEMLS ( $p > 0.05$ ). Conclusions: Further prospective cohort studies are needed to understand the influence of personal factors identified in this review and investigate the effect of other personal factors on pain, quality of life, and function.

PMID: [39381906](#)

## **6. Talocalcaneonavicular Realignment: The Foundation for Comprehensive Reconstruction of Severe, Resistant Neurologic Cavovarus, and Equinovarus Foot Deformities in Children and Adolescents**

María Galán-Olleros, Gonzalo Chorbadjian-Alonso, Ana Ramírez-Barragán, María Jesús Figueroa, Manuel Fraga-Collarte, Carmen Martínez-González, Carlos H Prato de Lima, Ignacio Martínez-Caballero

J Pediatr Orthop. 2024 Oct 4. doi: 10.1097/BPO.0000000000002838. Online ahead of print.

Introduction: The progression of neurologic cavovarus (NCV) and equinovarus (NECV) foot deformities during growth can eventually lead to non-reducible severe talonavicular (TN) and subtalar (ST) joint rotational malalignments. This study aimed to describe a technique to correct severe, resistant inversion deformity of the ST joint complex as the foundational procedure in comprehensive reconstruction of multi-segmental NCV and NECV deformities in pediatric patients and to analyze mid-term radiologic, functional, and satisfaction outcomes. Methods: This prospective study included children with severe NCV and NECV foot deformities who underwent TCNR between 2019 and 2022, with a minimum follow-up of 2 years. Talocalcaneal angle, talus-1 metatarsal angles, and TN coverage angle were measured in preoperative and postoperative weight-bearing foot radiographs. The foot and ankle disability index, foot function index, and Maryland foot score evaluated functionality. Qualitative questions assessed perceived improvement, satisfaction, and expectations of patients/caregivers. Descriptive, comparative pre-post, subgroup, correlation, and satisfaction analysis were performed. Results: Twenty-six patients (36 feet: 16 unilateral and 10 bilateral) were included; 50% were female, median age was 12.1 years (IQR, 3.21) and median follow-up was 32.9 months (IQR, 18.7). Fifty-four percent had cerebral palsy, and 23% had charcot-marie-tooth disease; 84.6% were ambulatory. Significant improvements were found in radiologic parameters and functional outcomes ( $P < 0.01$ ), with no relevant differences between unilateral or bilateral procedures, pathology, functional level, or ambulatory capacity ( $P > 0.05$ ). Correlations between radiologic parameters or functional scales with age were generally low. Most reported significant functional improvements, outcomes exceeding expectations, and high satisfaction; they would recommend the surgery and undergo the procedure again. There were 3 minor complications: hypersensitivity, partial recurrence, and undercorrection. Conclusions: The TCNR technique enables realignment of severe, resistant inversion deformity of the ST joint complex in NCV and NECV foot deformities. When combined with procedures to correct the other foot deformities and muscle imbalances, functional outcomes are enhanced, high patient/caregiver satisfaction is achieved, and low complication rates are possible. This approach represents an important modification and extension of an already described technique, the deep plantar-medial release. Level of evidence: Level III, therapeutic prospective cohort study.

PMID: [39382214](#)

## **7. Determinants of gait dystonia severity in cerebral palsy**

No authors listed

Dev Med Child Neurol. 2024 Oct 10. doi: 10.1111/dmcn.16119. Online ahead of print.

No abstract available

PMID: [39388606](#)

## **8. Natural history of gait patterns in untreated children with bilateral cerebral palsy in a low-income country setting**

Julie Stebbins, Laurence Wicks, Tim Nunn, Richard Gardner, Tewodros T Zerfu, Mesfin Kassahun, Tim Theologis

Dev Med Child Neurol. 2024 Oct 11. doi: 10.1111/dmcn.16113. Online ahead of print.

**Aim:** To assess a group of ambulant, untreated children with bilateral spastic cerebral palsy, in a resource-poor setting, who had never been assessed by a health care professional or received any treatment, to help establish the natural history of gait patterns in this condition. **Method:** At CURE Children's Hospital of Ethiopia, 46 children with no prior health care contact were assessed in a cross-sectional cohort study, through a detailed history, clinical examination, and instrumented gait analysis using a motion capture system. **Results:** There was a large spread in the data reflecting the high natural heterogeneity in this population. The severity of gait pathology did not correlate with age; however, a small but significant reduction in sagittal hip and knee range of motion with increasing age was observed. There was also a trend towards reduced passive knee extension with age. **Interpretation:** Improved understanding of the aspects of gait that are likely to naturally improve, deteriorate, or remain stable over time helps guide treatment decisions in this population.

PMID: [39392907](#)

### **9. Exploration of the triceps surae muscle in ambulatory children with cerebral palsy using instrumented measurements of stiffness and diffusion tensor magnetic resonance imaging for muscle architecture**

Alexandra Åhblom, Eva Pontén, Antea Destro, Sven Petersson, Ferdinand von Walden, Ruoli Wang, Cecilia Lidbeck

Observational Study BMC Musculoskelet Disord. 2024 Oct 11;25(1):803. doi: 10.1186/s12891-024-07890-4.

**Background:** Musculoskeletal alterations causing reduced range of motion of the ankle joint are common in children with cerebral palsy (CP). Objective measurements of passive joint resistance and three-dimensional skeletal muscle volume and muscle architecture can lead to a comprehensive understanding of which factors influence joint range of motion. **Research question:** To investigate the relation between the passive dorsiflexion of the ankle joint, biomechanical contributing factors to the passive joint resistance, and muscular architectural properties of the triceps surae muscle in children with CP. **Methods:** In this cross-sectional observational study, 14 children with spastic CP (bilateral: 5, unilateral: 9, Gross Motor Function Classification System (GMFCS) level I:11, II:3) naïve to intramuscular tone reducing treatment, and 14 TD children were included. The passive dorsiflexion of the ankle was measured with a goniometer. Passive joint resistance and related parameters were estimated based on a biomechanical model and measurements using a motorized device, the Neuroflexor. Three-dimensional muscle architecture was quantified with diffusion tensor magnetic resonance imaging (DT-MRI). **Results:** In the CP group, the median [min, max] passive dorsiflexion was decreased in the most affected leg (MAL) compared to the less affected leg (LAL) (2.5° [-25°, 20°] vs. 12.5° [5°, 30°],  $p = 0.001$ ). The stiffness coefficient (Nm/rad) in the MAL was significantly higher in children with CP compared to TD children (7.10 [3.39, 62.00] vs. 2.82 [1.24, 10.46],  $p = 0.015$ ). Muscle architecture properties did not differ between CP and TD, except for pennation angle in the medial gastrocnemius (MG) of the MAL (CP 17.64° (2.29) vs. TD 21.46° (3.20),  $p = 0.017$ ). The stiffness coefficient, in the MAL, correlated negatively to passive dorsiflexion ( $rs = -0.638$ ) and pennation angle in medial gastrocnemius ( $rs = -0.964$ ), and the non-linear coefficient (Non-linear 1) correlated negatively to the fascicle length of the medial gastrocnemius ( $rs = -0.857$ ). **Conclusion:** This study shows that stiffness of the plantarflexors is related to decreased passive dorsiflexion of the ankle and muscle structure of the MG in high-functioning children with spastic CP. Assessments of how dynamic components as well as microscopic muscle alterations contribute to joint stiffness in the plantarflexors in individuals with CP are warranted.

PMID: [39394126](#)

### **10. Descriptive Study of GoBabyGo Program Practices and Evaluation Processes**

Kelsey Ziegler, Carolyn P Da Silva, Katy Mitchell, Mary F Baxter, Christina Bickley

Pediatr Phys Ther. 2024 Oct 10. doi: 10.1097/PEP.0000000000001159. Online ahead of print.

**Purpose:** The aim of this study was to describe existing GoBabyGo (GBG) programs with physical or occupational therapist (PT or OT) involvement and identify eligibility criteria and evaluation processes of organizations that build modified ride-on cars (MROCs). **Methods:** Forty-four PTs and OTs completed a survey including descriptive information about GBG programs, barriers and facilitators, and functional aspects of the programs such as inclusion and exclusion criteria, outcome measure use, and follow-up practices. **Results:** Findings demonstrated the heterogeneous nature of GBG programs. GBG programs most commonly serve 2 to-5-year-olds with cerebral palsy, spina bifida, and chromosomal abnormalities. Outcome measure use and follow-up was minimal, and successful MROC use definitions varied from independent driving to passive use. **Conclusions:** Clinicians can use this information to help improve existing GBG programs and start new chapters as well as make appropriate referrals for clients who may benefit from a MROC.

PMID: [39382489](#)

### **11. Physical Therapy Dose After Orthopedic Multilevel Surgery Varies by Ambulatory Status in Children With Cerebral Palsy: A Pilot Study**

Kelly Greve, Amy F Bailes, Nanhua Zhang, Jason Long, Bruce Aronow, Alexis Mitelpunkt

Pediatr Phys Ther. 2024 Oct 10. doi: 10.1097/PEP.0000000000001153. Online ahead of print.

Purpose: To characterize physical therapy (PT) dose for children with cerebral palsy (CP) after multi-level surgery (MLS) and examine variation by ambulatory status and surgical burden. Methods: PT dose (Frequency, Intensity, Time, Type) data were extracted from electronic records of children with CP who received outpatient PT the year after MLS. Results: Seventeen children, mean 9 years, female (n=10), ambulatory (n=10), and high surgical burden (n=12) were included. In the year after surgery, 345 visits occurred. Intensity across visits was above average. Time was greatest for pre-functional activities, gait, and transitions/transfers. Types most often delivered were neuromuscular, musculoskeletal, and education/training. Ambulatory children received significantly more visits, higher intensity, and time in pre-functional activities and gait than non-ambulatory children. No differences in type by ambulatory status and PT dose by surgical burden were found. Conclusion: PT dose varied the first year after MLS indicating the need for guidelines by ambulatory status. Video abstract: Supplemental Digital Content available at: <http://links.lww.com/PPT/A516>.

PMID: [39392372](https://pubmed.ncbi.nlm.nih.gov/39392372/)

## 12. Corrigendum to "A Randomized Trial of Baby Triple P for Preterm Infants: Child Outcomes at 2 Years of Corrected Age". J Pediatr. 2019;210:48-54

Paul B Colditz, Roslyn N Boyd, Leanne Winter, Margo Pritchard, Peter H Gray, Koa Whittingham, Michael O'Callaghan, Luke Jardine, Peter O'Rourke, Louise Marquart, Kylee Forrest, Carmen Spry, Matthew R Sanders

Published Erratum J Pediatr. 2024 Oct 5:114293. doi: 10.1016/j.jpeds.2024.114293. Online ahead of print.  
No abstract available

Erratum for

A Randomized Trial of Baby Triple P for Preterm Infants: Child Outcomes at 2 Years of Corrected Age.  
Colditz PB, Boyd RN, Winter L, Pritchard M, Gray PH, Whittingham K, O'Callaghan M, Jardine L, O'Rourke P, Marquart L, Forrest K, Spry C, Sanders MR.  
J Pediatr. 2019 Jul;210:48-54.e2. doi: 10.1016/j.jpeds.2019.01.024. Epub 2019 Mar 8.  
PMID: 30857773 Clinical Trial.

PMID: [39370385](https://pubmed.ncbi.nlm.nih.gov/39370385/)

## 13. Real-time detection of spoken speech from unlabeled ECoG signals: A pilot study with an ALS participant

Miguel Angrick, Shiyu Luo, Qinwan Rabbani, Shreya Joshi, Daniel N Candrea, Griffin W Milsap, Chad R Gordon, Kathryn Rosenblatt, Lora Clawson, Nicholas Maragakis, Francesco V Tenore, Matthew S Fifer, Nick F Ramsey, Nathan E Crone

medRxiv [Preprint]. 2024 Sep 22:2024.09.18.24313755. doi: 10.1101/2024.09.18.24313755.

Objective: Brain-Computer Interfaces (BCIs) hold significant promise for restoring communication in individuals with partial or complete loss of the ability to speak due to paralysis from amyotrophic lateral sclerosis (ALS), brainstem stroke, and other neurological disorders. Many of the approaches to speech decoding reported in the BCI literature have required time-aligned target representations to allow successful training - a major challenge when translating such approaches to people who have already lost their voice. Approach: In this pilot study, we made a first step toward scenarios in which no ground truth is available. We utilized a graph-based clustering approach to identify temporal segments of speech production from electrocorticographic (ECoG) signals alone. We then used the estimated speech segments to train a voice activity detection (VAD) model using only ECoG signals. We evaluated our approach using held-out open-loop recordings of a single dysarthric clinical trial participant living with ALS, and we compared the resulting performance to previous solutions trained with ground truth acoustic voice recordings. Main results: Our approach achieves a median error rate of around 0.5 seconds with respect to the actual spoken speech. Embedded into a real-time BCI, our approach is capable of providing VAD results with a latency of only 10 ms. Significance: To the best of our knowledge, our results show for the first time that speech activity can be predicted purely from unlabeled ECoG signals, a crucial step toward individuals who cannot provide this information anymore due to their neurological condition, such as patients with locked-in syndrome. Clinical trial information: ClinicalTrials.gov, registration number NCT03567213.

PMID: [39371161](https://pubmed.ncbi.nlm.nih.gov/39371161/)

## 14. Reactive Gingival Hyperplasia Mimicking Pyogenic Granuloma: A Nonsurgical Management in Cerebral Palsy Patient

Shefali Negi, Ruchi Singhal, Krishan Kant, Anisha Kakran, Himani Kaushik, Ritu Namdev

Case Reports Int J Clin Pediatr Dent. 2024 Jul;17(7):812-814. doi: 10.5005/jp-journals-10005-2908.



Among the vast categorization of gingival lesions and overgrowths, the term "reactive hyperplastic lesions" is used to describe certain pathologies reactionary to underlying systemic conditions, local irritants, or trauma. It is emphasized in the literature that treatment planning for all such pathologies includes surgical excision by one means or another. However, an exception is to be made in cases where adhering to the conventional method can be very difficult but at the same time prove favorable for the patient. The present case report aims to showcase an unusual case of localized inflammatory gingival hyperplasia mimicking a reactive pyogenic granuloma in an 11-year-old boy with cerebral palsy. The management and the outcome miraculously favored the nonsurgical approach in dealing with such a gingival lesion.

PMID: [39372521](#)

### **15. Precision in Progress: Unraveling the Clinimetric Properties of Beery-Buktenica Developmental Test of Visual-Motor Integration in Children With Cerebral Palsy Across Diverse Motor Severities**

Yu-Hsin Chen, Chia-Ling Chen, Wei-Hsien Hong, Chung-Yao Chen, Chia-Ying Chung, Katie P H Wu, Ching-Yi Wu, Keh-Chung Lin

*Pediatr Neurol.* 2024 Sep 20;161:139-143. doi: 10.1016/j.pediatrneurol.2024.09.017. Online ahead of print.

**Background:** In the realm of pediatric cerebral palsy (CP), visual motor challenges often overshadow a child's developmental journey. This study delves into the responsiveness and crucial benchmarks, specifically the minimal clinically important difference (MCID), of the Beery-Buktenica Developmental Test of Visual-Motor Integration (Beery VMI) among children with varying motor severities. **Method:** Eighty-eight children with CP (50 males, 38 females; aged three to 12 years) with Gross Motor Function Classification System (GMFCS) levels I to III were recruited from the rehabilitation department of Chang Gung Memorial Hospital in Taiwan. Each participant received the Beery VMI tests at baseline and at one-year follow-up. The standardized response mean (SRM) was calculated to determine the responsiveness of Beery VMI, and a distribution-based approach was used to estimate MCID. **Results:** The Beery VMI exhibited remarkable responsiveness across GMFCS levels I to III (SRM = 0.98-2.36). MCIDs for Beery VMI varied across severities, with ranges of 2.93 to 4.41 (0.2 S.D.), 7.31 to 11.49 (0.5 S.D.), and 11.70 to 18.38 (0.8 S.D.). Notably, in the visual perception subset, MCIDs were 3.93 to 4.03 (0.2 S.D.), 9.83 to 10.07 (0.5 S.D.), and 15.73 to 16.11 (0.8 S.D.). In the supplemental motor coordination subtest, MCIDs spanned 1.67 to 4.87 (0.2 S.D.), 4.18 to 12.17 (0.5 S.D.), and 6.68 to 19.47 (0.8 S.D.). **Conclusions:** Beery VMI demonstrates robust responsiveness in children with CP. Motor-severity-tailored MCIDs offer a guide for clinicians and researchers, hinting at treatment efficacy. Particularly, lower change scores in VMI and motor coordination subtests may signal effective interventions for moderate motor disability over mild cases.

PMID: [39383587](#)

### **16. Motor practice related changes in the sensorimotor cortices of youth with cerebral palsy**

Max J Kurz, Brittany K Taylor, Elizabeth Heinrichs-Graham, Rachel K Spooner, Sarah E Baker, Tony W Wilson

*Brain Commun.* 2024 Sep 26;6(5):fcae332. doi: 10.1093/braincomms/fcae332. eCollection 2024.

The altered sensorimotor cortical dynamics seen in youth with cerebral palsy appear to be tightly coupled with their motor performance errors and uncharacteristic mobility. Very few investigations have used these cortical dynamics as potential biomarkers to predict the extent of the motor performance changes that might be seen after physical therapy or in the design of new therapeutic interventions that target a youth's specific neurophysiological deficits. This cohort investigation was directed at evaluating the practice dependent changes in the sensorimotor cortical oscillations exhibited by youth with cerebral palsy as a step towards addressing this gap. We used magnetoencephalography to image the changes in the cortical oscillations before and after youth with cerebral palsy (N = 25; age = 15.2 ± 4.5 years; Gross Motor Function Classification Score Levels I-III) and neurotypical controls (N = 18; age = 14.6 ± 3.1 years) practiced a knee extension isometric target-matching task. Subsequently, structural equation modelling was used to assess the multivariate relationship between changes in beta (16-22 Hz) and gamma (66-82 Hz) oscillations and the motor performance after practice. The structural equation modelling results suggested youth with cerebral palsy who had a faster reaction time after practice tended to also have a stronger peri-movement beta oscillation in the sensorimotor cortices following practicing. The stronger beta oscillations were inferred to reflect greater certainty in the selected motor plan. The models also indicated that youth with cerebral palsy who overshot the targets less and matched the targets sooner tended to have a stronger execution-related gamma response in the sensorimotor cortices after practice. This stronger gamma response may represent improved activation of the sensorimotor neural generators and/or alterations in the GABAergic interneuron inhibitory-excitatory dynamics. These novel neurophysiological results provide a window on the potential neurological changes governing the practice-related outcomes in the context of the physical therapy.

PMID: [39391334](#)

### **17. Using interactive computer play in physical therapy and occupational therapy clinical practice: an explanatory sequential mixed methods study**

Marina Petrevska, Jennifer L Ryan, Selvi Sert, Sarah Munce, F Virginia Wright, Elaine Biddiss

Front Med Technol. 2024 Sep 20;6:1381165. doi: 10.3389/fmedt.2024.1381165. eCollection 2024.

**Introduction:** This study explored the extent to which an interactive computer play system, Bootle Blast, supports motor learning in a clinical context and examined clinicians' perceptions of their therapeutic role in the system's use as an intervention tool. **Methods:** In this observational sequential explanatory mixed methods study, five children with cerebral palsy [mean age 9.4 years (SD, 0.5), Gross Motor Function Classification System Levels I-III] used Bootle Blast during a single video-recorded therapy session with their treating clinicians (physical therapists, occupational therapists, and therapy assistants). Children played one Bootle Blast mini game independently (without clinician involvement) before clinicians carried out therapy sessions with the game as per usual care. The type and extent of motor learning strategies (MLS) delivered by Bootle Blast and clinicians were rated from video recordings by a trained assessor using the 22-item Motor Learning Strategies Rating Instrument. Semi-structured interviews with clinicians were conducted to gain insights into MLS use and clinicians' perceived role during Bootle Blast use. Interviews were audio recorded, transcribed verbatim, and analyzed independently by two researchers using thematic analysis. Quantitative and qualitative data were merged and reported using narrative and joint display approaches. **Results:** Bootle Blast provided eight MLS, with clinicians adding or enhancing another eight. Four themes reflected clinicians' perspectives: (1) Bootle Blast disguises therapy as play, (2) clinicians give Bootle Blast the human touch; (3) home use of Bootle Blast is promising; and (4) Bootle Blast is not always the right fit but some shortcomings could be addressed. Agreement was found for nine MLS and disagreement for four MLS when quantitative and qualitative findings were merged. **Discussion:** Bootle Blast delivers several MLS as part of game play and clinicians can enhance and provide additional MLS to suit the child's needs/abilities. Further game refinements that were identified in this study may optimize its clinical use.

PMID: [39372965](#)

### **18. An exploratory study of functional brain activity associated with gross motor function improvement in children with unilateral cerebral palsy**

A J Hilderley, D Fehlings, M J Taylor, J L Chen, F V Wright

Dev Neurorehabil. 2024 Oct 6:1-9. doi: 10.1080/17518423.2024.2410184. Online ahead of print.

**Purpose:** Identify relations of gross motor function and primary motor cortex (M1) functional activity pre and post gross motor interventions for children with unilateral cerebral palsy (UCP). **Methods:** Thirteen children with UCP completed a gross motor intervention. Pre/post-intervention functional MRI outcomes included the laterality index (LI), activation volume, and spatial overlap of M1 activation during active ankle dorsiflexion. Advanced gross motor function (Challenge) was assessed pre/post-intervention, and 2-6 months later. Bivariate correlations and linear regression assessed relations between neuroimaging and motor function. **Results:** Mean pre-intervention M1 activity was contralateral during dominant (LI = +0.85, SD 0.21) but variable during the affected (LI = +0.43, SD 0.57) ankle dorsiflexion. Changes in motor function and neuroimaging outcomes were not significantly associated. However, smaller affected ankle activation and less spatial overlap between ankle activations pre-intervention predicted Challenge improvements post-intervention (adjusted R<sup>2</sup> = 0.74, p = .001). **Conclusions:** This exploratory study identified pre-intervention neuroimaging predictors of post-intervention improvements in advanced gross motor function.

PMID: [39369290](#)

### **19. Autism and cerebral palsy: evidence for converging phenotypes**

Elizabeth Greenfield, Salathiel Kendrick-Allwood

Pediatr Res . 2024 Oct 5. doi: 10.1038/s41390-024-03575-9. Online ahead of print.

No abstract available

PMID: [39369102](#)

### **20. Epilepsy trends in Kazakhstan: A retrospective longitudinal study using data from unified national electronic health system 2014-2020**

Ruslan Akhmedullin, Bermet Kozhobekova, Arnur Gusmanov, Temirgali Aimyshev, Zhasulan Utebekov, Gaziz Kyrgyzbay, Azat Shpekov, Abduzhappar Gaipov

Seizure. 2024 Sep 30;122:58-63. doi: 10.1016/j.seizure.2024.09.022. Online ahead of print.

**Objective:** This study is designed to estimate the epidemiology of epilepsy in Kazakhstan, using a large-scale administrative health database during 2014–2020. **Methods:** Using the Unified National Electronic Health System of Kazakhstan over a seven-year span, we explored incidence and prevalence rates, disability-adjusted life years (DALY), and all-cause mortality. Regression models using Cox proportional hazards were used to analyze the sociodemographic, mental, behavioral, and neurological factors affecting survival. Overall analyses were performed using STATA (V.16). **Results:** The total cohort comprised of 82,907 patients, with a significant increase in the incidence of epilepsy from 26.15 in 2014 to 88.80 in 2020 per 100,000 people. Similar trends were observed in the prevalence rates, which tripled from 26.06 in 2014 to 73.10 in 2020. While mortality rates fluctuated, the elderly and children had the greatest rates of 9.97 and 2.98 per 1000 person-years respectively. DALYs revealed a substantial disease burden, with 153,532 DALYs (824.5 per 100,000) being lost during the study period. A few comorbidities, such as cerebral palsy (adjusted hazard ratio (aHR) 2.23) and central nervous system atrophy (aHR, 27.79), markedly elevated all-cause mortality. Furthermore, extrapyramidal and movement disorders (aHR 2.16,  $p = 0.06$ ) and demyelinating diseases of the central nervous system (aHR 6.36,  $p = 0.06$ ) showed a trend toward increased mortality risk. **Conclusion:** To the best of our knowledge, this is the first study from Central Asia exploring a large epilepsy cohort. The findings highlight the need for targeted interventions to address the growing burden of epilepsy, particularly among children, male sex, and those with neurological comorbidities.

PMID: [39368328](#)

## 21. Mental health screening for parents following surgical neonatal intensive care unit (NICU) discharge

Nadine Griffiths, Sharon Laing, Kaye Spence, Maralyn Foureur, Himanshu Papat, Holly Gittany, Lynn Sinclair, Nadine Kasparian

Early Hum Dev. 2024 Oct 2;198:106128. doi: 10.1016/j.earlhumdev.2024.106128. Online ahead of print.

Admission to the surgical neonatal intensive care unit (sNICU) is a stressful experience. Care is often complex, with inherent risks and potential complications. This study describes the implementation of an outpatient mental health screening process for parents of infants admitted to a sNICU. Parents of infants aged >34 weeks gestation with a congenital anomaly requiring neonatal surgery participated in this prospective observational study. Standardised measures to screen for parenting stress (Parenting Stress Index™ Fourth Edition Short Form) and depressive symptoms (Center for Epidemiologic Studies Depression Scale) were administered at the first outpatient visit scheduled when the infant's corrected gestational age was 4 months. A triage algorithm was developed, to review the initial screening results prompting appropriate action and intervention. Positive screens were triaged as evaluate (assess within 48 h), targeted information (email contact), or escalate response (same day risk assessment). Demographic factors associated with parental stress and depressive symptoms were explored. Forty parents (response rate: 88 %) participated in screening. A high portion of parents (52.5 %) required secondary screening, for parenting stress ( $n = 10$ ), depressive symptoms ( $n = 5$ ) or both stress and depressive symptoms ( $n = 6$ ). Socioeconomic disadvantage was positively associated with parenting stress ( $p = 0.02$ ) and greater depressive symptoms with parent education levels ( $p = 0.01$ ). Results indicate screening of parent mental health in the outpatient setting is feasible. Use of a triage algorithm helped prioritise parent follow-up and facilitate workflows. Parent mental health screening should be prioritised within and beyond the sNICU to support family and infant outcomes during this critical period of development.

PMID: [39368218](#)

## 22. Vulnerability to depression and resolution in mothers of children with cerebral palsy

Tatjana Krstić, Sanja Batić Očovaj, Nina Brkić Jovanović, Ljiljana Milić

Res Dev Disabil. 2024 Oct 7;154:104852. doi: 10.1016/j.ridd.2024.104852. Online ahead of print.

**Background:** This study investigated associations between Self-Criticism and Dependency as factors of vulnerability to depression and maternal resolution. Resolution entails parental cognitive and emotional acceptance of the child's developmental disability. **Methods:** Our sample included 100 mothers whose children had a diagnosis of cerebral palsy. The Reaction to Diagnosis Interview, the Depressive Experiences Questionnaire and the Depression Scale were administered. **Results:** The results showed that unresolved mothers scored higher on the dimensions of Self-Criticism and Dependency compared to their resolved counterparts. The hierarchical cluster analysis yielded three maternal profiles based on the scores obtained on the dimensions of vulnerability to depression, regardless of maternal resolution status. The first profile was labeled Low Vulnerability and was characterized by low scores on Self-Criticism and Dependency. The second profile was labeled Dependent and it included mothers with higher scores on Dependency and lower scores on Self-Criticism. The third profile comprised mothers with higher scores on both Self-Criticism and Dependency. The smallest proportion of unresolved mothers belonged to the third, most vulnerable profile labeled Double Vulnerability. **Discussion:** We discussed the implications of the obtained results in light of a need for psychotherapeutic interventions that would focus on individual differences when providing support to parental resolution.



PMID: [39378737](#)

### 23. Occupational Therapy Assessment Tools for Children and Adolescents in Iran: A Scoping Review

Ehsan Jamshidian, Aynaz Jabbari, Fatemeh Dehghan, Elahe Fathi Azar, Hooshang Mirzaie

Review Iran J Med Sci. 2024 Sep 1;49(9):530-549. doi: 10.30476/ijms.2024.100756.3325. eCollection 2024 Sep.

**Background:** Assessment tools are essential in occupational therapy for providing client-centered care, clinical decision-making, evidence-based documentation, and defining expected outcomes. This study investigated available occupational therapy assessment tools for children and adolescents in Iran. **Methods:** A comprehensive search was conducted in MEDLINE, PubMed Central, Web of Science, Embase, Scopus, SID, Magiran, and Google Scholar from their inception until May 24, 2022. Two reviewers screened records and applied inclusion criteria focused on peer-reviewed articles in English or Persian, covering children and adolescents aged 0-18 years old in Iran. The methodological quality of each study and the evidence quality of each measurement tool was assessed using the COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) Risk of Bias Checklist, and the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) approach. **Results:** A review of 66 articles published between 2010 and 2021, identified 51 assessment tools. The majority of tools (70.7%) targeted typically developing children and those with cerebral palsy, with limited options for adolescents (n=5) and infants (n=1). These tools primarily focused on assessing body functions (47.06%), particularly sensory-motor functions. While numerous tools demonstrated good reliability (66.67%) and significant content validity (31.37%), there was a paucity of high-quality evidence supporting other psychometric properties. **Conclusion:** This study identified 51 occupational therapy assessment tools for Iranian children and adolescents. However, the present research identified some concerning trends, such as lack of tools available for specific populations, an overreliance on translated tools, and a predominant focus on body functions. Moreover, there were concerns about the methodological quality of studies using these tools.

PMID: [39371384](#)

### 24. Impact of World Cerebral Palsy Day on Public Interest in Brazil: Evidence from Internet Search Data

Nathalia Caroline Soares Chaves, Adriane Santos de Oliveira, Ana Clara Geremias Fischer, Jessica Paiva Tavares, André Luís Ferreira Meireles

Dev Neurorehabil. 2024 Oct 7:1-6. doi: 10.1080/17518423.2024.2410169. Online ahead of print.

**Aim:** This study investigated the impact of the World Cerebral Palsy Day (WCPD) campaign on the public interest using Google Trends Analysis data in Brazil. **Methods:** Google Trends was used to collect Relative Search Volume (RSV) data for "cerebral palsy" from 2004 to 2011 (control years) and 2012 to 2022 (WCPD years). RSV during the 4 weeks around WCPD (period of interest) was compared with the rest of the year (control period) in each timeframe. Regional RSV, search queries, and main topics were also investigated. **Results:** RSV increased by 62.22% from pre-campaign to campaign period. During the WCPD years, a 21.36% RSV increase occurred in campaign weeks, with an average difference of 12.16 (95% CI: 1.74, 22.58); notably in the last five years in the southeast 9.47 (95% CI: 2.93, 16.01) and south 8.66 (95% CI: 1.66, 15.66) macro-regions. **Conclusion:** The campaign has fulfilled its role, but targeting more vulnerable areas could further amplify its impact.

PMID: [39373585](#)

### 25. Neurobiological Insights Into Cerebral Palsy: A Review of the Mechanisms and Therapeutic Strategies

Izere Salomon

Review Brain Behav. 2024 Oct;14(10):e70065. doi: 10.1002/brb3.70065.

**Background:** Cerebral palsy (CP) is a common neurodevelopmental disorder characterized by impaired mobility and posture caused by brain injury or abnormal development. CP relates to a variety of neurological mechanisms and pathways that impact the type and severity of motor disability, as well as comorbidities. The heterogeneity in clinical phenotype, pathogenesis, and etiology poses significant challenges for effective therapeutic intervention. **Objectives:** The review aims to provide a comprehensive analysis of the neurobiological mechanisms underlying CP and evaluate current and prospective therapeutic strategies, highlighting the necessity for targeted interventions to address the disorder's multifaceted nature. **Methods:** A thorough literature review was conducted, focusing on studies published in peer-reviewed journals that explore the pathophysiological mechanisms, clinical interventions, and therapeutic strategies for CP. **Results:** The pathogenesis of CP involves a complex interplay of genetic, environmental, and perinatal factors leading to brain injury. Inflammatory processes, oxidative stress, and excitotoxicity are critical in CP development. Current therapeutic approaches primarily focus on symptom management through physical and occupational therapy, as well as pharmacological interventions. Emerging therapies, including anti-inflammatory agents, antioxidants, and neuroprotective and neurotrophic agents, show potential but require

further validation. Notably, although steroids provide anti-inflammatory benefits, their use in pediatric patients raises concerns regarding long-term adverse effects such as osteoporosis. Conclusion: Despite advances in understanding CP's neurobiological underpinnings, effective therapeutic targets remain elusive. A comprehensive approach addressing CP's heterogeneity is essential. Future research should emphasize in-depth evaluations of the efficacy and safety of therapeutic agents, particularly in pediatric populations, to develop targeted and effective treatments for CP.

PMID: [39378294](#)

## **26. Implementing Clinical Practice Guidelines for Improving Function in Cerebral Palsy: Development of a Fidelity Tool**

Michelle Jackman, Megan Thorley, Rachel Toovey, Andrea Burgess, Remy Blatch-Williams, Leanne Sakzewski, Roslyn N Boyd, Iona Novak

Pediatr Phys Ther. 2024 Oct 9. doi: 10.1097/PEP.0000000000001155. Online ahead of print.

Purpose: To develop a fidelity tool to support the implementation of clinical practice guidelines to improve physical function for children and young people with cerebral palsy. Methods: Fidelity tool development followed a 5-step process: the pilot study, using a mixed-methods action research approach, and including focus groups, questionnaires, and field notes. Results: A 21-item fidelity tool representing the core components of the clinical practice guidelines was developed, including subsections of goal setting, intervention, and elements seen throughout therapeutic intervention. Clinicians and supervisors reported this tool as acceptable and feasible, especially when used as a self-reflection tool. Conclusions: A fidelity tool has been developed that clinicians, supervisors and organizations can use to reflect on current practice and plan for changes to align practice with guidelines to improve function in children with cerebral palsy.

PMID: [39378353](#)

## **27. Incidence of lymphedema among adults with cerebral palsy**

Christine R Gettys, Sean Smith, Kimberly K Rauch, Daniel G Whitney

PM R. 2024 Oct 9. doi: 10.1002/pmrj.13277. Online ahead of print.

Background: Lymphedema is a chronic and progressive condition but is understudied among adults with cerebral palsy (CP). Objective: To compare the 2-year incidence of lymphedema between adults with versus without CP before and after accounting for multimorbidity, cancer diagnosis/treatment, and lymph node/channel surgery. Design: Retrospective cohort study. Setting: Nationwide commercial claims data from January 1, 2011 to December 31, 2017. Participants: Adults  $\geq 18$  years old with and without CP with at least 12 months of continuous health plan enrollment, defined as the baseline period, were included for analysis. The 12-month baseline period was used to establish information on preexisting lymphedema (for exclusion), presence of cancer, including radiation treatment and lymph node surgery, and the Whitney Comorbidity Index (WCI). Interventions: Not applicable. Main outcome measure: The 2-year incidence rate (IR) and IR ratio (IRR) of lymphedema were evaluated. Cox regression estimated the hazard ratio (HR) of 2-year lymphedema after adjusting for age, gender, WCI, cancer diagnosis/treatment, and lymph node/channel surgery. Results: The 2-year IR of lymphedema was 5.73 (95% confidence interval [CI] = 4.59-6.88) for adults with CP (n = 9922) and 1.81 (95% CI = 1.79-1.83) for adults without CP (n = 12,932,288); the IRR was 3.17 (95% CI = 2.59-3.87) and the adjusted HR was 2.43 (95% CI = 1.98-2.98). There was evidence of effect modification by gender, age, and WCI score. All HRs were elevated, but men with versus without CP had higher HRs than women with versus without CP; HRs for adults with versus without CP were higher for younger participants and those with lower WCI scores. Conclusions: Adults with CP had a higher 2-year rate of lymphedema compared with those without CP. Men with CP had a disproportionately higher rate than women with CP when compared with their gender-based reference cohorts without CP.

PMID: [39382021](#)

## **28. Early-onset preeclampsia/gestational hypertension may be associated with a low incidence of cerebral palsy at 3 years old in singleton very low-birth-weight infants born at 28-31 weeks of gestation (EOPE-DQ study): a multi-center retrospective cohort study in 2013-2016**

Akihide Ohkuchi, Hirotada Suzuki, Asako Kanai, Masashi Fukuda, Yoshinori Takeda, Chiho Fuseya, Makoto Nomiyama, Takafumi Ushida, Kazushi Watanabe, Yumi Kono, Katsuhiko Naruse, Hiroyuki Seki, Shigeru Saito

Hypertens Res. 2024 Oct 8. doi: 10.1038/s41440-024-01929-8. Online ahead of print.

Our aim was to evaluate the effects of any types of hypertensive disorders of pregnancy (HDP) on the development of either cerebral palsy (CP) or developmental delay (DD) at 3 years old in singleton very low-birth-weight (VLBW) infants born at 24-31 weeks of gestation. This was a retrospective cohort study of VLBW infants born at 24-31 weeks in 2013-2016 in Japan,

using a nationwide obstetrical database, and Neonatal Research Network Japan (NRNJ) Database, accompanied by a secondary survey of women complicated with HDP (EOPE-DQ study). In 529 candidates for long-term follow-up in 7 tertiary centers, the percentage undergoing follow-up for CP at 3 years old was 56.1%, and the percentage receiving follow-up for DD at 3 years old was 54.1%. The percentage of PE/SPE/GH was significantly lower in infants with CP than in controls (1/22 [4.5%] vs. 66/274 [24.1%],  $p = 0.034$ ); especially, in infants born at 28-31 weeks, the percentage of PE/SPE/GH was significantly lower in infants with CP than in controls (0/13 [0%] vs. 44/151 [29.1%],  $p = 0.021$ ). The percentage of PE/SPE/GH was not different between infants with DD and controls (9/49 [18.4%] vs. 54/237 [22.8%],  $p = 0.574$ ). The percentage of composite risk factors (either bronchopulmonary dysplasia at a postmenstrual age of 36 weeks, intraventricular hemorrhage, hypoxic ischemic encephalopathy, sepsis, necrotizing enterocolitis, or periventricular leukomalacia) was significantly higher in infants with DD than in controls. In conclusion, PE/SPE/GH around 30 weeks may be associated with a low incidence of CP.

PMID: [39379466](#)

### 29. Impact of care coordination on service utilisation for children with medically complex cerebral palsy

Adrienne Harvey, Daisy Shepherd, Susan Gibb, Gordon Baikie, Anita D'Aprano, Dinah Reddihough, Rose Babic, Frances Hunter, Gretta Jealous, Christine Imms

J Paediatr Child Health. 2024 Oct 9. doi: 10.1111/jpc.16690. Online ahead of print.

**Aim:** Complex care programmes for children with medically complex cerebral palsy (CP) exist; however, evidence for their impact is limited. This study (i) explored the impact of The Royal Children's Hospital Complex Care Hub (CCH) on hospital service utilisation rates over a 3-year period for children with medically complex CP compared with those eligible but received routine care, and (ii) compared health, disability and socio-demographic characteristics of children and their families in both groups. **Methods:** Electronic medical record data from 78 children (mean age 9.43 years, females  $n = 37$ ) with medically complex CP who accessed CCH services, and 92 (mean age 10.86 years, females,  $n = 39$ ) who received routine care were included. Multivariable regression was used to analyse service utilisation: number of emergency department (ED) presentations, length/number of inpatient and intensive care unit admissions and number/type of hospital appointments. Critical health-care needs, functioning/disability profile and child/family demographics for each group were compared. **Results:** More children in the CCH group had a mixed motor type (73.1% vs. 15.2%), were classified within Gross Motor Function Classification System level V (76.9% vs. 34.8%), had respiratory, nutrition and social support needs and epilepsy. Children receiving CCH services had higher service utilisation rates; ED presentations (rate ratio (RR) = 1.81, 95% confidence interval (CI): 1.09-3.01), inpatient admissions (RR = 2.77, 95% CI: 2.01-3.83), outpatient encounters (RR = 1.69, 95% CI: 1.31-2.18) and telephone encounters (RR = 6.05, 95% CI: 4.56-8.02). **Conclusions:** Children with medically complex CP accessing a complex care service have higher service utilisation rates yet have more complex clinical presentations and higher support needs.

PMID: [39385404](#)

### 30. Caring for children with cerebral palsy: A commentary on cerebral palsy in children: a clinical practice review

Emily Boone

Curr Probl Pediatr Adolesc Health Care. 2024 Oct 8:101701. doi: 10.1016/j.cppeds.2024.101701. Online ahead of print.

No abstract available

PMID: [39384457](#)

### 31. Health-related quality of life in children and adolescents born very preterm and its correlates: a cross-sectional study

Sarah R Haile, Gabriela P Peralta, Mark Adams, Ajay N Bharadwaj, Dirk Bassler, Alexander Moeller, Giancarlo Natalucci, Thomas Radtke, Susi Kriemler

Observational Study BMJ Paediatr Open. 2024 Oct 10;8(1):e002885. doi: 10.1136/bmjpo-2024-002885.

**Objective:** We aimed to assess health-related quality of life (HRQOL) in a cohort of very preterm born children and adolescents (aged 5-16), and to compare it with their fullterm born siblings and the general population. We also explored correlates of HRQOL among the very preterm born. **Design:** Cross-sectional survey. **Patients:** Children born <32 weeks gestation ( $N=442$ ) as well as their fullterm born siblings ( $N=145$ ). **Main outcome measures:** Primary outcome was KINDL total score (0 worst to 100 best), a validated multidimensional measure of HRQOL in children and adolescents. **Methods:** Linear mixed models accounted for family unit. Secondary analysis compared very preterm born children to another cohort of healthy children from the same time period. A classification tree analysis explored potential correlates of HRQOL. **Results:** On

average, preterm children, both <28 and 28-31 weeks gestational age, had similar KINDL total score to fullterm sibling controls (-2.3, 95% CI -3.6 to -0.6), and to population controls (+1.4, 95% CI 0.2 to 2.5). Chronic non-respiratory health conditions (such as attention deficit hyperactivity disorder or heart conditions, but not including cerebral palsy), age and respiratory symptoms affecting daily life were key correlates of HRQOL among very preterm born children. Conclusions: Very preterm birth in children and adolescents was not associated with a relevant reduction in HRQOL compared with their fullterm born peers. However, lower HRQOL was explained by other factors, such as older age, and the presence of chronic non-respiratory health conditions, but also by possibly modifiable current respiratory symptoms. The influence of respiratory symptom amelioration and its potential influence on HRQOL needs to be investigated further. Trial registration number: NCT04448717.

PMID: [39389623](#)

### 32. Maternal adiposity and perinatal and offspring outcomes: an umbrella review

Ziyi Yang, Gengchen Feng, Xueying Gao, Xueqi Yan, Yimeng Li, Yuteng Wang, Shumin Li, Yonghui Jiang, Shigang Zhao, Han Zhao, Zi-Jiang Chen

Nat Hum Behav. 2024 Oct 11. doi: 10.1038/s41562-024-01994-6. Online ahead of print.

Maternal adiposity deleteriously affects obstetrical health and has been associated with long-term adverse consequences in offspring. Here we conducted an umbrella review encompassing 194 observational meta-analyses, 10 Mendelian randomization studies and 748 interventional meta-analyses to appraise the published evidence on the associations between maternal adiposity and perinatal and offspring outcomes. Evidence grading suggested that 17 (8.8%) observational meta-analyses were supported by convincing evidence for 12 outcomes: maternal adiposity was associated with an increased risk of caesarean delivery following labour induction, infant mortality, Apgar score <7 at 1 min, antenatal depression, offspring overweight and obesity, early timing of puberty onset in daughters, attention deficit hyperactivity disorder, cerebral palsy, congenital heart disease and spina bifida (OR/RR ranging from 1.14 to 2.31), as well as increased offspring body fat percent and fat mass (SMD 0.31 and 0.35, respectively). Among these outcomes, interventional meta-analyses supported that maternal weight loss interventions significantly reduced the risk of antenatal depression but not low Apgar scores; these interventions also could not reduce offspring fat mass or body fat percent. Evidence from Mendelian randomization studies supported a causal relationship between maternal adiposity and gestational diabetes mellitus, preeclampsia, birth size and offspring adiposity. Our findings highlight that while observational meta-analyses reveal associations between maternal adiposity and various adverse perinatal and offspring outcomes, convincing, unbiased evidence or support from Mendelian randomization studies is limited. Maternal pre-conceptional and prenatal weight loss interventions can reduce some, but not all, of these adverse effects.

PMID: [39394444](#)

### 33. Incontinentia pigmenti

Tena Rosser

Review Semin Pediatr Neurol. 2024 Oct;51:101156. doi: 10.1016/j.spen.2024.101156. Epub 2024 Sep 12.

Incontinentia pigmenti (IP) is a rare X-linked dominant, multi-system genetic disorder characterized by evolving skin lesions that occurs almost exclusively in females. Additional manifestations most often involve embryologically-derived ectodermal tissues including the central nervous system (CNS), eyes, hair, teeth and nails. IP is associated with a wide range of neurologic abnormalities, several of which can be associated with significant morbidity. In the neonatal period, while the pathophysiology is poorly understood, inflammatory microvascular changes can lead to ischemic strokes in non-vascular territories and acute disseminated encephalomyelitis, resulting in serious chronic neurologic sequelae such as epilepsy, cerebral palsy and intellectual disability. Additional neuroimaging findings may include periventricular and subcortical white matter abnormalities and cerebral as well as cerebellar dysgenesis. Advancements over time have allowed for improved phenotyping, identification of the causative IKBKG pathogenic variant, creation and refinement of clinical diagnostic criteria and the development of management guidelines which promote multi-disciplinary care. Due to frequent CNS involvement, neurologists play a critical role in the treatment of individuals with IP throughout the lifespan.

PMID: [39389657](#)