Cerebral palsy research news

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Interventions and Management

Interventions and Management

1.Feasibility of HABIT-ILE@home in children with cerebral palsy and adults with chronic stroke: A pilot study

Edouard Ducoffre, Carlyne Arnould, Merlin Somville, Zélie Rosselli, Geoffroy Saussez, Yannick Bleyenheuft

PLOS Digit Health . 2025 May 8;4(5):e0000850. doi: 10.1371/journal.pdig.0000850. eCollection 2025 May.

Introduction: Children with cerebral palsy (CP) and adults with chronic stroke (CS) usually have disabilities in voluntary motor control. Hand-Arm Bimanual Intensive Therapy Including Lower Extremities (HABIT-ILE), an evidence-based therapy, has always been provided during day camps. This pilot study investigates if HABIT-ILE@home, a remote neurorehabilitation, is feasible for children with CP and adults with CS.
Methods: Four children with CP (5-18y) and three adults with CS were recruited. They received 15h (5x3h) of HABIT-ILE@home provided by a caregiver with a remote supervision of 30min at the beginning and end of each session. A large touch screen, the REAtouch Lite, was used as a support for the therapy. An interview based on a questionnaire (n = 73 items for CP/ n = 74 items for stroke patients; scored from 0 "disagree" to 3 "agree", a higher rating meaning a more positive aspect of the therapy) was conducted with patients and their caregivers after 15h of supervised home-therapy to assess their adherence to the treatment and the feasibility of HABIT-ILE@home. Performance and satisfaction in achieving functional goals were assessed before and after the intervention using the Canadian Occupational Performance Measure (COPM).
Results: Caregivers felt sufficiently supported by the supervision team (medians = 3) to carry out HABIT-ILE@home sessions thanks to an adequate clinical supervision (CP median = 2.6; CS median = 2.9). HABIT-ILE principles were transferable at patients' home (CP median = 2.6; CS median = 2.8). The impact of the therapy on daily organization was more problematic for children's caregivers (median = 1.5) than for adults' caregivers (median = 3). Children with CP enjoyed the therapy (median = 2) but felt that it was too long (median = 1) and significant fatigue was present (median = 1.3). CS adults did not find the therapy fun (median = 1) but considered it as extremely useful (median = 3). Although the motivational source differed between children and adults, this did not seem to strongly affect adherence to treatment. Performance and satisfaction in achieving functional goals improved over the MCID (2 points) for all CS participants and for 3 out 4 CP children.
Conclusion: HABIT-ILE@home seems to be feasible for children with CP and adults with CS. It may allow more patients to benefit from an efficient neurorehabilitation, whatever sanitary conditions or patients' home geographical locations.
PMID: 40338898

2.Interventions to Promote Bimanual Activities and Participation in Daily Life Activities in Children with Cerebral Palsy: A Scoping Review

Anne Claire David, Laura Fournier-Poisson, Maxime T Robert, Marika Demers

Review Phys Occup Ther Pediatr . 2025 May 8:1-16. doi: 10.1080/01942638.2025.2493118. Online ahead of print.

Aims: To identify rehabilitation interventions and outcome measures that target bimanual activities and autonomy in activities of daily living (ADLs) in children with cerebral palsy.
Methods: This scoping review followed the Arksey and O'Malley framework. The literature search was conducted in five medical databases. Inclusion criteria were studies of children with cerebral palsy that delivered rehabilitation interventions targeting upper limb function and used valid outcome measures assessing bimanual activities or ADLs. The exclusion criteria were pharmacological or surgical interventions, reviews, expert opinions, protocols and qualitative studies. Two independent researchers screened titles/abstracts and full texts. Data related to the study participants, interventions, outcome measures and results were extracted.
Results: Eighty-nine publications were included in this review. Out of the 17 interventions identified, the most frequent were constraint-induced movement therapy (n = 29), virtual reality (n = 22), hand-arm bimanual intensive training (n = 12), bimanual intensive training (n = 11) and action observation (n = 6). All five interventions showed significant improvements on bimanual function, whereas all but action observation showed improvements in autonomy in ADLs. We identified 15 outcome measures capturing bimanual activities and 6 capturing autonomy in ADLs.
Conclusion: This scoping review provides essential information for the improvement of rehabilitation interventions for children with cerebral palsy.
PMID: 40336491

3.What happens to the hip after scoliosis surgery in neuromuscular patients? Analyzing factors linked to pain, displacement, and need for surgery

Carmen Martínez-González, María Galán-Olleros, Laura Olías-Ortiz, Ana Ramírez-Barragán, Rosa M Egea-Gámez, Rafael González-Díaz, Ignacio Martínez-Caballero

Spine Deform . 2025 May 5. doi: 10.1007/s43390-025-01097-w. Online ahead of print.

Introduction: Patients with neuromuscular diseases frequently develop hip displacement (HD) and scoliosis, creating complex challenges in determining the optimal treatment strategy and sequence. This study aims to assess the frequency of new hip problems, including pain and HD progression, as well as the need for additional hip surgery following scoliosis correction in neuromuscular patients, and to identify predictive factors for these issues.
Methods: This retrospective study included 71 neuromuscular patients (142 hips) who underwent posterior spinal fusion (PSF) at a specialized center between 2015 and 2022. Clinical data such as age, sex, underlying pathology, ambulatory status, and prior hip surgeries were collected. Radiological parameters, including curve characteristics, coronal imbalance, Cobb angle, pelvic obliquity (PO), and migration percentage (MP), were measured pre- and post-operatively. Descriptive, comparative, and multivariate analyses, including logistic regression, were performed to identify significant predictors and determine optimal cutoff points.
Results: The mean age of patients was 15 ± 2 years, with 59% female and 84.5% nonambulatory. After scoliosis surgery, 15.5% of hips developed new hip problems: 20 hips experienced pain and 9 had HD progression, with 7 requiring additional surgery (3 reconstructive and 4 palliative). Factors including a preoperative up-hip and increased MP, with a cutoff > 25%, were strong predictors of hip pain. HD progression was linked to a postoperative up-hip and increased MP, with MP > 60% emerging as a critical predictor. The need for additional hip surgery was associated with cerebral palsy (CP) and with increased MP.
Conclusions: Approximately 1 in 7 hips developed new-onset problems following PSF in neuromuscular patients. Factors including a preoperative up-hip and increased MP were significant predictors of adverse outcomes, underscoring the importance of thorough preoperative assessment, personalized surgical planning, and proactive counseling regarding potential postoperative complications.
PMID: 40325335

4.Failure of Split Posterior Tibial Tendon Transfer in Cerebral Palsy Complex Foot Deformities: A Review of Failure Definitions and Risk Factors for Failure

Hussein Hashem, Joseph Hayek, Hassan Abou Adma, Karim Gaber, Waleed Kishta

Review Curr Rev Musculoskelet Med . 2025 May 3. doi: 10.1007/s12178-025-09975-6. Online ahead of print.

Purpose of review: This review examines variability in failure and recurrence rates following split posterior tibial tendon transfer (SPOTT) for spastic equinovarus deformity (SED) in children with cerebral palsy (CP). It evaluates patient-specific and surgical risk factors contributing to poor outcomes and assesses the inconsistent definitions of failure across the literature.
Recent findings: Across the seven included studies, failure was more common in patients under the age of 8, non-ambulatory individuals, and those with quadriplegic CP. Surgical contributors included poor tendon tensioning, residual spasticity, over- or under-correction, and untreated bony deformities. Although modified techniques demonstrated improved outcomes, the risk of recurrence was not completely eliminated. All studies consistently lacked standardized definitions of surgical failure and recurrence, limiting cross-study comparability. Postoperative management strategies-particularly structured bracing protocols and delaying surgery until after age 8-were associated with more favorable outcomes. SPOTT remains a viable surgical option for dynamic SED in children with CP, but long-term success is highly dependent on careful patient selection, surgical expertise, and consistent postoperative care. Inconsistent definitions of recurrence and failure remain a major barrier to improving clinical outcomes and conducting meaningful comparative research. To enhance clinical decision-making and guide future studies, a standardized grading system should be urgently developed and adopted in the field
PMID: 40317424

5.Gait profiles of children and adolescents with cerebral palsy according to their gross motor levels

Rejane Vale Gonçalves, Marina Barbosa Mendes, Priscilla Rezende Pereira Figueiredo, Renan Alves Resende, Sérgio Teixeira da Fonseca, Marisa Cotta Mancini, Marina de Brito Brandão

J Bodyw Mov Ther . 2025 Jun:42:313-318. doi: 10.1016/j.jbmt.2024.12.028. Epub 2024 Dec 28.

Introduction: Understanding gait alterations of children and adolescents with cerebral palsy (CP) classified at different levels of the Gross Motor Function Classification System (GMFCS) contributes to properly guided clinical reasoning. This study aims to identify a set of gait parameters that elucidate the gait profiles of children and adolescents with unilateral and bilateral spastic cerebral palsy (USCP; BSCP), according to their GMFCS level.
Method: Cross-sectional study, 115 children/adolescents aged 7-17 years, GMFCS I-III, were evaluated using the Edinburgh Visual Gait Score. Categorical principal component (PC) analysis grouped gait deviations by CP type and GMFCS levels. Mann Whitney and One-Way ANOVA compared the PC scores between GMFCS I-II (USCP) and I-III (BSCP).
Results: Two PCs explained 51.3% of the gait deviation variance (USCP). Individuals with GMFCS II showed alterations in their foot, knee, hip, and trunk joints in sagittal plane, that differentiate them from level I ($p = 0.029$). Among participants with BSCP, three PCs explained 53.3% of the variance. GMFCS II ($p = 0.007$) and III ($p = 0.004$) differed from level I in all lower limb joints, pelvis, and trunk.
Discussion: Individuals with USCP/GMFCS II have a more flexed gait pattern than those with USCP/GMFCS I. Similarly, individuals with BSCP/GMFCS II and III showed alterations typically found in those with a crouch gait pattern.
Conclusion: The alterations that can differentiate groups of functional mobility should be carefully evaluated, as these alterations are likely to cause greater functional impact in one group than in another.
PMID: 40325685

6.The effects of vestibular rehabilitation on preterm children with spastic hemiparetic cerebral palsy: Case report

Merve Kurt-Aydin, Pelin Atalan Efkere, Tülay Tarsuslu

Case Reports J Bodyw Mov Ther . 2025 Jun:42:297-301. doi: 10.1016/j.jbmt.2024.12.034. Epub 2024 Dec 27.

Introduction: Cerebral Palsy (CP), a common neurodevelopmental disorder, impacts the developing brain and leads to motor, postural, and sensory impairments in children. Since sensory processing, especially vestibular input, is crucial for balance, coordination, and movement quality, this case report aimed to investigate the effects of vestibular rehabilitation on muscle tone, motor function, and development in two preterm children with spastic hemiparetic CP.
Materials and methods: Demographic information and birth history were recorded, and assessments were conducted at the beginning and end of the 10-week vestibular rehabilitation program. Muscle tone was evaluated using the Modified Ashworth Scale (MAS), while motor development was measured with the Denver II Developmental Screening Test (DDST II) and the Alberta Infant Motor Scale (AIMS).
Results: After the 10-week vestibular rehabilitation program, both cases showed improvement on the DDST II: the first case in fine motor-adaptive, language, and gross motor areas; the second in personal-social, language, and gross motor areas. Upper extremity hypertonus scores decreased by 2 and 3 points, and lower extremity hypertonus by 5 points in each case. Additionally, total AIMS scores increased from 22 to 28 in the first case and from 16 to 23 in the second.
Conclusions: This case report suggests that vestibular rehabilitation may be beneficial in improving motor function and reducing hypertonus in preterm infants with spastic CP. These positive findings indicate that incorporating vestibular rehabilitation could enhance outcomes in the rehabilitation of children with CP.
PMID: 40325683

7.An overview of systematic reviews on the efficacy and safety of osteopathic techniques

Carolin R Zipp, Thomas Semlitsch, Gregor Tögel, Cornelia Krenn, Christine Loder, Klaus Jeitler, Andrea Siebenhofer

Review J Bodyw Mov Ther . 2025 Jun:42:1186-1197. doi: 10.1016/j.jbmt.2025.03.018. Epub 2025 Mar 17.

Objective: To investigate the efficacy and safety of manipulative osteopathic techniques in persons of all ages with various medical indications.
Design: Overview of systematic reviews and meta-analyses.
Method: We conducted a systematic literature search for systematic reviews of randomized controlled trials in English or German that compared osteopathic interventions to no treatment, sham treatment or any other non-osteopathic treatment, in bibliographic databases and other sources.
Results: We included 27 systematic reviews covering nine therapeutic indications. Based on moderate quality of evidence, osteopathic treatment was an effective means of reducing pain and partially improving physical function in adults with acute neck pain, chronic non-specific low back pain, low back pain in pregnancy, and chronic non-oncologic pain. It can also shorten the length of hospital stays in premature infants. Furthermore, osteopathic treatment may relieve symptoms in adults with chronic neck pain, postpartum low back pain, migraine, and irritable bowel syndrome, and it may help children with otitis media. It did not appear to provide relief to adults with acute non-specific low back pain, fibromyalgia, headaches of various causes, women with lower urinary tract symptoms, and children with cerebral palsy. Evidence for other indications like vertigo, chronic obstructive pulmonary disease, hypertension, gynecological or birth-related complaints, and a number of pediatric indications was insufficient to draw firm conclusions.
Conclusion: Manipulative osteopathic techniques appears to be particularly effective in musculoskeletal conditions. Overall, the evidence base for the outcomes of manual osteopathic treatment has improved, despite heterogeneous studies that are partly of poor methodological quality.
PMID: 40325655

8.Childbirth for females with cerebral palsy

Bernard Dan

Dev Med Child Neurol . 2025 May 9. doi: 10.1111/dmcn.16362. Online ahead of print.

No abstract available
PMID: 40346013

9.Cerebral Palsy and Ankyloglossia: Improved Sleep, Speech, Swallowing, and Breathing After Tongue-Tie Release: A Case Series

Richard Baxter, Robyn Merkel-Walsh

Case Reports Spec Care Dentist . 2025 May-Jun;45(3):e70046. doi: 10.1111/scd.70046.

Aims: To assess the impact of tongue-tie (ankyloglossia) and lip-tie release on functional outcomes in pediatric patients with cerebral palsy (CP) and explore the role of oral restrictions in hindering therapy progress.
Methods: Four female patients with CP, aged 10 months, 3 years, 6 years, and 7 years, underwent tongue-tie release with concomitant lip-tie and/or buccal-tie release. Pre- and postprocedure assessments focused on parental reports of quality of life improvements.
Results: All four patients demonstrated significant functional improvements following the release procedures. Reported improvements included better speech clarity, more effective swallowing, improved breathing, increased postural balance, reduced fascial tension, alleviation of gastrointestinal symptoms, and improved sleep patterns. These changes were observed consistently across all patients, suggesting a positive correlation between the release of oral restrictions and functional gains in children with CP.
Conclusions: Undiagnosed oral restrictions may impair mobility and development in children with CP. Addressing these restrictions may improve speech, swallowing, and other critical functions. Proper assessment of oral restrictions in children with CP or other comorbidities is essential to optimize therapeutic outcomes and enhance quality of life. This case series highlights the importance of considering oral restrictions in children with special healthcare needs and the ongoing need for further research.
PMID: 40326489

10.How to identify children with cerebral palsy at risk of low bone mineral density

Marianne Lindblad Pedersen, Johan Sebastian Ohlendorf, Thomas Alexander Gerds, Nanette Mol Debes, Christina Engel Hoei-Hansen, Bo Zerahn, Jesper Johannesen

Bone . 2025 May 6:197:117515. doi: 10.1016/j.bone.2025.117515. Online ahead of print.

Aim: Cerebral palsy is a common chronic motorically disabling condition in children. The aim of this study was to determine prevalence of low bone mineral density (BMD) in children with cerebral palsy and to examine the association between BMD with risk factors.
Methods: Cross sectional study of children with cerebral palsy analyzing Dual X-ray Absorptiometry, blood tests, full clinical medical examination including Tanner stage and nutritional status, measurement of anthropometrics and assessment of physical activity.
Results: The 81 participants were aged 2.1-17.4 years (median 9 years) and 64 out of 81 had a mild cerebral palsy (Gross Motor Function Classification System score of I-II). Mean BMD z-score was -0.2 (SD = 1.05, range -4.6 to 2.0). GMFCS score was negatively associated with BMD ($p < 0.01$) as higher score led to 1.43 SD lower BMD [-1.97 to -0.89]. Weight bearing activity was negatively associated with lower BMD z-score ($p = 0.01$), as having <30 min of weight bearing activity per day lead to 0.98 SD lower BMD [-1.75; -0.22]. Use of anti-seizure medication was negatively associated with BMD (BMD z-score 0.7 SD lower; $p = 0.02$, [-1.28; -0.12]). Serum vitamin D levels or fracture rates were not statistically significantly associated with BMD changes.
Conclusion: We found 17 % of children have low BMD regardless of motoric impairment level. GMFCS score, Sparse weight bearing activity and use of anti-seizure medicine were negatively associated to BMD. No significant associations were found with vitamin D, sex, BMI, puberty.
PMID: 40339775

11.A Pilot Investigation on the Relationship Between Infant Vocal Characteristics at 12 Months and Speech Motor Impairment at 4-5 Years

Helen L Long, Sydney Jensen, Katherine C Hustad

J Speech Lang Hear Res . 2025 May 5:1-13. doi: 10.1044/2025_JSLHR-24-00340. Online ahead of print.

Purpose: The objective of this pilot study was to investigate the relationship between infant vocal characteristics and later speech motor impairment in children at risk for cerebral palsy (CP) to inform the early prediction of speech motor impairment.
Method: Vocal complexity, volubility, and consonant inventories of 13 infants at risk of CP were examined at approximately 12 months. We examined their association with later levels of speech motor impairment as measured by the Viking Speech Scale (VSS).
Results: Children in our sample with greater speech motor impairment at age 4 years produced lower rates of developmentally complex vocalizations in infancy but showed no significant differences in vocal stage attainment, volubility, or consonant diversity.
Conclusions: Our results are in line with trends found in prior literature examining vocal characteristics of infants at risk for speech motor involvement. These results can inform data-driven hypotheses in future studies aimed at the early prediction of speech motor impairment through the study of infant vocal production.
PMID: 40324156

12.Analysis of multichannel intraluminal impedance and pH monitoring values in children with cerebral palsy: A comparative multicenter study

Cristina Lorenzo, Cecilia Zubiri, Anabella Zosi, Sandro Miculan, Daniela Neder, Ana Rocca, Judith Cohen Sabban, Roman Bigliardi, Maria Florencia Biasoli, Manuela Manterola, Maria de Los Angeles Savia, Luis Orlando Perez, Carlos Ruiz Hernández, Renata Weinschelbaum, Ana Cristina Fontenele Soares, Soraia Tahan, Veronica Plante, Christian Boggio, Soledad Arcucci, Erick Toro Monjaraz, Maria Alejandra Mortarini, Samantha Arrizabalo, Miguel Saps

J Pediatr Gastroenterol Nutr . 2025 May 6. doi: 10.1002/jpn3.70058. Online ahead of print.

Objectives: To compare the features of multichannel intraluminal impedance and pH monitoring (MII-pH) tracings in children with cerebral palsy (CP) and children without CP.
Methods: Multicenter, retrospective, analytical study. We examined tracings of children aged 1 to 15 years old, evaluated from May 2017 to January 2024. Population included two groups: Group 1 consisted of children with CP, while control group comprised children without CP who had extra-digestive symptoms suggestive of gastroesophageal reflux disease (GERD) but normal MII-pH results. Quantitative data were analyzed using analysis of variance and t tests. Qualitative data were analyzed using contingency tables and chi-square tests.
Results: We studied 245 children. CP group included 110 children with a mean age of 5.71 years (standard deviation [SD] ± 4.24), while control group included 135 children with a mean age of 5.73 years (SD ± 3.39). The CP group had fewer reflux episodes ($p = 0.0015$), slower mean acid clearance time ($p = 0.04$), lower mean baseline impedance and mean nocturnal baseline impedance ($p = 1.82e-07$ and $p = 7.50e-07$).
Conclusion: Children with CP have fewer reflux episodes and longer acid clearance times compared with children without CP. Prospective studies including esophagogastroduodenoscopy findings are needed to establish MII-pH reference values in children with CP.
PMID: 40329476

13.Prevalence of sleep problems in children with cerebral palsy: A systematic review and meta-analysis

Zain Ali Nadeem, Obaid Ur Rehman, Umar Akram, Muhammad Ali Iftikhar, Hamza Irfan, Eeshal Fatima, Hiba Imran, Sonia Hurjkaliani, Alishba Khan

Review Sleep Med . 2025 May 2:132:106552. doi: 10.1016/j.sleep.2025.106552. Online ahead of print.

Background: Children with cerebral palsy (CwCP) often struggle with sleep issues, which has a serious negative influence on their general health and quality of life. There are insufficient data on the prevalence of various sleep disorders, even though recognising and treating them is vital.
Objectives: Determining the prevalence of sleep disorders in CwCP is the primary objective of this systematic review and meta -analysis.
Methods: An electronic search was conducted on MEDLINE, Embase, Scopus, ScienceDirect, and Web of Science for all relevant articles using pre-specified eligibility criteria. Pooled proportions of CwCP having sleep problems were calculated in a random effects model using R version 4.3.2.
Results: The updated systematic review and meta-analysis included 42 studies. The Sleep Disturbance Scale for Children (SDSC) showed abnormal scores in 26 % (95 % CI: 17 %-37 %) of children with CP. Subscale abnormalities included disorders of initiation and maintenance of sleep (28 %), sleep breathing disorders (17 %), excessive somnolence (12 %), sleep hyperhidrosis (10 %), and sleep-wake transition disorders (19 %). The Paediatric Sleep Questionnaire (PSQ) indicated abnormal scores in 39 % (95 % CI: 6 %-80 %) of children. Sensitivity analyses confirmed these findings, though some publication bias was noted in the PSQ outcome.
Conclusion: About a quarter of CwCP have experienced sleep problems, which may deteriorate their quality of life. In order to improve the quality of life for CwCP, regular sleep examinations and focused therapies are necessary.
PMID: 40328188

14.Computer Vision Technologies in Movement Disorders: A Systematic Review

Pasquale Maria Pecoraro, Luca Marsili, Alberto J Espay, Matteo Bologna, Lazzaro di Biase

Review Mov Disord Clin Pract . 2025 May 6. doi: 10.1002/mdc3.70123. Online ahead of print.

Background: Evaluation of movement disorders primarily relies on phenomenology. Despite refinements in diagnostic criteria, the accuracy remains suboptimal. Such a gap may be bridged by machine learning and video technology, which permit objective, quantitative, non-invasive motor analysis. Markerless automated video-analysis, namely Computer Vision, emerged as best suited for ecologically-valid assessment.
Objectives: To systematically review the application of Computer Vision for assessment, diagnosis, and monitoring of movement disorders.
Methods: Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines, we searched Cochrane, Embase, PubMed, and Scopus databases for articles published between 1984 and September 2024. We used the following search strategy: ("video analysis" OR "computer vision") AND ("Parkinson's disease" OR "PD" OR "tremor" OR "dystonia" OR "parkinsonism" OR "progressive supranuclear palsy" OR "PSP" OR "multiple system atrophy" OR "MSA" OR "corticobasal syndrome" OR "CBS" OR "chorea" OR "ballism" OR "myoclonus" OR "Tourette's syndrome").
Results: Out of 1099 identified studies, 61 met inclusion criteria, and 10 additional studies were included based on authors' judgment. Parkinson's disease was the most investigated movement disorder, with gait as the prevalent motor task. OpenPose was the most used pose estimation software. Automated video-analysis consistently achieved diagnostic accuracies exceeding 80% across most movement disorders. For tremor, dystonia severity and tic detection, Computer Vision strongly aligned with accelerometery and clinical assessments.
Conclusions: Computer Vision holds potential to provide non-invasive quantification of presence and severity of movement disorders. Heterogeneity in video settings, software usage, and definition of standardized guidelines for videorecording are challenges to be addressed for real-word applications.
PMID: 40326633

15.Effect of immersive virtual reality on overground gait stability in children with cerebral palsy: A prospective case-control study

Regine Lohss, Morgan Sangeux, Rosa M S Visscher, Rebecca Winter, Michelle Gwerder, Norbert Zentai, Philippe Cattin, Elke Viehweger

Hum Mov Sci. 2025 May 7:101:103359. doi: 10.1016/j.humov.2025.103359. Online ahead of print.

Purpose: To evaluate the effect of walking in a virtual world, particularly on a virtual plank at varying heights, on gait stability in children with cerebral palsy (CP) and typical development (TD).
Method: Twenty-two participants with CP (13 males; 11 years 2 months) and twenty-four with TD (10 males; 11 years 11 months) were included. After undergoing clinical gait analysis, participants were immersed in VR via a head-mounted display and walked on a virtual plank at varying heights. Linear mixed-effect models were fitted for: margin of stability (MoS), whole-body angular momentum (WBAM), single limb support % (SLS), variability of step length (SLV), stride width (SWV), and kinematics (GaitSD). Fixed effects were group (CP vs. TD), condition (walking in the real world vs. virtual world) and virtual height.
Results: GaitSD and SWV were positively correlated with VR, and lateral MoS was negatively correlated. Lateral MoS and coronal WBAM were positively correlated with CP and VR, while anterior MoS and sagittal WBAM were negatively correlated. Lateral MoS was positively correlated with height in CP, while anterior MoS, sagittal WBAM, SLS, SLV and SWV were negatively correlated.
Conclusions: Virtual heights induced gait instability, which was more pronounced in CP than TD. WBAM, SLV, and SLS were the most appropriate biomarkers for defining gait instability.
PMID: 40339470

16.Effect of virtual reality on improving arm function in individuals with cerebral palsy: an overview of meta-analyses

Yuping Chen, Jin Xu, Ayanna Howard

Review Dev Neurorehabil . 2025 May 7:1-9. doi: 10.1080/17518423.2025.2499803. Online ahead of print.

Abstract
This overview was to understand the impact of virtual reality (VR) on upper-extremity function in individuals with cerebral palsy (CP). A systematic literature search was conducted using electronic databases (e.g. PubMed, Web of Science) and a manual search of the reference lists of each article. The quality of meta-analysis, average effect size, heterogeneity, and moderators were extracted and evaluated. Thirteen meta-analyses were included, with only one review (7.7%) rated High and the rest rated Critical Low (53.8%) or Low (38.5%). Immediate post-VR effect ranged from medium to large effect with an average effect of 0.69: VR showed a large effect of arm function (0.81) but a small effect of hand function (0.43). Short-term VR effect was inconsistent. Most meta-analyses showed moderate to substantial heterogeneity. VR seems to be a viable intervention to improve arm function, but further studies with vigorous design are needed.
PMID: 40331367

17.Vaccination and its social and behavioural drivers in children with disability in Fiji

Israt Jahan, Unise Vakaloloma, Sureni Perera, Ilisapeci Tuibeqa, Rachel Devi, Litiana Volavola, William May, Donald Wilson, Lanieta Tuimabu, Rosalie Power, Susan Woolfenden, Margie Danchin, Sarah McIntyre, Hayley Smithers-Sheedy, Nadia Badawi, Kristine Macartney, Gulam Khandaker, Meru Sheel

BMJ Glob Health. 2025 May 8;10(5):e017510. doi: 10.1136/bmjgh-2024-017510.

Introduction: Data on the vaccination of children with disabilities are limited across Pacific Island countries like Fiji. This study aimed to examine the vaccination status and measure the social and behavioural drivers influencing vaccination of children with disability in Fiji.
Methods: A cross-sectional survey was conducted in Suva-Nausori area, Rewa, Fiji among children with disabilities (eg, motor, vision, hearing, speech, intellectual, epilepsy) aged 2-19 years and their caregivers. Caregivers were interviewed using a questionnaire to collect data on sociodemographic, functional characteristics (UNICEF's child-functioning tool), child's vaccination status according to Fiji's National Immunisation Programme (NIP), and drivers of vaccination using the WHO-UNICEF Behavioural and Social Drivers Tool. Descriptive and regression analyses were undertaken.
Results: In April-May 2023, 198 children and their caregivers were recruited from the study area. The mean age of participating children was 7.6 years, 67.7% were male. Of the 198 children, 55% were fully vaccinated against all vaccines provided under the NIP. Percentage vaccination was highest for dose 1 of each NIP vaccine antigen and declined for subsequent doses. Vaccination against all NIP vaccines was significantly lower among children aged 15-19 years, those with hearing difficulties, and whose caregivers had low confidence in vaccine safety, whereas vaccination was higher among children with mobility difficulties.
Conclusion: Study findings highlight the need for equitable access to vaccines for children with disability who are vulnerable to infection from vaccine-preventable diseases. Policies and response plans should emphasise inclusiveness and assist children with disabilities to overcome access barriers within existing vaccination programmes.
PMID: 40345704

18.Respiratory admissions and impact of COVID-19 lockdowns for children with severe cerebral palsy

Susan M Reid, Moya Vendeleur, Danielle Wurzel, Katherine Frayman, Joshua Osowicki, Kylie Crompton, Gordon Baikie, Giuliana Antolovich, Angela Guzys, Monica S Cooper

Dev Med Child Neurol . 2025 May 8. doi: 10.1111/dmcn.16346. Online ahead of print.

Aim: To explore factors contributing to the burden of respiratory admissions in children with severe cerebral palsy (CP) by comparing admissions to a single tertiary paediatric hospital before, during, and after the period of social restrictions implemented to reduce transmission of COVID-19 (lockdown period).
Method: For this observational study, three severe CP cohorts (pre-lockdown, lockdown, post-lockdown) were identified from a state-wide cerebral palsy register and linked to patient-level clinical and demographic data. Medical records were manually searched to identify respiratory hospitalizations. Frequency and details of admissions were compared across the three 2-year periods.
Results: During the lockdown period, there were 24 hospitalizations for respiratory illness per 100 children compared to 37 and 47 in the pre-lockdown and post-lockdown periods ($p < 0.001$). Respiratory viruses (excluding picornaviruses) were detected in only 7% of lockdown admissions compared to 24% pre-lockdown and 30% post-lockdown. Sputum sampling was performed in 34% of admissions with gram-positive bacteria cultured in 6% admissions and gram-negative bacteria only in 18%.
Interpretation: The study findings highlight an important dynamic contribution of viral infections to respiratory illnesses in children with severe CP and the potential to improve outcomes with personalized approaches based on defining individual factors predisposing to recurrent respiratory admissions.
PMID: 40344424

19.Cerebral Palsy in a Rural Desert Population of Southern Algeria: A Cross-Sectional Study of Epidemiology of Comorbidities and Unmet Needs

Linda Bonezzi, Ilaria Accorinti, Francesca Maria Agostina Papoff, Maria Orsi, Giacomo D'Arcangelo, Emanuele Bartolini, Roberta Battini

J Child Neurol . 2025 May 8:8830738251336486. doi: 10.1177/08830738251336486. Online ahead of print.

Abstract
Background Cerebral palsy is a group of nonprogressive motor disorders resulting from early brain development impairment. Its prevalence is higher in low- and middle-income countries, where health care resources are limited. Data on cerebral palsy in refugee settings remain scarce, particularly in regions marked by prolonged displacement. Methods This cross-sectional study examined 29 children with cerebral palsy in the Sahrawi refugee camps in Tindouf, Algeria. Detailed demographic, medical history, neurological findings, and comorbidity data were collected during outpatient visits conducted as part of a humanitarian mission. Results Perinatal distress was reported in 65.5% of cases. Motor impairments were significant, with only 44.8% able to walk and 20.7% lacking head control. Language delays (65.5%), feeding difficulties (65.5%), and epilepsy (52%) were highly prevalent. Diagnostic evaluations, such as magnetic resonance imaging (MRI) and electroencephalography (EEG), were scarce and inconsistent. Access to rehabilitation services was discontinuous, and pharmacologic treatments for spasticity and pain were unavailable. Environmental factors, such as sandy terrain, further complicated mobility. Conclusion Cerebral palsy in the Sahrawi refugee camps reflects patterns seen in low- and middle-income countries but is exacerbated by displacement and resource scarcity. Improved access to early diagnosis, structured rehabilitation, and targeted pharmacologic therapies is urgently needed to address these unmet needs and improve outcomes for affected children.
PMID: 40340658

20.Immunization status of children with cerebral palsy: A cross-sectional hospital-based study in Vietnam

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Aim: To describe the immunization status of children with CP in Vietnam and identify factors associated with vaccine non-uptake in this group.
Methods: We conducted an active prospective case ascertainment of children with cerebral palsy (CP) attending the National Children's Hospital in Hanoi between June to November 2017, following the model proposed by the Paediatric Active Enhanced Disease Surveillance system in Australia. All children were assessed by trained paediatricians at the hospital and their immunization history was recorded.
Results: Data were collected from 765 children with CP (median age = 1.7 years, IQR = 2.7 years). Of these children, 82.7% were fully immunized for their age (compared to 96.4% of the general child population) according to the Vietnamese Expanded Programme on Immunization (EPI) schedule. A BCG vaccination scar was present in 94.0% of children with CP, and 95.9% of eligible children had received the measles-rubella vaccine as part of the national campaign (compared with 96.0% and 98.2% of the general population respectively). Incomplete vaccination according to the EPI was associated with younger age, living in an earth/sand house, homebirth, low-level maternal education, being diagnosed with CP before the age of three, having bilateral CP, having associated impairments (i.e., epilepsy, intellectual, visual, speech), being at level IV-V on the Gross Motor Function Classification System, and being undernutrition.
Conclusion: This is the first study to document the immunization status of children with CP in Vietnam. A large proportion had not received the measles-rubella vaccine and 17.3% were not fully immunized. To increase vaccination coverage, interventions and strategies are required to ensure that all children with CP have equitable access to early diagnosis, immunization, health education programs, outreach programs, and frequent follow-up. Early diagnosis and focused intervention in early life could further improve vaccination coverage in children with CP.
PMID: 40333874

21.Executive function in cerebral palsy: A transdiagnostic marker for neurodevelopmental complexity

Kelsie A Boulton, Adam J Guastella

Dev Med Child Neurol . 2025 May 7. doi: 10.1111/dmcn.16341. Online ahead of print.

No abstract available
PMID: 40342049

22.The silent majority: Adults with cerebral palsy and the research funding crisis

Riccardo Ribera

Dev Med Child Neurol . 2025 May 8. doi: 10.1111/dmcn.16360. Online ahead of print.

No abstract available
PMID: 40342040

23.The use of protein supplements in children with cerebral palsy: A scoping literature review

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Abstract
The aim of this scoping review was to examine the literature regarding the use of protein supplements to improve macroscopic muscle properties in a pediatric population in general, and more specifically in children with cerebral palsy. Based on our prospectively registered protocol (https://doi.org/10.17605/OSF.IO/8DM9G), a systematic literature search was performed in five databases and two clinical registers. Studies were selected by two independent reviewers using predefined selection criteria, and data were summarized using a data extraction form. A broader search on adults with cerebral palsy and the general pediatric population was considered to be relevant due to the limited number of studies conducted in children with cerebral palsy. After deduplication, 5207 records were identified and screened. A total of 18 publications were included in the current review. Two studies were performed in individuals with cerebral palsy, eight in healthy children, two in children with respiratory problems, one in critically ill children, one in children with end-stage liver disease, one in children and adolescents undergoing treatment for a pediatric malignancy, one in children with Pompe disease and two in children with Duchenne muscular dystrophy. The different muscle parameters reported were muscle volume, muscle mass, fat-free mass and fat-free mass index, lean body mass and lean body mass percentage, arm muscle area and muscle cross-sectional area of the arm, thigh and calf. The heterogeneity of the included studies and their moderate quality level made it difficult to draw solid overall conclusions. More research is needed on the use of protein supplements in children with cerebral palsy. However, supplementation with branched-chain amino acids, in particular leucine, might be promising.
PMID: 40338872

24.A human rights consideration of public involvement and phenomenological research

Paul Boyle, Graham Stew

Disabil Rehabil . 2025 May 7:1-7. doi: 10.1080/09638288.2025.2500071. Online ahead of print.

Purpose: The aim of this article is to encourage phenomenological research that involves members of the public to inform the design of research to ensure outputs are relevant whilst maintaining methodological integrity.
Method: This article explores the relevance of public involvement in research design and application. In particular, consideration of human rights is examined in relation to phenomenological research with some reflection on a study which explored the lived experience of transition from adolescence to adulthood for young people living with cerebral palsy.
Results: Methodological issues relating to public involvement, human rights, and the potential challenges this may present for phenomenological researchers are explored. Consideration is provided as to what public involvement might mean in terms of generating and analysing data and how phenomenological researchers understand core principles such as phenomenological reduction, the epoché, and Dasein, with examples provided as to what might be possible to promote public involvement.
Conclusion: With well-designed public involvement, phenomenological research might be regarded with greater credibility by rehabilitation professionals.
Plain language summary
Phenomenological research with a strong public involvement dimension is likely to be considered with greater creditability by rehabilitation professionals. Public involvement can be a significant strength in terms of designing studies more likely to provide relevant outputs. Meaningful consultation with people living with disability can enhance inclusivity in terms of recruitment in rehabilitation research.
PMID: 40331342

25.Towards Comprehensive and Accurate Recording of Cerebral Palsy Diagnoses in Registries: Challenges and Implications

Malika Delobel-Ayoub, Catherine Arnaud

Paediatr Perinat Epidemiol . 2025 May 6. doi: 10.1111/ppe.70018. Online ahead of print.

No abstract available
PMID: 40326047

26.A coadapted community-based participatory group programme for parents/carers of children with complex neurodisability (Encompass-2): a pilot and feasibility study protocol

Kirsten Prest, Angela Harden, Kirsten Barnicot, Michelle Heys

Pilot Feasibility Stud . 2025 May 3;11(1):59. Doi: 10.1186/s40814-025-01619-3.

Background: Parents/carers of children with complex neurodisability continue to lack appropriate family-centred care. "Encompass" is a community-based group programme that was co-adapted from "Baby Ubuntu" in Uganda. It is an example of a "decolonised healthcare innovation" as it is a low-cost solution from a low-income country for use in a resource-constrained UK National Health Service (NHS).
Methods and analysis: We will conduct a mixed-methods pilot feasibility study to determine the feasibility and acceptability of delivering and evaluating "Encompass" with parents/carers of children under 5 years with complex neurodisability in the UK. We aim to recruit 20 parents/carers of children from two NHS trusts in England serving urban areas where there is high social deprivation and ethnic diversity. Recruited parents/carers will attend the 10-modular, participatory group programme over a 6-month period. Groups will be facilitated by a trained allied health professional and an "expert parent" with lived experience. The primary outcomes of interest are the feasibility of delivering and evaluating the programme (recruitment, retention rates, acceptability as perceived by the parents/carers, facilitators and wider key NHS partners), intervention fidelity and participant adherence. Results will be collectively assessed against traffic light criteria. Pre-, post- and follow-up data collection questionnaires will include the Family Empowerment Scale (FES), the Power Ladder Question, the Parent Patient Activation Measure (P-PAM), Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS), EuroQoL-5D-5-level (EQ-5D-5L) and parent/carer greatest needs and goals questionnaire. Post-intervention semi-structured interviews will be conducted with parents/carers, facilitators and key NHS partners.
Discussion: A community-based participatory group programme is a potentially affordable and sustainable way for the NHS to provide family-centred support. The programme aims to improve outcomes for parents/carers of children with complex neurodisability. Example outcomes include knowledge, skills, confidence, wellbeing and quality of life. The programme also provides opportunities for peer support and aims to empower parents/carers in navigating community health systems.
Registration: The protocol is registered on clinical trials.gov (ID: NCT06310681).
Ethical approval: Health Research Authority ref. 23/EM/0213.
PMID: 40319319

Prevention and Cure

27.Midline Head Position for Preterm Infants in the First 72 h: A Pilot Randomised Control Trial

Traci-Anne Goyen, Hannah Skelton, Daphne D'Cruz, Rajesh Maheshwari, Bronwyn Edney, James Marceau, Patricia Viola,

Melissa Luig, Dharmesh Shah, Pranav Jani
J Paediatr Child Health . 2025 May 7. doi: 10.1111/jpc.70079. Online ahead of print.

Aim: Midline head positioning for preterm infants in the first 72 h of life may prevent intraventricular haemorrhage (IVH). The feasibility of conducting a RCT was explored, namely (1) acceptability of the recruitment and consenting process, (2) practicality of recruitment within 4 h after birth, (3) protocol compliance, and (4) staff satisfaction with the intervention.
Methods: An open-label, single centre, balanced 1:1 allocation, parallel-group pilot RCT was adopted. Inborn infants < 29 weeks admitted to the NICU with no IVH on screening ultrasound and parental consent obtained within 4 h after birth were randomised to either midline head and supine body position (intervention) or variable position (control) for 72 h, stratified according to gestation. Measures were recruitment rate, time to complete recruitment, protocol compliance audit, and staff satisfaction survey.
Results: Sixty participants were enrolled with a recruitment rate of 67%. Recruitment and intervention were commenced by 6 h. Compliance was 98% for midline head position. Nursing satisfaction was positive in 30/33 (91%). No safety issues were reported for stability, skin integrity, comfort, pain, and head preference.
Conclusion: It is feasible and safe to conduct a RCT to examine the neuroprotective effects of positioning the preterm infant in the first 72 h after birth.
Trial registration: Australian and New Zealand Clinical Trials Registry: ACTRN12619000276156.
PMID: 40331478