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Cerebral palsy research news

Monday 03 Febuarry 2025

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Interventions and Management

1.Affective touch enhances low gamma activity during hand proprioceptive perception in children with different neurodevelopmental conditions

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Front Hum Neurosci . 2025 Feb 11:19:1538428. doi: 10.3389/fnhum.2025.1538428. eCollection 2025.

Background: Gamma wave activity in the sensorimotor cortex is a critical neural mechanism associated with proprioceptive processing, which is essential for motor coordination, balance, and spatial orientation. The modulation of gamma oscillations by different types of tactile stimuli, including affective touch, is not well understood, particularly in children with neurodevelopmental disorders such as cerebral palsy and autism spectrum disorder.
Aims: This study aims to explore how affective touch influences gamma oscillatory activity and proprioceptive performance in children with typical development, cerebral palsy and autism spectrum disorders.
Methods and procedures: EEG data were recorded from participants during passive wrist mobilizations under three conditions: following an affective touch stimulus, after a non-affective touch stimulus, and with no tactile stimulation. Time-frequency analysis of low gamma activity (30-45 Hz) on the left somatosensory cortex was conducted for each condition. Proprioceptive performance was assessed through participants' accuracy in identifying wrist positions. Proprioception and pleasantness of affective and non-affective touch were also assessed.
Results: Affective touch increased proprioceptive gamma power density. Children with cerebral palsy had poorer proprioception and higher brain gamma power density for processing movement than children with typical development or autism, and their proprioception worsened with non-affective touch.
Conclusion and implications: These findings highlight the potential of affective touch to modulate gamma oscillatory activity and enhance proprioceptive function, particularly in children with cerebral palsy. The results underscore the importance of incorporating emotionally meaningful sensory inputs in therapeutic interventions to support proprioceptive and motor function in children with neurodevelopmental disorders.
PMID: 40007885

2.Radiological outcomes of surgical techniques for spastic hip in cerebral palsy: a systematic review and meta-analysis

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Meta-Analysis J Orthop Traumatol. 2025 Feb 28;26(1):13. doi: 10.1186/s10195-025-00827-0.

Background: In patients with cerebral palsy (CP), spastic hip is a prevalent complication. Various surgical approaches,, including pelvic osteotomy (PO), femoral osteotomy (FO), combined femoral and pelvic osteotomy (CFPO), and soft tissue surgery (STS), have been used to address this problem. This systematic review and meta-analysis was designed to compare the radiologic outcomes of these interventions for spastic hip in patients with CP.
Methods: To identify relevant studies, databases were searched using specific keywords. Initially, duplicates were removed, then the titles and abstracts were screened, followed by a comprehensive full-text review. Data extraction took place from the studies that met the inclusion criteria. Subsequently, a meta-analysis was conducted.
Results: The analysis of 6116 hips from 4546 patients across 81 studies demonstrated that PO significantly enhanced the center-edge angle (CEA), reduced the acetabular index (AI) and migration percentage (MP), and improved the Sharp and Tönnis angles. FO led to a substantial decrease in AI and MP, though CEA did not show a significant change, while CFPO resulted in significant improvements across AI, MP, neck-shaft angle (NSA), CEA, Sharp angle, and Tönnis angle. STS did not show significant changes in AI or CEA, but MP was notably reduced. Tone-decreasing procedures, such as selective dorsal rhizotomy and botulinum toxin injections, did not significantly alter MP, whereas guided growth techniques showed a significant reduction. MP improvements in FO decreased over time, with other radiologic parameters remaining relatively stable as follow-up increased. Age-specific trends indicated that children under 6 years primarily underwent tone-decreasing procedures and STS, while those around 7 years favored FO and guided growth, and older children (over 9 years) more commonly underwent PO, CFPO, or percutaneous osteotomy. Comparative analysis showed PO and percutaneous osteotomy were particularly more effective in reducing MP, with PO also being superior for AI improvement; whereas CFPO provided better outcomes for enhancing CEA. No significant differences were found among surgical methods for improving NSA.
Conclusions: This systematic review and meta-analysis underscores the superior efficacy of PO and CFPO in correcting spastic hip deformity in children with CP. Radiological outcomes demonstrate significant improvements following these procedures. The findings suggest that these approaches are particularly effective for complex cases where procedures such as FO, STS, or TDS may fall short. Future studies should focus on refining surgical protocols and exploring the long-term functional outcomes of these interventions.
PMID: 40021534

3.Incidence of Femur Fracture Post Hardware Removal in Children With Cerebral Palsy Who Have Undergone Varus Derotational Osteotomy

Parma E Montufar Wright, Luiz Carlos da Almeida Silva, Jason J Howard, Sarah Raab, Kenneth J Rogers, Amelia Lindgren, Freeman Miller, Arianna Trionfo, Michael Wade Shrader

J Pediatr Orthop. 2025 Feb 26. doi: 10.1097/BPO.0000000000002936. Online ahead of print.

Background: Children with cerebral palsy (CP) often undergo hip reconstruction through proximal femoral varus derotation osteotomy (VDRO), with orthopaedic implants used for fixation. Posthealing, hardware may be retained or removed, either reactively due to complications or prophylactically. The controversy surrounding implant removal persists. This study aimed to compare the rate of proximal femoral fractures in children with CP who retained their hardware versus those who had it removed after VDRO. A secondary aim was to identify fracture risk factors after VDRO and report complications related to hardware removal.
Methods: This retrospective study included 334 children who met inclusion (VDRO procedure) and exclusion (<2 y postoperative follow-up) criteria; 122 were eligible for the hardware removal group. Patients were followed from the initial VDRO to 2 years, hardware removal, or fracture. After removal, follow-up continued for a minimum of 2 years or until fracture. Frequency distribution summarized categorical variables, while mean and range were used for continuous variables. Median and interquartile range (IQR) was utilized for non-normally distributed data. $\chi 2$ testing determined fracture risk factors post-hardware removal, with a significance level set at P-value <0.05.
Results: Of 334 patients, 11 (3%) experienced a peri-implant fracture after VDRO; 8 (2%) occurred within 2 years. The median time to fracture was 1.3 years (IQR, 3.2; range, 0.0 to 12.4). In the hardware removal group, 10 (5%) of 212 patients fractured postremoval, all within 2 years. The mean time from removal to fracture was 0.48±0.65 years (range, 0.02 to 1.94). Significant risk factors included prior VDRO revision surgery (P=0.029) and hardware removal within 1 year post-VDRO (P=0.007).
Conclusion: No significant difference in fracture rates was found between the 2 groups. However, patients with prior revision surgery or hardware removed within 1 year post-VDRO faced increased fracture risks. This study provides evidence to proceed with caution when removing hardware if a patient has had prior revision surgery and to wait at least 1 year after VDRO to remove proximal femoral implants.
PMID: 40008403

4.The Effect of Foot-Ankle Condition On Physical Performance in Cerebral Palsy With Spastic Equinus Deformity

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J Am Podiatr Med Assoc . 2025 Feb 19:1-24. doi: 10.7547/23-088. Online ahead of print.

Background: The severity of foot disability in children with cerebral palsy (CP) should be examined with both objective and subjective assessment tools. This cross-sectional study investigated the effect of foot-ankle function on physical performance in CP with spastic equinus deformity.
Methods: A cross-sectional prospective study was performed on 61 children with cerebral palsy. Participants were evaluated by Gross Motor Function Classification System (GMFCS), Oxford Ankle Foot Questionnaire for Children (OxAFQ-C), Timed Up and Go Test (TUG), Single Leg Stance Test (SLST), 3-Meter Backward Walking Test (3MBWT) and Functional Reach Test (FRT).
Results: The mean age of the children with CP (28 female, 33 male) included in the study was 11.3±4.4 years. Individuals with higher ankle-foot function had better TUG, 3MBWT, and SLST performances ($p<0.005$). OxAFQ-C physical scale was moderately correlated with TUG ($r=-0.474$) and SLST (right extremity-eyes open) ($r=0.386$) ($p<0.01$). In addition, there was a low significant correlation between 3MBWT, SLST (right extremity-eyes closed), SLST (left extremity-eyes open), and SLST (left extremity-eyes closed) with OxAFQ-C physical scale ($p<0.05$). OxAFQ-C school and play scale had a moderate to weak correlation coefficient ($r=0.257$-0.430) with all physical performance tests ($p<0.05$). In addition, there were moderate and low correlations between OxAFQ-C emotional scale with TUG ($r=-0.495$) and 3MBWT ($r=-0.298$), respectively.
Conclusion: The results showed that foot-ankle performance influenced physical performance on time-based physical tasks but not better performance-based physical conditions. It was concluded that foot-ankle condition was most strongly associated with sit-to-stand and walking performance.
PMID: 40009489

5.Functional electrical stimulation for walking in adults with cerebral palsy: a service evaluation

Rebecca Walters, Coralie Seary, Ben Beare, Valerie L Stevenson

J Neuroeng Rehabil . 2025 Feb 28;22(1):41. doi: 10.1186/s12984-024-01538-z.

Abstract
Cerebral palsy (CP) is a neuromotor disorder which can lead to walking difficulties. Functional electrical stimulation (FES) is approved by The National Institute for Health and Care Excellence (NICE) for managing foot drop in upper motor neuron disorders, however there is limited evidence for its use in CP. We discuss a cohort of 26 patients with CP using FES for a 3 month period and longitudinal data for a subset of 11 patients that have used FES for at least 4 years. Patients were referred for the following common barriers to walking: reported falls (54%), foot drop (46%) and tripping (15%). After application of FES at baseline, there was a small clinically insignificant orthotic effect on walking speed (0.01 m/s on/off difference). However, orthotic effects became statistically and clinically significant at three months of continuous use (0.12 m/s on/off difference, $p = 0.01$) and in the subset of 11 patients this remained significant at four years (0.24 m/s on/off difference, $p = 0.01$). Patient reported walking satisfaction (numerical rating scale) improved when comparing no-FES versus FES at three months and at four years. FES is a safe, cost-effective treatment option and should be considered, for adults with CP who have walking difficulties.
PMID: 40022119

6.Rehabilitation effect of aquatic exercise on motor function in children with cerebral palsy: Systematic review of randomized controlled trials

Fangqin Li, Wenjiao Huang, Huanhuan Li, Zuoyan Liu, Liwei Feng

Review J Back Musculoskelet Rehabil . 2025 Feb 26:10538127251313951. doi: 10.1177/10538127251313951. Online ahead of print.

Background: Cerebral palsy (CP) refers to a lasting motor impairment resulting from atypical brain development or injury. Aquatic exercise (AE) is frequently utilized as an approach for rehabilitating children with CP because of its appealing water properties.
Objective: The aim of this study was to examine how AE influences motor skills in children affected by CP.
Methods: Systematic searches of databases provided randomized controlled trials (RCTs) published from their inception up until May 22, 2024. The study compared the impacts of AE training with those of routine rehabilitation training (RRT). A random-effects model was employed to assess the aggregated data.
Results: In total, 491 articles were retrieved, and 15 studies (n = 595 patients) were included in this study. Compared with RRT, AE improved the gross motor function of children with CP (SMD = 7.63, 95% CI 5.79-9.47, P < 0.01), especially in the lying and turning over positions (SMD = 15.66, 95% CI 13.85-17.46, P < 0.01). AE also reduced muscle tension (SMD = -0.75, 95% CI -1.03--0.47, P < 0.01).
Conclusions: AE is expected to improve motor function in children with CP. Moreover, this study emphasizes the need for future high-quality related studies to supplement the results and improve the conclusions.
PMID: 40012180

7.Correlation of Neuroanatomical Structures Related to Speech in Cerebral Palsy Patients Aged 0-17: A Retrospective MRI Study

Erhan Berk, Rümeysa Üzümcüoğlu, Feyza İnceoğlu, Merve Aydın, Muhammed Furkan Arpacı, Ahmet Sığırcı, Hıdır Pekmez

Children (Basel) . 2025 Feb 19;12(2):249. doi: 10.3390/children12020249.

Abstract
Background/Objectives: Cerebral Palsy (CP) is a non-progressive clinical condition characterized by secondary issues, including speech impairments. Our study aims to evaluate the volumes of brain areas related to speech in patients diagnosed with CP between the ages of 0-17. Methods: this study includes the images of 84 children: 42 in the control group who applied to the hospital between the specified dates and were reported as healthy by MRI from the patient records, and 42 patients with CP. Results: in the CP group, white and gray matter, cerebrum, cerebellum, thalamus, lobus frontalis, lobus temporalis, lobus parietalis, lobus insularis, gyrus cinguli, and nuclei basales volumes were observed to decrease statistically significantly compared to the control group (p < 0.001). Conclusions: we found a significant decrease in the volumes of speech-related brain areas in CP patients, indicating that CP can significantly impact the brain's speech-related regions.
PMID: 40003351

8.Caregivers' experiences of feeding children with cerebral palsy: a systematic review of qualitative evidence

Christine Taylor, Nadia Badawi, Iona Novak, Jann Foster

JBI Evid Synth. 2025 Feb 17. doi: 10.11124/JBIES-24-00208. Online ahead of print.

Objective: The objective of this review was to investigate the feeding experiences of caregivers of children with cerebral palsy, in any setting, by identifying, critically appraising, and synthesizing the relevant literature.
Introduction: Feeding difficulties in children with cerebral palsy are common and affect both children and caregivers. Difficulties include dysphagia and risk of aspiration, which can result in poor growth and development. Caregivers find feeding challenging and stressful due to the time involved, fear of aspiration, and the pressure of meeting other family demands. Finding ways to support caregivers effectively in feeding will have important health and quality-of-life outcomes for caregivers and their children with cerebral palsy.
Inclusion criteria: Studies with qualitative data exploring informal caregivers' experiences (eg, perspectives, challenges, feelings) of feeding children with cerebral palsy, in any country or setting, were included. Informal caregivers (eg, parents, foster carers, grandparents) could be of any age, gender, or cultural background. Children with cerebral palsy of any severity level were included. Formal caregivers, such as health professionals, were ineligible. The feeding method could include oral feeding, tube feeding, or both.
Methods: The JBI methodology for systematic reviews of qualitative evidence was followed. The databases searched on June 27, 2023, included CINAHL (EBSCOhost), APA PsycINFO (Ovid), MEDLINE (Ovid), ProQuest Central, Scopus, and ProQuest Dissertations and Theses. Two members of the review team independently screened titles and abstracts, and full texts of eligible studies. Three members of the review team independently appraised selected studies for methodological quality. The meta-aggregation approach was used for data synthesis to pool findings from included studies to form categories and synthesized findings. Finally, the ConQual approach was used to establish confidence in the synthesized findings based on their dependability and credibility.
Results: From the literature search and citation searching, 619 records were screened, from which 10 studies were included in the review. A total of 196 findings were extracted for analysis, which resulted in 19 categories and 5 synthesized findings. The synthesized findings were "Feeding and feeding difficulties," "Caregiver emotions and burden around feeding a child with cerebral palsy," "Caregiver support and feeding," "Feeding, social interaction, and mothering," and "Gastrostomy tube decisions and perceptions". The overall ConQual score for each synthesized finding was rated as low.
Conclusions: Feeding a child with CP was a difficult experience for caregivers. Caregivers were able to problem-solve feeding issues, but they often felt unsupported by health professionals and services. Feeding negatively impacted caregivers' and children's social interactions outside the home, where caregivers sought to achieve normalcy for their child and family. However, feeding was described as an essential part of mothering, and caregivers felt like a failure if they could not feed their child orally. Caregivers struggled with the decision to allow their child to have a gastrostomy tube, but most viewed it positively once it was inserted. More research into other cultures and research into fathers' experiences of feeding children with cerebral palsy is recommended.
PMID: 40012369

9.Use of a specialized peptide-based enteral formula containing medium-chain triglycerides for enteral tube feeding in children with cerebral palsy and previous tube feeding intolerance on standard enteral formula: a prospective observational TolerUP study

Aydan Kansu, Gunsel Kutluk, Gonul Caltepe, Cigdem Arikan, Nafiye Urganci, Gokhan Tumgor, Aysel Yuce, Ceyda Tuna Kirsaclioglu, Arzu Meltem Demir, Fatma Demirbas, Merve Usta, Sibel Yavuz, Duygu Demirtas Guner, Ersin Gumus, Buket Dalgic, Yasar Dogan, Nelgin Gerenli, Halil Kocamaz, Fulya Gulerman, Elif Sag, Aysugul Alptekin Sarioglu, Neslihan Eksi Bozbulut, Demet Teker Duztas, Hatice Altug Demirol, Coskun Celtik, Olcay Gungor, Kaan Demiroren, Aysen Uncuoglu Aydogan, Ozlem Bekem, Zeynep Arslan, Murat Cakir, Arzu Ekici, Nihal Uyar Aksu, Cigdem Ecevit, Simge Erdogan

Front Pediatr. 2025 Feb 12:13:1448507. doi: 10.3389/fped.2025.1448507. eCollection 2025.

Objective: Use of peptide-based formulas supplemented with medium chain triglycerides (MCTs) is considered a beneficial strategy to decrease the tube-feeding associated gastrointestinal tolerance. In children with cerebral palsy (CP), overall effects of enteral tube feeding as well as the utility of peptide-based specialized enteral formulas in those with gastrointestinal intolerance have not been extensively studied. This study aimed to evaluate the utility of enteral tube feeding via specialized peptide-based formula containing MCTs in children with CP in terms of gastrointestinal intolerance, anthropometrics, defecation characteristics and parental satisfaction with enteral formula.
Methods: Children with CP who received enteral tube feeding via specialized peptide-based formula containing MCTs were included in this prospective observational study. Anthropometrics (z scores for weight for age [WFA], weight for height [WFH], triceps skinfold thickness [TSFT] and mid-upper arm circumference [MUAC]), gastrointestinal intolerance symptoms, defecation frequency and stool patterns and formula satisfaction were recorded at baseline and during 6-month follow up.
Results: A total of 96 children with CP (mean ± SD age: 5.6 ± 3.2 years, 56.3% were boys) were included. Significant improvements were noted in MUAC, TSFT and WFH z scores at the 6th month visit. The rate of "severe symptoms" and the likelihood of Type-1/Type-2 (constipation) stool pattern were significantly decreased. Majority of parents were satisfied with the study formula.
Conclusion: Our findings revealed favorable efficacy and safety of using a specialized peptide-based formula containing MCT in provision of enteral tube feeding among children with CP in terms of improved anthropometrics, amelioration of gastrointestinal intolerance symptoms and normalization of bowel movements along with a high parental satisfaction.
PMID: 40013110

10.Data-Driven Early Prediction of Cerebral Palsy Using AutoML and interpretable kinematic features

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

medRxiv [Preprint]. 2025 Feb 12:2025.02.10.25322007. doi: 10.1101/2025.02.10.25322007.

Abstract

Early identification of cerebral palsy (CP) remains a major challenge due to the reliance on expert assessments that are time-intensive and not scalable. Consequently, a range of studies have aimed at using machine learning to predict CP scores based on motion tracking,e.g. from video data. These studies generally predict clinical scores which are a proxy for CP risk. However, clinicians do not REALLY want to estimate scores, they want to estimate the patients' risk of developing clinical symptoms. Here we present a data-driven machine-learning (ML) pipeline that extracts movement features from infant video based motion tracking and estimates CP risk using AutoML. Using AutoSklearn, our framework minimizes risk of overfitting by abstracting away researcher-driver hyperparameter optimization. Trained on movement data from 3- to 4-month-old infants, our classifier predicts a highly indicative clinical score (General Movements Assessment [GMA]) with an ROC-AUC of 0.78 on a held-out test set, indicating that kinematic movement features capture clinically relevant variability. Without retraining, the same model predicts the risk of cerebral palsy outcomes at later clinical follow-ups with an ROC-AUC of 0.74, demonstrating that early motor representations generalize to long-term neurodevelopmental risk. We employ pre-registered lock-box validation to ensure rig-orous performance evaluation. This study highlights the potential of AutoML-powered movement analytics for neurodevelopmental screening, demonstrating that data-driven feature extraction from movement trajectories can provide an interpretable and scalable approach to early risk assessment. By integrating pre-trained vision transformers, AutoML-driven model selection, and rigorous validation protocols, this work advances the use of video-derived movement features for scalable, data-driven clinical assessment, demonstrating how computational methods based on readily available data like infant videos can enhance early risk detection in neurodevelopmental disorders.
PMID: 39990562

11.Empowering Functional Independence for Children With Severe Cerebral Palsy: A Randomized Controlled Trial Study Protocol

Lisa K Kenyon, John P Farris, Sango Otieno

Pediatr Phys Ther. 2025 Feb 25. doi: 10.1097/PEP.0000000000001189. Online ahead of print.

Purpose: To explore the effectiveness of a wheelchair skills (PWC) training intervention provided using the IndieTrainer System.
Methods: This 2-arm, parallel group, single-blinded, pre-test-post-test randomized controlled trial will have 2 groups. Outcomes will be assessed at 3 timepoints. Sixteen child-parent/caregiver dyads will participate in the study. Each child participant will have a diagnosis of severe cerebral palsy (CP), be 5 to 17 years old, and have cause and effect skills. Outcome measures will include the Assessment of Learning Powered mobility use, the Wheelchair Skills Checklist, and the Canadian Occupational Performance Measure.
Impact: Children with severe CP are often dependent on others for mobility. PWC skills training may allow more children to meet the specifications for obtaining their own PWC, thereby maximizing their functional independence.
PMID: 39998201

12.Effect of explicit literacy instruction on letter-sound correspondence acquisition for a child with cerebral palsy who uses AAC eye gaze

Jessica G Caron, Nicole Ryan, Salena Babb, Christine Holyfield, Meghan O'Brien

Augment Altern Commun . 2025 Feb 27:1-12. doi: 10.1080/07434618.2025.2466166. Online ahead of print.

Abstract
This pilot study examines the effectiveness of an adapted literacy intervention focused on the acquisition of seven letter-sound correspondences (LSC) with a child with cerebral palsy who uses high-tech eye-gaze to communicate. A single case multiple probes across letter-sounds design was used. The independent variable was explicit instruction with materials that were adapted on the participant's AAC device. Instruction was provided by a trained graduate student. The dependent variable was the child's accuracy in identifying the correct letter from a high-tech eye-gaze grid of four letters, when provided with the letter-sound by the graduate student. Results indicated that the implementation of the literacy instruction by the graduate clinician was effective in teaching seven LSCs to the child with cerebral palsy who uses high-tech eye-gaze to communicate and participate in instruction. The participant demonstrated gains for all targeted LSCs and positive trends continued after the intervention was introduced through replications of each new LSC. Average gain scores ranged from +60% to +90%. Calculation of IRD was 1.0 across all LSCs, indicative of a very large effect. The student's gains in this pilot study indicate the promise of adapted literacy instruction for individuals with severe speech and motor impairments, who use alternative access to participate in literacy instruction. More literacy research is needed for learners who use AAC and alternative access methods.
PMID: 40016692

13.The immigration paradox in cerebral palsy: More and better data are needed

Marcelo L Urquia, Maria Ricci

Dev Med Child Neurol . 2025 Feb 26. doi: 10.1111/dmcn.16292. Online ahead of print.

No abstract available
PMID: 40012196

14."My child is completely underestimated": Canadian parents' perspectives on implementing an accessible language comprehension assessment for non-speaking children with cerebral palsy

Juno Coan-Brill, Jodi Friesen, Jessica Kay, Frances Aileen Costigan, Tom Chau, Johanna Geytenbeek, Kristine Stadskleiv, Beata Batorowicz, Dayle McCauley, Sarah Hopmans, Danijela Grahovac, Gail Teachman, Barbara Jane Cunningham

Disabil Rehabil . 2025 Feb 28:1-13. doi: 10.1080/09638288.2025.2468844. Online ahead of print.

Purpose: Reliable assessment of language comprehension is difficult for children with significant speech and motor limitations. The Computer-Based instrument for Low motor Language Testing (C-BiLLT) was designed for children with cerebral palsy (CP) and speech and motor limitations. A Canadian English version (C-BiLLT-CAN) has been validated. However, early investigation identified feasibility challenges necessitating further exploration. This study aimed to understand parents' perceived barriers and facilitators to implementing the C-BiLLT-CAN in the Canadian clinical context.
Materials and methods: Seven focus groups were conducted synchronously online with 16 parents from five Canadian provinces/territories. Transcripts were analyzed using semi-deductive thematic analysis, framing results within the Consolidated Framework for Implementation Research (CFIR).
Results: Parents unanimously expressed interest in making the C-BiLLT-CAN clinically available. Facilitators and barriers were discussed under five themes. Key facilitators included the unique design, standardized nature, and potential flexibility of the C-BiLLT-CAN. Barriers involved the inability to accommodate all children, the potential for unintended assessment impacts, and clinics' readiness and willingness to prioritize implementation.
Conclusions: This study contributes new knowledge surrounding the assessment needs of parents of children with CP and speech and motor limitations. Alongside findings from a parallel clinician study, results will inform adaptations to the C-BiLLT-CAN to facilitate implementation.
Plain language summary
IMPLICATIONS FOR REHABILITATION Parents showed interest in having the Canadian English Computer-Based Instrument for low-motor Language Testing (C-BiLLT-CAN) made available to their children. Facilitators included the unique, standard, and flexible design of the C-BiLLT-CANBarriers included doubts about accommodating all children and unintended impacts of assessment Findings will inform an adapted C-BiLLT-CAN to facilitate implementation in Canada.
PMID: 40018756

15.Telehealth Programme for the Education and Enrichment of Relational Skills (PEERS) for adolescents with acquired and congenital brain injuries: a protocol for mixed-methods randomised trial

Leanne Sakzewski, Rose Gilmore, Nicola Hilton, Sarah Goodman, Koa Whittingham, Jacqui Barfoot, Bianca Thompson, Afroz Keramat, Roslyn N Boyd

Randomized Controlled Trial BMJ Open . 2025 Feb 26;15(2):e081843. doi: 10.1136/bmjopen-2023-081843.

Introduction: For adolescents with brain injury, challenges with social function often persist into adulthood, impacting social participation and quality of life. The Programme for the Education and Enrichment of Relational Skills (PEERS) is a manualised group-based intervention with preliminary evidence demonstrating improved social knowledge and participation for adolescents with acquired brain injury or cerebral palsy when delivered face to face. The recent COVID-19 pandemic and challenges for families living outside metropolitan centres to access the programme suggest a telehealth delivered PEERS should be explored. This study aims to compare telehealth PEERS to usual care in a mixed-methods randomised waitlist-controlled trial to determine preliminary efficacy to improve social functioning and secondarily to determine acceptability, feasibility, cost and contextual factors impacting the implementation.
Methods and analysis: In this single-centre mixed-methods randomised waitlist-controlled trial, 32 adolescents with brain injury, aged 11-17 years attending mainstream high school and their caregivers will be randomised to receive either (a) telehealth PEERS once/week for 1.5 hours for 14 weeks or (b) usual care (UC). UC is highly variable in Australia but often comprises fortnightly occupational therapy, physiotherapy or speech therapy. The waitlist group will then receive PEERS following the 26-week retention time point. Measures will be administered at baseline, 14 weeks (immediately post) and then 26 and 52 weeks post baseline. The primary outcome is self-reported performance and satisfaction with social goals on the Canadian Occupational Performance Measure at 14 weeks. Secondary outcomes include self and parent-reported social competence, frequency of get-togethers with peers, self-report knowledge of social skills, frequency of peer victimisation and quality of life. An implementation evaluation will be done to determine acceptability, feasibility, cost and identify barriers and facilitators in the implementation of the intervention and map these against the Consolidated Framework for Implementation Research. This study will assess the unit costs of implementing the PEERS from an Australian health system perspective.
Ethics and dissemination: The Children's Health Queensland Hospital and Health Service and The University of Queensland Human Research Ethics Committees have approved this study. Findings will be disseminated in peer-reviewed journals and conference presentations.
Trial registration number: ACTRN1263000082606.
PMID: 40010832

16.Recent trends in National Institutes of Health funding for cerebral palsy lifespan research

Simon G Keep, Donna Omichinski, Mark D Peterson

Dev Med Child Neurol . 2025 Feb 26. doi: 10.1111/dmcn.16281. Online ahead of print.

Aim: To determine the landscape of recent National Institutes of Health (NIH) funding for cerebral palsy (CP)-related research regarding lifespan issues.
Method: This longitudinal study examined NIH funding for CP-related research between 2014 and 2023, particularly focusing on lifespan issues. We searched NIH databases Research Portfolio Online Reporting Tools Expenditures and Results, and Research, Condition, and Disease Categorization for keyword 'cerebral palsy'. We classified grants by type and area of study.
Results: From 2014 to 2023, CP NIH funding averaged US$22.7 million per year, not adjusted for inflation, for a total cost of US$226.7 million. This supported research pertaining to treatments/early interventions (51.0% of total), causes/mechanisms/risk factors (22.6%), and screening/early detection/diagnosis (9.6%). Infrastructure/surveillance funding was 6.6%, whereas services/implementation research received 7.9%. Funding for lifespan/adulthood CP research represented only 2.3% of funding. Annual NIH funding for CP increased steadily over the period from US$22.0 million in 2014 to US$24.8 million in 2023; however, funding focused on lifespan studies has been relatively unchanged, never rising above US$0.91 million.
Interpretation: While NIH funding for CP studies increased over the study period, lifespan studies have not. Additional research funds are needed to improve the clinical care and understanding of lifespan needs faced by individuals living with CP.
PMID: 40012226

17.Transition and Life-Long Care for Adults With Cerebral Palsy: A Patient Group 'Too Hard to Impact!' Are We Still Sending Young People 'Off a Cliff'?

Susie Turner, Charlotte Nash, Jane Goodwin, Johanna Smith, Charlie Fairhurst, Jill Cadwgan

J Eval Clin Pract. 2025 Feb;31(1):e70011. doi: 10.1111/jep.70011.

Objectives: At Evelina London Children's Hospital, tertiary care is provided for children with Cerebral Palsy (CP) across the South East of England. An increasing number of adults with CP remain under the care of the children's hospital due to a lack of appropriate adult neurodisability services. This quality improvement project as part of a gap analysis regarding transition pathways for young adults with CP, aimed to explore the lived experience of young adults within our service, with respect to transition and care in adulthood.
Methods: This was a multi-methods design. Firstly, a bespoke questionnaire to young adults with CP and their families evaluated their experience of transition, access to services, challenges with care, and their needs from healthcare professionals (n = 46). Then, a focus group with parents of adults with CP (n = 4) and interviews with adults with CP (n = 5) informed design of an ideal transition pathway and adult service. The qualitative data were thematically analysed.
Results: Framework analysis of the questionnaire data was mapped against the International Classification of Functioning (ICF) with the following themes identified: Body structure and function: pain and anxiety; Activity: equality; accessibility and relationships; Participation: need for friendship and social opportunities, employment and education; Environmental factors: health services and providers; home environment and wider community; Personal factors: independence. Analysis of the focus group and interviews identified five main themes: Gradual and co-ordinated transition process; Co-ordination of care in adult services; Knowledge, skills and experience of professionals; Communication; and Worrying about the future.
Conclusions: Participants identified significant challenges with transition pathways and adult care. Annual reviews from healthcare professionals with expertise in CP should be offered to young adults to ensure early identification of health needs. Further research is needed to support business planning in development of appropriate adult services for adults with CP and ensure successful transition pathways.
PMID: 40019844

18.Attention Deficit Hyperactivity Disorder in Children With Cerebral Palsy: A Case-Control Study

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Neurology . 2025 Mar 25;104(6):e213425. doi: 10.1212/WNL.0000000000213425. Epub 2025 Feb 25.

Background and objectives: Cerebral palsy (CP) is the most prevalent physical disability in children and is often accompanied by other neurodevelopmental disorders (NDDs) such as attention deficit hyperactivity disorder (ADHD). Both conditions are influenced by genetic and environmental factors and significantly affect daily functioning. This study aims to estimate the prevalence of ADHD in school-aged children with CP from a large, population-based registry and explore associated factors including sex, material and social deprivation, epilepsy, prematurity, CP subtype, and motor functioning.
Methods: This cross-sectional study linked a population-based registry (the Registre de la paralysie cérébrale du Québec [CP Registry]) and 2 administrative health claims databases (the Régie de l'assurance maladie du Québec [RAMQ] and Maintenance et Exploitation des Données pour l'Étude de la Clientèle Hospitalière). The study included children diagnosed with CP born between 1999 and 2002, tracked through these databases. ADHD diagnosis was identified using International Classification of Diseases codes and specific ADHD medication prescriptions. Odds ratios and 95% confidence intervals were used to explore factors associated with an ADHD diagnosis.
Results: The study comprised 302 children with CP and 6,040 controls matched by age, sex, and region. The prevalence of ADHD in the CP cohort was significantly higher (38%) compared with the control group (12%). Univariate analysis showed that odds of ADHD in the CP cohort were higher in male children (OR 1.63, 95% CI 1.02-2.62) and individuals with no epilepsy diagnosis (OR 1.70, 95% CI 1.02-2.87), a spastic hemiplegic CP subtype (OR 1.87, 95% CI 1.10-3.20), and less severe motor impairment (OR 2.48, 95% CI 1.37-4.65). In the multivariate analysis, odds of ADHD were only higher in those with less severe motor impairment (OR 2.02, 95% CI 1.07-3.94).
Discussion: ADHD is significantly more prevalent among children with CP compared with their peers, aligning with previous literature that suggests a neurodevelopmental overlap. The study highlights the importance of considering NDDs in CP management, particularly ADHD, which may contribute to the challenges faced by these children. Future research is needed to explore the neurobiological links between CP and ADHD and the impact of NDDs on health outcomes in this population.
PMID: 39999396

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

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medRxiv [Preprint]. 2025 Feb 13:2025.02.12.25322169. doi: 10.1101/2025.02.12.25322169.

Introduction: Emerging evidence suggests that 20-30% of cases of cerebral palsy (CP) may have a genetic cause. Our group previously identified subsets of patients with CP or CP-masquerading conditions who warrant genetic testing, including those with regression or progressive neurological symptoms (CP masqueraders) and those without any known risk factors for CP (cryptogenic CP). Recognition of these subgroups in clinical settings remains challenging.
Methods: To address this challenge, we developed and evaluated a computational phenotyping approach using ICD- 9/ICD-10 billing codes to automatically identify patients with unexplained CP or CP-masquerading conditions who may benefit from genetic testing. We applied this computational phenotyping approach to a cohort of 250 participants from the Boston Children's Hospital CP Sequencing Study, aimed at identifying genetic causes in CP and CP-masquerading conditions.
Results: Manual review served as the gold standard, identifying 8% as CP masqueraders, 42% as cryptogenic CP, and 50% as non-cryptogenic CP. Computational phenotyping based on ICD-9/10 codes achieved a sensitivity of 95%, specificity of 72%, positive predictive value of 77%, and negative predictive value of 94% in identifying cases warranting genetic testing.
Conclusions: Our findings demonstrate the feasibility of using computational phenotyping to identify patients with CP or CP-masquerading conditions who warrant genetic testing. Further studies are needed to evaluate the effectiveness and real-world application of this tool in larger healthcare systems. Nonetheless, the computational phenotyping approach holds promise as a possible clinical decision support that could be integrated into electronic health record systems, enhancing clinical workflows and facilitating actionable genetic diagnoses.
PMID: 39990554