Cerebral palsy research news

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Interventions and Management

1. Bimanual performance in children with unilateral perinatal arterial ischaemic stroke or periventricular haemorrhagic infarction
Cornelia H Verhage, Floris Groenendaal, Janjaap van der Net, Monique Mj van Schooneveld, Linda S de Vries, Niek E van der Aa

Eur J Paediatr Neurol. 2022 Jan 14;37:46-52. doi: 10.1016/j.ejpn.2022.01.009. Online ahead of print.

Background: Long term outcome data on bimanual performance in children with perinatal arterial ischaemic stroke (PAIS) and periventricular haemorrhagic infarction (PVHI) with and without unilateral spastic cerebral palsy (USCP) is sparse. Aims: To assess bimanual performance in children with PAIS or PVHI with and without USCP and to explore the relationship with unilateral hand function and full-scale IQ (FSIQ) in a cross-sectional study. Methods: Fifty-two children with PAIS (n = 27) or PVHI (n = 25) participated at a median age of 12 years and 1 month (range 6-20 years). The Bruininks Oseretsky Test of Motor Proficiency-2 (bimanual precision and dexterity subtest), Assisting Hand Assessment, Purdue Pegboard Test and Wechsler Intelligence scale were administered. Results: Bimanual dexterity was worse in children with USCP ($p < 0.02$) without a difference for the pathology groups. In children without USCP (n = 21), those with PAIS showed a better bimanual precision compared to children with PVHI ($p < 0.04$). The AHA score and the Purdue Pegboard score of the dominant hand explained 51% of the variance in bimanual precision and dexterity in children with USCP. In absence of USCP, FSIQ together with AHA scores explained 66% of the variance in bimanual precision and FSIQ together with the Purdue Pegboard Test score of the dominant hand, 71% of the variance in bimanual dexterity. Conclusions: Children with PAIS without USCP have a more favourable bimanual hand function compared to children with PVHI. This difference appears to be associated with a preserved FSIQ.

PMID: 35093802

2. Synergies are minimally affected during emulation of cerebral palsy gait patterns
Alyssa M Spomer, Robin Z Yan, Michael H Schwartz, Katherine M Steele

J Biomech. 2022 Jan 10;133:110953. doi: 10.1016/j.jbiomech.2022.110953. Online ahead of print.

Muscle synergy analysis is commonly used to characterize motor control during dynamic tasks like walking. For clinical populations, such as children with cerebral palsy (CP), synergies are altered compared to nondisabled (ND) peers and have been associated with both function and treatment outcomes. However, the factors that contribute to altered synergies remain unclear. In particular, the extent to which synergies reflect altered biomechanics (e.g., changes in gait) or underlying neurologic injury is debated. To evaluate the effect that altered biomechanics have on synergies, we compared synergy complexity and structure while ND individuals (n = 14) emulated four common CP gait patterns (equinus, equinus-crouch,

mild-crouch, and moderate crouch). Secondarily, we compared the similarity of ND synergies during emulation to synergies from a retrospective cohort of individuals with CP walking in similar gait patterns (n = 28 per pattern). During emulation, ND individuals recruited similar synergies as baseline walking. However, pattern-specific deviations in synergy activations and complexity emerged. In particular, equinus gait altered plantarflexor activation timing and reduced synergy complexity. Importantly, ND synergies during emulation were distinct from those observed in CP for all gait patterns. These results suggest that altered gait patterns are not primarily driving the changes in synergies observed in CP, highlighting the value of using synergies as a tool to capture patient-specific differences in motor control. However, they also highlight the sensitivity of both synergy activations and complexity to altered biomechanics, which should be considered when using these measures in clinical care.

PMID: 35092908

3. Gait changes following robot-assisted gait training in children with cerebral palsy
D Žarković, M Šorfová, J J Tufano, P Kutílek, S Vítečková, D Ravnik, K Groleger-Sršen, I Cikajlo, J Otáhal

Physiol Res. 2021 Dec 31;70(S3):S397-S408.

This study investigated changes of gait pattern induced by a 4-week robot-assisted gait training (RAGT) in twelve ambulatory spastic diparesis children with cerebral palsy (CP) aged 10.4+/-3.2 years old by using computerized gait analysis (CGA). Pre-post intervention CGA data of children with CP was contrasted to the normative data of typically developing children by using cross-correlation and statistically evaluated by a Wilcoxon test. Significant pre-post intervention changes ($p<0.01$) include: decreased muscle activity of biceps femoris, rectus femoris, and tibialis anterior; a decrease in range of internal hip joint rotation, higher cadence, step length, and increased stride time. This study suggests that RAGT can be used in muscle reeducation and improved hip joint motion range in ambulatory children with CP.

PMID: 35099258

4. Exploring the Effects of Power Mobility Training on Parents of Exploratory Power Mobility Learners: A Multiple-Baseline Single-Subject Research Design Study
Lisa K Kenyon, Naomi J Aldrich, John P Farris, Brianna Chesser, Kyle Walenta

Physiother Can. Winter 2021;73(1):76-89. doi: 10.3138/ptc-2019-0045.

Purpose: This study investigated the effects of power mobility training provided to exploratory power mobility learners with cerebral palsy (CP; Gross Motor Function Classification System Level V) on (1) parenting stress, (2) parents' perceptions of their children, and (3) children's attainment of power mobility skills. Method: A non-concurrent, multiple-baseline A-B single-subject research design study was conducted with three participants. The target behaviour was changes in the magnitude of parenting stress as measured by the Parenting Stress Index-Short Form. Parents' perceptions of their children were assessed using the Caregiver Priorities and Child Health Index of Life with Disabilities Questionnaire and a parent interview. Children's attainment of power mobility skills was assessed using the Canadian Occupational Performance Measure (COPM), the Assessment of Learning Powered mobility use, and the Wheelchair Skills Checklist. Power mobility training was provided twice a week for 8 weeks using an alternative power mobility device. Results: Positive and negative changes in both magnitude of parenting stress and parents' perceptions were identified post-intervention. All participants gained power mobility skills, assessed with the COPM. Conclusions: Power mobility training provided to exploratory power mobility learners with CP may influence levels of parenting stress.

PMID: 35110826

5. Changes in Electroencephalography Activity in Response to Power Mobility Training: A Pilot Project
Lisa K Kenyon, John P Farris, Naomi J Aldrich, Joshua Usoro, Samhita Rhodes

Physiother Can. Summer 2020;72(3):260-270. doi: 10.3138/ptc-2018-0092.

Purpose: The purposes of this pilot project were to examine the impact of power mobility training on (1) electroencephalography (EEG) activity in children with severe cerebral palsy (CP) and (2) power mobility skill acquisition. Method: A single-subject A-B-A-B research design with a 5-week duration for each phase (20 wk total) was replicated across three participants with severe CP (Gross Motor Function Classification System Level V). Data related to the target behaviour, as represented by EEG activity, were collected each week. Power mobility skills were assessed using the Canadian Occupational Performance Measure (COPM), the Wheelchair Skills Checklist (WSC), and the Assessment of Learning Powered mobility use (ALP). Weekly power mobility training was provided during the intervention phases. EEG data were analyzed by means of three measurement metrics (power spectral density, mutual information, and transfer entropy). Results: All three participants demonstrated changes in activation in frontoparietal EEG recordings and clinically significant improvements in power mobility skill acquisition as measured by the COPM as well as by the ALP and WSC. Conclusions: Power mobility training appeared to affect both neuroplastic and skill acquisition. Combining the use of EEG with direct therapist-observation measurement tools may provide a more complete understanding of the impact of power mobility training on children with severe CP.

PMID: 35110795

6. Mini-EDACS: Development of the Eating and Drinking Ability Classification System for young children with cerebral palsy
Diane Sellers, Lindsay Pennington, Elizabeth Bryant, Katherine Benfer, Kelly Weir, Sonia Aboagye, Christopher Morris

Dev Med Child Neurol. 2022 Jan 29. doi: 10.1111/dmcn.15172. Online ahead of print.

Aim: To develop and test Mini-EDACS to describe developing eating and drinking abilities of children with cerebral palsy (CP) aged between 18 and 36 months. Method: The existing Eating and Drinking Ability Classification System (EDACS) was modified to define Mini-EDACS content. Mini-EDACS was developed in three stages: (1) EDACS was modified after application to videos of standardized feeding evaluations of children with CP aged 18 to 36 months (n = 130); (2) refined content and validity of Mini-EDACS was established through an international Delphi survey; (3) interobserver reliability was assessed by comparing Mini-EDACS levels assigned by speech and language therapists (SaLTs) from video data and parent report. Results: Mini-EDACS provides age-appropriate descriptions for children aged 18 to 36 months with CP. Eighty-nine stakeholders participated in the Delphi survey; required levels of agreement were met after one round (i.e. >80% agreement). Thirteen SaLTs completed paired ratings from 43 video recordings: absolute agreement was 58% (kappa 0.43; intraclass correlation coefficient 0.78; 95% confidence interval 0.63-0.87). Interpretation: Mini-EDACS provides a valid system for classifying eating and drinking performance of children with CP under 3 years old. Results suggest moderate agreement and good reliability when rating Mini-EDACS levels from video recordings of young children with CP.

PMID: 35092689

7. Program for the Education and Enrichment of Relational Skills for adolescents with an acquired brain injury: A randomized controlled trial
Rose Gilmore, Jenny Ziviani, Sarah Mcintyre, Hayley Smithers Sheedy, Nicola Hilton, Tracey Williams, Mark D Chatfield, Elizabeth Laugeson, Leanne Sakzewski, Friends Project Group

Dev Med Child Neurol. 2022 Jan 28. doi: 10.1111/dmcn.15144. Online ahead of print.

Aim: To test the efficacy of a group social skills intervention on social functioning in adolescents with a brain injury. Method: Thirty-six adolescents (mean age 14y, SD 1y 8mo, age range 12y 1mo-16y 3mo; 17 females) with acquired brain injury (ABI; ≥12mo postintervention; n=19) or cerebral palsy (n=17) were randomly allocated to the Program for the Education in Enrichment of Relational Skills (PEERS) or usual care. The primary outcome was the Social Skills Improvement System-Rating Scales (SSIS-RS). Secondary outcomes were scores derived from the Test of Adolescent Social Skills Knowledge-Revised (TASSK-R), Social Responsiveness Scale, Second Edition, and Quality of Socialization Questionnaire. Between-group differences postintervention and at the 26-week retention time point were compared using linear mixed modelling for continuous outcomes and Poisson regression for count data. Results: There were no between-group differences on the primary outcome (SSIS-RS). Regarding the secondary outcomes, the PEERS-exposed group achieved significantly greater improvements on the TASSK-R (mean difference [MD]=6.8, 95% confidence interval [CI]=4.8-8.8, p<0.001), which were maintained at the 26-week retention time point (MD=8.1, 95% CI=6.0-10.2, p<0.001). PEERS was also associated with a significant increase in parent-reported invited get-togethers at 26 weeks (incidence rate ratio=4.0, 95% CI=1.0-16.0, p=0.05). Interpretation: Adolescents with brain injury who completed the PEERS learned and retained social knowledge and increased

social participation.

PMID: 35092016

8. An exploratory study: The effects of sleep systems on sleep quality, pain and carer goals for non-ambulant children and young people with cerebral palsy
Nicola Wood, Sarah Brown

J Rehabil Assist Technol Eng. 2022 Jan 22;9:20556683211070729. doi: 10.1177/20556683211070729. eCollection Jan-Dec 2022.

Introduction: Sleep systems are supports used in lying, forming part of 24 h posture management programmes, for children and adults with severe motor disorders. Improved posture reduces likelihood of secondary complications such as pain and poor sleep quality, thus improving quality of life. The study aims are to investigate the effect of sleep systems on sleep quality and quantity, pain for young people with Cerebral Palsy and outcomes for carers. Methods: Baseline data were gathered for 1 month prior to sleep system provision. Comparative data with the sleep system in place, were gathered for 5 months. The sample comprised four children with Cerebral Palsy, GMFCS level V, average age of 11.5, who did not have a sleep system. Data on sleep quality and quantity was gathered using the Chailey Sleep Questionnaire and sleep diaries and pain levels using the Paediatric Pain Profile. GAS Light verbal outcome measure was used to measure carer goals. Results: Descriptive statistics and paired sample t-tests were used, demonstrating pain levels remained static, improvements in sleep quality and quantity were found and carer goals achieved. Conclusion: A small sample size and subjective data collection methods were used; further research is required to obtain more conclusive results.

PMID: 35096414

9. Determinants of functional mobility in children with cerebral palsy in three different environments: A registry-based study
Maysoun Saleh, Nihad A Almasri, Sana M N Abu-Dahab

Physiother Theory Pract. 2022 Feb 3;1-11. doi: 10.1080/09593985.2022.2027583. Online ahead of print.

Background: Functional mobility in children with cerebral palsy (CP) varies widely and is affected by many factors related to the child and environment. Understanding this variability in child's natural environments: home, school, and community; and its determinants are important for effective child management. Methods: This cross-sectional study aims to investigate the functional mobility of children with CP within home, school, and community, and explore its determinants. Participants were 107 children with CP (aged 6.4 ± 2.9 years). Functional Mobility Scale was the outcome variable. Potential determinants included child-associated impairments and interventions. Three ordinal logistic regression analyses were conducted. Results: Children in Gross Motor Functional Classification System-Expanded and Revised level I walked without assistive devices in all environments, while children in levels II/III used different mobility methods in different environments. Children in levels IV/V used a wheelchair or had no form of functional mobility in all environments. Determinants of mobility varied across different environments but included impairments (visual impairments, scoliosis) and interventions (Botox, medications for spasticity, orthoses). Conclusions: Child impairments and interventions received should be considered when exploring mobility options for children with CP in different environments. Further research is needed to examine other environmental and personal factors affecting mobility.

PMID: 35114901

10. Towards creation of national cerebral palsy registries in Arab countries: what is missing?
Sahar M A Hassanein, Tamer A El-Sobky

World J Pediatr. 2022 Feb 2. doi: 10.1007/s12519-021-00510-4. Online ahead of print.

PMID: 35107782

11. Epidemiological, clinical, and treatment-related features of children with cerebral palsy in Cameroon: A hospital-based study
D C Kedy Mangamba, D Enyama, L P Kojom Foko, J Tankou, D Noukeu Njinkui, H Essome, L M Endale Mangamba, C Eposse Ekoube, R Mbono Betoko, P Epée Eboumbou, Y Mapoure Njankoua, C I Penda

Arch Pediatr. 2022 Jan 27;S0929-693X(22)00003-3. doi: 10.1016/j.arcped.2022.01.006. Online ahead of print.

Background: Pediatric cerebral palsy (CP) remains a poorly studied public health problem in sub-Saharan Africa, especially in Cameroon. This study aimed at determining the epidemiological, clinical, and treatment-related characteristics of CP in Cameroonian children. Methods: A cross-sectional study was conducted at the pediatric department of the Douala Gynaeco-Obstetric and Pediatric Hospital (DGOPH). Medical records of children attending the department during the study period were reviewed. Only medical records of children aged from 3 months to 15 years and diagnosed with CP were included. Parents/guardians of children presenting with CP were contacted and invited to come with their children to the DGOPH where they were examined by a pediatric neurologist. A questionnaire designed for the study was used to collect sociodemographic, clinical, paraclinical, and treatment data for each child. Results: Out of the 4064 medical records reviewed, CP was diagnosed in 198 children (4.86%). These children were predominantly male (53.6%), aged 3-24 months (54.0%). Perinatal disorders were the main CP etiologies, especially neonatal asphyxia (55.1%), jaundice (32.8%), and neonatal infections (25.8%). Most of the children were born at term (81.6%) and by vaginal delivery (62.6%), with a normal birth weight (83.2%). Several comorbidities were found including speech delay (74.2%) and epilepsy (34.4%). The patients with CP presented predominantly with the spastic form of the disease, especially spastic quadriplegia (44.3%). Less than half of the children were managed at hospital, while the majority of parents were following various traditional treatments. Conclusion: Addressing preventable causes of CP and improving awareness in the population will be of great help to reduce CP in Cameroon.

PMID: 35094907

12. Underlying causes of cerebral palsy: public health perspectives
Gulnara Kapanova, Shynar Malik, Aima Adylova

Review Folia Neuropathol. 2021;59(4):386-392. doi: 10.5114/fn.2021.112019.

Cerebral palsy (CP) is a neurological pathology that is characterized by a combination of signs and symptoms that occur in neurodegenerative or metabolic disorder during the first few years of life. It is a complex pathology orchestrated by a plethora of different causes. The current diagnostic regimen for CP involves brain magnetic resonance imaging (MRI), and antenatal and perinatal insult. Despite advances in the field of genetics and molecular biology, the evaluating the underlying causes of this severe pathology are still bleak. In this review we have attempted to provide a landscape of the underlying mechanisms of cerebral palsy. We have partitioned this review broadly into genetic and proteomic-based studies, which have enriched our understanding about the pathogenesis of CP.

PMID: 35114779

13. Diagnostic preferences include discussion of etiology for adults with cerebral palsy and their caregivers
Bhooma R Aravamuthan, Michele Shusterman, Leeanne Green Snyder, Monica E Lemmon, Jennifer M Bain, Paul Gross, For Simons Searchlight; Cerebral Palsy Research Network

Dev Med Child Neurol. 2022 Jan 29. doi: 10.1111/dmcn.15164. Online ahead of print.

Aim: To determine the views of individuals with cerebral palsy (CP) and their caregivers (CP community members) about carrying a CP diagnosis, an etiological diagnosis, or both diagnoses together. Method: We surveyed CP community members across two registries querying their views on carrying a CP diagnosis, one type of etiological diagnosis (specifically, a genetic diagnosis), or both. Open-ended responses were analyzed using a conventional content analysis approach. Results: Of 197 respondents (108 adults with CP and 89 caregivers), most (75%) valued knowing the cause of their CP. Of those with a diagnostic preference, most preferred carrying both CP and etiological diagnoses together (68%). When compared with carrying an etiological diagnosis alone, significantly more respondents felt a CP diagnosis helped anticipate symptom evolution

(84% vs 54%), explain symptoms to others (86% vs 48%), access services (86% vs 48%), and join support communities (78% vs 50%) ($p < 0.01$, $\chi 2$ test). Interpretation: Most CP community members surveyed want to know the cause of their CP and would prefer carrying both CP and etiological diagnoses together. Clinical practice should evolve to meet these community needs.

PMID: 35092695

14. Evidence review for spasticity: Cannabis-based medicinal products
No authors listed

London: National Institute for Health and Care Excellence (NICE); 2019 Nov. NICE Evidence Reviews Collection.

Spasticity is a specific form of increased muscle tone (hypertonia) associated with a number of neurological disorders. The prevalence of lower limb spasticity reported in a systematic review was 28–37% in people with stroke, 41–69% in people with multiple sclerosis, 13% in people with traumatic brain injury and 75% moderate-severe spasticity in people with cerebral palsy. The impact of spasticity and co-existing disorders on the individual varies. Common problems include motor developmental delay (in children), pain from muscle spasms, impaired motor function affecting the person's ability to participate in society, and difficulties with daily care due to the onset of secondary complications of spasticity. Management should be tailored to meet the problems faced by the individual and achieve their goals. The NICE guidelines on Spasticity in under 19s, Multiple sclerosis, Cerebral palsy in adults, Cerebral palsy in under 25s and Motor neurone disease, include recommendations on how to manage spasticity in these conditions. The aim of this review is to examine the effectiveness of cannabis-based medicinal products (CBMP) for people with spasticity. This review also aims to identify adverse events, complications and contraindications associated with the use of CBMP. Additionally, this review will examine individual patient requirements, treatment durations, reviewing and stopping criteria with the use of CBMP. Review question: What is the clinical and cost effectiveness of cannabis-based medicinal products for people with spasticity? What are the adverse effects or complications of cannabis-based medicinal products for people with spasticity? What are the contraindications, potential interactions and risks and cautions for use of cannabis-based medicinal products for people with spasticity? What are the individual patient monitoring requirements, treatment durations, reviewing and stopping criteria, including how should treatment be withdrawn or stopped, for use of cannabis-based medicinal products for people with spasticity? The review protocol for this review question is in Appendix A. The PICO table below formed part of the search strategy to identify studies associated with spasticity.

PMID: 35107908

15. Early motor repertoire and neurodevelopment at 2 years in infants born extremely preterm or extremely-low-birthweight
Amanda K L Kwong, Lex W Doyle, Joy E Olsen, Abbey L Eeles, Katherine J Lee, Jeanie L Y Cheong, Alicia J Spittle

Dev Med Child Neurol. 2022 Feb 1. doi: 10.1111/dmcn.15167. Online ahead of print.

Aim: To determine the relationship between early motor repertoire and 2-year neurodevelopment in infants born extremely preterm (<28 weeks' gestation) or extremely-low-birthweight (ELBW) (<1000g). Method: This was a geographical prospective cohort of 139 infants born extremely preterm/ELBW (mean gestational age 26.7 weeks, standard deviation [SD] 2.0, 68/139 [49%] male), with parent-recorded videos suitable for scoring the General Movements Assessment (GMA). Motor repertoire was assessed using the Motor Optimality Score-Revised (MOS-R), with and without the fidgety movement subsection, and the GMA alone at 12 to 13+6 weeks corrected age and 14 to 15+6 weeks corrected age. At 2 years corrected age, impaired development was defined as Bayley Scales of Infant and Toddler Development, Third Edition motor and cognitive development scores 1SD or less relative to controls born at term; paediatricians diagnosed cerebral palsy (CP). Results: Greater MOS-R scores at 14 to 15+6 weeks corrected age were associated with lower odds of CP (odds ratio [OR] per 1-point increase=0.83, 95% confidence interval [CI]=0.71-0.99), and motor (OR=0.93, 95% CI=0.87-0.99), or cognitive impairment (OR=0.94, 95% CI=0.88-0.99). Absent/abnormal GMA at 14 to 15+6 weeks was associated with CP and motor delay. There was little evidence that MOS-R scores at 12 to 13+6 weeks were associated with neurodevelopmental outcomes at 2 years. Interpretation: Poorer MOS-R scores and absent/abnormal GMA, scored from parent-recorded videos at 14 to 15+6 weeks gestational age, are associated with CP and developmental impairment in 2-year-old infants born extremely preterm/ELBW.

PMID: 35103304

16. Can items on the TIMP aide in determining the motor performance of children with severe cerebral palsy? A pilot study
Sébastien Vanderlinden, Delphine Dispa, Fanny Gustin, Clémence Arets, Gay L Girolami, Hélène M Larin

Physiother Theory Pract. 2022 Feb 2;1-8. doi: 10.1080/09593985.2022.2032511. Online ahead of print.

Background: Assessing the functional level of children with severe cerebral palsy (CP) requires sensitive tools. In this study, an 'assessment tool' was developed based on the Test of Infant Motor Performance (TIMP) for this population and the reliability and validity evaluated. Methods: Five physical therapists administered the 'assessment tool' to six children (3-6 years old with a diagnosis of CP, GMFCS Level V). Subtest I of the Gross Motor Function Measure (GMFM-88) was also administered. Intra- and inter-rater reliability were assessed, and the concurrent validity between the 'assessment tool' and GMFM-88 calculated. Results: The intra-rater reliability, a comparison of the total scores on the 'assessment tool' (live test) and the videotaped rescoring of the same test one month later showed consistency among four of the five therapists (ICC = 0.7545 to 0.979). The inter-rater reliability varied on some of the items but the total score on the 'assessment tool' showed good reliability (ICC2,5 0.816). Scores of children with dyskinesia were less stable. The Spearman's rank correlation coefficient was not significant. Therapists provided recommendations for item revisions. Conclusion: Further development of an 'assessment tool' appears justified; a larger study using a version with revised administration guidelines and items should be undertaken to re-verify the psychometrics properties of the 'assessment tool.'

PMID: 35105255

17. Reference material for Hammersmith Infant Neurological Examination scores based on healthy, term infants aged 3 to 7 months
Ulf Wike Ljungblad, Henriette Paulsen, Trine Tangeraas, Kari Anne I Evensen

J Pediatr. 2022 Jan 27;S0022-3476(22)00058-0. doi: 10.1016/j.jpeds.2022.01.032. Online ahead of print.

Objective: To provide a valid, continuous reference interval, including a 10th percentile cut-off, for Hammersmith Infant Neurological Examination (HINE) scores based on 3-7 months old term infants with weight appropriate for gestational age. Study design: In a prospective study we examined 168 Norwegian infants at one timepoint with HINE at 3-7 months of age. In 134 of these infants Ages and Stages Questionnaire was completed by their parents at two years of age to ensure typical motor development. We calculated a reference interval for HINE scores with the 10th percentile as cut-off for age-dependent optimal scores. Results: The best fitting mean model for HINE total score was 78.1358+9659.231*1/age2-5104.174*LN(age)/age2, which explained 49.8% of the variance. The HINE total score 10th percentile cut-off corresponded to 52.1 points at age 12 weeks, 55.6 points at 16 weeks, 59.0 points at 20 weeks, 61.8 points at 24 weeks and 63.8 points at 28 weeks. We found an excellent intra-class correlation coefficient of 0.953 (0.931-0.968) between two examiners. The infants had a typical motor development at two years follow-up. Conclusion: We have presented a valid, continuous reference interval and a 10th percentile cut-off for HINE scores for infants aged 3 to 7 months.

PMID: 35093317

18. Growth in infants, children and adolescents with unilateral and bilateral cerebral palsy
Maria de Las Mercedes Ruiz Brunner, Eduardo Cuestas, Florian Heinen, Andreas Sebastian Schroeder

Sci Rep. 2022 Feb 3;12(1):1879. doi: 10.1038/s41598-022-05267-y.

To compare growth patterns during infancy, childhood and adolescence in children with unilateral and bilateral cerebral palsy (CP) phenotype and to assess the association with gross motor impairment, dysphagia and gestational age. We retrospectively studied 389 children with CP from a single center population in Munich, Germany. 1536 measurements of height and weight were tabulated and z-scored from 6 to 180 months of age. Generalized linear mixed model were used to examine the association between growth, GMFCS, dysphagia and gestational age by CP phenotype. Children with unilateral CP tend to grow similarly to their typically developed peers. In the main effect model, bilateral CP phenotype was significantly associated with decreased mean z-scores for height (β [95% CI] - 0.953 [- 1.145, - 0.761], p < 0.001), weight (- 0.999 [- 1.176, - 0.807], p

< 0.001) and BMI (β [95% CI] - 0.437 [- 0.799, - 0.075]), compared with unilateral CP phenotype. This association remained significant in the interaction models. The height-for-age z-scores, weight-for-age decreased z-scores and BMI-for-age z-scores of children with bilateral CP and GMFCS III-V or dysphagia decreased more significantly than those of children with unilateral CP. Preterm birth was not significantly associated with decreased growth in height, weight and BMI. Reduced growth in children with bilateral CP was strongly associated with moderate to severe impairment in gross motor function (GMFCS III-V) and dysphagia.

PMID: 35115566

19. Mapping the focus of research conducted with adults with cerebral palsy: an overview of systematic reviews
Lyndal Hickey, Osman Kuyucak, Lukas Clausen, Christine Imms

Disabil Rehabil. 2022 Feb 3;1-24. doi: 10.1080/09638288.2022.2032412. Online ahead of print.

Purpose: To map research conducted with adults with cerebral palsy (CP) to the International Classification of Functioning, Disability and Health (ICF) to understand the array of research available, identify key clinical messages and inform future research. Materials and methods: An overview of systematic reviews was conducted. Comprehensive searches (to December 2021) were conducted in PsycINFO, Web of Science, MEDLINE, CINAHL, Cochrane, JBI, and EMBASE. Eligible studies were systematic reviews that included primary studies of adults with CP. Included reviews were assessed for study quality and mapped to the ICF components and chapters. A narrative synthesis of commonly reported outcomes within the component/s and chapter/s was conducted. Results: All 24 included reviews were published since 2010. Thirteen focused on body functions: movement related functions and cardiovascular and respiratory systems. Although nine reviews focused on gait and mobility, considerable overlap of included studies limited the volume of evidence and variability in review quality limited generalisability of findings. Conclusions: Research involving adults with CP is growing; however, this overview of reviews found a predominant focus on mobility and gait. Future research, informed by consumer priorities, is needed to address a broader range of key health and participation outcomes. Implications for rehabilitation: Fitness, mobility, and gait were the most common research topics found in these systematic reviews suggesting a narrow research focus in adults with CP. There are significant gaps in our knowledge to inform clinical messages for practice about broad long-term outcomes of CP and how best to support their activity performance and participation. There is very limited evidence with which to guide and support rehabilitation professionals working in this field.

PMID: 35114857

20. Corrigendum: Shared Physiologic Pathways Among Comorbidities for Adults With Cerebral Palsy
Daniel G Whitney, Mary Schmidt, Edward A Hurvitz

Published Erratum Front Neurol. 2022 Jan 18;12:830052. doi: 10.3389/fneur.2021.830052. eCollection 2021.

[This corrects the article DOI: 10.3389/fneur.2021.742179.].

PMID: 35115999

21. A Severe Baclofen Intoxication Mimicking Post-Hypoxic Encephalopathy: Wait and See!
Lieke Muntinga, Adine J Klijn, Gerrit Jan Noordergraaf

J Emerg Med. 2022 Jan 28;S0736-4679(21)00916-1. doi: 10.1016/j.jemermed.2021.11.007. Online ahead of print.

Background: A severe baclofen intoxication is a potentially life-threatening condition. It is associated with coma and can cause brainstem reflexes to disappear, simulating a brain death-like condition. When given intensive supportive care and time, patients can recover without residual neurological damage. Case report: We present a case of a patient with known spastic cerebral palsy who was found unresponsive with no signs of breathing. He was brought to the Emergency Department,

intubated, put on the ventilator, and hemodynamically stabilized. Brainstem reflexes were absent and he appeared brain dead. During the secondary survey, an intrathecal baclofen pump was found at his left lower abdomen, with a swelling next to it. A baclofen intoxication was suspected. He was admitted to the Intensive Care Unit, and after 72 h of supportive care complete neurological recovery was achieved. WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?: Systemic baclofen intoxication can simulate a brain death-like condition. There is no reliable correlation between baclofen serum levels and central nervous system depression in case of an intoxication. It is important for emergency physicians to recognize a baclofen intoxication as a possible cause of coma and absent brainstem reflexes. Recuperation is spontaneous and can follow within days without residual damage. Because these patients may be brought in after a period of apnea or cardiopulmonary resuscitation, focus may be on post-hypoxic encephalopathy considerations instead of a possible baclofen intoxication.

PMID: 35101314