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Interventions and Management

1. Spinal cord microstructural changes are connected with the aberrant sensorimotor cortical oscillatory activity in adults with cerebral palsy

Michael P Trevarrow, Anna Reelfs, Sarah E Baker, Rashelle M Hoffman, Tony W Wilson, Max J Kurz

Sci Rep. 2022 Mar 21;12(1):4807. doi: 10.1038/s41598-022-08741-9.

Previous animal models have illustrated that reduced cortical activity in the developing brain has cascading activity-dependent effects on the microstructural organization of the spinal cord. A limited number of studies have attempted to translate these findings to humans with cerebral palsy (CP). Essentially, the aberrations in sensorimotor cortical activity in those with CP could have an adverse effect on the spinal cord microstructure. To investigate this knowledge gap, we utilized magnetoencephalographic (MEG) brain imaging to quantify motor-related oscillatory activity in fourteen adults with CP and sixteen neurotypical (NT) controls. A subset of these participants also underwent cervical-thoracic spinal cord MRI. Our results showed that the strength of the peri-movement beta desynchronization and the post-movement beta rebound were each weaker in the adults with CP relative to the controls, and these weakened responses were associated with poorer task performance. Additionally, our results showed that the strength of the peri-movement beta response was associated with the total cross-sectional area of the spinal cord and the white matter cross-sectional area. Altogether these results suggest that the altered sensorimotor cortical activity seen in CP may result in activity-dependent plastic changes within the spinal cord microstructure, which could ultimately contribute to the sensorimotor deficits seen in this population.

PMID: [35314729](#)

2. The Psychometric Properties of the Trunk Impairment Scale in Children with Cerebral Palsy

Hyerim Jung, Young-Eun Choi

Children (Basel). 2022 Mar 19;9(3):435. doi: 10.3390/children9030435.

The Trunk Impairment Scale (TIS) measures static and dynamic seated trunk control in children with cerebral palsy (CP) who have postural control problems. Studies have investigated the reliability and validity of the TIS. However, the fitness and difficulty of the scale items have not been investigated. This study used Rasch analysis to test the construct validity of TIS for children with CP. TIS data were collected from 60 children with CP and analyzed for person and item fit, item difficulty, rating scale suitability, and separation reliability. Principal component analyses of residuals revealed that TIS had unidimensionality. Five misfit items (static sitting balance (SSB) items 2 and 3, dynamic sitting balance (DSB) items 4 and 5, and coordination (COO) item 3) were identified. DSB8 is the most difficult item, followed by DSB3 and COO4. On the other hand, the SSB3 item was found to be a relatively easy item. The rating scales demonstrated that out of the three subscales, SSB, DSB, and COO, only the SSB subscale did not meet the appropriate criteria. We demonstrated that statistical item analysis with the Rasch model could provide valuable information related to psychometric properties.

PMID: [35327807](#)

3. Reliability and validity of the Swaymeter for measuring the trunk control in children with spastic cerebral palsy

Arisa Parameyong, Sirinun Boripuntakul, Nuanlaor Thawinchai, Jitapa Chawawisuttikool, Teerawat Kamnardsiri

Dev Neurorehabil. 2022 Mar 23;1-7. doi: 10.1080/17518423.2022.2055189. Online ahead of print.

Aims: To examine the reliability and validity of a simple device, the Swaymeter, for measuring trunk control in children with CP. **Methods:** Twenty children with spastic CP participated in this study. Trunk sway was measured while quietly sitting for 30s. Children lean forward or backward as far as possible for measuring dynamic balance range. Test-retest reliability was conducted. The concurrent and construct validity of the Swaymeter was assessed by comparison to the motion capture system and gross motor function measure (GMFM). **Results:** The reliability of the Swaymeter was moderate to excellent in measuring trunk sway and dynamic balance range (ICCs = 0.696-0.948). Concurrent validity showed good results ($r = 0.818-0.997$) and construct validity of dynamic balance in anterior direction showed moderate to high correlation with the GMFM ($r = 0.599-0.849$). **Conclusion:** Assessment of trunk control in a sitting position using the Swaymeter in this study was valid and reliable in children with CP.

PMID: [35319339](#)

4. Operative treatment of the young cerebral palsy hip

Hyrum Judd, Joshua E Hyman

J Pediatr Rehabil Med. 2022 Mar 12. doi: 10.3233/PRM-220022. Online ahead of print.

Hip dysplasia, subluxation, and eventual hip dislocation are commonly encountered in the cerebral palsy population secondary to spasticity and loss of motor control, especially in those patients with more severe neurologic involvement. The treatment of hip disorders in these patients should take into account the degree of limb and hip involvement, pain severity, and overall functioning. Conservative management focuses on mitigating spasticity and preserving range of motion in order to provide an environment in which the femoral head remains concentrically reduced in the acetabulum. However, operative management, consisting of soft tissue or tendon releases, femoral or pelvic osteotomies, or hip salvage procedures, is sometimes necessary to treat the painful, subluxated, or dislocated hip. Radiographic hip surveillance in the pediatric cerebral palsy population is used to guide operative treatment. Long term hip containment is generally improved when surgical intervention is performed in the earlier stages of dysplasia. Younger patients who demonstrate progressive hip subluxation despite conservative measures may be carefully selected to undergo soft tissue procedures. Bony reconstruction, with adjunctive soft tissue procedures, is often necessary to better contain the proximal femur in patients above the age of four years.

PMID: [35311730](#)

5. Hip surveillance for patients with cerebral palsy in the United States

M Wade Shrader, Paul H Gross, Amy F Bailes, Amanda T Whitaker

J Pediatr Rehabil Med. 2022 Mar 12. doi: 10.3233/PRM-220013. Online ahead of print.

No abstract available

PMID: [35311728](#)

6. A pediatric physiatrist's approach to neuromuscular hip dysplasia in cerebral palsy

Amy Tenaglia, Hana Azizi, Heakyung Kim

Review J Pediatr Rehabil Med. 2022 Mar 12. doi: 10.3233/PRM-220007. Online ahead of print.

Cerebral palsy (CP) encompasses a group of disorders pertaining to abnormalities in movement, tone, and/or posture due to a nonprogressive lesion to an immature brain. Hip dysplasia is the second most common orthopedic deformity seen in CP, and its severity can range from a hip at risk for subluxation to full hip dislocation with degenerative changes. The purpose of this

article is to review the hip pathologies that occur in CP focusing on their pathogenesis, physical exam findings, impact on function, and conservative treatment. Through a review of the medical literature, it is demonstrated that early, aggressive, and comprehensive care led by a pediatric physiatrist is essential to mitigate progression to complete hip dislocation and preserve range of motion, prevent contracture, and promote maximum functional ability in all children with CP.

PMID: [35311727](#)

7. Australian hip surveillance guidelines at 10 years: New evidence and implementation

Noula Gibson, Meredith Wynter, Pam Thomason, Felicity Baker, Heather Burnett, H Kerr Graham, Megan Kentish, Sarah C Love, Eliza Maloney, Katherine Stannage, Kate Willoughby

J Pediatr Rehabil Med. 2022 Mar 15. doi: 10.3233/PRM-220017. Online ahead of print.

Optimum management of hip displacement in children with cerebral palsy (CP) is facilitated by an approach that focuses on anticipatory and preventive measures. Hip surveillance programs for children with CP were developed at the beginning of the new millennium, with the purpose of identifying hip displacement sufficiently early to permit a choice of effective management options. In the early years, hip surveillance was guided by epidemiological analysis of population-based studies of prevalence. In Australia, a National Hip Surveillance in CP Working Group was first convened in 2005. This resulted in a 2008 Consensus Statement of recommendations published and endorsed by Australasian Academy of Cerebral Palsy and Developmental Medicine (AusACPD). The group undertook that the recommendations should be reviewed every 5 years to ensure currency and congruency with the emerging evidence base. As new evidence became available, hip surveillance guidelines developed, with the most recent 2020 Australian Hip Surveillance Guidelines endorsed by the AusACPD. Implementing comprehensive hip surveillance programs has now been shown to improve the natural history of hip dislocations and improve quality of life. Standardised hip surveillance programs can also facilitate planning for multicentre research through harmonisation of data collection. This, in turn, can help with the identification of robust new evidence that is based on large cohort or population studies. Here a review of evidence informing the updated 2020 Hip Surveillance Guidelines is presented.

PMID: [35311729](#)

8. Ankle-foot orthosis adherence in children and adolescents with cerebral palsy: A scoping review

Alice Faux-Nightingale, Mihaela Kelemen, Caroline Stewart

Prosthet Orthot Int. 2022 Mar 22. doi: 10.1097/PXR.000000000000095. Online ahead of print.

Ankle-foot orthoses (AFOs) are commonly supplied to children with cerebral palsy (CP) to support their gait. However, usage is reported to decrease through adolescence. Because AFOs can allow users to engage in daily activities and develop their independence, a wider understanding of nonadherence is essential to determining the most appropriate ways to support orthotic prescription for children with CP in the future. This scoping review will present the literature that investigates AFO adherence of children or adolescents with CP and identify potential avenues for future research and practice. A literature search was carried out using the EBSCO and Web of Science databases to identify literature that investigates AFO adherence by children with CP through measurement of AFO usage and exploration of factors that may influence that usage. Papers that investigated AFO adherence in children/adolescents with CP, either through usage or factors that could affect usage, were included in this review. Data were synthesized using a charting form developed for this review. In total, three papers were included in this review. Two included assessments of AFO usage and all three included at least anecdotal references to factors that could influence that usage. Variation in usage time was seen across participants in all studies, although the method used to record usage may influence reported usage values. Key factors that could affect usage were observed in four key categories: physical/AFO-related factors, personal factors, social factors, and situational appropriateness. Adherence is a complex subject, and both measurement of usage and factors that influence usage are key components needed to understand how children engage with their AFO. By better understanding the motivators and barriers to adherence, it is possible to better support the provision of AFOs in the future.

PMID: [35315831](#)

9. Orthoses for neurological ankles

Stephen Kirker

Editorial Pract Neurol. 2022 Mar 24;practneurol-2022-003357. doi: 10.1136/practneurol-2022-003357. Online ahead of print.

Patients with weakness or abnormal posture of their lower leg may benefit greatly from appropriate orthoses. This paper describes the sorts of problems that can be helped in neurological practice and the range of devices commonly used, and also highlights some of the factors influencing selection. With greater understanding of their use, clinicians will feel more confident about referring patients for early orthotic assessment.

PMID: [35332078](#)

10. Are Clinical Impairments Related to Kinematic Gait Variability in Children and Young Adults With Cerebral Palsy?

Anne Tabard-Fougère, Dionys Rutz, Annie Pouliot-Laforte, Geraldo De Coulon, Christopher J Newman, Stéphane Armand, Jennifer Wegrzyk

Front Hum Neurosci. 2022 Mar 2;16:816088. doi: 10.3389/fnhum.2022.816088. eCollection 2022.

Intrinsic gait variability (GV), i.e., fluctuations in the regularity of gait patterns between repetitive cycles, is inherent to the sensorimotor system and influenced by factors such as age and pathology. Increased GV is associated with gait impairments in individuals with cerebral palsy (CP) and has been mainly studied based on spatiotemporal parameters. The present study aimed to describe kinematic GV in young people with CP and its associations with clinical impairments [i.e., passive range of motion (pROM), muscle weakness, reduced selective motor control (selectivity), and spasticity]. This retrospective study included 177 participants with CP (age range 5-25 years; Gross Motor Function Classification System I-III) representing 289 clinical gait analyses [$n = 172$ for unilateral CP (uCP) vs. 117 for bilateral CP (bCP)]. As variability metrics, Root Mean Square Deviation (RMSD) for nine lower-limb kinematic parameters and Gait Standard Deviation (GaitSD) - as composite score of the kinematic parameters - were computed for the affected (unilateral = uCP) and most affected side (bilateral = bCP), respectively, as defined by clinical scores. GaitSD was then computed for the non/less-affected side for between leg comparisons. Uni- and multivariate linear regressions were subsequently performed on GaitSD of the affected/most affected side with all clinical impairments (composite scores) as independent variables. Highest RMSD were found in the transverse plane (hip, pelvis), for distal joints in the sagittal plane (knee, ankle) and for foot progression. GaitSD was not different between uCP and bCP (affected/most affected side) but higher in the non-affected vs. affected side in uCP. GaitSD was associated with age ($p < 0.001$), gait deviation index (GDI) ($p < 0.05$), muscle weakness ($p < 0.001$), selectivity ($p < 0.05$), and pROM ($p < 0.001$). After adjustment for age and GDI, GaitSD remained associated with muscle weakness (uCP: $p = 0.003$, bCP: $p < 0.001$) and selectivity (bCP: $p = 0.024$). Kinematic GV can be expressed as global indicator of variability (GaitSD) in young people with CP given the strong correlation of RMSD for lower-limb kinematic parameters. In terms of asymmetry, increased variability of the non-affected vs. affected side may indicate contralateral compensation mechanisms in uCP. Notably muscle weakness (uCP, bCP) and selectivity (bCP) - but not spasticity - were associated with GaitSD. Further studies need to explore the clinical relevance of kinematic GV in CP to support the interpretation of clinical gait analyses and therapeutic decision-making.

PMID: [35308609](#)

11. Is robotic gait training effective for individuals with cerebral palsy? A systematic review and meta-analysis of randomized controlled trials

Benjamin C Conner, Nushka M Remec, Zachary F Lerner

Clin Rehabil. 2022 Mar 25;2692155221087084. doi: 10.1177/02692155221087084. Online ahead of print.

Aim: To determine if robotic gait training for individuals with cerebral palsy is more effective than the standard of care for improving function. **Method:** PubMed, Embase, Scopus, and Cochrane databases were searched from 1980-January, 2022 for articles that investigated robotic gait training versus standard of care (i.e. physical therapy or standard gait training) for individuals with cerebral palsy. Articles were included if a randomized controlled trial design was used, and excluded if robotic gait training was combined with another neuromuscular intervention, such as functional electrical stimulation. A meta-analysis of outcomes measured in at least four studies was conducted. **Results:** Eight citations met all criteria for full-text review and inclusion in the meta-analysis. A total of 188 individuals with cerebral palsy, ages four to 35, and Gross Motor Function Classification System levels I-IV were studied. Level of evidence ranged from 2b-1b. All studies utilized a tethered, assistive device for robotic gait training. The overall effect was not significantly different between the robotic gait training and control interventions for six minute walk test performance (95% CI: -0.17, 0.73; $P = 0.22$), free walking speed (95% CI: -0.18, 0.57; $P = 0.30$), or Gross Motor Function Measures D (Standing) (95% CI: -0.29, 0.39; $P = 0.77$) and E (Walking, Running and Jumping) (95% CI: -0.11, 0.57; $P = 0.19$). **Conclusion:** Tethered robotic devices that provide assistive gait training for individuals with cerebral palsy do not provide a greater benefit for improving mobility than the standard of care.

PMID: [35331027](#)

12. Recurrence of Equinus Foot in Cerebral Palsy following Its Correction-A Meta-Analysis

Axel Horsch, Matthias Claus Michael Klotz, Hadrian Platzer, Svenja Elisabeth Seide, Maher Ghandour

Review Children (Basel). 2022 Mar 2;9(3):339. doi: 10.3390/children9030339.

Background: Recurrence in cerebral palsy (CP) patients who have undergone operative or non-operative correction varies greatly from one study to another. Therefore, we conducted this meta-analysis to determine the pooled rate of equinus recurrence following its correction either surgically or non-surgically. Methods: Nine electronic databases were searched from inception to 6 May 2021, and the search was updated on 13 August 2021. We included all studies that reported the recurrence rate of equinus following its correction among CP patients. The primary outcome was recurrence, where data were reported as a pooled event (PE) rate and its corresponding 95% confidence interval (CI). We used the Cochrane's risk of bias (RoB-II) tool and ROBINS-I tool to assess the quality of included randomized and non-randomized trials, respectively. We conducted subgroup analyses to identify the sources of heterogeneity. Results: The overall rate of recurrence was 0.15 (95% CI: 0.05-0.18; I² = 88%; p < 0.01). Subgroup analyses indicated that the laterality of CP, study design, and intervention type were significant contributors to heterogeneity. The recurrence rate of equinus differed among interventions; it was highest in the multilevel surgery group (PE = 0.27; 95% CI: 0.19-0.38) and lowest in the Ilizarov procedure group (PE = 0.10; 95% CI: 0.04-0.24). Twelve studies had a low risk of bias, eight had a moderate risk, and nine had a serious risk of bias. Conclusion: The recurrence of equinus following its correction, either surgically or non-surgically, in CP patients is notably high. However, due to the poor quality of available evidence, our findings should be interpreted with caution. Future studies are still warranted to determine the actual risk of equinus recurrence in CP.

PMID: [35327713](#)

13. Simple rule to automatically recognize the orientation of the sagittal plane foot angular velocity for gait analysis using IMUs on the feet of individuals with heterogeneous motor disabilities

Lena Carcreff, Cléo Moulin, Benoit Mariani, Stéphane Armand

J Biomech. 2022 Mar 18;135:111055. doi: 10.1016/j.jbiomech.2022.111055. Online ahead of print.

Automatic sensor-to-foot alignment is required in clinical gait analysis using inertial sensors to avoid assumptions about sensors initial positions and orientations. Numerous studies have proposed alignment methods. The current study aimed at describing and accessing the performance of a simple rule to automatically recognize the orientation of the sagittal plane foot angular velocity that can be used with any alignment method and any populations including individuals with severe motor disorders such as patients with cerebral palsy (CP). Fifty-five participants (15 healthy, 15 with CP and 25 with various other motor disorders) wore IMUs on both feet during one or several visits of clinical gait analysis (CGA) with optical motion capture system as reference. The foot coordinate system was determined using acceleration during motionless periods and angular velocity during walking, as previously described in the literature. Based on the foot sagittal plane angular velocity, a novel rule is introduced to determine the latest uncertainty related to mediolateral axis direction which often causes errors. It consisted of massively filtering the signal and applying a simple peak detection, omitting the double peaks with the same sign. The time between the negative and positive peaks can inform on the axis direction. This verification showed excellent results with 99.94% sensibility against the reference. This simple rule could be used to further improve existing sensor-to-segment algorithms with inertial sensors located on the feet, and thus improve pathological gait analysis.

PMID: [35325752](#)

14. Traceable Features of Static Plantar Pressure Characteristics and Foot Postures in College Students with Hemiplegic Cerebral Palsy

Tong-Hsien Chow

J Pers Med. 2022 Mar 4;12(3):394. doi: 10.3390/jpm12030394.

Patients with cerebral palsy (CP) are characterized by disturbances of mobility with postural and foot deformities. Subsequent development of CP may lead to changes in plantar loading. This study examined the characteristics of foot types and relative loads associated with centers of gravity and foot posture in college students with left and right hemiplegic CP, as well as these differences between unaffected and hemiplegic limbs. A cross-sectional study of 45 hemiplegic college students with mild CP and 62 healthy students was conducted. Static plantar pressure was measured with a JC Mat. CP students exhibited low arches, and their plantar pressure distributions (PPDs) were mainly exerted on the left forefoot, as well as on the right forefoot and

rearfoot. The weight shifted to the unaffected foot with dual plantar loading regions (forefoot and rearfoot), rather than the hemiplegic foot with a single region (forefoot). PPDs commonly increased at the medial metatarsals of both feet, and hemiplegic CP students presented the increased PPDs on the medial aspect of the hemiplegic foot accompanied by a rearfoot valgus posture pattern. The findings revealed a traceable feature to a possible connection among the pronated low arches, mild centers of gravity, metatarsal syndrome and rearfoot valgus of the hemiplegic limbs in CP patients.

PMID: [35330394](#)

15. Individuals with Chronic Mild-to-Moderate Traumatic Brain Injury Exhibit Decreased Neuromuscular Complexity During Gait

Samuel A Acuña, Mitchell E Tyler, Darryl G Thelen

Neurorehabil Neural Repair. 2022 Mar 23;15459683221081064. doi: 10.1177/15459683221081064. Online ahead of print.

Background: Synergy analysis provides a means of quantifying the complexity of neuromuscular control during gait. Prior studies have shown evidence of reduced neuromuscular complexity during gait in individuals with neurological disorders associated with stroke, cerebral palsy, and Parkinson's disease. **Objective:** The purpose of this study was to investigate neuromuscular complexity during gait in individuals who experienced a prior traumatic brain injury (TBI) that resulted in chronic balance deficits. **Methods:** We measured and analyzed lower extremity electromyographic data during treadmill and overground walking for 44 individuals with residual balance deficits from a mild-to-moderate TBI at least 1 year prior. We also tested 20 unimpaired controls as a comparison. Muscle synergies were calculated for each limb using non-negative matrix factorization of the activation patterns for 6 leg muscles. We quantified neuromuscular complexity using Walk-DMC, a normalized metric of the total variance accounted for by a single synergy, in which a Walk-DMC score of 100 represents normal variance accounted for. We compared group average synergy structures and inter-limb similarity using cosine similarity. We also quantified each individual's gait and balance using the Sensory Organization Test, the Dynamic Gait Index, and the Six-Minute Walk Test. **Results:** Neuromuscular complexity was diminished for individuals with a prior TBI. Walk-DMC averaged 92.8 ± 12.3 for the TBI group during overground walking, which was significantly less than seen in controls (100.0 ± 10.0). Individuals with a prior TBI exhibited 13% slower overground walking speeds than controls and reduced performance on the Dynamic Gait Index (18.5 ± 4.7 out of 24). However, Walk-DMC measures were insufficient to stratify variations in assessments of gait and balance performance. Group average synergy structures were similar between groups, although there were considerable between-group differences in the inter-limb similarity of the synergy activation vectors. **Conclusions:** Individuals with gait and balance deficits due to a prior TBI exhibit evidence of decreased neuromuscular complexity during gait. Our results suggest that individuals with TBI exhibit similar muscle synergy weightings as controls, but altered control of the temporal activation of these muscle weightings.

PMID: [35321610](#)

16. International football players with cerebral palsy maintained their physical fitness after a self-training program during the COVID-19 lockdown

Iván Peña-González, José Manuel Sarabia, Agustín Manresa-Rocamora, Manuel Moya-Ramón

PeerJ. 2022 Mar 17;10:e13059. doi: 10.7717/peerj.13059. eCollection 2022.

Background: The COVID-19 global pandemic caused a complete stop in sport participation which meant a detraining period for athletes. High-level athletes had to train at home guided by their coaches and conditioning trainers in an effort to maintain their physical fitness. The aim of maintaining the training adaptations and physical fitness during the COVID-19 mandatory lockdown was especially important for CP athletes, in which the detraining period was expected to cause early declines in motor function, poor coordination and muscle weakness due to their disability. **Methods:** The present study assessed the effect of a guided self-training program on international CP football players' physical fitness during the COVID-19 mandatory lockdown. Fifteen CP football players from the Spanish National Team participated in the study. An experimental design with a pre- (T1) and a post-intervention (T2) assessment was carried out, with a 12-week period of players' self-training (divided in two periods of 6 weeks) which combined strength and endurance training. Physical performance assessment consisted in the free countermovement jump (CMJ), 5, 10 and 20-m sprint, the modified agility T-test (MAT) and a dribbling test. The Kruskal-Wallis test was used for between-group comparisons, while the Student's paired t test or the Fisher Pitman permutation test, based on the normality of the data, were used for within-group comparisons. **Results:** The results showed no differences between sport classes (FT1, FT2 and FT3) in physical fitness change after the training program ($\text{Chi}^2 = 0.16$ to 1.73 ; $p = 0.42$ to 0.92). Within-group comparisons showed an increase of jump height in the CMJ (4.19 cm [$2.46, 5.93$]; $p < 0.001$) and a maintenance of the 5, 10 and 20-m sprint, MAT and dribbling ability (<0.01 to 0.09 s; $p = 0.19$ to 0.97). **Discussion:** To the authors' knowledge, this is the first study that examined the physical fitness adaptations to a training program with CP football players. The results show that a 12-week guided self-training program without football-specific stimulus may be effective to

maintain or even improve the specific physical performance of international CP football players during a non-competitive period (as the COVID-19 lockdown). This study reveals that CP football players are able to show adaptations to the strength and endurance training and this could be the basis for future research regarding training adaptations in CP football players.

PMID: [35317073](#)

17. The Effect of Context-Based Interventions at the Systems-Level on Participation of Children with Disabilities: A Systematic Review

Paul Yejong Yoo, Ebele R I Mogo, Janet McCabe, Melanie Bergthorson, Rose Elekanachi, Roberta Cardoso, Mehrnoosh Movahed, Annette Majnemer, Keiko Shikako

Phys Occup Ther Pediatr. 2022 Mar 24;1-24. doi: 10.1080/01942638.2022.2051675. Online ahead of print.

Aims: To synthesize evidence on the impact of context-based interventions on the participation of children with disabilities in the community. **Methods:** A systematic review was conducted using the American Academy for Cerebral Palsy and Developmental Medicine Guidelines for systematic reviews. Seven databases were searched; articles included were on children with developmental disabilities under the age of 19 years, describing systems-level, context-based interventions aimed to improve participation and Participation-related outcomes of the Family of Participation-related Constructs framework. **Intervention characteristics** were coded using the Community Wellbeing Framework (CWF). **Results:** Eleven articles were included for knowledge synthesis. Four studies were level I, II, and III based on the Center for Evidence-Based Medicine hierarchy. All four showed that context-based interventions had a positive effect on participation and participation-related outcomes. All 11 studies had intervention properties that were coded to at least one domain on the CWF. **Conclusion:** There is a scarcity of high-quality studies that focus on context-based interventions at the systems-level, as opposed to the individual-level. Albeit low-level quality, existing evidence emphasized the importance of using known facilitators to participation, such as staff training, peer mentorship, awareness-raising, and development of partnerships to change the system and promote participation.

PMID: [35331080](#)

18. Ultrasound-Guided OnabotulinumtoxinA Injections to Treat Oromandibular Dystonia in Cerebral Palsy

Fabiola I Reyes, Hannah A Shoval, Amy Tenaglia, Heakyung Kim

Case Reports Toxins (Basel). 2022 Feb 22;14(3):158. doi: 10.3390/toxins14030158.

Cerebral palsy (CP) is a group of non-progressive disorders of motor function in children resulting from an injury to an immature brain. In addition to abnormal limb and trunk movement, individuals with CP can experience involuntary muscle contractions of the lower facial muscle groups, causing oromandibular dystonia (OMD). Contraction of the lateral pterygoids and submandibular muscles depresses the mandible. OMD involving the lateral pterygoids can therefore lead to involuntary jaw opening posture, affecting the ability to feed and speak effectively. We present a case series of five patients with CP and OMD that received novel ultrasound-guided onabotulinumtoxinA to the lateral pterygoid muscles. Our goal was to determine if chemodenervation would improve the mouth-closing ability, thus in turn improving the ability to swallow, chew, manage secretions, and communicate. We describe this unique injection method and report a subjective improvement in eating abilities and communication, in addition to a positive upward trend in most patients' weights, with no significant adverse side effects.

PMID: [35324655](#)

19. The role of Augmentative and Alternative Communication in Speech and Language Therapy: A mini review

Ayesha Kamal Butt, Rabia Zubair, Farooq Azam Rathore

Review J Pak Med Assoc. 2022 Mar;72(3):581-584. doi: 10.47391/JPMA.22-023.

Augmentative and Alternative Communication is an aided or unaided means of communication which supports existing communication abilities of an individual or replaces natural speech due to any speech and language disorder. The deficit could be developmental or acquired such as autism spectrum disorder, cerebral palsy, learning difficulties, dysarthria, dyspraxia or due to any acquired neurological condition such as aphasia and other degenerative disorders. Furthermore, it may be due to surgical procedures such as laryngectomy. Alternate means of communication have also been successfully used with COVID-19 patients. These tools may include pictures, symbols, signs or voice output devices. Parents of children with special needs

and medical professionals have been reluctant in implementing the approach due to certain misconceptions. The aim of this review is to summarize the current evidence for the use of Augmentative and Alternative Communication with a range of disorders in relation to in relation to Pakistan.

PMID: [35320253](#)

20. Social skills group training in adolescents with disabilities: A systematic review

Rose Gilmore, Jenny Ziviani, Mark D Chatfield, Sarah Goodman, Leanne Sakzewski

Review Res Dev Disabil. 2022 Mar 17;125:104218. doi: 10.1016/j.ridd.2022.104218. Online ahead of print.

Background: Group social skills interventions (GSSIs) are offered to youth with Autism Spectrum Disorder (ASD) to improve social functioning. This systematic review focused on the adolescent population, including a wider range of disabilities. **Aims:** To evaluate effectiveness of GSSIs at improving social functioning in adolescents with congenital, acquired or developmental disabilities. **Methods and procedures:** Databases, trial registries and dissertations were systematically searched and a meta-analysis of randomized controlled trials conducted. Study screening, risk-of-bias assessment and Grading of Recommendations Assessment, Development and Evaluation were completed. **Outcomes and results:** Sixteen studies ($n = 1119$), 15 with adolescents with ASD and one with brain tumor survivors, revealed GSSIs reduced social impairment on the Social Responsiveness Scale (mean difference (MD) 9.68, 95% CI 5.63-13.73; $P < 0.001$), increased social skills on the Social Skill Improvement System Rating Scales (SMD 0.38, 95% CI 0.10-0.65; $P = 0.007$), and improved adolescent social knowledge on the Test of Adolescent Social Skills (MD 7.43 points, 95% CI 5.36-9.50; $P < 0.001$). **Conclusions and implications:** There is moderate certainty evidence that GSSIs improve social responsiveness, social skills and knowledge, and low certainty of evidence to improve social participation for adolescents with ASD. High quality randomized studies are required to inform clinical practice with adolescents with other disabilities. What this paper adds: Current evidence for group social skills interventions (GSSIs) is for adolescents with autism (ASD). GSSIs likely improve social knowledge and reduce impairments in adolescents with ASD, however the effect of GSSIs on social participation is not well understood. Only one randomized trial investigated GSSIs in another population of adolescents, highlighting the need for more high-quality studies including adolescents with other disabilities.

PMID: [35306461](#)

21. Intrathecal baclofen pumps: what the neurologist needs to know

Michelle S Balaratnam , Valerie L Stevenson

Pract Neurol. 2022 Mar 21;practneurol-2021-003184. doi: 10.1136/practneurol-2021-003184. Online ahead of print.

Increasing numbers of patients have an intrathecal baclofen pump implanted as part of spasticity management. Neurologists may be asked about the management of these devices when patients attend emergency departments for unrelated illnesses. Occasionally, the intrathecal baclofen system itself will directly lead to an acute presentation. Furthermore, the presence of an intrathecal baclofen pump needs consideration when requesting investigations, particularly MR imaging. This review aims to increase understanding of intrathecal baclofen treatment, highlighting serious complications and outlining considerations for routine investigations. Neurologists may still need advice from the intrathecal baclofen specialist team.

PMID: [35314493](#)

22. Age-Related Effects on the Spectrum of Cerebral Visual Impairment in Children With Cerebral Palsy

Jessica Galli, Erika Loi, Anna Molinaro, Stefano Calza, Alessandra Franzoni, Serena Micheletti, Andrea Rossi, Francesco Semeraro, Elisa Fazzi, CP Collaborative Group

Front Hum Neurosci. 2022 Mar 2;16:750464. doi: 10.3389/fnhum.2022.750464. eCollection 2022.

Background: Cerebral Visual Impairment (CVI) is a very common finding in children affected by Cerebral Palsy (CP). In this paper we studied the characteristics of CVI of a large group of children with CP and CVI, describing their neurovisual profiles according to three different age subgroups (subgroup 1: infants 6 months-2 years; subgroup 2: pre-school age 3-5 years; subgroup 3: school age ≥ 6 years). **Methods:** We enrolled 180 subjects (104 males, mean age 66 ± 42.6 months; range 6-192

months) with CP and CVI for the study. We carried out a demographic and clinical data collection, neurological examination, developmental or cognitive assessment, and a video-recorded visual function assessment including an evaluation of ophthalmological characteristics, oculomotor functions, and basic visual functions. In school-aged children, we also performed an evaluation of their cognitive-visual profiles. Results: There were signs of CVI in all the three subgroups. Subgroup 1 (62 children) and subgroup 2 (50 children) were different for fixation ($p = 0.02$), visual acuity ($p = 0.03$) and contrast sensitivity ($p < 0.01$), being more frequently impaired in younger children. Comparing subgroup 2 with subgroup 3 (68 children), the older children presented more frequently myopia ($p = 0.02$) while the younger ones esotropia ($p = 0.02$) and alteration in smooth pursuit ($p = 0.03$) and saccades ($p < 0.01$). Furthermore, fixation, smooth pursuit, visual acuity, contrast sensitivity and visual field ($p < 0.01$) were more frequently impaired in younger children (subgroup 1) compared to the older ones. Multiple correspondence analysis (MCA) confirmed the different neurovisual profiles according to age: younger children with CP showed more signs of CVI compared to the older ones. 34 out of 68 children belonging to subgroup 3 underwent the cognitive visual evaluation; an impairment of cognitive visual skills was detected in 21 subjects. Conclusion: Younger children with CP showed more signs of CVI compared to the older ones, likely for the physiological maturation of visual system and mechanisms of neuroplasticity. In this direction, we suggest an early neurovisual evaluation to detect any weak visual functions.

PMID: [35308614](#)

23. Videofluoroscopy compared to clinical feeding evaluation in children with suspected aspiration

Patrick Stafler, Khaled Akel, Yuliana Eshel, Adi Shimoni, Sylvia Grozovski, Meir Mei-Zahav, Hagit Levine, Yulia Gendler, Hannah Blau, Dario Prais

Acta Paediatr. 2022 Mar 22. doi: 10.1111/apa.16338. Online ahead of print.

Aim: Video fluoroscopy swallow studies (VFSS) are gold standard to diagnose aspiration in children but require resources and radiation compared to clinical feeding evaluation (CFE). We evaluated their added value for diagnosis, feeding management and clinical status. Methods: A retrospective single-center cross-sectional study of children aged 0-18 years, with respiratory morbidity, referred for VFSS at a tertiary pediatric hospital. Results: 113 children, median age (range) 2.2 years (0.1-17.9) underwent VFSS. Diagnosis included chronic pulmonary aspiration (CPA), 87 (77%); neurologic, 73 (64%); gastrointestinal, 73 (64%) and congenital heart disease, 42 (37%), not mutually exclusive. Forty-six (41%) aspirated, 9 (8%) only overtly and 37 (33%) including silent aspirations. Those with CPA or cerebral palsy were more likely to have VFSS aspiration, OR 3.2 and 9.8 respectively. Feeding recommendations after VFSS differed significantly from those based on prior CFE, $p < 0.001$: The rate of exclusively orally fed children rose from 65% to 79%, $p = 0.006$; exclusively enterally fed children from 10% to 14%; $p = 0.005$. During the year after VFSS, there were significantly less antibiotic courses, total and respiratory admissions. Conclusion: In this population with high prevalence of clinically suspected CPA, VFSS altered feeding management compared to CFE, and may have contributed to subsequent clinical improvement.

PMID: [35316543](#)

24. Evaluating the clinical benefit of brain-computer interfaces for control of a personal computer

Adam Fry, Ho Wing Chan, Noam Harel, Lisa Spielman, Miguel Escalon, David Putrino

J Neural Eng. 2022 Mar 24. doi: 10.1088/1741-2552/ac60ca. Online ahead of print.

Brain-computer interfaces (BCIs) enabling the control of a personal computer could provide myriad benefits to individuals with disabilities including paralysis. However, to realize this potential, these BCIs must gain regulatory approval and be made clinically available beyond research participation. Therefore, a transition from engineering-oriented to clinically oriented outcome measures will be required in the evaluation of BCIs. This review examined how to assess the clinical benefit of BCIs for the control of a personal computer. We report that: 1) a variety of different patient-reported outcome measures can be used to evaluate improvements in how a patient feels, and we offer some considerations that should guide instrument selection. 2) Activities of daily living can be assessed to demonstrate improvements in how a patient functions, however, new instruments that are sensitive to increases in functional independence via the ability to perform digital tasks may be needed. 3) Benefits to how a patient survives has not previously been evaluated, but establishing patient-initiated communication channels using BCIs might facilitate quantifiable improvements in health outcomes.

PMID: [35325875](#)

25. Effect of antenatal magnesium sulphate on MRI biomarkers of white matter development at term equivalent age: The MagNUM Study

Tanya Poppe, Benjamin Thompson, James P Boardman, Mark E Bastin, Jane Alsweiler, Gerard Deib, Jane E Harding, Caroline A Crowther, MagNUM Study Group

EBioMedicine. 2022 Mar 21;103923. doi: 10.1016/j.ebiom.2022.103923. Online ahead of print.

Background: Magnesium sulphate given to women prior to very preterm birth protects the perinatal brain, so fewer babies die or develop cerebral palsy. How magnesium sulphate exerts these beneficial effects remains uncertain. The MagNUM Study aimed to assess the effect of exposure to antenatal magnesium sulphate on MRI measures of brain white matter microstructure at term equivalent age. **Methods:** Nested cohort study within the Magnesium sulphate at 30 to <34 weeks' Gestational age Neuroprotection Trial (MAGENTA). Australian New Zealand Clinical Trials Registry ACTRN12611000491965. Mothers at risk of preterm birth at 30 to <34 weeks' gestation were randomised to receive either 4 g of magnesium sulphate heptahydrate [8 mmol magnesium ions], or saline placebo, when preterm birth was planned or expected within 24 h. Participating babies underwent diffusion tensor MRI at term equivalent age. The main outcomes were fractional anisotropy across the white matter tract skeleton compared using Tract-based Spatial Statistics (TBSS), with adjustment for postmenstrual age at birth and at MRI, and MRI site. Researchers and families were blind to treatment group allocation during data collection and analyses. **Findings:** Of the 109 babies the demographics of the 49 babies exposed to magnesium sulphate were similar to the 60 babies exposed to placebo. In babies whose mothers were allocated to magnesium sulphate, fractional anisotropy was lower within the corticospinal tracts and corona radiata, the superior and inferior longitudinal fasciculi, and the inferior fronto-occipital fasciculi compared to babies whose mothers were allocated placebo ($P < 0.05$). **Interpretation:** In babies born preterm after 30 weeks' gestation, antenatal magnesium sulphate exposure did not promote development of white matter microstructure in pathways affecting motor or cognitive function. This suggests that if the neuroprotective effect of magnesium sulphate treatment prior to preterm birth is confirmed at this gestation, the mechanisms are not related to accelerated white matter maturation inferred from fractional anisotropy. **Funding:** This study was funded by a project grant from the Health Research Council of New Zealand (HRC 14/153).

PMID: [35331677](#)

26. Relationship between Admission Temperature and Risk of Cerebral Palsy in Infants Admitted to Special Care Unit in a Low Resource Setting: A Retrospective Single-Center Study

Chiara Guadagno, Francesco Cavallin, Luca Brasili, Donald Micah Maziku, Dionis Erasto Leluko, Gaetano Azzimonti, Giovanni Putoto, Andrea Pietravalle, Daniele Trevisanuto

Children (Basel). 2022 Mar 3;9(3):352. doi: 10.3390/children9030352.

Background: Deviations from normothermia affect early mortality and morbidity, but the impact on neurodevelopment of the survivors is unclear. We aimed to investigate the relationship between neonatal temperature at admission and the risk of cerebral palsy (CP) at one month of age in a low-resource setting. **Methods:** This retrospective study included all inborn neonates admitted to the Special Care Unit of Tosamaganga Hospital (Tanzania) between 1 January 2019 and 31 December 2020. The neurological examination at one month of age was performed using the Hammersmith method. The relationship between the admission temperature and the risk of CP was investigated using logistic regression models, with temperature modeled as the non-linear term. **Results:** High/moderate risk of CP was found in 40/119 (33.6%) of the neonates at one month of age. A non-linear relationship between the admission temperature and moderate/high risk of CP at one month of age was found. The lowest probability of moderate/high risk of CP was estimated at admission temperatures of between 35 and 36 °C, with increasing probability when departing from such temperatures. **Conclusions:** In a low-resource setting, we found a U-shaped relationship between the admission temperature and the risk of CP at one month of life. Expanding the analysis of the follow-up data to 12-24 months of age would be desirable in order to confirm and strengthen such findings.

PMID: [35327724](#)

27. Chorioamnionitis and risk of long-term neurodevelopmental disorders in offspring; a population-based cohort study

Eleni Tsamantioti, Sarka Lisonkova, Giulia Muraca, Anne K Örtqvist, Neda Razaz

Am J Obstet Gynecol. 2022 Mar 16;S0002-9378(22)00199-5. doi: 10.1016/j.ajog.2022.03.028. Online ahead of print.

Background: Evidence indicates that in utero exposure to chorioamnionitis might increase the risk of neurodevelopmental disorders in the offspring. However, findings on this topic have been inconsistent. **Objective:** To examine the association

between chorioamnionitis and neurodevelopmental disorders in offspring. Study design: This was a retrospective population-based cohort study in Sweden. A total of 2,228,280 singleton live births and stillbirths between 1998 and 2019 were included in our study population. Data on maternal characteristics and neurodevelopmental disorders in offspring were obtained by individual record-linkages of nationwide Swedish registries. Chorioamnionitis was identified using the Medical Birth Registry. Inpatient and outpatient diagnoses were obtained for cerebral palsy, autism, attention deficit hyperactivity disorder, epilepsy, and intellectual disability. Multivariable Cox proportional hazards regression was used to estimate the association between chorioamnionitis and each neurodevelopmental disorders with adjusted hazard ratios and 95% confidence intervals. A causal mediation analysis of the relationship between chorioamnionitis and neurodevelopmental disorders with preterm delivery (<37 weeks) was performed. Results: A total of 5,770 (0.26%) offspring were exposed to chorioamnionitis during pregnancy. During the study's follow-up time there were 4,752 (0.21%) cases of cerebral palsy, 17,897 (0.80 %) cases of epilepsy, 50,570 (2.27 %) cases of autism, 114,087 (5.12%) cases of attention deficit hyperactivity disorder and 14,574 (0.65%) cases of intellectual disability. After adjusting for potential confounders, exposure to chorioamnionitis increased the hazard ratios of cerebral palsy (adjusted hazard ratio, 7.43; 95% confidence interval (5.90-9.37), autism (adjusted hazard ratio, 1.43; 95% confidence interval (1.21-1.68), attention deficit hyperactivity disorder (adjusted hazard ratio, 1.17; 95% confidence interval (1.03-1.33) and intellectual disability (adjusted hazard ratio, 1.99; 95% confidence interval, 1.53-2.58), while chorioamnionitis was not significantly associated with higher rates of epilepsy in offspring. Mediation analysis revealed that these associations were mainly explained through preterm delivery, however, increased risk was also observed among term infants. Conclusion: Chorioamnionitis increases the risk of neurodevelopmental disorders, particularly cerebral palsy, autism, attention deficit hyperactivity disorder, and intellectual disability. These associations were mainly mediated through preterm delivery. Efforts for timely identification and appropriate interventions to treat infections during pregnancy will have sustained benefits in reducing the burden of neurological complications in children at the population level.

PMID: [35305960](#)

28. Frequency of language and swallowing problems in children with cerebral palsy at a tertiary care hospital Rawalpindi, Pakistan

Kalsoom Altaf, Amir Waheed Butt, Sikander Ghayas Khan, Fazaila Ehsaan, Arshad Mehmood, Faiza Yousaf, Anila Irshad

J Pak Med Assoc. 2022 Feb;72(2):236-238. doi: 10.47391/JPMA.972.

Objective: To investigate the occurrence of language and swallowing problem in individuals with cerebral palsy. Methods: The cross-sectional survey was conducted at the Riphah International University, Rawalpindi, Pakistan, from September 2018 to January 2019 while data was collected from the Armed Forces Institute of Rehabilitation Medicine, Rawalpindi, a tertiary care hospital. The sample comprised individuals with cerebral palsy of either gender aged 5-18 years. Language Sample Checklist was used for language problems and the North western Dysphagia Patient Checklist was used for swallowing problems. Data was analysed using SPSS- Version 21. Results: Of the 55 subjects, 62% were males, 38% were females, 76% were from urban areas and 24% were from rural areas. In terms of concepts, processing, and comprehension, 18(33%) persons were able to attempt the tasks, 45(81%) were unable to attempt morphological tasks, 41(74%) were unable to attempt sentence structure tasks, 40(72%) were unable to attempt literacy and narrative skills tasks, 41(74%) could not fulfil pragmatic tasks and 49(89%) had unintelligible speech. The patient checklist showed that 47(85%) children had normal medical history, 41(75%) had normal behavioural variable, 29(52%) had normal gross motor ability, 40(73%) completed oral motor test, and 39(71%) had normal swallow trials. Conclusion: Language problems were more prevalent in children with cerebral palsy compared to swallowing difficulties.

PMID: [35320168](#)

29. Post-fracture pneumonia risk and association with health and survival outcomes for adults with cerebral palsy: A retrospective cohort study

Daniel G Whitney, Tao Xu, Maryam Berri

Bone. 2022 Mar 17;159:116390. doi: 10.1016/j.bone.2022.116390. Online ahead of print.

Background: For adults with cerebral palsy (CP), fragility fractures may be a risk factor for pneumonia, a leading cause of death for this population; yet, the timing and complications are unknown. The objectives were to determine the 30-day pneumonia rate post-fracture and its association with mortality and incident cardiovascular events among adults with CP. Methods: This retrospective cohort study used nationwide administrative claims data from 01/01/2012-12/31/2017 from a random 20% sample of the Medicare fee-for-service and Optum Clinformatics® Data Mart. Cohorts included ≥ 18 years of age with CP with an incident fragility fracture (CP + Fx) and comparison cohorts: CP without fractures (CPw/oFx) and without CP with an incident fragility fracture (w/oCP + Fx). Incidence rate (IR) of pneumonia 30-days post-fracture and IR ratios were

estimated by age group: 18-40, 41-64, and ≥ 65 years. For CP + Fx, Cox regression examined the association between time-varying pneumonia (within 30-days post-fracture) with mortality and incidence of cardiovascular events 0-30-days and 31-365-days post-fracture. Results: There were 3688 CP + Fx (mean [SD] age, 58.2 [14.9]; 56.4% women), 29,429 CPw/oFx (50.3 [15.8]; 45.9% women), and 363,995 w/oCP + Fx (65.9 [18.3]; 65.5% women). The IR of 30-day pneumonia for CP + Fx was similar across age groups (IR per 100 person-months, 8.4-11.0) and 1.77-16.18-fold higher (all $P < 0.05$) than comparison cohorts. Peri/post-fracture pneumonia was associated with an increased rate of mortality (30-day-adjusted HR [aHR] = 5.89, 95%CI = 3.54-9.81; 31-365-day aHR = 2.89, 95%CI = 2.13-3.92), congestive heart failure 0-30-days (aHR = 3.64, 95%CI = 2.01-6.57) and 31-365-days (time-dependent), myocardial infarction 31-365-days (aHR = 2.03, 95%CI = 1.11-3.71), and cerebrovascular disease 0-30-days (time-dependent), without evidence of effect modification by age, sex, or fracture site. Conclusions: Adults with CP are particularly vulnerable to 30-day risk of post-fracture pneumonia and its complications across the adult lifespan and not just in the elderly years.

PMID: [35307581](#)

30. Changing trends in cerebral palsy prevalence: an opportunity to consider etiological pathways

Eduardo Villamor

Dev Med Child Neurol. 2022 Mar 23. doi: 10.1111/dmcn.15223. Online ahead of print.

No abstract available

PMID: [35322400](#)

31. Preeclampsia and Cerebral Palsy in Offspring

Miltiadis Badagionis, Theodoros N Sergentanis, Panagiota Pervanidou, Emmanouil Kalampokas, Nikolaos Vlahos, Makarios Eleftheriades

Review Children (Basel). 2022 Mar 9;9(3):385. doi: 10.3390/children9030385.

The aim of this systematic review and meta-analysis is to examine the association between exposure to preeclampsia during pregnancy and the occurrence of cerebral palsy in offspring. For this reason, the authors searched PubMed/Medline, EMBASE, and Google Scholar databases (end-of-search: 22 November 2021) and identified the most relevant studies. Then, a meta-analysis of all the eligible studies was performed. Subgroup and meta-regression analyses by study design, degree of adjustment, and geographical region were also conducted. A total of 10 studies were finally included, and no statistical significance was noted in the association between preeclampsia and cerebral palsy (pooled OR = 1.16, 95% CI: 0.77-1.74). The subgroup of studies that provided adjusted odds ratios for any variable except for gestational age showed a statistically significant association (pooled OR = 1.62, 95% CI: 1.36-1.93), whereas the association dissipated in studies also adjusting for gestational age (pooled OR = 1.63, 95% CI: 0.48-5.50). In conclusion, it seems that preeclampsia is not associated with cerebral palsy independently of gestational age; however, further research is needed to shed light on this topic.

PMID: [35327757](#)

32. Neurodevelopmental disorders and somatic diagnoses in a national cohort of children born before 24 weeks of gestation

Eva Morsing, Pia Lundgren, Anna-Lena Hård, Alexander Rakow, Lena Hellström-Westas, Lena Jacobson, Mats Johnson, Staffan Nilsson, Lois E H Smith, Karin Sävman, Ann Hellström

Acta Paediatr. 2022 Mar 22. doi: 10.1111/apa.16316. Online ahead of print.

Aim: This study investigated childhood diagnoses in children born extremely preterm before 24 weeks of gestation. Methods: Diagnoses of neurodevelopmental disorders and selected somatic diagnoses were retrospectively retrieved from national Swedish registries for children born before 24 weeks from 2007 to 2018. Their individual medical files were also examined. Results: We studied 383 children born at a median of 23.3 (range 21.9-23.9) weeks, with a median birthweight of 565 (range 340-874) grams. Three-quarters (75%) had neurodevelopmental disorders, including speech disorders (52%), intellectual disabilities (40%), attention deficit hyperactivity disorder (30%), autism spectrum disorders (24%), visual impairment (22%), cerebral palsy (17%), epilepsy (10%) and hearing impairment (5%). More boys than girls born at 23 weeks had intellectual

disabilities (45% vs. 27%, $p < 0.01$) and visual impairment (25% vs. 14%, $p < 0.01$). Just over half of the cohort (55%) received habilitation care. The majority (88%) had somatic diagnoses, including asthma (63%) and failure to thrive/short stature (39%). Conclusion: Most children born before 24 weeks had neurodevelopmental disorders and/or additional somatic diagnoses in childhood and were referred to habilitation services. Clinicians should be aware of the multiple health and developmental problems affecting these children. Resources are needed to identify their long-term support needs at an early stage.

PMID: [35318709](#)

33. Modelling quality of life in children with intellectual disability using regression trees

Peter Jacoby, Katrina Williams, Dinah Reddihough, Helen Leonard, Andrew Whitehouse, Jenny Downs

Dev Med Child Neurol. 2022 Mar 23. doi: 10.1111/dmcn.15206. Online ahead of print.

Aim: To identify factors associated with quality of life (QoL) in children with intellectual disability. We aimed to identify patterns of association not observable in previous hypothesis-driven regression modelling using the same data set from a cross-sectional observational study. **Method:** A questionnaire was completed by 442 caregivers of children with confirmed intellectual disability and a diagnosis of autism spectrum disorder, cerebral palsy, Down syndrome, or Rett syndrome. The Quality of Life Inventory-Disability (QI-Disability) questionnaire was used to assess child QoL. Independent variables described the child's health, functional abilities, community participation, and sociodemographics. The R package rpart was used to build the regression trees. **Results:** The mean total QI-Disability score was 69.2 out of a maximum 100. The subgroup with the lowest QoL scores comprised children with a high degree of daytime sleepiness ($n=74$, mean 57.5) while the subgroup with the highest QoL scores ($n=91$, mean 80.3) comprised children with little daytime sleepiness who participated more frequently in community activities and displayed good eye contact while listening. **Interpretation:** Regression tree analysis provides insights into the relative importance of associated factors. Sleep problems and community participation were more important than functional abilities in accounting for differences in QoL.

PMID: [35322406](#)

34. Quality of Life, Participation, and Functional Status in Cerebral Palsy: A 13-year Follow-up Study

Bilinc Dogruoz Karatekin, Afitap Icagasioglu

Medeni Med J. 2022 Mar 18;37(1):105-112. doi: 10.4274/MMJ.galenos.2022.54920.

Objective: This study aimed to investigate the current status and changes in motor and functional status, participation, and quality of life of individuals with cerebral palsy (CP) during the 13-year follow-up. **Methods:** Data from the database were retrospectively analyzed, including comorbidities, mobility status, orthotic usage, and information about the rehabilitation program and follow-up. The EuroQol 5-Dimension 3-Level (EQ-5D-3L) was used to measure the health-related quality of life. **Results:** Of our participants, 38.4% could independently walk 13-years ago, which increased to 51.2% presently. The orthotic usage decreased from 48.7% to 25.6%, and the rate of continuing rehabilitation decreased from 100% to 58.9%. The mean EQ-5D-3L score was 0.36 ± 0.42 , and the mean EQ-visual analog scale score was 68 ± 24.01 . **Conclusions:** Individuals with CP and their caregivers should be aware that CP is a lifelong disease and their continuity in rehabilitation programs should be encouraged. Independence in daily life activities should be aimed and participation in social life should be ensured.

PMID: [35306797](#)

35. Functional and environmental predictors of health-related quality of life of school-age children with cerebral palsy: A cross-sectional study of caregiver perspectives

Milena Milićević

Child Care Health Dev. 2022 Mar 19. doi: 10.1111/cch.13007. Online ahead of print.

Background: Caregivers' reports often serve as a decision-making guide in the treatment and rehabilitation of children with cerebral palsy (CP). This study identified predictors of the caregiver-reported health-related quality of life (HRQoL) of school-age children with CP. **Methods:** A cross-sectional study was conducted using the convenience sample of 108 children with CP

(60 males; aged 7-18 years; mean age 12y 8mo [SD 3y 5mo]). Caregivers reported their child's HRQoL using KIDSCREEN-27. Standard multiple regression analyses were conducted to test if the child characteristics (gender, age, GMFCS-E&R, MACS, intellectual disability, health problems, communication, social skills, behavioural difficulties), family characteristics (income, type, home adaptation), physical, social and attitudinal barriers, environmental features and family-centeredness of service delivery significantly predicted HRQoL. Results: Fine manual abilities, home adaptation, and the magnitude of barriers predicted physical wellbeing. The child's challenging behaviour, the magnitude of barriers, and the barriers related to different policies predicted psychological wellbeing. The home adaptation level and provision of general information about the child's disability and available types of services predicted HRQoL domain related to interactions and relationships with parents. Children with behavioural difficulties and more severe limitations in communication had less social support from friends and peers. The social skills and intellectual functioning combined with the parental ratings of the child's behaviour, other people's attitudes toward the child, and the lack of support predicted HRQoL in the School Environment domain. The magnitude and frequency of barriers were the strongest predictors of general HRQoL. Conclusion: From the caregivers' perspective, home adaptation, supportive laws and policies, and family-centred rehabilitation care that meets the family needs may promote children's HRQoL. Specific interventions addressing modifiable environmental features and continuous support to children in improving their fine motor abilities, communication, and social skills and families in managing behavioural difficulties may be relevant for HRQoL of school-age children with CP.

PMID: [35305043](#)

36. Life expectancy in cerebral palsy litigation: What constitutes an expert opinion?

Jordan Brooks, Lewis Rosenbloom

Dev Med Child Neurol. 2022 Mar 22. doi: 10.1111/dmcn.15220. Online ahead of print.

No abstract available

PMID: [35318653](#)

37. The history of advocacy in cerebral palsy

Cynthia Frisina, Lisa Thornton

J Pediatr Rehabil Med. 2022 Mar 12. doi: 10.3233/PRM-220023. Online ahead of print.

No abstract available

PMID: [35311731](#)