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Interventions and Management

1. Rectus femoris transfers with and without a hamstring lengthening will not change hip kinematics in children with cerebral palsy
Jason T Rhodes, Alex Tagawa, Lucas Moore, Amy Tavenner, Patrick Carry, Austin Skinner, Scott Miller, Sayan De, James Carollo

Gait Posture. 2022 Nov 17;99:119-123. doi: 10.1016/j.gaitpost.2022.11.004. Online ahead of print.

Background: A rectus femoris transfer (RFT) surgery with and without a hamstring lengthening (HSL) is used to treat stiff-knee gait in children with cerebral palsy (CP). While current literature has reported that a RFT surgery improves the kinematics at the knee, little is known about the kinematic changes at the hip. Research question: Does a RFT surgery change hip joint kinematics in children with CP? Methods: This retrospective study included children (<18 years old) diagnosed with CP, who underwent a RFT procedure, and who were seen at our institution's accredited clinical motion laboratory. Patients with both pre- and post-operative gait analysis were identified and comparison between those analyses were performed to identify kinematic differences at the hip and knee. A total of 66 legs from 46 children (mean age: 11.1 ± 3.6) met the inclusion criteria. Results: Overall results revealed that a RFT did not change kinematics at the hip [$p > 0.05$], however, a RFT did increase the maximum knee flexion during the swing period [Mean Difference Post - Pre: 8.3°, 95% CI: 4.9-11.8, $p < 0.0001$]. Additionally, it was found that changes in hip extension during the terminal stance phase were significantly different between the combined RFT and HSL compared to solely an RFT. The results of this study also revealed that children whose stiff-knee gait did not improve, tended to have increased hip external rotation during terminal stance and swing and greater hip extension during terminal stance, compared to children whose stiff-knee gait did improve. Significance: Overall, a RFT with and without a HSL surgery improves hip and knee kinematics in the sagittal plane, however, improvements at the hip were not clinically significant. As a result, a RFT or a combined RFT with HSL should not be used to change hip kinematics in children with CP.

PMID: 36410181

2. The medium-term effects of selective dorsal rhizotomy on gait compared to a matched cerebral palsy non-SDR group: A follow-up study
A Marron, R O'Sullivan, J Leonard, D Kiernan

Gait Posture. 2022 Nov 15;99:124-132. doi: 10.1016/j.gaitpost.2022.11.006. Online ahead of print.

Background: Selective dorsal rhizotomy (SDR) has been shown to improve gait in the short-term in children with cerebral palsy (CP). Further study is needed to look at the trajectory of outcomes over the longer-term. Research question: What are the medium-term effects of SDR on gait compared to a matched CP non-SDR group? Methods: Participants underwent SDR

at mean age 6.3 years and completed baseline, 1-year and 5-year follow-up gait analyses. Non-SDR participants were matched at baseline. Differences were assessed within and between groups. Kinematic variables were analysed using Statistical non-Parametric Mapping (SnPM). Other gait and clinical data were analysed using Friedman's one-way repeated measure analysis of variance and a Mann-Whitney U-test. Results: The initial SDR group consisted of 29 participants, reducing to 22 at 5-year follow-up. Of these, 15 (68 %) had orthopaedic surgeries either concurrent with or in the intervening period since the SDR, mean 3.3 procedures per participant. The initial non- SDR group had 18 participants, reducing to 17 at 5-year follow-up. Of these, 13 (76 %) had orthopaedic surgeries, mean 5.7 procedures. At 1-year follow-up the SDR group had significantly improved knee extension, ankle dorsiflexion, foot progression, Gait Deviation Index, and normalised step length compared to baseline, $p < 0.05$, and outcomes were maintained at 5-years. At 1-year follow-up the non-SDR group kinematic patterns were unchanged, but at 5-year follow-up this group demonstrated significantly improved knee extension, ankle dorsiflexion and foot progression. There were no significant kinematic differences between the SDR and the non-SDR group at medium-term follow -up. Significance: We have documented the trajectory of gait outcomes post-SDR over 3 assessments and found that short-term gait changes endured in the medium-term. However, kinematic changes were similar to a non-SDR group undergoing routine and orthopaedic care. These outcomes are important to guide surgical decision making and to manage treatment goals and expectations.

PMID: 36413875

3. Effectiveness of Pelvic Proprioceptive Neuromuscular Facilitation on Balance and Gait Parameters in Children With Spastic Diplegia
Vikrant G Salphale, Rakesh K Kovela, Moh'd Irshad Qureshi, Pallavi Harjpal

Cureus. 2022 Oct 22;14(10):e30571. doi: 10.7759/cureus.30571. eCollection 2022 Oct.

Background Among several variants of Cerebral Palsy, Spastic Diplegic is encountered most commonly in clinical setups. A majority of children with Spastic Diplegia manifest themselves with a disturbance in the geometrical orientation of their pelvis, which imposes an effect on their functional capabilities like walking with independence. This research had an emphasis on the extraction of the efficacy of Pelvic Proprioceptive Neuromuscular Facilitation (PNF) Techniques on Balance and Gait Parameters in children suffering from Spastic Diplegia. Method Participants included in the study were between the age groups of 8 to 12 years who were diagnosed with Spastic Diplegia with an independent sitting and walking ability and who are coming in stages I to III according to Gross Motor Function Classification System. Subjects in group A were given Pelvic PNF techniques for 15 minutes on both sides along with Task-Oriented training for 30 minutes, six days a week and continuously for four weeks, while the subjects in group B were given only Task-Oriented activity for the same duration. The pre- and post-treatment assessments of all 40 subjects were gathered using the Paediatric Balance Scale, Palpation Meter device, and Gait Parameters. Results The study included 40 participants, which were segregated into two groups of 20 subjects in each group. Group A received Pelvic Proprioceptive Neuromuscular Facilitation with Task-Oriented Training, and group B received only Task-Oriented training activities. The contrast of pre- and post-treatment findings of both the groups revealed that group A reported a significant improvement in their outcomes ($P>0.0001$). Conclusion The present study, which included 40 subjects, has generated evidence regarding the efficacy of Pelvic PNF on Balance and Gait Parameters in children with Spastic Diplegia.

PMID: 36415346

4. Auditory Stimulation Improves Gait and Posture in Cerebral Palsy: A Systematic Review with Between- and Within-Group Meta-Analysis
Shashank Ghai, Ishan Ghai, Susanne Narciss

Review Children (Basel). 2022 Nov 15;9(11):1752. doi: 10.3390/children9111752.

The past decade has seen an increased interest in the implementation of auditory stimulation (AStim) for managing gait and postural deficits in people with cerebral palsy. Although existing reviews report beneficial effects of AStim on the spatiotemporal and kinematic parameters of gait, there are still numerous limitations that need to be addressed to correctly interpret these results. For instance, existing reviews have failed to characterize the effects of AStim by conducting separate between and within-group meta-analyses, these reviews have not evaluated the influence of AStim on postural outcomes, and nor have included several high-quality existing trials. In this study, we conducted between- and within-group meta-analyses to establish a state of evidence for the influence of AStim on gait and postural outcomes in people with cerebral palsy. We searched the literature according to PRISMA-P guidelines across 10 databases. Of 1414 records, 14 studies, including a total of

325 people with cerebral palsy, met the inclusion criterion. We report a significant enhancement in gait speed, stride length, cadence, and gross motor function (standing and walking) outcomes with AStim compared to conventional physiotherapy. The findings from this analysis reveal the beneficial influence of AStim on the spatiotemporal and kinematic parameters of gait and postural stability in people with cerebral palsy. Furthermore, we discuss the futurized implementation of smart wearables that can deliver person-centred AStim rehabilitation in people with cerebral palsy.

PMID: 36421201

5. Weight distribution asymmetry in relation to walking speed in children with spastic cerebral palsy
Nahla M Ibrahim, Mai Elsayed Abbass

Afr Health Sci. 2022 Jun;22(2):565-572. doi: 10.4314/ahs.v22i2.65.

Background: Gait speed and postural stability are indicators of community level ambulation and may be a valuable measure of disability. Objectives: to investigate the relation between the distribution of weight on both lower extremities and gait speed in children with spastic cerebral palsy. Methods: Evaluation for weight distribution on both lower limbs and speed during gait for sixty children with spastic diplegia and forty-five children with hemiplegia was carried out by the Biodex gait trainer. Pearson correlation test was conducted to determine the relation of the symmetry index and the percent of weight bearing to speed. Results: A significant weak positive correlation was found between speed and symmetry index in diplegic group, while there was a non-significant weak negative correlation between speed and symmetry index was noticed in hemiplegic group. Nonsignificant weak positive correlation between speed and weight on most affected side was recorded in diplegic group. While in hemiplegic group, there was significant weak negative correlation between weight on affected side and speed. Conclusion: Children with cerebral palsy demonstrate asymmetrical weight distribution during walking. Physical therapy training should be directed to enhance weight bearing distribution thus improving gait and postural stability.

PMID: 36407341

6. Benefits of animal-Assisted interventions in preschool children: A systematic review
Ana Myriam Lavín-Pérez, Beatriz Rivera-Martín, Luis Lucio Lobato-Rincón, Santos Villafaina-Domínguez, Daniel Collado-Mateo

Review Clin Child Psychol Psychiatry. 2022 Nov 24;13591045221142115. doi: 10.1177/13591045221142115. Online ahead of print.

Animal-assisted interventions are frequently used to stimulate and improve different skills in children with and without disabilities. However, the heterogeneity of AAI studies in preschool children is large, including different health conditions, duration, outcomes, study design or therapy animals. Therefore, the current study aims to summarize all intervention procedures and provide an updated analysis of the effectiveness of AAI intervention in the early childhood. Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines (PRISMA), a systematic search was conducted in two databases: Pubmed (MedLine) and Web of Science. The risk of bias was assessed using the Evidence Project risk of bias tool. A total of 319 articles were identified and 17 were finally included in the qualitative synthesis. Due to the large heterogeneity in terms of study design, intervention, and sample characteristics, it was not possible to conduct a meta-analysis. Animal-assisted interventions might lead to a positive impact on physical, physiological, psychosocial, and language skills in preschool children. These enhancements may be observed both in healthy children and in those with different health conditions, such as intellectual disabilities, cerebral palsy, autism disorder, or Down syndrome. Results must be interpreted with caution due to the large heterogeneity and risk of bias in the included articles.

PMID: 36424180

7. Multisensory stimulation and rehabilitation for disability improvement: Lessons from a case report
Viviana Lo Buono, Michele Torrisi, Simona Leonardi, Alessandra Pidalà, Francesco Corallo

Case Reports Medicine (Baltimore). 2022 Nov 18;101(46):e31404. doi: 10.1097/MD.0000000000031404.

Rationale: Spastic quadriplegia is most severe form of Infantile Cerebral Palsy. Patients are unable to use their legs, arms and body and show language disorder and profound intellectual disability. The treatment of patients diagnosed with spastic quadriplegia is complex and multidisciplinary. In this case report we described the positive effect of multisensory environment (MSEs) rehabilitation, and the strategies and technologies used to provide child who have to severe spastic quadriplegia and intellectual disability, palsy with playful and fun activities designed according to his abilities. Patient concern: A 7-years-old boy diagnosed with spastic quadriplegia and severe intellectual disability began rehabilitation by MSEs. Diagnoses: Spastic quadriplegia is most severe form of Infantile Cerebral Palsy. Patients are unable to use their legs, arms and body and show language disorder and profound intellectual disability. Interventions: Multisensory room is a large environment containing various elements where child can interact spontaneously and independently. Outcomes: The comparison scores between T0-T1 showed a reduction in self-harm and motor stereotypies (hand flapping). Sustained attention was improved and we observed a better therapeutic compliance by means of greater involvement in gaming activities. Conclusion: The stimuli within the MSEs provided the child opportunities to express himself with facilities more suited to his potential. Future research should project designed randomized controlled trials to examine the efficacy of multisensory on reduction disability.

PMID: 36401482

8. Psychometric properties of the Viking Speech Scale-Turkish version for children with cerebral palsy aged 4-18 years based on live and video-based observation
Kübra Seyhan-Biyik, Fatma Esen-AydinlI, Sinem Asena Sel, Önal Incebay, Esra Özcebe, Mintaze Kerem-Günel, Fatma Banu Anlar, Lindsay Pennington

Int J Lang Commun Disord. 2022 Nov 25. doi: 10.1111/1460-6984.12810. Online ahead of print.

Background: Speech is the most common method of communication. Video-based clinical communication evaluation is a requirement for children with speech-language impairments living in rural areas, and those who have limited mobility. Aims: To determine the validity and reliability of the Turkish version of the Viking Speech Scale (VSS-T) via live and video-based observation for children with cerebral palsy (CP) aged 4-18 years. Methods & procedures: A total of 142 children (mean age 8.18 ± 3.98 years; 68 female) with CP were included in this study. Their motor, communication, visual and eating-drinking function levels and comorbidities (dental, swallowing, cognitive impairments and epilepsy) were recorded. The Intelligibility in Context Scale (ICS), the Pediatric Evaluation of Disability Inventory-Social Function (PEDI-SF), and the Functional Independence Measure for Children-Communication (WeeFIM-C) were assessed to examine the concurrent validity of the VSS-T. The interrater reliability of the VSS-T was analysed between parents, physical therapists, and speech and language therapists from live and video-based observation. Intra-rater reliability was calculated from ratings made from live and video-based observations taken 3 weeks apart. Outcomes & results: The VSS-T was strongly related to the ICS ($r = -0.830$), PEDI-SF ($r = -0.819$), WeeFIM-C ($r = -0.643$), other functional classifications ($r > 0.432$), and the comorbidities (Cramer's $V > 0.284$, $p < 0.001$). Good to excellent interrater reliability ($\kappa w \geq 0.838$) and intra-rater reliability (intraclass correlation coefficient (ICC) = 0.848-0.995) were found between parents and therapists. Conclusions & implications: Speech and language therapists, physical therapists, and parents can use the VSS-T as a valid and reliable classification system to describe speech intelligibility of 4-18-year-old children with CP. Both live and video-based observations can be used to administer the VSS-T. What this paper adds: What is already known on the subject? The English version of the VSS has been shown to be a valid and reliable tool used to classify the speech of children with CP aged 4-13 years. The scale can be administered by means of live observation of the child or based on clinicians' notes on the case by parents, SLTs, physiotherapists and paediatricians. What this paper adds to existing knowledge The VSS-T is valid and reliable for children with CP aged 4-18 years. Video-based observation is a suitable method for evaluating the VSS-T levels. The VSS-T has a moderate association with the CFCS. What are the potential or actual clinical implications of this work? The VSS-T is a valid and reliable method of categorizing the severity of motor speech impairment for Turkish children with CP in clinical research studies, registry systems or epidemiological studies. Both experienced and inexperienced therapists can use either live or video-based observation methods to administer the VSS-T. This study extended the validity and reliability of the scale in children with CP aged up to 18 years. The VSS-T is also associated with the Visual Functional Classification System (VFCS), which has been recently developed for describing the visual abilities of children with CP in daily life. In addition, the VSS-T is associated with the presence of dental, swallowing, cognitive problems and epilepsy.

PMID: 36426770

9. Fatigue and functionality in cerebral palsy
Michael J Joyner

Dev Med Child Neurol. 2022 Nov 20. doi: 10.1111/dmcn.15472. Online ahead of print.

No abstract available

PMID: 36403179

10. Short-Term Outcome of Rehabilitation Program with Hybrid Assistive Limb after Tendon Lengthening in Patients with Cerebral Palsy
Mayumi Matsuda Kuroda, Hirotaka Mutsuzaki, Shogo Nakagawa, Kenichi Yoshikawa, Kazushi Takahashi, Yuki Mataki, Ryoko Takeuchi, Nobuaki Iwasaki, Masashi Yamazaki

Pediatr Rep. 2022 Nov 12;14(4):505-518. doi: 10.3390/pediatric14040059.

In this study, we aimed to evaluate the short-term outcomes of a rehabilitation program with the Hybrid Assistive Limb® after soft tissue lengthening in young patients with cerebral palsy. We assessed six patients with cerebral palsy who underwent soft tissue surgery followed by gait training using the Hybrid Assistive Limb®. Clinical assessments were conducted preoperatively, before, immediately after, and at 1, 2, and 3 months after gait training. Gross Motor Function Measure was improved 5.93 ± 6.11% (mean ± standard deviation, p < 0.05), Canadian Occupational Performance Measure performance was improved 3.12 ± 1.53 points, and satisfaction was improved 3.80 ± 2.14 points (p < 0.05). The knee extension strength on the operated side was changed 7.75 ± 4.97 Nm after the intervention (p = 0.07). In ambulatory patients, gait speed was changed 8.37 ± 1.72 m/min, stride length was changed 10 ± 6.16 cm, and 6 min walking distance was changed 52 ± 16 m after the intervention. Training with the Hybrid Assistive Limb® may improve walking ability and clinical outcomes in young patients with cerebral palsy after soft tissue lengthening.

PMID: 36412666

11. Brain-Computer Interface-Controlled Exoskeletons in Clinical Neurorehabilitation: Ready or Not?
Annalisa Colucci, Mareike Vermehren, Alessia Cavallo, Cornelius Angerhöfer, Niels Peekhaus, Loredana Zollo, Won-Seok Kim, Nam-Jong Paik, Surjo R Soekadar

Review Neurorehabil Neural Repair. 2022 Nov 25;15459683221138751. doi: 10.1177/15459683221138751. Online ahead of print.

The development of brain-computer interface-controlled exoskeletons promises new treatment strategies for neurorehabilitation after stroke or spinal cord injury. By converting brain/neural activity into control signals of wearable actuators, brain/neural exoskeletons (B/NEs) enable the execution of movements despite impaired motor function. Beyond the use as assistive devices, it was shown that-upon repeated use over several weeks-B/NEs can trigger motor recovery, even in chronic paralysis. Recent development of lightweight robotic actuators, comfortable and portable real-world brain recordings, as well as reliable brain/neural control strategies have paved the way for B/NEs to enter clinical care. Although B/NEs are now technically ready for broader clinical use, their promotion will critically depend on early adopters, for example, research-oriented physiotherapists or clinicians who are open for innovation. Data collected by early adopters will further elucidate the underlying mechanisms of B/NE-triggered motor recovery and play a key role in increasing efficacy of personalized treatment strategies. Moreover, early adopters will provide indispensable feedback to the manufacturers necessary to further improve robustness, applicability, and adoption of B/NEs into existing therapy plans.

PMID: 36426541

12. Growth and Neurodevelopmental Outcomes of Very Low Birth Weight Infants at One-year of Corrected Age from Southern India
Sushil Gupta, B Adhisivam, B Vishnu Bhat, Nivedita Mondal

Indian Pediatr. 2022 Nov 19;S097475591600468. Online ahead of print.

Objective: To assess the growth and neurodevelopmental outcome of very low birth weight (VLBW) infants at one-year corrected age. Methods: This prospective cohort study enrolled VLBW infants delivered in a tertiary care hospital, and followed up till one-year corrected age. The WHO Anthropo version 3.2.2 software was used to calculate weight for age, length for age; and head circumference z-score during follow-up. Neurodevelopmental assessment was done using Developmental Assessment Scale for Indian Infants (DASII) at the age of one year. Results: The mean (SD) z-scores at one-year for weight for age, length for age and head circumference were - 2.1 (1.1), - 1.4 (1.03) and - 2.2 (1.2), respectively. The mean (SD) DASII motor and mental scores were 90.8 (13.4) and 96.5 (13.2), respectively. Major and minor developmental abnormalities were noted in 9.4% and 18.2%, infants, respectively. Cerebral palsy was noted in 5.8% infants. Conclusion: VLBW infants showed impaired growth and significant developmental abnormalities, at one year corrected age.

PMID: 36415113

13. Parent-mediated intervention training for caregivers of children with developmental differences in Zambia
Jillian M Pierucci, Gabriela A Aquino, Alexandra Pearson, Monica Perez, Sylvia Mwanza-Kabaghe, Francis Sichimba, Haatembo Mooya

Res Dev Disabil. 2022 Nov 19;132:104373. doi: 10.1016/j.ridd.2022.104373. Online ahead of print.

Background: Lower- and middle-income countries (LAMICs) are under-resourced and have limited intervention services for children with developmental differences and their families. A logical method to address service gaps within resource-scarce contexts is to train caregivers as interventionists, specifically using empirically-supported parent-mediated Naturalistic Developmental Behavioral Interventions (P-M NDBIs; Kasari et al., 2010; Ingersoll & Wainer, 2013). Aims: The study implemented the first P-M NDBI in Zambia and aimed to train caregivers and improve children's social-communication skills. Methods/procedures: The current study utilized a mixed-methods, pre-post design and implemented Project ImPACT (Ingersoll & Dvortcsak, 2010, 2019). Participants included 19 Zambian caregivers of children (n = 20) with developmental differences including autism spectrum condition, Down syndrome, and cerebral palsy. Outcomes/results: Findings indicated that children's language skills and pretend play skills significantly improved from pre- to post-assessment, and caregivers most frequently used intervention strategies for modeling communication and prompting communication. Conclusions/implications: The success and feasibility of implementing Project ImPACT in Zambia, and recommendations for culturally adapting and implementing P-M NDBIs in LAMICs, were discussed.

PMID: 36413886

14. Towards developing a comprehensive treatment schedule for patients with cerebral palsy: factors influencing patient's adherence to physiotherapy treatment
Chigozie Uchenwoke Ikenna, Chidimma Ofodum Mirian, Chinonso Nwachukwu Paul, Christiana Osuoha Onyekachi, Kenechukwu Okonkwo Kingsley, Lynda Anih Chidera

Purpose: This study is aimed to identify factors influencing patient's adherence to treatment in a bid to characterize the extent to which these factors are considered while developing a treatment schedule for patients with cerebral palsy in Nigeria. Methods: Descriptive cross-sectional study of physiotherapists involved in the care of patients with cerebral palsy. Factors influencing treatment adherence were assessed using a pre-tested, self-administered questionnaire. Participants were sampled from physiotherapists working at University of Nigeria Teaching Hospital, Enugu State, Nigeria. The data were analyzed using descriptive statistics of percentage and frequencies. Results: A total of fifty three (31 males and 22 females) physiotherapists completed and returned the questionnaire. Participants (84.9%) agreed that patients occasionally forget to meet up with their appointment days; with majority of them agreeing that distance to the clinic and economic factor (cost of treatment and transportation) influence patient's adherence to treatment. Presence/absence of a caregiver and relationship between patients and their physiotherapist are also important factors influencing patient's treatment schedules. Conclusion: Distance to the clinic when compared to other (economic, patient-therapist relationship) factors is the major barrier to patient's adherence to

treatment and therefore should be considered while developing treatment schedules for patients with cerebral palsy.

PMID: 36407377

15. Quality of life of primary caregivers of children living with cerebral palsy at two clinics in Blantyre, Malawi
Alice Namanja, Vincent Samuel Phiri

Malawi Med J. 2022 Sep;34(3):176-183. doi: 10.4314/mmj.v34i3.6.

Introduction: In Malawi, Primary Caregivers (PCGs) of children living with Cerebral Palsy report challenges such as physical strain and lack of resources that affect care giving. Although such experiences affect the PCGs' Quality of Life (QoL), there is paucity of data for Malawi. Understanding their QoL would inform establishment of holistic intervention(s) tailored to meet their needs. Therefore, the purposes of this study were to determine QoL of PCGs of the children who were receiving rehabilitation at Queen Elizabeth Central Hospital (QECH) and Feed the Children (FtC), to identify PCG's and children's socio-demographic factors that may attribute to the perceived QoL, and to compare the PCGs' QoL between the sites. Methods: A cross-sectional study was conducted from January to April 2019 on 142 PCGs of children aged between 2 and 18 years of age. All PCGs who were employed for the child-care, or had a chronic sickness were excluded. QoL was assessed using the World Health Organization Brief questionnaire, with a cut-off point of <60% for poor QoL. The severity of children's impairments was assessed using Gross Motor Function Classification System. Descriptive and inferential statistics were conducted to analyze the data. The PCGs' age, sex, marital status and level of education, and child's severity of impairment were compared with QoL. Results: The majority of PCGs (61.30%) had poor QoL, and there was no significant difference in overall QoL of the PCGs between the sites ($p<0.31$). The PCGs at QECH had significantly higher physical domain mean scores than at FtC ($U=1906$, $p<0.01$). The overall QoL differed significantly across the marital statuses of the PCGs ($p<0.03$). Conclusion: The study has established that most PCGs at both sites possess poor QoL. However, there is need to investigate how the rehabilitation institutions and workers influence the QoL of the PCGs within and between the facilities.

PMID: 36406099

16. Establishing childhood disability clinics may help reduce the prevalence of disability among children in Africa: A viewpoint
Auwal Abdullahi, Thomson W L Wong, Shamay S M Ng

Review Front Public Health. 2022 Nov 4;10:1010437. doi: 10.3389/fpubh.2022.1010437. eCollection 2022.

Globally, there are about a billion people comprising of about 95 million children who experience disability. The number of people in Africa living with disability is about 80 million people; out of which 10%-15% are children of school age. The causes of disability among these children include epilepsy, vision loss, or hearing loss, cerebral palsy, poliomyelitis, tetanus, cerebrospinal meningitis and malaria. However, these causes of disability are preventable and can be managed with proper care. The aim of this article is to propose the establishment of childhood disability clinics in Africa in order to help prevent or reduce the incidence/ prevalence of disability among children. Some of the mandates of the clinics will be to carry out routine assessment of children for disability, to provide education on disability and strategies for disability prevention to parents and caregivers, to promptly prevent and manage disability or its causes. However, establishing these clinics requires shared commitment of all the stakeholders.

PMID: 36407982

17. Clinical Profile of Pediatric Neurology Disorders: A Study From a Semi-Urban Medical College in Northwestern India
Girish Kumar, Vandana Sharma, Amit Kumar

Cureus. 2022 Oct 16;14(10):e30359. doi: 10.7759/cureus.30359. eCollection 2022 Oct.

Introduction: Neurological disorders are characterized by dysfunction in any part of the nervous system and are a major cause of disability among children and adolescents in developing countries, just as it is in India. There is a lack of information on the prevalence of neurological disorders in developing countries due to the lack of quality health information and a lack of awareness of these disorders. This local study aims to provide an understanding of the profile and characteristics of neurological disorders in children that will aid in the development and implementation of preventive healthcare strategies. Methods: A retrospective observational study was conducted in the Department of Pediatrics. All pediatric neurology patients' data were retrieved from January 2020 to December 2020. Results: Of the 12,782 children seen in the pediatric outpatient department (OPD), 133 (1.04%) had neurological disorders and about 65% were male. Childhood seizures 92 (69%) and developmental delay 13 (9.7%) were the most common neurological conditions, although there was an overlap of the conditions. Conclusion: This study provides some valuable information about common neurological disorders in children. Seizures, cerebral palsy, and developmental delay were the most common neurological disorders in children.

PMID: 36407270

18. Can web-based implementation interventions improve physician early diagnosis of cerebral palsy? Protocol for a 3-arm parallel superiority randomised controlled trial and cost-consequence analysis comparing adaptive and non-adaptive virtual patient instructional designs with control to evaluate effectiveness on physician behaviour, diagnostic skills and patient outcomes

Lynda McNamara, Karen Scott, Roslyn N Boyd, Elizabeth Farmer, Annabel Webb, Margot Bosanquet, Kim Nguyen, Iona Novak

BMJ Open. 2022 Nov 21;12(11):e063558. doi: 10.1136/bmjopen-2022-063558.

Introduction: Cerebral palsy (CP) is the most common childhood physical disability. Accurate diagnosis before 6 months is possible using predictive tools and decision-making skills. Yet diagnosis is typically made at 12-24 months of age, hindering access to early interventions that improve functional outcomes. Change in practice is required for physicians in key diagnostic behaviours. This study aims to close the identified research-practice gap and increase accurate CP diagnosis before 6 months of age through tailored web-based implementation interventions. This trial will determine whether adaptive e-learning using virtual patients, targeting CP diagnostic behaviours and clinical decision-making skills, effectively changes physician behaviour and practice compared with non-adaptive e-learning instructional design or control. Methods and analysis: This study is a 3-arm parallel superiority randomised controlled trial of two tailored e-learning interventions developed to expedite physician CP diagnosis. The trial will compare adaptive (arm 1) and non-adaptive (arm 2) instructional designs with waitlist control (arm 3) to evaluate change in physician behaviour, skills and diagnostic practice. A sample size of 275 paediatric physicians enables detection of small magnitude effects (0.2) of primary outcomes between intervention comparators with 90% power (α=0.05), allowing for 30% attrition. Barrier analysis, Delphi survey, Behaviour Change Wheel and learning theory frameworks guided the intervention designs. Adaptive and non-adaptive video and navigation sequences utilising virtual patients and clinical practice guideline content were developed, integrating formative key features assessment targeting clinical decision-making skills relative to CP diagnosis.Physician outcomes will be evaluated based on postintervention key feature examination scores plus preintervention/postintervention behavioural intentions and practice measures. Associations with CP population registers will evaluate real-world diagnostic patient outcomes. Intervention costs will be reported in a cost-consequence analysis from funders' and societal perspectives. Ethics and dissemination: Ethics approved from The University of Sydney (Project number 2021/386). Results will be disseminated through peer-reviewed journals and scientific conferences. Trial registration number: Australian New Zealand Clinical Trials Registry: ACTRN 12622000184774.

PMID: 36410832

19. Shall we start? Ready, set, go! Toward early intervention in infants with unilateral cerebral palsy. A randomized clinical trial protocol

Rocío Palomo-Carrión, Elena Pinero-Pinto, Helena Romay-Barrero, Isabel Escobio-Prieto, Carmen Lillo-Navarro, Rita-Pilar Romero-Galisteo

Ther Adv Chronic Dis. 2022 Nov 14;13:20406223221136059. doi: 10.1177/20406223221136059. eCollection 2022.

Background: It is crucial to start an early intervention in unilateral cerebral palsy. Intensive therapies are focused on training based on activities. Objective: The objective of the study was to study the changes in the bimanual functional performance (BFP) after early intensive therapies at home compared with standard care in children with unilateral cerebral palsy from 9 to

18 months of age. Design: A single-blind comparative effectiveness study will be conducted. Methods and analysis: Children will be randomized into four groups: infant-mCIMT, infant-BIT, infant-hybrid, and infant standard therapy (control group, CG). Each early intensive protocol will last 50 h and will be applied throughout a 10-week period with the family involvement at home. The main outcomes are BFP measure with mini-Assisting Hand Assessment (mini-AHA) scale, functional goals measure with Goal Attainment Scale (GAS), and satisfaction and expectations on intensive therapy from parents measure through specific questionnaire. Baseline characteristics between groups will be compared using independent t test and Fisher's exact test. Pre- and post-treatment outcomes of standard assessments will be compared using analysis of variance (ANOVA) for parametric and Kruskal-Wallis test for non-parametric variables. The Bonferroni correction is applied for multiple comparisons. An alpha level of $p \leqslant 0.05$ is considered significant. Discussion: In relation to other studies that have analyzed intensive therapies, although with fewer intervention groups, it seems that the application of any of the intensive interventions is effective with the applied dose to obtain changes in BFP and increase the spontaneous use of the affected upper limb. Registration: ClinicalTrials.gov Identifier: NCT04642872.

PMID: 36420043

20. From guidelines to practice: A retrospective clinical cohort study investigating implementation of the early detection guidelines for cerebral palsy in a state-wide early intervention service
Sue-Anne Davidson, Roslyn Ward, Catherine Elliott, Courtenay Harris, Natasha Bear, Ashleigh Thornton, Alison Salt, Jane Valentine, Group EI at-risk CP Team

BMJ Open. 2022 Nov 25;12(11):e063296. doi: 10.1136/bmjopen-2022-063296.

Objectives: To report on knowledge translation strategies and outcomes from the implementation of the early detection guidelines for cerebral palsy (CP) in a state-wide tertiary early intervention (EI) service and investigate the impact of social determinants on clinical services. Design: Retrospective longitudinal cohort study. Setting: The Western Australia tertiary paediatric EI service. Participants: EI clinicians, consumers and children using the EI service. Outcome measures: Knowledge translation strategies including consumer perspectives, clinician training and Communities of Practice (CoP) guided implementation. We measured changes in referral number and age, delivery of early detection and intervention following the implementation of the guidelines. Exposure to adverse childhood experiences (ACEs), appointment non-attendance (DNA) rates, remoteness and socioeconomic quintiles were used to measure social determinants of health using negative binomial (Incidence Rate Ratios, IRR) and logistic regression (Odds Ratios, ORs). Results: Ten consumers participated in Focus Groups, 100 clinicians were trained and 22 clinicians established a monthly CoP. Referrals increased fourfold to 511 children. Corrected gestational age at referral decreased from a median of 16.1 to 5.1 months ($p<0.001$) and at first appointment from 18.8 to 6.8 months ($p<0.001$). Children living in social disadvantage had the highest DNA risk (quintile 1 vs 5: IRR 2.2, 95% CI 1.1 to 4.6, $p=0.037$). Children exposed to ACEs had higher odds of living in social disadvantage (quintile 1 vs 5, OR=3.8, 95% CI 1.4 to 10.0, $p=0.007$). No significant association was found between remoteness and DNA rate or ACE score. Conclusions: Implementation strategies reduced referral age and improved the delivery of early detection assessments. Further investigation of the association between social disadvantage, DNA risk and ACE score is required in the development of a state-wide early detection network.

PMID: 36428013

21. Providing a Primary Care Medical Home for Children and Youth With Cerebral Palsy
Garey Noritz, Lynn Davidson, Katherine Steingass, Council on Children with Disabilities, The American Academic for Cerebral Palsy and Developmental Medicine

Pediatrics. 2022 Nov 21;e2022060055. doi: 10.1542/peds.2022-060055. Online ahead of print.

Cerebral palsy (CP) is the most common motor disorder of childhood, with prevalence estimates ranging from 1.5 to 4 in 1000 live births. This clinical report seeks to provide primary care physicians with guidance to detect children with CP; collaborate with specialists in treating the patient; manage associated medical, developmental, and behavioral problems; and provide general medical care to their patients with CP.

PMID: 36404756

22. Executive Summary: Providing a Primary Care Medical Home for Children and Youth With Cerebral Palsy
Garey Noritz, Lynn Davidson, Katherine Steingass

Pediatrics. 2022 Nov 21;e2022060056. doi: 10.1542/peds.2022-060056. Online ahead of print.

No abstract available

PMID: 36404760

23. Probabilistic mapping of deep brain stimulation in childhood dystonia
Daniel E Lumsden, Kantharuby Tambirajoo, Harutomo Hasegawa, Hortensia Gimeno, Margaret Kaminska, Keyoumars Ashkan, Richard Selway, Jean-Pierre Lin

Parkinsonism Relat Disord. 2022 Nov 11;105:103-110. doi: 10.1016/j.parkreldis.2022.11.006. Online ahead of print.

Objectives: In adults with dystonia Probabilistic Stimulation Mapping (PSM) has identified putative "sweet spots" for stimulation. We aimed to apply PSM to a cohort of Children and Young People (CYP) following DBS surgery. Methods: Pre-operative MRI and post-operative CT images were co-registered for 52 CYP undergoing bilateral pallidal DBS (n = 31 genetic/idiopathic dystonia, and n = 21 Cerebral Palsy (CP)). DBS electrodes (n = 104) were automatically detected, and Volumes of Tissue Activation (VTA) derived from individual patient stimulation settings. VTAs were normalised to the MNI105 space, weighted by percentage improvement in Burke-Fahn-Marsden Dystonia Rating scale (BFMDRS) at one-year post surgery and mean improvement was calculated for each voxel. Results: For the genetic/idiopathic dystonia group, BFMDRS improvement was associated with stimulation across a broad volume of the GPi. A spatial clustering of the upper 25th percentile of voxels corresponded with a more delineated volume within the posterior ventrolateral GPi. The MNI coordinates of the centroid of this volume (X = -23.0, Y = -10.5 and Z = -3.5) were posterior and superior to the typical target for electrode placement. Volume of VTA overlap with a previously published "sweet spots" correlated with improvement following surgery. In contrast, there was minimal BFMDRS improvement for the CP group, no spatial clustering of efficacious clusters and a correlation between established "sweet spots" could not be established. Conclusions: PSM in CYP with genetic/idiopathic dystonia suggests the presence of a "sweet spot" for electrode placement within the GPi, consistent with previous studies. Further work is required to identify and validate putative "sweet spots" across different cohorts of patients.

PMID: 36403506

24. Monitoring the beautiful adapted game: a 3-year prospective surveillance study of injuries in elite English Para football
Richard Weiler, Evert Verhagen, Aileen Taylor, Osman Hassan Ahmed

Sci Med Footb. 2022 Nov;6(4):415-420. doi: 10.1080/24733938.2021.1984556. Epub 2021 Oct 1.

Para football is currently played in impairment-specific formats by thousands of people worldwide. To date, there have been no prospective longitudinal injury surveillance studies. This study aimed to implement a prospective injury surveillance study within elite English Para football and analyse the injury risk within the England Blind and Cerebral Palsy (CP) squads. Match and training injury data based on a 'time loss' definition were collected and analysed for each squad including incidence per 1,000 player hours, severity, injury location and associated event of injury. Injury incidence were lower in training than matches (CP 67.6/1000 player match hours (CI 33.8-135.2) and 5.7/1000 training hours (CI 3.8-8.7) and Blind 44.0/1000 player match hours (CI 26.1-74.3) and 5.5/1000 training hours (CI 3.5-8.6). Training injuries were more severe than match injuries across both squads (CP median 12 days lost in matches and 16 training and Blind median days 5 matches and 12 training). 73% Blind and 74% CP footballer injuries were to the lower limb and 17% head and neck equally across both Para football squads. 'Muscle and tendon injuries' (51%) represented the greatest proportion of injuries for CP footballers, and 'joint (non-bone)/ligament injuries' (43%) for Blind footballers. Collaboration and implementation of higher quality surveillance methodology and data collection in Para sport with greater athlete numbers are needed to inform injury prevention strategies.

PMID: 36412183

25. Expression of Concern: Downregulation of transcription factor TCTP elevates microRNA-200a expression to restrain Myt1L expression, thereby improving neurobehavior and oxidative stress injury in cerebral palsy rats
No authors listed

Cell Cycle. 2022 Nov 25;1. doi: 10.1080/15384101.2022.2151242. Online ahead of print.

No abstract available

PMID: 36426657