Cerebral Palsy ALLIANCE

NEWS
Cerebral Palsy Research

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Interventions and Management

1. Dev Med Child Neurol. 2013 May 16. doi: 10.1111/dmcn.12162. [Epub ahead of print]

Clinical tools to assess balance in children and adults with cerebral palsy: a systematic review.

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We aimed to review tools used to assess balance in clinical practice in children and adults with cerebral palsy (CP), to describe their content and measurement properties and to evaluate the quality of the studies that have examined these properties. CINAHL, Embase, and PubMed/MEDLINE were searched. The COnsensus-based Standards for selection of health Measurement INstruments (COSMIN) was used to assess the 'quality of studies' and the Terwee criteria were used to assess the 'result of studies'. Twenty-two clinical balance tools were identified from 35 papers. The content and focus of the tools varied significantly. There was moderate or limited levels of evidence for most of the measurement properties of the tools; the strongest level of evidence was found for the Trunk Control Measurement Scale and the Level of Sitting Scale, in the category 'maintain balance', the Timed Up and Go and the Segmental Assessment of Trunk Control in the categories 'achieve balance' and 'restore balance' respectively. Information on responsiveness was scarce. Further studies providing better evidence for reliability and responsiveness for clinical balance tools are needed. In the meantime, results of studies evaluating effects of treatment of balance in individuals with CP should be interpreted with caution.

PMID: 23679987 [PubMed - as supplied by publisher]

2. J Bone Joint Surg Am. 2013 May 15;95(10):931-8. doi: 10.2106/JBJS.K.01542.

Multilevel Surgery for Equinus Gait in Children with Spastic Diplegic Cerebral Palsy: Medium-Term Follow-up with Gait Analysis.

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BACKGROUND: In children with spastic diplegia, surgery for ankle equinus contracture is associated with a high prevalence of both overcorrection, which may result in a calcaneal deformity and crouch gait, and recurrent equinus contracture, which may require revision surgery. We sought to determine if conservative surgery for equinus gait, in the context of multilevel surgery, could result in the avoidance of overcorrection and crouch gait as well as an acceptable rate of recurrent equinus contracture at the time of medium-term follow-up. METHODS: This was a retrospective, consecutive cohort study of children with spastic diplegia who had had surgery for equinus gait between 1996 and 2006. All children had distal gastrocnemius recession or differential gastrocnemius-soleus complex lengthening, on one or both sides, as part of single-event multilevel surgery. The primary outcome measures were the Gait Variable Scores (GVS) and Gait Profile Score (GPS) at two time points after surgery. RESULTS: Forty children with spastic diplegia, Gross Motor Function Classification System (GMFCS) level II or III, were included in this study. There were twenty-five boys and fifteen girls. The mean age was ten years at the time of surgery and seventeen years at the time of final follow-up. The mean postoperative follow-up period was 7.5 years. The mean ankle GVS improved from 18.5° before surgery to 8.7° at the time of short-term follow-up (p < 0.005) and 7.8° at the time of medium-term follow-up. The equinus gait was successfully corrected in the majority of children, with a low rate of overcorrection (2.5%) and a high rate of recurrent equinus (35%), as determined by sagittal ankle kinematics. Mild recurrent equinus was usually well tolerated and conferred some advantages, including contributing to strong coupling at the knee and independence from using an ankle-foot orthosis. CONCLUSIONS: Surgical treatment for equinus gait in children with spastic diplegia was successful, at a mean of seven years, in the majority of cases when combined with multilevel surgery, orthoses, and rehabilitation. No patient developed crouch gait, and the rate of revision surgery for recurrent equinus was 12.5%.

LEVEL OF EVIDENCE: Therapeutic Level IV. See Instructions for Authors for a complete description of levels of evidence.

PMID: 23677361 [PubMed - in process]

3. J Foot Ankle Surg. 2013 May 8. pii: S1067-2516(13)00141-5. doi: 10.1053/j.jfas.2013.03.026. [Epub ahead of print]

Single-Event Multilevel Acute Total Correction of Complex Equinocavovarus Deformity in Skeletally Mature Patients with Spastic Cerebral Palsy Hemiparesis.

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Complex multiplanar ankle/foot deformity as equinocavovarus is a common problem in patients with spastic cerebral palsy hemiparesis. The data from 30 consecutive patients (30 feet), treated between March 2009 and March 2010, with equinocavovarus and toe clawing secondary to spastic cerebral palsy hemiparesis, aged 16 to 18 years, were analyzed clinically and radiographically. All the patients had received conservative physiotherapy treatment and ankle/foot orthoses before undergoing combined soft tissue and bony surgical procedures performed in a single session to correct the complex toe clawing, cavus, varus, and equinus deformities. Preoperative measurements of certain foot angles were compared with their corresponding postoperative values. A grading system for evaluation of the results using a point scoring system was used to accurately evaluate both the clinical and the radiographic results after an average follow-up period of 2.5 years. Of the 30 patients (30 feet), 18 (60%) had excellent, 9 (30%) good, 3 (10%) fair, and 0 had poor outcomes. Neither vascular problems nor nonunion occurred. Significant improvement was seen postoperatively ($p < .0333$). Neither staged surgical procedures nor gradual distraction techniques using external fixators are ideal modalities to correct complex ankle/foot equinocavovarus deformity in patients with spastic cerebral palsy. Single-event, multilevel surgery with complete soft tissue and bony correction appears to be the treatment of choice in such cases. It shortens the treatment period and avoids patient dissatisfaction associated with multiple procedures, without major complications.

PMID: 23664083 [PubMed - as supplied by publisher]

4. J Child Neurol. 2013 May 10. [Epub ahead of print]

Pallidal Stimulation in Children: Comparison Between Cerebral Palsy and DYT1 Dystonia.

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The authors compared the outcomes of 17 children aged 7 to 15 years with DYT1 dystonia or cerebral palsy following deep brain stimulation. While patients with cerebral palsy presented with significantly greater motor disability than the DYT1 cohort at baseline, both groups demonstrated improvement at 1 year (cerebral palsy = 24%; DYT1 = 6%). The group as a whole demonstrated significant improvement on the Barry-Albright Dystonia Scale across time. Gains in motor function were apparent in both axial and appendicular distributions involving both upper and lower extremities. Gains achieved by 6 months were sustained in the cerebral palsy group, whereas the DYT1 group demonstrated continued improvement with ongoing pallidal stimulation beyond 18 months. Young patients with dystonia due to cerebral palsy responded comparably to patients with DYT1 dystonia. The severity of motor impairment in patients with cerebral palsy at baseline and follow-up raises the issue of even earlier intervention with neuromodulation in this population to limit long-term motor impairments due to dystonia.

PMID: 23666041 [PubMed - as supplied by publisher]

5. Ugeskr Laeger. 2013 Feb 25;175(9):600.

Does spasticity lead to contractures? [Article in Danish]

Nielsen JB, Willerslev-Olsen M, Lorentzen J, Sinkjær T.

PMID: 23620893 [PubMed - indexed for MEDLINE]

6. J Child Neurol. 2013 May 10. [Epub ahead of print]

Pursuit of Complementary and Alternative Medicine Treatments in Adolescents With Cerebral Palsy.

Majnemer A, Shikako-Thomas K, Shevell MI, Poulin C, Lach L, Schmitz N, Law M, Group TQ.

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This study determined the extent to which parents of adolescents with cerebral palsy seek out complementary and alternative medicine services. A regional sample of 166 adolescents (15.5 ± 2.4 years) with cerebral palsy were recruited. Parents completed a questionnaire identifying the complementary and alternative medicine services received over the past year. Most (73.2%) did not currently utilize any of the listed services; 7.3% used 2 or more services. The most commonly used services were massage (15.4%), hyperbaric oxygen (9.6%), and osteopathy (5.7%). Youth with limited hand function were more likely (P = .01) to undergo hyperbaric oxygen. Massage therapy services were more frequent in youth with greater activity limitations (P < .005). Sociodemographic factors were not predictive of use. Approximately one quarter of families sought out these services for their adolescents with cerebral palsy. Many are expensive privately funded treatments. Physicians should openly discuss these options with families, highlighting the current state of knowledge on their efficacy.

PMID: 23666036 [PubMed - as supplied by publisher]

7. Dev Med Child Neurol. 2013 May 11. doi: 10.1111/dmcn.12157. [Epub ahead of print]

Intelligence assessments for children with cerebral palsy: a systematic review.

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AIM: Cerebral palsy (CP) is defined as a primary disorder of posture and movement; however, approximately 45% of children with CP also have an intellectual impairment. Prevalence estimates are limited by a lack of guidelines for intelligence testing. This systematic review aims to identify and examine intelligence assessments for children with CP. METHOD: Electronic databases (PubMed, PsycINFO, Web of Science, CINAHL, EMBASE, and ERIC) were searched to identify assessments that (1) measured intellectual function, (2) in children aged 4 to 18 years, (3) with CP, and (4) with psychometrics available. RESULTS: Searches yielded 48 assessments, of which nine provided psychometric data for children with CP. The included tests were the Columbia Mental Maturity Scale, the Leiter International Performance Scale, the Peabody Picture Vocabulary Test, the Pictorial Test of Intelligence, the Raven's Coloured Progressive Matrices, the Stanford-Binet Intelligence Scales, the Wechsler Adult Intelligence Scale, the Wechsler Intelligence Scale for Children, and the Wechsler Preschool and Primary Scale of Intelligence. INTERPRETATION: Intelligence assessments in children with CP lack reliability data, consensus regarding validity data, and population-specific norms. Research is required to establish psychometrics for children with CP. For children with higher motor involvement and/or communication and/or visual impairments, multiple options are required to assess intelligence appropriately.

PMID: 23662850 [PubMed - as supplied by publisher]

8. IEEE Trans Neural Syst Rehabil Eng. 2013 May;21(3):427-34. doi: 10.1109/TNSRE.2013.2254724.

On the automated removal of artifacts related to head movement from the EEG.

Daly I, Billinger M, Scherer R, Muller-Putz G.

Contamination of the electroencephalogram (EEG) by artifacts related to head movement is a major cause of reduced signal quality. This is a problem in both neuroscience and other uses of the EEG. To attempt to reduce the influence, on the EEG, of artifacts related to head movement, an accelerometer is placed on the head and independent component analysis is applied to attempt to separate artifacts which are statistically related to head movements. To evaluate the method, EEG and accelerometer measurements are made from 14 individuals with Cerebral palsy attempting to control a sensorimotor rhythm based brain-computer interface. Results show that the approach significantly reduces the influence of head movement related artifacts in the EEG.

PMID: 23673459 [PubMed - in process]

9. J Pediatr (Rio J). 2013 Apr 26. pii: S0021-7557(13)00057-0. doi: 10.1016/j.jped.2012.11.008. [Epub ahead of print]

Anthropometric assessment of patients with cerebral palsy: which curves are more appropriate?

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OBJECTIVE: To describe the nutritional assessment of children with cerebral palsy, verifying the correlation of growth curves specific for cerebral palsy with general curves, in addition to assessing the presence of digestive manifestations associated with nutritional problems. METHODS: This was a cross-sectional study of 187 individuals with cerebral palsy, evaluating anthropometric data in curves commonly used in pediatrics and specific curves for

cerebral palsy, in addition to the description of presence of dysphagia, constipation, and respiratory infections. RESULTS: 58% of patients were males, with a mean age of 5.6±3.5 years. Anthropometric data of weight below the 10th percentile occurred in 10% of the sample considering the cerebral palsy scale, versus 51% when considering the reference from the Centers for Disease Control and Prevention ($p < 0.01$; Kappa 0.19). The weight of most individuals with dysphagia, recurrent respiratory infections, and constipation was below the 50th percentile, with respective percentages of 67%, 75%, and 72%. CONCLUSION: The references commonly used in pediatrics tend to overestimate malnutrition in individuals with cerebral palsy, and their correlation with specific references for cerebral palsy is low. Digestive manifestations were mainly found in those individuals whose anthropometric measurements were below the 50th percentile.

PMID: 23664198 [PubMed - as supplied by publisher]

10. Eur J Paediatr Neurol. 2013 May 11. pii: S1090-3798(13)00062-7. doi: 10.1016/j.ejpn.2013.04.005. [Epub ahead of print]

Communication ability in cerebral palsy: A study from the CP register of western Sweden.

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BACKGROUND: Communication is often impaired in cerebral palsy (CP). Tools are needed to describe this complex function, in order to provide effective support. AIM: To study communication ability and the relationship between the Communication Function Classification System (CFCS) and CP subtype, gross motor function, manual ability, cognitive function and neuroimaging findings in the CP register of western Sweden. METHODS: Sixty-eight children (29 girls), 14 with unilateral spastic CP, 35 with bilateral spastic CP and 19 with dyskinetic CP, participated. The CFCS, Gross Motor Function Classification System (GMFCS) and Manual Ability Classification System (MACS) levels, cognitive impairment and neuroimaging findings were recorded. RESULTS: Half the children used speech, 32% used communication boards/books and 16% relied on body movements, eye gaze and sounds. Twenty-eight per cent were at the most functional CFCS level I, 13% at level II, 21% at level III, 10% at level IV and 28% at level V. CFCS levels I-II were found in 71% of children with unilateral spastic CP, 46% in bilateral spastic CP and 11% in dyskinetic CP ($p = 0.03$). CFCS correlated with the GMFCS, MACS and cognitive function ($p < 0.01$). Periventricular lesions were associated with speech and more functional CFCS levels, while cortical/subcortical and basal ganglia lesions were associated with the absence of speech and less functional CFCS levels ($p < 0.01$). CONCLUSION: Communication function profiles in CP can be derived from the CFCS, which correlates to gross and fine motor and cognitive function. Good communication ability is associated with lesions acquired early, rather than late, in the third trimester.

PMID: 23672835 [PubMed - as supplied by publisher]

11. Braz J Otorhinolaryngol. 2013 Apr;79(2):163-167.

Pediatric phoniatry outpatient ward: clinical and epidemiological characteristics [Article in English, Portuguese]

Fávero ML, Higino TC, Pires AP, Burke PR, Silva FL, Tabith Júnior A.

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Children with language or learning impairment and normal hearing need phoniatric assessment to analyse various communication and development aspects targeting the differential diagnosis and therapeutic indications.

OBJECTIVE: Characterize clinical and epidemiological features of a pediatric population treated in a phoniatric

outpatient clinic. METHOD: A cross-sectional historical cohort study (retrospective study) was performed involving 68 patients undergoing phoniatric consultation. Outcome measures were age, gender, source of referral for phoniatric consultation, phoniatric diagnosis, mean age at diagnosis, neonatal risks, family history of communication disorders and referrals. RESULTS: 70.58% were male and 29.42% female, mean age 6.85 ± 2.49 years. 63.23% from external services and 45.59% had no hearing diagnosis. 14 different diagnoses were performed: 50% had Cerebral Palsy, Specific Language Impairment and Pervasive Developmental Disorder. The difference between the average ages was statistically significant (F = 4.369 p = 0.00). 50% had a family history of communication disorders and 51.47% history of neonatal risk. 51.47% were referred for neurological consultation and 79.41% for therapies. CONCLUSION: The population seen was predominantly male, with more complex language development deviations probably due to multiple etiologies. Many of them had no hearing diagnosis.

PMID: 23670320 [PubMed - as supplied by publisher]

12. J Intellect Dev Disabil. 2013 May 14. [Epub ahead of print]

Social outcomes of young adults with cerebral palsy.

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Background: Functional abilities and social outcomes of young adults with cerebral palsy (CP) are relatively underresearched. Improvements in paediatric care have extended the expectation of achieving adulthood to 90%. Method: Young adults aged 20-30 years with CP (n = 335) were compared to a population-based control group (n = 2,152) of the same age. Motor function, self-care abilities, educational level, and social outcomes were determined by questionnaire. Results: Half the study group walked independently, but only 35.5% were independent in self-care. In comparison to their peers without disability, the study group's highest educational level was lower (p < .0001), as were rates of employment (36.3% compared with 80%), they were more likely to be living with parents (80% compared with 21%), to be single, and to have limited financial resources. Conclusion: Young adults with CP are functionally and socially disadvantaged in contrast with their peers without disability. Self-care dependence, intellectual disability, and communication impairments contribute to these outcomes but are not solely responsible.

PMID: 23672634 [PubMed - as supplied by publisher]

13. Phys Occup Ther Pediatr. 2013 May 13. [Epub ahead of print]

"It's the Participation that Motivates Him": Physical Activity Experiences of Youth with Cerebral Palsy and Their Parents.

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Youth with cerebral palsy (CP) face significant barriers to participation in physical activity (PA). There is little information available about the nature of these barriers. Seventeen (17) youth and/or their parents participated in focus groups and individual interviews to identify factors that make it easy or hard to be physically active. Four themes emerged across functional levels: environmental and personal factors, limitations related to impairment in body structure and function, the perception that health benefits alone do not motivate youth to be physically active, and variable preferences for activity delivery. Dialogue with participants revealed that interventions to promote PA in youth should mitigate the interactions between personal and environmental factors that act as barriers to PA, and enhance the interactions that facilitate PA. Partnerships between researchers, policy makers, service providers, and families must be developed to address system barriers and build capacity in youth with CP and their communities.

PMID: 23663137 [PubMed - as supplied by publisher]

Prevention and Cure

14. Dev Med Child Neurol. 2013 May 16. doi: 10.1111/dmcn.12166. [Epub ahead of print]

The potential for stem cell therapies to have an impact on cerebral palsy: opportunities and limitations.

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Abstract

Cerebral palsy (CP) is a chronic childhood disorder described by a group of motor and cognitive impairments and results in a substantial socio-economic burden to the individual, family, and healthcare system. With no effective biological interventions, therapies for CP are currently restricted to supportive and management strategies. Cellular transplantation has been suggested as a putative intervention for neural pathology, as mesenchymal and neural stem cells, as well as olfactory ensheathing glia and Schwann cells, have shown some regenerative and functional efficacy in experimental central nervous system disorders. This review describes the most common cell types investigated and delineates their purported mechanisms in vivo. Furthermore, it provides a cogent summary of both current early-phase clinical trials using neural precursor cells (NPCs) and the state of stem cell therapies for neurodegenerative conditions. Although NPCs are perhaps the most promising candidates for cell replacement therapy in the context of CP, much still remains to be understood regarding safety, efficacy, timing, dose, and route of transplantation, as well as the capacity for combinatorial strategies.

PMID: 23680015 [PubMed - as supplied by publisher]

15. Int J Biomed Sci. 2011 Jun;7(2):145-9.

Pattern of paediatric neurological disorders in Port Harcourt, Nigeria.

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BACKGROUND: Paediatric Neurological disorders in developing countries are very challenging. This is due to its chronicity, late presentation and unavailability of modern diagnostic facilities in developing countries like Nigeria. Lack of these modern technology and manpower contribute significantly to increased morbidity and mortality. This study demonstrates the pattern of neurological disorders and the challenges in management in a developing country. MATERIALS AND METHOD: This was a retrospective hospital based analysis of neurological disorders seen in the Paediatric neurology unit of the University of Port Harcourt Teaching hospital, Nigeria from January 2004 to December 2009. Descriptive statistics was used to present the result. RESULT: A total of 35,473 patients were seen in the Paediatric unit. Of these 2,379 had neurological disorders. This gave a prevalence of 6.7% of Paediatric neurological disorders. There were 1,431 males and 948 females (male: female ratio of 1.51:1.0). The age ranged from 3 months to 15 years. The age group 1->5 years accounted for the most affected age group constituting 87.7%. The most frequent Paediatric neurological disorders were epilepsy (24.6%), cerebral palsy (15.4%), and central nervous system infections (9.5%). CONCLUSIONS RECOMMENDATION: Wide spectrum of neurological disorders occur in our environment. The high incidence of epilepsy and cerebral palsy suggests that effort should be geared towards educating the populace about early diagnosis and prompt management.

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