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Interventions and Management

1. Interventions and Management

How reliable is the Assisting Hand Assessment for adolescents with unilateral cerebral palsy?

Dev Med Child Neurol. 2017 Jun 29. doi: 10.1111/dmcn.13488. [Epub ahead of print]

Gordon AL.

This commentary in on the original article by Louwers et al.

[PMID: 28660646](#)

2. Feasibility, stability and validity of the four square step test in typically developed children and children with brain damage.

Leizerowitz G, Katz-Leurer M.

Brain Inj. 2017 Jun 30:1-6. doi: 10.1080/02699052.2017.1332384. [Epub ahead of print]

PURPOSE: To assess feasibility, test-retest reliability and validity of the Four Square Step Test (FSST) in typically developed children (TD), and children with cerebral palsy (CP) and acquired brain injury (ABI). **METHODS:** 30 TD children, 20 with CP and 12 with ABI participated in the study. The FSST while sitting and standing, the Timed Up and Go (TUG) and the balance subtest of the Bruininks-Oseretsky Test (BOT-2) were assessed. Each child attempted the FSST twice within 1 week. The scores for the FSST were assigned according to the original test: two successes in four trials, and according to a more lenient test, one success in four trials. **RESULTS:** The original form of the FSST is not feasible for children with CP or ABI. In TD children the lenient version is feasible (93%) and has moderate stability (Interclass correlation, ICC = 0.723), with a significant, positive correlation with the TUG (rs = 0.56). In children with CP the lenient test is feasible (80%), stable (rs = 0.83) and negatively correlates with the BOT-2 (rs=-0.69). In children with ABI the test is less feasible (67%) and neither stable nor valid. **CONCLUSIONS:** The lenient form of the FSST is feasible, reliable and valid in TD children and children with CP.

[PMID: 28665697](#)

3. A Progressive Running Program for an Adolescent With Cerebral Palsy.

Lewis J.

Pediatr Phys Ther. 2017 Jul;29(3):E12-E16. doi: 10.1097/PEP.0000000000000429.

PURPOSE: To describe the physical therapy intervention and outcomes for a 20-week progressive running program.

SUMMARY OF KEY POINTS: A 12-year-old boy with spastic diplegic cerebral palsy, Gross Motor Function Classification System level II, participated in a 20-week running program. The 6-minute walk test and the 88-item and 66-item versions of the Gross Motor Function Measure (GMFM) were administered at baseline and program completion. After completion of the program, the participant exceeded thresholds for minimally clinically important differences on the GMFM-66 total score and GMFM-88 Dimension D and E scores. He improved gait speed and distance walked during the 6-minute walk test.

CONCLUSIONS AND RECOMMENDATIONS FOR CLINICAL PRACTICE: Participation in a progressive running program is a feasible intervention to promote improvements in walking speed and gross motor function in some adolescents with spastic diplegic cerebral palsy in Gross Motor Function Classification System level II.

[PMID: 28654506](#)

4. Effectiveness of Functional Power Training on Walking Ability in Young Children With Cerebral Palsy: Study Protocol of a Double-Baseline Trial.

van Vulpen LF, de Groot S, Rameekers EAA, Becher JG, Dallmeijer AJ.

Pediatr Phys Ther. 2017 Jul;29(3):275-282. doi: 10.1097/PEP.0000000000000424.

PURPOSE: To evaluate the effect of functional high-velocity resistance (power) training to improve walking ability of young children with cerebral palsy. **METHODS:** Twenty-two children with bi- or unilateral spastic cerebral palsy, Gross Motor Function Classification System levels I and II, aged 4 to 10 years will be recruited. A double-baseline design will be used to compare a 14-week functional power training (3 times a week) program with a 14-week usual care period and a 14-week follow-up period. The power exercises will be loaded and performed at 50% to 70% of the maximum unloaded speed. Load will be increased when exercises are performed faster than 70% of the unloaded speed. Primary outcomes will be sprinting capacity (15-m Muscle Power Sprint Test) and goal attainment scaling score of walking-related treatment goals. Secondary outcomes will be walking speed (1-min walk test), endurance (10-m shuttle run test), gross motor function, lower-limb strength, and parent-reported mobility.

[PMID: 28654503](#)

5. A Home-Based Body Weight-Supported Treadmill Program for Children With Cerebral Palsy: A Pilot Study.

Visser A, Westman M, Otieno S, Kenyon L.

Pediatr Phys Ther. 2017 Jul;29(3):223-229. doi: 10.1097/PEP.0000000000000406.

PURPOSE: The purpose of this pilot study was to explore the effect and feasibility of a home-based body weight-supported treadmill training (BWSTT) program on walking capacity and functional mobility in children with cerebral palsy (CP).

METHODS: A within-subjects, repeated-measures design was used. Ten children with CP ages 6 to 16 years participated in pre- and postintervention testing sessions, an initial home training session, and a 12-week home-based BWSTT program conducted 3 to 4 times per week by a parent or caregiver for up to 20 minutes each session. Multiple outcome measures for walking capacity and functional mobility were used. **RESULTS:** As a group, participants demonstrated significant improvements in walking capacity and functional mobility at the completion the 12-week intervention program.

CONCLUSIONS: Additional research regarding home-based BWSTT programs in children with CP is warranted and should focus on identifying specific parameters that promote achievement of optimal functional outcomes.

[PMID: 28654490](#)

6. Commentary on "A Home-Based Body Weight-Supported Treadmill Program for Children With Cerebral Palsy: A Pilot Study".

Tobias L, Carey H.

Pediatr Phys Ther. 2017 Jul;29(3):229. doi: 10.1097/PEP.0000000000000431.

[PMID: 28654491](#)

7. Evaluation Of The Official Match External Load In Soccer Players With Cerebral Palsy.

Yanci J, Castillo D, Iturricastillo A, Reina R.

J Strength Cond Res. 2017 Jun 22. doi: 10.1519/JSC.0000000000002085. [Epub ahead of print]

The aims of this study were to analyze the official match external loads (i.e. total distance [TD], distance covered at different speeds, accelerations, decelerations, player load [PL], peak metabolic power [PMP] and changes of direction [CODs]) of football players with cerebral palsy (CP), and to determine the external loads according to playing time (i.e. < 20 min, 20-40 min and > 40 min). The external load of thirty-one international football players with CP (23.0 ± 6.6 years; 69.1 ± 9.0 kg; 174.8 ± 7.3 cm) was analyzed during a World Championship Qualification Tournament (n = 8 matches, 58 individual observations). Results showed that the football players with CP, covered less distance at high intensity running and sprinting, performing a smaller number of moderate and high intensity accelerations and decelerations, had a lower PL and made fewer CODs in official matches compared to conventional football players as reported in other studies. The number of minutes played by the players (i.e. < 20 min, 20-40 min and > 40 min) could significantly influence the players' match external load (ES = 0.3-5.5, small to extremely large). The impairments presented by football players with CP affect players' match external loads, especially in short-term high-intensity neuromuscular actions.

[PMID: 28658075](#)

8. Changes in hip abductor moment 3 or more years after femoral derotation osteotomy among individuals with cerebral palsy.

Boyer ER, Novacheck TF, Schwartz MH.

Dev Med Child Neurol. 2017 Jun 29. doi: 10.1111/dmcn.13494. [Epub ahead of print]

AIM: To examine the effect of femoral derotation osteotomy (FDO) on dimensionless hip abductor moment during gait in children with cerebral palsy. METHODS: We retrospectively analyzed data from independent ambulators within our database. Postoperative visits 1 year (short-term) and at least 3 years (mid-term) were analyzed. We estimated the coronal plane hip abductor moment arm based on musculoskeletal modeling that accounted for anteversion and hip rotation. RESULTS: There were 140 individuals with a short-term analysis (77 males, 63 females; age at surgery 9y 11mo [range 4y 5mo-17y 5mo]) and 29 with mid-term analysis (15 males, 14 females; age at surgery 8y 7mo [range 4y 5mo-13y 1mo]). At short-term, anteversion and internal hip rotation decreased 35° and 13° respectively, which increased median (IQR) moment arms from 20 (23) per cent below normal to 2 (12) per cent above normal. Dimensionless mean hip abductor moment remained unchanged at short-term. Mid-term anteversion did not change but hip rotation increased 8° and hip abductor moment increased to 0.040 (0.029). There was no change in pelvic and trunk obliquity, although hip abductor strength increased and walking velocity decreased at mid-term. INTERPRETATION: The unexpected lack of improvement in hip abductor moment from pre- to short-term may be caused by gait compensations that unload the hip. The increase in hip abductor moment beyond 3 years postoperatively underscores the benefits of an FDO into adolescence for independent ambulating individuals with cerebral palsy.

[PMID: 28660621](#)

9. Functional Outcomes of Childhood Selective Dorsal Rhizotomy 20 to 28 Years Later.

Park TS, Liu JL, Edwards C, Walter DM, Dobbs MB.

Cureus. 2017 May 17;9(5):e1256. doi: 10.7759/cureus.1256.

BACKGROUND: Selective dorsal rhizotomy (SDR) is a surgical method used to treat childhood spastic cerebral palsy (CP). However, the effects of early SDR on functional outcomes and quality of life decades later in adulthood remains to be elucidated. **OBJECTIVES:** To evaluate the long-term outcomes in terms of satisfaction and mobility of adult patients who received childhood SDR. **METHODS:** Adult patients who received SDR in childhood were surveyed. The survey questionnaire asked about demographic information, quality of life, health outcomes, SDR surgical outcomes, ambulation, manual ability, pain, braces/orthotics, post-SDR treatment, living situation, education level, and work status. **RESULTS:** Our study included 95 patients. The age that patients received SDR was between two and 18 years. The age at the time of survey was between 23 and 37 years (mean \pm S.D., 30.2 ± 3.6 years). Post-SDR follow-up ranged from 20 to 28 years (mean \pm S.D., 24.3 ± 2.2 years). Seventy-nine percent of patients had spastic diplegia, 20% had spastic quadriplegia, and one percent had spastic triplegia. Ninety-one percent of patients felt that SDR impacted positively the quality of life and two percent felt that the surgery impacted negatively the quality of life after SDR. Compared to pre-operative ambulatory function, 42% reported higher level of ambulation and 42% ambulated in the same level. Eighty-eight percent of patients would recommend the procedure to others and two percent would not. Thirty-eight percent reported pain, mostly in the back and lower limbs, with mean pain level 4.2 ± 2.3 on the Numeric Pain Rating Scale (NPRS). Decreased sensation in patchy areas of the lower limbs that did not affect daily life was reported by eight percent of patients. Scoliosis was diagnosed in 31%. The severity of scoliosis is unknown. Only three percent of them underwent spinal fusion. Fifty-seven percent of patients required some orthopedic surgery after SDR. The soft-tissue tendon lengthening procedures included lengthening on hamstrings, Achilles tendons or adductors. Out of all bone procedures, 24% of patients had hip surgery, five percent had knee surgery, and 10% had derotational osteotomies. No late side effects of SDR surgery were reported in this survey. **CONCLUSIONS:** In our 95 adult patients who received SDR in childhood, the surgery had positive effects on the quality of life and ambulation 20-28 years later. There were no late complications of SDR surgery.

[PMID: 28649479](#)

10. Gross motor function change after multilevel soft tissue release in children with cerebral palsy.

Chang CH, Chen YY, Yeh KK, Chen CL.

Biomed J. 2017 Jun;40(3):163-168. doi: 10.1016/j.bj.2016.12.003. Epub 2017 May 30.

BACKGROUND: Improving motor function is a major goal of therapy for children with cerebral palsy (CP). However, changes in motor function after orthopedic surgery for gait disorders are seldom discussed. This study aimed to evaluate the postoperative changes in gross motor function and to investigate the prognostic factors for such changes. **METHODS:** We prospectively studied 25 children with CP (4-12 years) who were gross motor function classification system (GMFCS) level II to IV and underwent bilateral multilevel soft-tissue release for knee flexion gait. Patients were evaluated preoperatively and at 6 weeks and 3 and 6 months postoperatively for Gross Motor Function Measure (GMFM-66), range of motion, spasticity, and selective motor control. The associations between change in GMFM-66 score and possible factors were analyzed. **RESULTS:** 25 children with gross motor function level II to IV underwent surgery at a mean age of 8.6 years (range, 4-12 years). Mean GMFM-66 score decreased from 55.9 at baseline to 54.3 at 6-weeks postoperatively and increased to 57.5 at 6-months postoperatively ($p < 0.05$). Regression analysis revealed better gross motor function level and greater surgical reduction of spasticity were predictors for decreased GMFM-66 score at 6-weeks postoperatively. Younger age was a predictor for increased GMFM-66 score at 6-months postoperatively. **CONCLUSION:** Reduction of contracture and spasticity and improvement of selective motor control were noted after surgery in children with CP. However, a down-and-up course of GMFM-66 score was noted. It is emphasized that deterioration of motor function in children with ambulatory ability and the improvement in young children after orthopedic surgery for gait disorders.

[PMID: 28651738](#)

11. Botulinum toxin and short-term electrical stimulation in the treatment of equinus in cerebral palsy.

Detrembleur C, Lejeune TM, Renders A, Van den Bergh PYK.

Mov Disord. 2002 Jan;17(1):162-169. doi: 10.1002/mds.1282. Epub 2001 Dec 13.

Intramuscular botulinum toxin type A (BT-A) has been shown to reduce spasticity and to improve gait in children with cerebral palsy. To determine whether the efficacy of BT-A may be enhanced by electrical stimulation, as suggested in focal dystonia or in adult spastic patients, 12 children with dynamic foot equinus deformity were randomly assigned to two groups in a blinded, clinically controlled trial. Intramuscular BT-A into calf muscles was followed by adjuvant electrical stimulation in Group A (n = 6) but not in Group B (n = 6). Clinical assessment and instrumented gait analysis were performed before and 1, 3, and 6 months after treatment. The combined treatment of BT-A and electrical stimulation was not superior to BT-A alone. For all patients, improvement of the clinical and gait variables occurred at 1 and 3 months after BT-A injection. © 2001 Movement Disorder Society.

[PMID: 28650125](#)

12. Real-time ultrasound elastography of the Achilles tendon in patients with cerebral palsy: is there a correlation between strain ratio and biomechanical indicators?

Öztürk M, Sayinbatur B.

J Med Ultrason (2001). 2017 Jun 27. doi: 10.1007/s10396-017-0800-y. [Epub ahead of print]

PURPOSE: Our aim was to comparatively investigate the strain ratio and thickness of the Achilles tendon in children with cerebral palsy (CP), and to elucidate whether there is a correlation between biomechanical features of the Achilles tendon and strain ratio. **METHODS:** A total of 155 participants (72 CP patients and 83 healthy controls) who underwent real-time elastography of both Achilles tendons were studied. A linear transducer (4.8-11.0 MHz) was used to obtain the images. Correlation analysis between age, length, and thickness of the Achilles tendon, and strain ratio (SR) was performed by means of Pearson correlation and Spearman's rho tests. **RESULTS:** Comparison of results obtained from CP patients and controls showed that the length of the Achilles tendon was shorter ($p < 0.001$) and SR was higher ($p < 0.001$) in CP patients. In CP patients, there was a positive correlation between SR and age and between SR and the thickness and length of the Achilles tendon ($p < 0.001$ for all). Furthermore, the length of the tendon and age were positively associated ($p < 0.001$). ROC analysis revealed that the cut-off value for SR was 1.89. **CONCLUSION:** The results of the present study demonstrated that real-time elastography can constitute a simple, practical, and noninvasive method for evaluation of the elasticity of the Achilles tendon in children with CP.

[PMID: 28656513](#)

13. Markerless motion capture systems as training device in neurological rehabilitation: a systematic review of their use, application, target population and efficacy.

Knippenberg E, Verbrugghe J, Lamers I, Palmaers S, Timmermans A, Spooren A.

J Neuroeng Rehabil. 2017 Jun 24;14(1):61. doi: 10.1186/s12984-017-0270-x.

BACKGROUND: Client-centred task-oriented training is important in neurological rehabilitation but is time consuming and costly in clinical practice. The use of technology, especially motion capture systems (MCS) which are low cost and easy to apply in clinical practice, may be used to support this kind of training, but knowledge and evidence of their use for training is scarce. The present review aims to investigate 1) which motion capture systems are used as training devices in neurological rehabilitation, 2) how they are applied, 3) in which target population, 4) what the content of the training and 5) efficacy of training with MCS is. **METHODS:** A computerised systematic literature review was conducted in four databases (PubMed, Cinahl, Cochrane Database and IEEE). The following MeSH terms and key words were used: Motion, Movement, Detection, Capture, Kinect, Rehabilitation, Nervous System Diseases, Multiple Sclerosis, Stroke, Spinal Cord, Parkinson Disease, Cerebral Palsy and Traumatic Brain Injury. The Van Tulder's Quality assessment was used to score the methodological quality of the selected studies. The descriptive analysis is reported by MCS, target population, training parameters and training

efficacy. RESULTS: Eighteen studies were selected (mean Van Tulder score = 8.06 ± 3.67). Based on methodological quality, six studies were selected for analysis of training efficacy. Most commonly used MCS was Microsoft Kinect, training was mostly conducted in upper limb stroke rehabilitation. Training programs varied in intensity, frequency and content. None of the studies reported an individualised training program based on client-centred approach. CONCLUSION: Motion capture systems are training devices with potential in neurological rehabilitation to increase the motivation during training and may assist improvement on one or more International Classification of Functioning, Disability and Health (ICF) levels. Although client-centred task-oriented training is important in neurological rehabilitation, the client-centred approach was not included. Future technological developments should take up the challenge to combine MCS with the principles of a client-centred task-oriented approach and prove efficacy using randomised controlled trials with long-term follow-up.

[PMID: 28646914](#)

14. Range and Precision of Formant Movement in Pediatric Dysarthria.

Allison KM, Annear L, Policcio M, Hustad KC.

J Speech Lang Hear Res. 2017 Jun 28;1-13. doi: 10.1044/2017_JSLHR-S-15-0438. [Epub ahead of print]

PURPOSE: This study aimed to improve understanding of speech characteristics associated with dysarthria in children with cerebral palsy by analyzing segmental and global formant measures in single-word and sentence contexts. METHOD: Ten 5-year-old children with cerebral palsy and dysarthria and 10 age-matched, typically developing children participated in this study. Vowel space area and second formant interquartile range were measured from children's elicited productions of single words and sentences. RESULTS: Results showed that the children with dysarthria had significantly smaller vowel space areas than typically developing children in both word and sentence contexts; however, overall ranges of second formant movement did not differ between groups in word or sentence contexts. Additional analysis of single words revealed that, compared to typical children, children with dysarthria had smaller second formant interquartile ranges in single words with phonetic contexts requiring large changes in vocal tract configuration, but not in single words with monophthongs. CONCLUSIONS: Results of this study suggest that children with dysarthria may not have globally reduced ranges of articulatory movement compared to typically developing peers; however, they do exhibit reduced precision in producing phonetic targets.

[PMID: 28655064](#)

15. Acoustic and Perceptual Consequences of Speech Cues for Children With Dysarthria.

Levy ES, Chang YM, Ancelle JA, McAuliffe MJ.

J Speech Lang Hear Res. 2017 Jun 22;60(6S):1766-1779. doi: 10.1044/2017_JSLHR-S-16-0274.

PURPOSE: Reductions in articulatory working space and vocal intensity have been linked to intelligibility deficits in children with dysarthria due to cerebral palsy. However, few studies have examined the outcomes of behavioral treatments aimed at these underlying impairments or investigated which treatment cues might best facilitate improved intelligibility. This study assessed the effects of cues targeting clear speech (i.e., "Speak with your big mouth") and greater vocal intensity (i.e., "Speak with your strong voice") on acoustic measures of speech production and intelligibility. METHOD: Eight children with spastic dysarthria due to cerebral palsy repeated sentence- and word-level stimuli across habitual, big mouth, and strong voice conditions. Acoustic analyses were conducted, and 48 listeners completed orthographic transcription and scaled intelligibility ratings. RESULTS: Both cues resulted in significant changes to vocal intensity and speech rate although the degree of change varied by condition. In a similar manner, perceptual analysis revealed significant improvements to intelligibility with both cues; however, at the single-word level, big mouth outperformed strong voice. CONCLUSION: Children with dysarthria are capable of changing their speech styles differentially in response to cueing. Both the big mouth and strong voice cues hold promise as intervention strategies to improve intelligibility in this population.

[PMID: 28655046](#)

16. Initial Observations of Lingual Movement Characteristics of Children With Cerebral Palsy.

Nip ISB, Arias CR, Morita K, Richardson H.

J Speech Lang Hear Res. 2017 Jun 22;60(6S):1780-1790. doi: 10.1044/2017_JSLHR-S-16-0239.

PURPOSE: This preliminary study compared the speech motor control of the tongue and jaw between children with cerebral palsy (CP) and their typically developing (TD) peers. **METHOD:** Tongue tip and jaw movements of 4 boys with spastic CP and 4 age- and sex-matched TD peers were recorded using an electromagnetic articulograph during 10 repetitions of "Dad told stories today." The duration, path distance, average speed, and speech movement stability of the movements were calculated for each repetition. **RESULTS:** The children with CP had longer durations than their TD peers. Children with CP had longer path distances and faster average speed as compared with their TD peers for both articulators. The TD group but not the CP group had longer path distances and faster average speeds for the tongue than the jaw. The CP group had reduced speech movement stability for the tongue as compared with their TD peers, but both groups had similar speech movement stability for the jaw. **CONCLUSIONS:** Children with CP had impaired speech motor control of the tongue and jaw as compared with their TD peers, and these speech motor control deficits were more pronounced in the tongue tip than the jaw.

[PMID: 28655047](#)

17. Cross-cultural Translation and Adaptation of the Lifestyle Assessment Questionnaire (LAQ-CP) Into Dutch: A Brief Report.

Beckers L, Speth L, Rameckers E, Janssen-Potten Y.

Pediatr Phys Ther. 2017 Jul;29(3):251-255. doi: 10.1097/PEP.0000000000000428.

PURPOSE: To produce a Dutch translation of the Lifestyle Assessment Questionnaire for children with cerebral palsy (LAQ-CP), adapted for cross-cultural differences. **METHODS:** The translation process consisted of 6 stages, following a guideline for cross-cultural adaptations including duplicate forward- and back-translations, expert group review, pilot-testing, and a process audit. **RESULTS:** Several adaptations to the questionnaire were required due to cross-cultural differences. As a result of the pilot-test, the layout was adapted to the desires of the users. The process auditor stated that the process had been comprehensive and valued the quality of the work. **CONCLUSION:** The project resulted in a Dutch translation of the LAQ-CP, adapted for cross-cultural differences. Validation of the translated questionnaire is required before use in clinical practice and research is recommended (Dutch abstract, Supplemental Digital Content 1, available at: <http://links.lww.com/PPT/A164>).

[PMID: 28654498](#)

18. What housing features should inform the development of housing solutions for adults with neurological disability?: A systematic review of the literature.

Wright CJ, Zeeman H, Kendall E, Whitty JA.

Health Place. 2017 Jun 21;46:234-248. doi: 10.1016/j.healthplace.2017.06.001. [Epub ahead of print]

Despite the recent emphasis in Australian political, academic, and legislative narratives to more actively promote real housing choice for people with high healthcare and support needs, there is a lack of understanding regarding the specific housing features that might constitute better housing solutions for this population. Inclusive housing provision in Australia rightly emphasises safety and accessibility issues but often fails to incorporate factors related to broader psychosocial elements of housing such as dwelling location, neighbourhood quality, and overall design. While the importance of these broader elements appears obvious, it is not yet clear what specific housing features relate to these elements and how they might contribute to housing solutions for people with high healthcare and support needs. For individuals with complex neurological conditions such as brain injury or cerebral palsy, who require maximum support on a daily basis yet want to live independently and away from a primary care hospital or health facility, a more detailed understanding of the housing features that might influence design and development is needed. Thus, in order to clarify the broader factors related to housing solutions for this population, a systematic review was conducted to identify and synthesise the current research evidence (post-2003) and guide future housing design and development opportunities. From the included studies (n=26), 198 unique housing features were identified. From the 198 features, 142 related to housing design (i.e., internal or external characteristics of the dwelling and its land), 12 related to the dwelling's location (i.e., its proximity to available resources), and 54 related to the nature of the surrounding neighbourhood (i.e., the physical, social, and economic conditions of the area). The findings of this review contribute

significantly to the literature by reporting a broader scope of relevant housing features for people with neurological disability, presenting preliminary guiding principles for housing design and development for this population, and identifying opportunities for future research.

[PMID: 28646691](#)

19. Therapy Use for Children With Developmental Conditions: Analysis of Colorado Medicaid Data.

McManus BM, Rapport MJ, Richardson Z, Lindrooth R.

Pediatr Phys Ther. 2017 Jul;29(3):192-198. doi: 10.1097/PEP.0000000000000425.

STUDY PURPOSE: To examine therapy use and spending for Medicaid-enrolled infants and toddlers with developmental conditions. **METHODS:** Sample infants and toddlers had a diagnosis (eg, cerebral palsy) or developmental delay (DD). Colorado Children's Medicaid administrative outpatient therapy claims (2006-2008) were used to estimate differences, by condition type and number of comorbid chronic conditions (CCCs), of any physical therapy (PT)/occupational therapy (OT) and Medicaid PT/OT spending. **RESULTS:** The sample included 20 959 children. Children with at least 2 CCCs had higher odds of PT/OT than children with no CCC. Children with DD had 12-fold higher odds of having any PT/OT compared with children with diagnosis. Children with a DD and 2 CCCs had the highest PT/OT spending. **CONCLUSIONS:** Medicaid PT/OT use and spending are higher for children with more CCCs and those with DD because children with DD receive more specialized PT/OT.

[PMID: 28654483](#)

20. Validation of US cerebral palsy growth charts using a UK cohort.

Wright CM, Reynolds L, Ingram E, Cole TJ, Brooks J.

Dev Med Child Neurol. 2017 Jun 28. doi: 10.1111/dmcn.13495. [Epub ahead of print]

AIM: Growth charts for cerebral palsy (CP) have been constructed using data for 24 920 Californian patients, covering ages 2 to 20 years, with separate charts for the five severity levels of the Gross Motor Function Classification System (GMFCS). Our aim was to test how the data for British children with CP fit these charts, compared with conventional local charts. **METHOD:** US CP growth reference was reanalysed using the lambda-mu-sigma (LMS) method to allow calculation of standard deviation z-scores. Growth data for 195 children with CP in Glasgow, UK, were retrieved and converted to z-scores using the CP reference as well as the combined World Health Organization and UK 1990 growth reference (UK-WHO). **RESULTS:** Compared to the UK-WHO reference, measurements diverged progressively with increasing severity, with mean height for GMFCS level V being close to the second UK-WHO centile. Compared with the CP reference, mean height and weight z-scores were between the 50th and 75th centiles for all severity levels, while body mass index was just below the 50th centile. **INTERPRETATION:** British children with severe CP seem relatively very small when their growth data are plotted on non-CP charts, but their data for weight and body mass index fit well to US CP charts and reasonably well for height. The LMS look-up tables will make it possible to calculate z-scores and produce charts in local formats.

[PMID: 28656704](#)

21. Coupling Timing of Interventions With Dose to Optimize Plasticity and Participation in Pediatric Neurologic Populations.

Gannotti ME.

Pediatr Phys Ther. 2017 Jul;29 Suppl 3 Supplement, IV Step 2016 Conference Proceedings Supplement:S37-S47. doi: 10.1097/PEP.0000000000000383.

PURPOSE: The purpose of this article is to propose that coupling of timing of interventions with dosing of interventions optimizes plasticity and participation in pediatric neurologic conditions, specifically cerebral palsy. Dosing includes frequency, intensity, time per session, and type of intervention. Interventions focus on body structures and function and activity and

participation, and both are explored. Known parameters for promoting bone, muscle, and brain plasticity and evidence supporting critical periods of growth during development are reviewed. Although parameters for dosing participation are not yet established, emerging evidence suggests that participation at high intensities has the potential for change. Participation interventions may provide an additional avenue to promote change through the life span. Recommendations for research and clinical practice are presented to stimulate discussions and innovations in research and practice.

[PMID: 28654476](#)

Prevention and Cure

22. Maternal Obesity and Cerebral Palsy in Offspring-Reply.

Villamor E, Tedroff K, Cnattingius S.

JAMA. 2017 Jun 27;317(24):2550. doi: 10.1001/jama.2017.5979.

Comment on

Maternal Obesity and Cerebral Palsy in Offspring. [JAMA. 2017]

[PMID: 28655006](#)

23. Maternal Obesity and Cerebral Palsy in Offspring.

Li YJ, Li YM.

JAMA. 2017 Jun 27;317(24):2549-2550. doi: 10.1001/jama.2017.5975.

Comment in

Maternal Obesity and Cerebral Palsy in Offspring-Reply. [JAMA. 2017]

Comment on

Association Between Maternal Body Mass Index in Early Pregnancy and Incidence of Cerebral Palsy. [JAMA. 2017]

[PMID: 28655001](#)

24. The Causation of Cerebral Palsy is Evolving.

Murphy JFA.

Ir Med J. 2017 Feb 10;110(2):509.

[No abstract available]

[PMID: 28657254](#)