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Interventions and Management

1. J Neurosurg Pediatr. 2015 Jan 16:1-7. [Epub ahead of print]

Denervation of the infraspinatus and release of the posterior deltoid muscles in the management of dyskinetic external shoulder rotation in cerebral palsy.

Blaszczyk I1, Granström AC, Wiberg M.

OBJECT The dyskinetic subtype of cerebral palsy is difficult to manage, and there is no established gold standard for treatment. External rotation of the shoulder(s) is often managed nonsurgically using injections of botulinum toxin A into the external rotator muscles. This article reports a new surgical technique for managing external rotation when botulinum toxin A treatment is not sufficient or possible. **METHODS** Six patients with dyskinetic cerebral palsy underwent denervation of the infraspinatus muscle and release of the posterior part of the deltoid muscle. Postoperative questionnaires were given to the patients/caregivers, and video recordings were made both pre- and postoperatively. Preoperative and postoperative Assisting Hand Assessment was possible in only 1 case. **RESULTS** Five patients were very satisfied with their outcome. Four patients' video recordings showed improvement in their condition. One patient developed postoperative complications. **CONCLUSIONS** The results indicate that denervation of the infraspinatus muscle and posterior deltoid release can be an option for patients with dyskinetic cerebral palsy to manage external rotation of the shoulder when other treatment alternatives are insufficient.

[PMID: 25580511](https://pubmed.ncbi.nlm.nih.gov/25580511/) [PubMed - as supplied by publisher]

2. Exp Brain Res. 2015 Jan 13. [Epub ahead of print]

Upper limb performance and the structuring of joint movement in teenagers with cerebral palsy: the reciprocal role of task demands and action capabilities.

Figueiredo PR1, Silva PL, Avelar BS, da Fonseca ST, Bootsma RJ, Mancini MC.

Individuals with unilateral cerebral palsy (CP) demonstrate reduced performance in upper limb tasks compared to typically developing (TD) peers. We examined whether task conditions modify differences between teenagers with and without CP during a reciprocal aiming task. Twenty teenagers (nine CP and 11 TD) moved a pointer between two targets as fast as possible without missing a target. Task conditions were manipulated by changing the targets' size, by modifying the inertial properties of the pointer and by varying the upper limb used to perform the task (preferred/non-affected and non-preferred/affected upper limbs). While compared to TD peers, CP teenagers

exhibited lower performance (longer movement times). Such differences were attenuated when the task was performed with the preferred upper limb and when accuracy requirements were less stringent. CP teenagers were not differentially affected by the pointer inertia manipulation. Task conditions not only affected performance but also joint kinematics. CP teenagers revealed less movement at the elbow and more movement at the shoulder when performing the task with their less skilled upper limb. However, both CP and TD teenagers demonstrated a larger contribution of trunk movement when facing more challenging task conditions. The overall pattern of results indicated that the joint kinematics employed by individuals with unilateral CP constituted adaptive responses to task requirements. Thus, the explanation of the effects of unilateral CP on upper limb behavior needs to go beyond a context-indifferent manifestation of the brain injury to include the interaction between task demands and action capabilities.

[PMID: 25579662](#) [PubMed - as supplied by publisher]

3. J Pediatr Orthop. 2015 Jan 8. [Epub ahead of print]

Short-term and Long-term Clinical Results of the Surgical Correction of Thumb-in-Palm Deformity in Patients With Cerebral Palsy.

Alewijnse JV1, Smeulders MJ, Kreulen M.

BACKGROUND: Thumb-in-palm deformity disturbs a functional grip of the hand in patients with cerebral palsy. Reported recurrence rates after surgical correction are contradicting and earlier studies are limited to short-term follow-up. Therefore, the aim of this retrospective clinical outcome study is to evaluate the success rate of surgical correction of thumb-in-palm deformity around 1 year and at a minimum of 5 years follow-up. In addition, long-term patient satisfaction of the treatment is evaluated. **METHODS:** Patients with cerebral palsy who underwent a surgical correction for their thumb-in-palm deformity between April 2003 and April 2008 at the Academic Medical Center in Amsterdam were included. All patients were classified into 4 categories according to the assessment system of the Committee on Spastic Hand Evaluation. The result of surgery was considered "short-term successful" and "long-term successful" when, respectively, short-term and long-term classification was better compared with preoperative. The association between the patient satisfaction outcomes and the long-term clinical outcomes were statistically analyzed. **RESULTS:** Data were collected from 39 patients and their charts. The success rate was 87% at short-term follow-up, which in the long term decreased to 80%. Interestingly, thumb position deteriorated in 29% of the patients between short-term and long-term follow-up. In the long term, 74% of the patients were satisfied with the position of their thumb and 87% would undergo the surgery again. Both these outcomes were statistically significant associated with the long-term success rate ($P < 0.05$). **CONCLUSIONS:** The surgical correction of thumb-in-palm deformity has a high clinical success rate and patient satisfaction in the long term. However, it should be taken into account that the clinical result around 1 year postoperative cannot be considered final.

LEVEL OF EVIDENCE: Level IV.

[PMID: 25575357](#) [PubMed - as supplied by publisher]

4. Phys Ther. 2015 Jan 8. [Epub ahead of print]

Design and Kinematic Evaluation of a Novel Joint-Specific Play Controller: An Application for Wrist and Forearm Therapy.

Crisco JJ1, Schwartz JB2, Wilcox B3, Costa L4, Kerman K5.

BACKGROUND: Wrist extensors/flexors are profoundly affected in most children with hemiparetic cerebral palsy (CP) and are the major target of PT/OT efforts to restore useful hand functions. A limitation of any therapeutic or exercise program can be the level of the child's engagement or compliance. The proposed approach capitalizes upon the primary learning avenue for children: toy play. **OBJECTIVE:** Develop and evaluate the measurement accuracy of innovative, motion-specific play controllers that are engaging rehabilitative devices for enhancing therapy and promoting neural plasticity and functional recovery in children with CP. **DESIGN:** Design objectives of the play controller included a cost effective, home-based supplement to physical therapy, the ability to calibrate the controller so that play can be accomplished with any active range of motion, and the capability of logging play activity and wrist motion over week-long periods. **METHODS:** Accuracy of the play controller in measuring wrist

flexion-extension was evaluated in six children who were developing in a typical manner, using optical motion capture of the wrist and forearm as the gold standard. RESULTS: The error of the play controller was estimated at approximately 5° in both maximum wrist flexion and extension. LIMITATIONS: Measurements were taken during a laboratory session, with children without CP, and no toy or computer game was interfaced with the play controller. Therefore, the potential engagement of the proposed approach for therapy remains to be evaluated. CONCLUSIONS: This study presented the concept, development and the wrist tracking accuracy of an inexpensive approach to extremity therapy that may have a health benefit for children with hemiparesis, and potentially for patients of any age with a wide range of extremity neuromotor impairments.

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5. Braz J Phys Ther. 2015 Jan 9;0:0. [Epub ahead of print]

Functional priorities reported by parents of children with cerebral palsy: contribution to the pediatric rehabilitation process [Article in English, Portuguese]

Brandão MB1, Oliveira RH1, Mancini MC2.

Background: Collaborative actions between family and therapist are essential to the rehabilitation process, and they can be a catalyst mechanism to the positive outcomes in children with cerebral palsy (CP). Objectives: To describe functional priorities established by caregivers of CP children by level of severity and age, and to assess changes on performance and satisfaction on functional priorities reported by caregivers, in 6-month interval. Method: 75 CP children, weekly assisted at Associação Mineira de Reabilitação, on physical and occupational therapy services. The following information was collected: gross motor function (Gross Motor Function Classification System-GMFCS) and functional priorities established by caregivers (Canadian Occupational Performance Measure-COPM). Data were collected in two moments, with a 6-month interval. Results: The main functional demands presented by caregivers were related to self-care activities (48.2%). Parents of children with severe motor impairment (GMFCS V) pointed higher number of demands related to play ($p=0.0036$), compared to the other severity levels. Parents of younger children reported higher number of demands in mobility ($p=0.025$) and play ($p=0.007$), compared to other age groups. After 6 months, there were significant increase on COPM performance ($p=0.0001$) and satisfaction scores ($p=0.0001$). Conclusions: Parents of CP children identified functional priorities in similar performance domains, by level of severity and age. Orienting the pediatric rehabilitation process to promote changes in functional priorities identified by caregivers can contribute to the reinforcement of the parent-therapist collaboration.

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6. Eur Spine J. 2015 Jan 9. [Epub ahead of print]

Annual changes in radiographic indices of the spine in cerebral palsy patients.

Lee SY1, Chung CY, Lee KM, Kwon SS, Cho KJ, Park MS.

PURPOSE: We estimated the annual changes in radiographic indices of the spine in cerebral palsy (CP) patients and analyzed the factors that influence its progression rate. METHODS: We included CP patients who had undergone whole-spine radiography more than twice and were followed for at least 1 year. The scoliosis Cobb angle, coronal balance, apical vertebral translation, apical rotation, and pelvic obliquity were measured on anteroposterior (AP) radiographs; thoracic kyphosis and lumbar lordosis angles, and sagittal balance was measured on lateral radiographs; and migration percentage was measured on AP hip radiographs to determine hip instability. For each gross motor function classification system (GMFCS) level, the Cobb angles, apical vertebral translation, coronal and sagittal balance, and pelvic obliquity were adjusted by multiple factors with a linear mixed model. RESULTS: A total of 184 patients (774 radiographs) were included in this study. There was no significant annual change in scoliosis Cobb, thoracic kyphosis, and lumbar lordosis angles in the GMFCS level I-II and III groups. In the GMFCS level IV-V group, there was an annual increase of 3.4° in the scoliosis Cobb angle ($p = 0.020$). The thoracic kyphosis angle increased by 2.2° ($p = 0.018$) annually in the GMFCS level IV-V group. Apical vertebral translation increased by 5.4 mm ($p = 0.029$) annually in the GMFCS level IV-V group. Progression of

coronal and sagittal balance and pelvic obliquity with aging were not statistically significant. Sex, hip instability, hip surgery, and triradiate cartilage did not affect the progression of scoliosis and the balance of the spine and pelvis. CONCLUSIONS: The scoliosis Cobb angle, thoracic kyphosis angle, and apical vertebral translation in the GMFCS level IV-V CP patients progressed with age. These findings can predict radiographic progression of scoliosis in CP patients.

[PMID: 25572149](#) [PubMed - as supplied by publisher]

7. Childs Nerv Syst. 2015 Jan 14. [Epub ahead of print]

Long-term outcome after selective dorsal rhizotomy in children with spastic cerebral palsy.

Ailon T1, Beauchamp R, Miller S, Mortenson P, Kerr JM, Hengel AR, Steinbok P.

PURPOSE: The purpose of this study is to evaluate long-term outcomes after selective dorsal rhizotomy (SDR) for children with spastic cerebral palsy. **METHODS:** This is a retrospective review of a prospective database of patients who underwent SDR at British Columbia Children's Hospital. Hip adductor spasticity, hip range of motion (ROM), quadriceps strength, and motor function were assessed pre-operatively, at 6 months to 5 years and more than 10 years postoperatively. Patients were stratified by Gross Motor Function Classification System (GMFCS) level into group 1 (GMFCS II and III) and group 2 (GMFCS IV and V). **RESULTS:** Forty-four patients, with mean age at SDR of 4.5 years (range 2.9-7.7), were followed for a mean 14.4 years. Spasticity (Modified Ashworth Scale) decreased 1.5 ($p<0.0001$) by early postoperative evaluation with further decrease at late evaluation of 0.8 ($p<0.0001$). Early improvement in hip ROM of 13.7 degrees ($p<0.0001$) was not sustained at late assessment. Motor function improved in both groups at early assessment but was only sustained in group 1. Group 1 increased 10.0 points ($p<0.0001$) at early evaluation with subsequent decrease of 3.5, resulting in an overall increase of 6.6 ($p=0.04$) from baseline. Group 2 patients had an initial increase of 8.3 [2.0, 14.6] ($p=0.01$) but then declined to 4.9 below baseline ($p=0.3$). **CONCLUSIONS:** SDR yields durable reduction in spasticity after 10 years. Early improvements in motor function are present, but at long-term follow-up, these improvements were attenuated in GMFCS II and III and were not sustained in GMFCS IV and V.

[PMID: 25586074](#) [PubMed - as supplied by publisher]

8. Res Dev Disabil. 2015 Jan 6;38C:256-261. doi: 10.1016/j.ridd.2014.12.017. [Epub ahead of print]

Effects of an eight-week whole body vibration on lower extremity muscle tone and function in children with cerebral palsy.

Cheng HK1, Yu YC2, Wong AM3, Tsai YS4, Ju YY5.

The aim of this study was to evaluate the effect of an eight-week whole body vibration (WBV) on lower extremity spasticity and ambulatory function in children with cerebral palsy with a complete crossover design. Sixteen participants aged 9.2 (2.1) years participated in this study. Half of the participants received a 10-min WBV, 3 times a week for 8 weeks. Then a 4-week washout period followed, after which they received a sham WBV 3 times a week for 8 weeks. The other half received the intervention in a reversed order. The participants were evaluated via variables measuring range-of-motion, muscle tone, and ambulatory function before, immediately after, 1 day after, and 3 days after each intervention. Repeated-measures analyses revealed significant beneficial effects on most variables except the passive range-of-motion measurement. Significant correlations were found between timed up-and-go and relaxation index, and between timed up-and-go and six-minute walk test. The results suggested that an 8-week WBV intervention normalized muscle tone, improved active joint range and enhanced ambulatory performance in children with cerebral palsy for at least 3 days. These indicated that regular WBV can serve as an alternative, safe, and efficient treatment for these children in both clinical and home settings.

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9. Dev Med Child Neurol. 2015 Jan 12. doi: 10.1111/dmcn.12677. [Epub ahead of print]**Associations between fitness and mobility capacity in school-aged children with cerebral palsy: a longitudinal analysis.**

Balemans AC1, Van Wely L, Becher JG, Dallmeijer AJ.

AIM: The aim of this study was to determine the longitudinal associations among fitness components and between fitness and mobility capacity in children with cerebral palsy (CP). **METHOD:** Forty-six children (26 males, 20 females; mean age 9y 7mo [SD 1y 8mo]) with a bilateral (n=24) or a unilateral spastic CP (n=22) participated in aerobic and anaerobic fitness measurements on a cycle ergometer and isometric muscle strength tests (Gross Motor Function Classification System [GMFCS] level I [n=26], level II [n=12], level III [n=8]). Mobility capacity was assessed with the gross motor function measure (GMFM) and a walking capacity test. Associations over longitudinal measurements (three or four measurements over 1y) were determined since longitudinal data allow a more accurate estimation. The associations were determined using a mixed model with fixed effects (mobility capacity as dependent variables and fitness components as independent variables) and a random intercept. **RESULTS:** In children with bilateral CP, changes in aerobic fitness were associated with changes in anaerobic fitness ($p < 0.001$), and changes in aerobic fitness showed an association with changes in muscle strength ($p < 0.05$). Anaerobic fitness was not associated with muscle strength. No associations between fitness components were found in unilateral CP. Anaerobic fitness and muscle strength were significant determinants for GMFM and walking capacity in bilateral but not in unilateral CP. **INTERPRETATION:** The longitudinal associations between aerobic and anaerobic fitness and mobility indicate that increasing either aerobic or anaerobic fitness is associated with improvements in mobility in children with bilateral CP. While increasing anaerobic fitness might be beneficial for mobility capacity in children with bilateral CP, this is less likely for children with unilateral CP.

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[PMID: 25582163](#) [PubMed - as supplied by publisher]**10. Cudas. 2014 Dec;26(6):447-56. doi: 10.1590/2317-1782/20140201435. Epub 2014 Dec 1.****Correlation between sleep and quality of life in cerebral palsy [Article in English, Portuguese]**

Zuculo GM1, Knap CC1, Pinato L2.

PURPOSE: To investigate and correlate the sleep pattern and quality of life in individuals with cerebral palsy (CP) compared to healthy controls. **METHODS:** Seventy-eight subjects (aged 4-18 years, both genders) comprised two groups: CP, composed of 43 individuals with CP, and control, composed of 35 individuals without neurodevelopmental disorders. General Sleep Habits Questionnaire, Sleep Disturbance Scale for Children, sleep diary, Child Health Questionnaire, and Children's Quality of Life Scale were used. **RESULTS:** This study identified that 60.5% individuals with CP had sleep disorders. The respiratory disorders (25.6%) and the sleep hyperhidrosis (34.9%) were the most common disturbances in the group with CP. Moreover, 23.2% individuals of the group with CP reported awaking in the middle of the night and 37.2% of them snore, both percentages were higher than those in the control group. The sleep diary showed that individuals in the group with CP spend more time to initiate sleep (around 21 minutes). The group with CP also showed deficits in all parameters analyzed by the Child Health Questionnaire, except in family activity and the sleep-wake pattern, and quality of life showed negative correlation in several respects. **CONCLUSION:** The altered pattern of sleep in individuals with CP directly affects their physical and emotional well-being.

[PMID: 25590906](#) [PubMed - in process] Free full text**11. Disabil Rehabil Assist Technol. 2015 Jan 14:1-6. [Epub ahead of print]****Everyday use of assistive technology devices in school settings.**

Øien I1, Fallang B, Østensjø S.

Purpose: To gain more knowledge about ATDs as social-cultural objects in school settings, particularly from the

children's perspective. Methods: Nine children with cerebral palsy, aged five to six years, were observed 3?days in kindergarten and twice in the first year at primary school. At the primary school, we interviewed the children. During the interviews, the children were shown photos taken during the observations. In addition, dialogues with parents, therapists and school staff were carried out. Results and discussions: ATDs seem to have the potential both to exacerbate disability and to enhance selfhood, embodied capacities and participation. Through use, ATDs become social objects with symbolic values that influence their use. Devices corporally embedded into the child's body schema appeared as facilitators for participation in culturally valued activities. In contrast, devices prescribed as medical interventions tended to be greeted with ambivalence by the children themselves, their parents and school staff. A device incorporated into one situation was not necessarily relevant for use in another. Conclusions: In recognizing the value of exploring children's experiences, professionals are left with the challenge of creating space for children to reflect on the worthiness of an ATD across place, time and functionality. Implications for Rehabilitation Used in everyday life, ATDs become social objects with potential both to exacerbate disability and to enhance selfhood, embodied capacities and participation. The child's everyday environment is a vulnerable setting for implementing rehabilitation interventions, such as ATDs. Creating space for children to reflect on the worthiness of an ATD, regarding place, time and functionality, may enhance their participation in everyday life.

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12. J Indian Soc Pedod Prev Dent. 2015 Jan-Mar;33(1):25-7. doi: 10.4103/0970-4388.148969.

Assessment of traumatic dental injuries in patients with cerebral palsy.

Dubey A1, Ghafoor PA, Rafeeq M.

BACKGROUND: Cerebral palsy is an umbrella term for a group of conditions characterized essentially by motor dysfunctions that may be associated with sensory or cognitive impairment. Such children tend to have a higher incidence of traumatic dental injuries than the general population. This increased incidence is often attributed to poor muscular co-ordination that predisposes individuals with Cerebral palsy to trauma **Aim:** The study was conducted to assess different dental injuries and the risk factors for dental trauma to occur in patients with cerebral palsy. **MATERIALS AND METHODS:** The study comprised 70 children and adolescents with cerebral palsy attending special school in Durg and Bhillai city between 7 and 18 years of age. **RESULTS:** Dentinal fracture was seen in 40% of cases. Few cases had tooth displacement, discoloration, and pulpal involvement. **CONCLUSION:** Dentists should be well aware of the possible dental injuries in such patients. Preventive measure measures should be taken by health care provider to reduce traumatic exposure.

[PMID: 25572369](#) [PubMed - in process] Free full text

13. J Contemp Dent Pract. 2014 Jul 1;15(4):491-5.

Orthodontic Management of a Patient with Cerebral Palsy: Six Years Follow-up.

Sabuncuoglu FA1, Özcan E2.

AIM: Cerebral palsy (CP) is a disorder that affects muscle tone, movement and motor skills. CP can also lead to other health issues, including vision, hearing and speech problems, as well as learning disabilities and dental problems. A case report describing the successful orthodontic treatment of a 10-year-old boy with the dyskinesia type of CP and severe malocclusion is presented. **MATERIALS AND METHODS:** A 10-year and 2-month old boy was presented by his parents for orthodontic treatment, complaining of his unsatisfactory occlusion and poor chewing efficacy. An extraoral examination showed a convex profile. An intraoral examination showed the patient to be in mixed dentition with a class II molar relationship, 10 mm overjet and 4 mm overbite. In addition, his maxillary and mandibular arches were severely crowded. Cephalometric analysis indicated a severe skeletal class II discrepancy, which was confirmed by an ANB of 12°. The first phase of treatment involved the use of twin blocks with a headgear tube to attempt some growth modification and reduce the overjet. Once it was clear that the appliance was being well tolerated and the oral hygiene was satisfactory, the fixed appliance was used. **RESULTS:** Because of the good participation of the patient and his parents, orthodontic treatment was successful in the patient, achieving a normal overjet in combination with successful orofacial therapy. **CONCLUSION:** As demonstrated in our case report, the success of the treatment was dependent on the cooperation of the patient and his parents. Furthermore, this case illustrates the importance of the treatment by a dental team in patients with CP.

[PMID: 25576118](#) [PubMed - in process]

14. *Pediatr Gastroenterol Hepatol Nutr.* 2014 Dec;17(4):214-22. doi: 10.5223/pghn.2014.17.4.214. Epub 2014 Dec 31.

Short-Term Complications of Percutaneous Endoscopic Gastrostomy according to the Type of Technique.

Gang MH1, Kim JY1.

PURPOSE: The method of percutaneous endoscopic gastrostomy (PEG) tube placement can be divided into the pull and introducer techniques. We compared short-term complications and prognosis between patients who underwent the pull technique and two other types of introducer techniques, the trocar introducer technique and T-fastener gastropexy technique. **METHODS:** Twenty-six patients who underwent PEG were enrolled in this study. We retrospectively investigated the age, sex, body weight, weight-for-age Z-score, underlying diseases, PEG indications, complications, duration of NPO (nil per os), pain control frequency, and duration of antibiotic therapy. The patients were classified into three groups according to the PEG technique. The occurrence of complications was monitored for 10 weeks after the procedure. **RESULTS:** The age, sex, body weight, and weight-for-age Z-score were not significantly between the three groups. Most patients had cerebral palsy and seizure disorders. Dysphagia was the most common indication for PEG. Major complications occurred in 5 (50%), 4 (66.7%), and 0 (0%) patients in group I, II, and III, respectively ($p=0.005$). Further, peristomal infection requiring systemic antibiotic therapy occurred in 2 (20%), 3 (50%), and 0 (0%) patients in group I, II, and III, respectively ($p=0.04$). There was no significant difference between the groups with respect to minor complications, duration of NPO, pain control frequency, and duration of antibiotic therapy. **CONCLUSION:** The results indicate that the T-fastener gastropexy technique was associated with the lowest rate of major complications.

[PMID: 25587521](#) [PubMed] [PMCID: PMC4291446](#) Free PMC Article

15. *J Surg Case Rep.* 2015 Jan 14;2015(1). pii: rju148. doi: 10.1093/jscr/rju148.

A simple case of gallstone ileus?

Farrell I1, Turner P2.

A 68-year-old gentleman presented with abdominal distension and faeculent vomiting. He had a background of cerebral palsy with learning difficulties making history taking problematic. A CT scan suggested small bowel obstruction secondary to gallstone ileus. The most likely differential diagnosis was an inguinal hernia which was noted adjacent to the transition point. Laparotomy revealed grossly dilated small bowel with a 3-cm intraluminal gallstone. The gallstone was freely mobile within the lumen on the ileum and thus could not be causing obstruction. A caecal mass was also found, which was determined to be the cause of the obstruction. Limited ileocaecectomy was performed, which revealed a Duke's A adenocarcinoma. Gallstone ileus and caecal tumour can commonly be confused prior to surgery. There are however no previous reports of concurrent gallstone ileus and caecal tumour. Communication issues with the patient are likely to have contributed to the difficulty in diagnosis.

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16. *Int J Lang Commun Disord.* 2015 Jan 14. doi: 10.1111/1460-6984.12128. [Epub ahead of print]

Interactions of pre-symbolic children with developmental disabilities with their mothers and siblings.

Singh SJ1, Iacono T, Gray KM.

BACKGROUND: Depending on the severity of their disabilities, children with Down syndrome (DS) and with cerebral palsy (CP) may remain pre-symbolic for prolonged periods of time. When interacting with pre-symbolic children, communication partners have a role in identifying which of their behaviours are communicative, to be able

to respond to those behaviours and maintain reciprocal interaction. To date, most research on these children's communication development has been conducted within the context of mother-child interaction. Seldom have they been observed interacting with other family members, and in interactions other than dyadic, despite these interactions also occurring daily. AIMS: To explore and compare the interaction of mothers and siblings with pre-symbolic children with DS and with CP in dyadic and triadic contexts. METHODS & PROCEDURES: Twelve pre-symbolic children with DS (aged 1;10-5;04 years) and 12 with CP (aged 1;09-5;07 years), and their mothers and siblings participated in this study. They were recruited from early intervention centres from the West Coast of Peninsular Malaysia. Children were observed as they engaged in three play interactions: mother-child, sibling-child and mother-sibling-child (triadic). OUTCOMES & RESULTS: Children produced the most pre-symbolic communicative behaviours during mother-child, followed by triadic and lastly sibling-child interaction, suggesting that the mother's presence encouraged children to communicate. Mothers created a more facilitative communication environment for the children than did siblings, by directing high rates of initiations towards them and by taking turns that paved the way for the child's next turn. Although siblings' low rates of interaction did not provide children with as many opportunities to produce communicative behaviours, it encouraged them to produce high proportions of initiations. During triadic interaction, mothers and siblings had to direct interaction towards two communication partners, causing them to direct less interaction towards the children with DS or CP. There was no significant difference in mother and sibling responsiveness to children's communicative behaviours across interactions and disability types, suggesting that mothers and siblings might have adapted to the children's various early communicative behaviours. CONCLUSIONS & IMPLICATIONS: From this study, it was evident that mothers and siblings of pre-symbolic children with DS and with CP engaged them in reciprocal interaction. Findings on how mothers and siblings influence pre-symbolic children's communication suggest the need to involve them in assessment and intervention for these children.

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17. Disabil Rehabil. 2015 Jan 14:1-10. [Epub ahead of print]

Activities and participation of children with cerebral palsy: parent perspectives.

Mei C1, Reilly S, Reddihough D, Mensah F, Green J, Pennington L, Morgan AT.

Purpose: To explore parents' views of the activities and participation of children with cerebral palsy (CP) with a range of communicative abilities and the factors (personal and environmental) that influenced these. Methods: Thirteen parents of children with CP aged 4-9 years participated in semi-structured individual interviews. Interviews were recorded, transcribed and analysed thematically. Identified codes and themes were mapped to the domains of the International Classification of Functioning, Disability and Health - Children and Youth Version (ICF-CY). Results: Parents' responses reflected all ICF-CY domains comprising activity, participation and environmental factors. Codes were primarily mapped to the domains learning and applying knowledge, communication, mobility and interpersonal interactions and relationships. Key barriers identified included aspects of parents' own interactions with their child (e.g. not offering choices), unfamiliar people and settings, negative attitudes of others and children's frustration. Facilitators included support received from the child's family and school, being amongst children, having a familiar routine and the child's positive disposition. Conclusions: Despite the barriers experienced, children participated in a range of activities. Parents placed importance on communication and its influence on children's independence, behaviour and relationships. Barriers and facilitators identified highlight aspects of the environment that could be modified through intervention to enhance communication and participation. Implications for Rehabilitation Children's activities and participation were largely related to early learning tasks (e.g. literacy), communication, mobility and interactions. Intervention aimed at improving activities and participation may address the various child, impairment, social and environment factors identified here as impacting on activities and participation (e.g. the child's personal characteristics, communication and physical impairments, the support and attitudes of others and the familiarity of the environment). Therapists will need to consider (and manage) the potential negative impact communication deficits may have on children's behaviour, independence and social skills which may in turn detrimentally impact on activity and participation.

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18. J Child Health Care. 2015 Jan 15. pii: 1367493514564632. [Epub ahead of print]

Transition from paediatric to adult health services in Scotland for young people with cerebral palsy.

Wright AE1, Robb J1, Shearer MC2.

Transition from paediatric to adult health-care services has been characterized as being poorly planned and coordinated, resulting in a reduction in services and may be distressing for families. This study aimed to establish what provisions are currently available in Scotland for transition of young people with cerebral palsy and what some clinicians believe future provisions should involve. Semi-structured interviews were conducted with 13 community paediatricians (or equivalents in health boards without community paediatricians) from 12 different Scottish health boards. Interviews were audio recorded, transcribed and analysed thematically using framework analysis. Both current transition provision and the areas that the clinicians felt needed improvement varied greatly between health boards. Key areas in need of improvement were coordination and communication within health services and also between health services and educational, social services and adult health services to which young people were transitioning. Transition remains problematic and variable. For transition to be improved, further research is needed to explore the effect this variation is having on young people and their families.

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19. J Clin Diagn Res. 2014 Nov;8(11):WD01-2. doi: 10.7860/JCDR/2014/9336.5110. Epub 2014 Nov 20.

Intellectual disability and multiple co morbid psychiatric disorders in a child: a case report.

Gautam P1, Bhatia MS2, Rathi A1.

Comorbid psychiatric Disorders are seen commonly in people with intellectual disability and in fact they are at greater risk for developing other health disorders. Most prevalent chronic health conditions in children with intellectual disability are epilepsy, cerebral palsy, anxiety disorders, sleep disorders and autism spectrum disorders. Co morbidities multiply the problem of people with intellectual impairment to a great extent and hence an accurate psychological assessment of multiple diagnoses is useful in detecting the specific underlying processes differentiating the co morbid syndrome and in planning an appropriate management and rehabilitation program. This case report is presented to emphasize the fact that though. It is common for intellectually disabled children to have other co-morbid psychiatric disorders, it is important to have accurate, suitable assessment and recording of every co-morbid disorder as it has its own implication in course and outcome of the disability in the child. A comprehensive management approach involving people from various spheres would be required to improve the quality of life and for reduction of burden of care giver. We describe a child of intellectual disability with multiple co morbidities.

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Prevention and Cure

20. Brain Dev. 2015 Jan 5. pii: S0387-7604(14)00294-0. doi: 10.1016/j.braindev.2014.12.009. [Epub ahead of print]

Cerebellar injury in preterm children with cerebral palsy after intraventricular hemorrhage: Prevalence and relationship to functional outcomes.

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OBJECTIVES: To elucidate the prevalence of cerebellar injury and its relationship to functional outcomes in preterm children with cerebral palsy (CP) after intraventricular hemorrhage (IVH). **PARTICIPANTS:** We selected 69

children (40 males and 29 females, aged between 6 and 13 years) out of 2049 with cerebral palsy who visited Morinomiya Hospital, the regional center hospital for CP in West Japan. The inclusion criteria were (1) gestational age under 36 weeks at birth, (2) clear history of postnatal intraventricular hemorrhage, and (3) age at investigation over 6 years old. Those without sufficient imaging study or functional evaluation were excluded. METHODS: The participants were divided into four groups according to the presence of post-hemorrhagic hydrocephalus (PH) and cerebellar injury (CI): PH+/CI+, PH+/CI-, PH-/CI+, and PH-/CI-. Type of CP, ability to walk, verbal function, the incidence of severe visual impairment, and the complication of epilepsy were investigated and compared among the groups. RESULTS: The gestational ages of the participants were between 22 and 34 weeks, and their birth weight was between 412 and 1788g. PH and CI were found in 39 (57%) and 40 (58%) children, respectively. Both the PH+/CI+ group (n=31) and the PH-/CI+ group (n=9) showed significantly lower walking and verbal abilities and a higher incidence of epilepsy than the PH-/CI- group (n=21), while the PH+/CI- group showed no significant difference from the PH-/CI- group. Severe visual impairment was found only in the PH+/CI+ group and the PH-/CI+ group. CONCLUSIONS: The prevalence of CI in preterm children with CP after IVH (58%) was almost the same as that of PH. CI is one of the most significant complications in preterm infants, affecting motor and verbal functions and being associated with epilepsy more than PH.

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21. Cytotherapy. 2015 Feb;17(2):232-41. doi: 10.1016/j.jcyt.2014.10.011. Epub 2014 Nov 1.

Intrathecal injection of CD133-positive enriched bone marrow progenitor cells in children with cerebral palsy: feasibility and safety.

Zali A1, Arab L2, Ashrafi F1, Mardpour S2, Niknejhadi M3, Hedayati-Asl AA4, Halimi-Asl A5, Ommi D1, Hosseini SE2, Baharvand H2, Aghdami N6.

BACKGROUND AIMS: Recent studies have proposed that cellular transplantation may have some regenerative and functional efficacy in the treatment of cerebral palsy (CP); however, much remains to be understood regarding its safety, feasibility and efficacy. This study was initiated to evaluate the safety of autologous bone marrow-derived CD133(+) cell intrathecal injection. METHODS: Children (n = 12), aged 4 to 12 years, who were diagnosed with different types of CP underwent BM aspiration. CD133(+) cells were enriched from the BM samples and intrathecally injected. The Gross Motor Function Measure (GMFM-66), Gross Motor Function Classification System (GMFCS), UK FIM+FAM, Functional Independence Measure (FIM) and Functional Assessment Measure (FAM) were assessed at baseline and 6 months after the procedure. Patients' ability to balance was measured by the Berg Balance Scale (BBS), and severity of spasticity was evaluated by the Modified Ashworth Scale. Magnetic resonance imaging was done at baseline and 6 months after therapy. This study was registered in ClinicalTrials.gov (NCT01404663). RESULTS: There were no adverse events detected by clinical and laboratory tests or imaging studies, with the exception of a seizure in 1 patient. A significant improvement was observed 6 months after cell transplantation versus baseline according to GMFM, GMFCS, FIM+FAM, Ashworth Scale, and BBS outcomes. CONCLUSIONS: Subarachnoid injection of CD133-positive enriched bone marrow progenitor cells in children with CP is a safe approach. The results suggest a possible short-term improvement in neurological function.

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22. Cytotherapy. 2015 Feb;17(2):224-31. doi: 10.1016/j.jcyt.2014.09.010.

Effect of umbilical cord mesenchymal stromal cells on motor functions of identical twins with cerebral palsy: pilot study on the correlation of efficacy and hereditary factors.

Wang X1, Hu H1, Hua R1, Yang J1, Zheng P1, Niu X1, Cheng H1, Dai G1, Liu X1, Zhang Z1, An Y2.

BACKGROUND AIMS: The objective of this study was to compare the impact of umbilical cord-derived mesenchymal stromal cell (UCMSC) transplantation on the motor functions of identical twins with cerebral palsy (CP) and to analyze the correlation between the efficacy and hereditary factors. METHODS: Eight pairs (16

individuals) of identical twins with CP were recruited and received allogenic UCMSC transplantation by means of subarachnoid injection. The gross motor function measure (GMFM) and the fine motor function measure (FMFM) were performed before and 1 and 6 months after the treatment to analyze the results of individuals before and after the therapy, between two individuals of an identical twin and among twin pairs. Repeated-measured data variance was used to analyze the GMFM and FMFM scores of patients before and 1 and 6 months after the therapy.

RESULTS: Eight pairs (16 individuals) of children with CP had significant improvement in the GMFM at the end of the 1st and 6th months after the therapy compared with that before the therapy, whereas the amelioration of the FMFM was not statistically significant. The improvements in motor functions between two individuals of an identical twin but not among twin pairs were correlated. **CONCLUSIONS:** UCMSC transplantation significantly improves GMFM in children with CP; motor function improvements in the GMFM between two individuals of an identical twin were closely correlated, but improvements among twin pairs were not correlated. We hypothesize that hereditary factors contribute to the mechanisms of UCMSC transplantation in motor function improvement in children with CP.

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23. Facts Views Vis Obgyn. 2014;6(4):177-83.

Identification of peripartum near-miss for perinatal audit.

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INTRODUCTION: Today, perinatal audit focuses basically on cases of perinatal mortality. In most centres in Western Europe, perinatal mortality is low. Identification of metabolic acidosis at birth may increase index cases eligible for evaluation of perinatal care, and this might improve quality of perinatal audit. The aim of this study is to assess the incidence of metabolic acidosis at birth in order to estimate its impact on perinatal audit. **PATIENTS AND METHODS:** Cord blood was analysed for every neonate born between January 1, 2010 and December 31, 2012 in Ziekenhuis Oost-Limburg, Genk. Acidosis was defined as an umbilical arterial pH = 7.05 with or without a venous pH = 7.17. Respiratory acidosis (RA) was defined as acidosis with normal base excess, and metabolic acidosis (MA) was defined as acidosis with an arterial or venous base excess = -10 mmol/L. In case of failed cord blood sampling, 5 minute Apgar score = 6 was considered as the clinical equivalent of MA. Retrospective chart review of obstetric and paediatric files was performed for all cases of MA, together with review of paediatric follow-up charts from at least 6 months after birth. Perinatal asphyxia was defined as biochemical evidence for MA at birth, associated with early onset neonatal encephalopathy and long-term symptoms of cerebral palsy. **RESULTS:** In a total of 6614 babies, perinatal death up to 7 days of life occurred in 40 babies (6.0‰). Acidosis was present in 183 neonates (2.8%), of which 130 (2.0%) had RA and 53 (0.8%) had MA. Of the 173 neonates with unknown pH values, 6 had Apgar scores = 6. Of 59 babies born with MA or its clinical equivalent, 52 (88.1%) showed no neurologic symptoms at birth. Two (3.4%) died in the early neonatal period, one after abruptio placentae and one due to chorioamnionitis and severe prematurity. Five (8.5%) MA babies had symptoms of early onset neonatal encephalopathy, which recovered in three (5.1%), and persisted long-term in two others (3.4%). The two babies with cerebral palsy (prevalence 1/3300) were both born after instrumental vaginal delivery for foetal distress. **CONCLUSION:** In our study cohort, the incidence of perinatal mortality is 6‰. The incidence of metabolic acidosis is 9‰. Addition of cases of metabolic acidosis to those of mortality doubles index cases eligible for perinatal audit. The incidence of babies surviving with cerebral palsy after metabolic acidosis at birth is very low (0.3‰). Our results suggest that instrumental delivery for foetal distress might be a risk factor for metabolic acidosis with persisting neurologic dysfunction. Our study illustrates that identification of peripartum near-miss is useful for perinatal audit.

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24. Lung. 2015 Jan 13. [Epub ahead of print]

Prognosis of Very Preterm Infants with Severe Respiratory Distress Syndrome Receiving Mechanical Ventilation.

Sun H1, Zhou Y, Xiong H, Kang W, Xu B, Liu D, Zhang X, Li H, Zhou C, Zhang Y, Zhou M, Meng Q.

OBJECTIVE: To evaluate the prognosis of very preterm infants with severe respiratory distress syndrome (RDS) receiving mechanical ventilation. **METHODS:** A total of 288 preterm infants mechanically ventilated for severe RDS and completed follow-up till 18 months of corrected age comprised these study subjects. The associations of prenatal and postnatal factors, mode and duration of conventional mechanical ventilation (CMV), medication and treatment, and complications with cerebral palsy or mental developmental index (MDI) < 70 at 18 months of age were analyzed. **RESULTS:** The incidences of CP among study subjects were 17, 5, and 2 % in infants less than 28, 28-30, and 30-32 weeks, respectively. The incidences of MDI < 70 were 49, 24, and 13 % in infants less than 28 weeks, 28-30 weeks, and 30-32 weeks, respectively. Antenatal corticosteroids, preeclampsia, fetal distress, early and late bacteremia, and decreased weight gain were associated with CP and an MDI < 70. In the CP and MDI < 70 groups, the number of infants on CMV was significantly higher than on high-frequency oscillatory ventilation (HFOV). Longer duration of mechanical ventilation and blood transfusions were associated with an increased risk of having an MDI < 70 or CP. The complications in study subjects associated with an MDI < 70 or CP were BPD, NEC, and IVH grade III-IV. **CONCLUSION:** The prognosis of very preterm infants with severe RDS may be influenced by several prenatal and postnatal factors. HFOV although decreased the duration of mechanical ventilation, whether it will decrease the incidence of neurodevelopmental disability, needs to be explored further.

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25. Pract Midwife. 2014 Nov;17(10):16-7.

The impact of litigation on midwives.

Fraser J.

Litigation is rising in maternity care and there is no evidence that it will slow down. Advertisements with a 'no win no fee' message encourage people to seek out lawyers. It is true that we are becoming an increasingly litigious society and claims in maternity care often lead to very high pay-outs. This can be millions of pounds for child with cerebral palsy if liability is admitted. Legal processes are fascinating but it does not feel like this if you are personally caught up in them.

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26. Res Dev Disabil. 2015 Jan 8;38C:301-308. doi: 10.1016/j.ridd.2014.11.014. [Epub ahead of print]

Perinatal stroke causes abnormal trajectory and laterality in reaching during early infancy.

Chen CY1, Tafone S1, Lo W2, Heathcock JC3.

The developmental progression of reaching and early signs of upper extremity neglect is common concern for infants at risk for hemiparesis and cerebral palsy. We investigated the emergence of reaching and laterality in infants at risk for hemiplegic cerebral palsy. Eight infants with perinatal stroke (PS) and thirteen infants with typical development (TD) were assessed bimonthly from 2 to 7 months of age for 10 visits per infant. Reaching number and hand-toy contact duration were measured. Infants with PS demonstrated a linear trajectory of reaching behaviors with asymmetrical upper extremity performance. Infants with TD demonstrated a linear and quadratic trajectory of reaching behaviors and symmetrical upper extremity performance over the same age range. These results suggest that infants with PS have delay reaching and early signs of neglect not currently accounted for in clinical practice.

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