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This free weekly bulletin lists the latest research on cerebral palsy (CP), as indexed in the NCBI, PubMed (Medline) and Entrez (GenBank) databases.

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## Interventions

### 1. *Dev Neurorehabil.* 2010 Oct;13(1):46-52.

#### **Distribution of contractures and spinal malalignments in adolescents with cerebral palsy: observations and influences of function, gender and age.**

Wright M, Bartlett DJ.

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**OBJECTIVE:** To describe distributions of contracture and spinal malalignment in adolescents with cerebral palsy (CP) and determine associations with age, gender and function. **METHODS:** Data were collected using the Spinal Alignment and Range of Motion Measure (SAROMM), the Gross Motor Function Classification System (GMFCS) and the Activity Scale for Kids (ASK). **RESULTS:** Two hundred and twenty-five adolescents (122 males; mean age 14 years 8 months; SD 1 year 8 months) participated. SAROMM scores by GMFCS levels and item scores in various body regions are presented. Correlations between indices of function and SAROMM total score were  $>0.70$  ( $p < 0.001$ ). Males in GMFCS levels I/V obtained higher total SAROMM scores than females. Age was significantly associated with SAROMM scores for GMFCS levels IV/V participants. **CONCLUSIONS:** These data provide benchmarks for evaluating impairments in adolescents with CP and support the role of function in contracture development and possibly prevention. Gender and age were factors that modified outcomes.

PMID: 20067345 [PubMed - in process]

### 2. *Child Care Health Dev.* 2010 Jan 13. [Epub ahead of print]

#### **Health status of caregivers of children with cerebral palsy.**

Byrne MB, Hurley DA, Daly L, Cunningham CG.

Central Remedial Clinic, Dublin, Ireland.

**Background and Aims:** While a 'Family-Centered' approach to care is accepted as best practice in the context of childhood disability, it may lead to increased demands on family members by requiring them to be active participants in their child's care. This may impact upon the physical and mental health of the caregiver and therefore needs to be investigated. This study aimed to assess the health status of caregivers of children with cerebral palsy (CP) in Ireland and to identify vulnerable subgroups. **Methods:** A cross-sectional postal survey was conducted using a questionnaire incorporating the SF-36v2.0. The sample consisted of male and female caregivers of children with CP, representing all levels of ability. Two questionnaires were sent to each child's home; a total of 312 questionnaires were sent to the homes of 156 children. **Results:** Completed questionnaires were returned by 161 caregivers (100 women, 61 men) of 101 children, giving a response rate of 65%. Caregivers of children with CP were found to have poorer health than the Irish general population, for whom normative data exist. Female caregivers had poorer health than male caregivers in both the physical ( $P < 0.05$ ) and mental health ( $P < 0.001$ ) domains of the SF-36. Caregivers spending more time caring had significantly poorer mental health than those spending less

time caring ( $P < 0.05$ ). There was no difference in the health of caregivers of 'more independent' versus 'more dependent' children, apart from the latter group reporting higher levels of bodily pain ( $P < 0.05$ ). Conclusion: This study provides evidence of the inferior health status of caregivers of children with CP in Ireland, particularly that of women.

PMID: 20074250 [PubMed - as supplied by publisher]

### 3. Disabil Rehabil. 2010 Jan 13. [Epub ahead of print]

#### **The influence of selected personal and environmental factors on leisure activities in adults with cerebral palsy.**

Boucher N, Dumas F, B Maltais D, Richards CL.

Centre Interdisciplinaire de Recherche en Réadaptation et Intégration Sociale (CIRRS) et l'Institut de Réadaptation en Déficience Physique de Québec (IRDPQ), Québec, Canada.

**Purpose.** This study examined the influence of selected personal and environmental factors on leisure participation in adults with cerebral palsy (CP). **Methods.** A group of 145 adults with CP (18-41 years old, 51% male) responded to questionnaires regarding 1) socio-demographic and health factors, 2) life habits (Life-H: short version 3.1) and 3) the environment (Measure of the Quality of the Environment: version 2.0). A chi(2) statistic ( $p < 0.05$ ) estimated the association between 1) socio-demographic and health factors and the environment and 2) the level of leisure activity participation. **Results.** Most participants (mean age = 28 years) lived with their parents. Leisure activities were their principal occupation. Mobility and participation were positively associated. The environment (e.g. accompanying services, adapted transport, cultural services and computers) facilitated leisure for those with a high or moderate participation level. Individuals with low participation perceived the environment as having no influence. **Conclusions.** Adults with CP who are more mobile participate more in leisure activities. A positive perception of the environment (facilitating leisure participation) likely reflects the individual's ability to benefit from the environment, whereas a neutral view of the environment may reflect the fact that other factors, such as mobility limitations, are of greater relevance to leisure participation.

PMID: 20067427 [PubMed - as supplied by publisher]

### 4. BMC Neurol. 2010 Jan 12;10(1):4. [Epub ahead of print]

#### **INCITE: A randomised trial comparing constraint induced movement therapy and bimanual training in children with congenital hemiplegia.**

Boyd RN, Sakzewski L, Ziviani J, Abbott DF, Badawy R, Gilmore R, Provan K, Tournier JD, Macdonnell RA, Jackson GD.

**BACKGROUND:** Congenital hemiplegia is the most common form of cerebral palsy (CP) accounting for 1 in 1300 live births. These children have limitations in capacity to use the impaired upper limb and bimanual coordination deficits which impact on daily activities and participation in home, school and community life. There are currently two diverse intensive therapy approaches. Traditional therapy has adopted a bimanual approach (BIM training) and recently, constraint induced movement therapy (CIMT) has emerged as a promising unimanual approach. Uncertainty remains about the efficacy of these interventions and characteristics of best responders. This study aims to compare the efficacy of CIMT to BIM training to improve outcomes across the International Classification of Functioning, Disability and Health (ICF) for school children with congenital hemiplegia. **METHODS:** A matched pairs randomised comparison design will be used with children matched by age, gender, side of hemiplegia and level of upper limb function. Based on power calculations a sample size of 52 children (26 matched pairs) will be recruited. Children will be randomised within pairs to receive either CIMT or BIM training. Both interventions will use an intensive activity based day camp model, with groups receiving the same dosage of intervention delivered in the same environment (total 60 hours over 10 days). A novel circus theme will be used to enhance motivation. Groups will be compared at baseline, then at 3, 26 and 52 weeks following intervention. Severity of congenital hemiplegia will be classified according to brain structure (MRI and white matter fibre tracking), cortical excitability using Transcranial Magnetic Stimulation (TMS), functional use of the hand in everyday tasks (Manual Ability Classification System) and Gross Motor Function Classification System (GMFCS). Outcomes will address neurovascular changes

(functional MRI, functional connectivity), and brain (re)organisation (TMS), body structure and function (range of motion, spasticity, strength and sensation), activity limitations (upper limb unimanual capacity and bimanual motor coordination), participation restrictions (in home, school and recreation), environmental (barriers and facilitators to participation) and quality of life. **DISCUSSION:** This paper outlines the theoretical basis, study hypotheses and outcome measures for a matched pairs randomised trial comparing CIMT and BIM training to improve outcomes across the ICF. Trial Registration: ACTRN12609000912280.

PMID: 20064275 [PubMed - as supplied by publisher]

##### **5. Eur Spine J. 2010 Jan 12. [Epub ahead of print]**

###### **Cervical myelopathy in athetoid and dystonic cerebral palsy: retrospective study and literature review.**

Jameson R, Rech C, Garreau de Loubresse C.

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The early onset of degenerative cervical lesions has been well described in patients suffering from athetoid or dystonic cerebral palsy. Myelopathy can occur and aggravate of their unstable neurological status. Diagnosis and treatment are delayed and disrupted by the abnormal movements. This retrospective study was implemented to evaluate the symptoms, the anatomical findings, and the surgical management of seven patients from 20 to 56 years old suffering from cervical myelopathy and athetoid or dystonic cerebral palsy. The mean delay in diagnosis was 15 months and the mean follow-up was 33 months. The initial symptoms were spasticity, limbs weakness, paresthesias and vesico-sphincteric dysfunction. In addition to abnormal movements, imaging demonstrated disc herniation, spinal stenosis and instability. All patients were managed surgically by performing simultaneous spinal cord decompression and fusion. Two patients benefited from preoperative botulinum toxin injections, which facilitated postoperative care and immobilization. Strict postoperative immobilization was achieved for 3 months by a Philadelphia collar or a cervico-thoracic orthosis. All patients improved functionally with a mean Japanese Orthopaedic Association score gain of 1.5 points, in spite of the permanent disabilities of the myelopathy. Complications occurred with wound infection, metal failure and relapse of cervical myelopathy at an adjacent level in one case each. All the previous authors advised against isolated laminectomy but no consensus emerged from the literature analysis. Spinal fusion is usually recommended but can be complicated by degenerative adjacent deterioration. Surgical management provides good outcomes but requires a long-term follow-up.

PMID: 20066444 [PubMed - as supplied by publisher]

##### **6. IEEE Trans Inf Technol Biomed. 2010 Jan 12. [Epub ahead of print]**

###### **Feasibility of modified remotely-monitored in-home gaming technology for improving hand function in adolescents with cerebral palsy.**

Huber M, Rabin B, Docan C, Burdea G, Abdelbaky M, Golomb M.

The convergence of game technology, the Internet, and rehabilitation science forms the second-generation virtual rehabilitation framework. This paper presents the first pilot study designed to look at the feasibility of at-home use of gaming technology adapted to address hand impairments in adolescents with hemiplegia due to perinatal stroke or intra-ventricular hemorrhage. Three participants trained at home for approximately 30 minutes/day, several days a week, for 6 to 10 months. During therapy they wore a 5DT Ultra sensing glove and played custom developed Java 3D games on a modified PlayStation 3. The games were designed to accommodate the participants limited range of motion and to improve finger range and speed of motion. Trials took place in Indiana, while monitoring/data storage took place at Rutgers Tele-Rehabilitation Institute (New Jersey). Significant improvements in finger range of motion (as measured by the sensing glove) were associated with self- and family-reported improvements in Activities of Daily Living. In online subjective evaluations participants indicated they liked the system ease of use, clarity of instructions and appropriate length of exercising. Other tele-rehabilitation studies are compared to this study and its technology challenges. Directions for future research are included.

PMID: 20071262 [PubMed - as supplied by publisher]

**7. IEEE Trans Neural Syst Rehabil Eng. 2010 Jan 12. [Epub ahead of print]****Towards an Intelligent Wheelchair System for Users With Cerebral Palsy.**

Montesano L, Diaz M, Bhaskar S, Minguez J.

This paper describes and evaluates an intelligent wheelchair, adapted for users with cognitive disabilities and mobility impairment. The study focuses on patients with cerebral palsy, one of the most common disorders affecting muscle control and coordination, thereby impairing movement. The wheelchair concept is an assistive device that allows the user to select arbitrary local destinations through a tactile screen interface. The device incorporates an automatic navigation system that drives the vehicle, avoiding obstacles even in unknown and dynamic scenarios. It provides the user with a high degree of autonomy, independent from a particular environment, i.e., not restricted to predefined conditions. To evaluate the rehabilitation device, a study was carried out with four subjects with cognitive impairments, between 11 and 16 years of age. They were first trained so as to get acquainted with the tactile interface and then were recruited to drive the wheelchair. Based on the experience with the subjects, an extensive evaluation of the intelligent wheelchair was provided from two perspectives: (i) based on the technical performance of the entire system and its components and, (ii) based on the behavior of the user (execution analysis, activity analysis and competence analysis). The results indicated that the intelligent wheelchair effectively provided mobility and autonomy to the target population.

PMID: 20071276 [PubMed - as supplied by publisher]

**8. IEEE Trans Neural Syst Rehabil Eng. 2010 Jan 12. [Epub ahead of print]****Augmentative Communication Based on Realtime Vocal Cord Vibration Detection.**

Falk T, Chan J, Duez P, Teachman G, Chau T.

A binary switch based on the detection of periodic vocal cord vibrations is proposed for individuals with multiple and severe disabilities. The system offers three major advantages over existing speech-based access technologies, namely, insensitivity to environment noise, increased robustness against user-generated artifacts such as coughs, and reduced exertion during prolonged usage periods. The proposed system makes use of a dual-axis accelerometer placed non-invasively in proximity of the vocal cords by means of a neckband. Periodic vocal cord vibrations are detected using the normalized cross-correlation function computed from anterior-posterior and superior-inferior accelerometry signals. Experiments with a participant with hypotonic cerebral palsy show the proposed system outperforming a popular commercial sound-based system in terms of sensitivity, task time, and user-perceived exertion.

PMID: 20071275 [PubMed - as supplied by publisher]

**9. Am J Phys Med Rehabil. 2010 Jan 11. [Epub ahead of print]****Botulinum Toxin A Injection into Calf Muscles for Treatment of Spastic Equinus in Cerebral Palsy: A Controlled Trial Comparing Sonography and Electric Stimulation-Guided Injection Techniques: A Preliminary Report.**

Kwon JY, Hwang JH, Kim JS.

Affiliations: From the Department of Physical and Rehabilitation Medicine (J-YK, JHH), Samsung Medical Center, Sungkyunkwan University School of Medicine, Ilwon-dong, Kangnam-gu, Seoul, Republic of Korea; and Department of Rehabilitation Medicine (J-SK), St. Vincent's Hospital, College of Medicine, The Catholic University of Korea, Seoul, South Korea.

Kwon J-Y, Hwang JH, Kim J-S: Botulinum toxin A injection into calf muscles for treatment of spastic equinus in cerebral palsy: A controlled trial comparing sonography and electric stimulation-guided injection techniques: A preliminary report. **OBJECTIVE::** To compare the clinical outcomes of two different injection techniques, one guided by electric stimulation and the other by sonography, for botulinum toxin A injection into calf muscles for the treatment of spastic equinus in children with cerebral palsy. **DESIGN::** Thirty-two children with cerebral palsy with spastic

equinus gait were enrolled in separate categories according to their level under the Gross Motor Function Classification System and divided into two groups with alternate allocation: sonography-guided group and electric stimulation-guided group. Equal amounts of botulinum toxin A were injected into the gastrocnemius at four to six points in 30 children with cerebral palsy. The injection was guided by electric stimulation in 14 and by ultrasonography in 16 children. Modified Ashworth Scale, Modified Tardieu Scale, Selective Motor Control, and Physician's Rating Scale were measured at baseline, 1 mo, and 3 mos posttreatment. RESULTS:: Subscales of the Physician's Rating Scale (gait pattern and hindfoot position-maximum foot/floor contact during stance) significantly improved in the sonography-guided group. No statistical differences were noted in Modified Ashworth Scale, Modified Tardieu Scale, and Selective Motor Control. CONCLUSIONS:: Visual feedback by ultrasonography could improve the accuracy of selective neuromuscular blocking of the gastrocnemius.

PMID: 20068435 [PubMed - as supplied by publisher]

#### 10. J Sep Sci. 2010 Jan 8. [Epub ahead of print]

##### **A bio-analytical hydrophilic interaction LC-MS/MS method for the simultaneous quantification of omeprazole and lansoprazole in human plasma in support of a pharmacokinetic omeprazole study in children.**

De Smet J, Boussery K, De Cock P, De Paepe P, Remon JP, Van Winckel M, Van Bocxlaer J.

Laboratory of Medical Biochemistry and Clinical Analysis, Ghent University, Ghent, Belgium.

A hydrophilic interaction LC method with MS/MS was developed and validated for the simultaneous quantification of omeprazole and lansoprazole in human plasma. Chromatographic separation was achieved on a Betasil silica column using a high organic mobile phase (eluent A: ACN/formic acid 997.5:2.5 v/v; eluent B: water/formic acid 997.5:2.5 v/v) and gradient elution. The mass spectrometer was operated in the Multiple Reaction Monitoring mode. Prior to chromatography, liquid-liquid extraction with ethyl acetate was used and the organic layer was diluted with ACN, allowing direct injection on column. The method showed acceptable linearity, high precision (RSD%<10.5%), accuracy (88.9-109.3%) and selectivity in the two concentration ranges studied: 1.5-100 and 5-2000 ng/mL. The LOQ was established at 1.5 and 5 ng/mL for the two concentration ranges. Lack of variability in matrix effects was demonstrated and mean extraction recovery for omeprazole and lansoprazole was determined in the low (56.3-67.7%) and high (45.3-44.3%) concentration range, respectively. Additionally, plasma samples were found to be stable after three freeze-thaw cycles and for at least 15 h after extraction. This assay was successfully applied to a pharmacokinetic omeprazole study in children with cerebral palsy and mental retardation.

PMID: 20063355 [PubMed - as supplied by publisher]

#### 11. Dev Med Child Neurol. 2010 Jan 5. [Epub ahead of print]

##### **Assessing bimanual performance in young children with hemiplegic cerebral palsy: a systematic review.**

Greaves S, Imms C, Dodd K, Krumlinde-Sundholm L.

La Trobe University, Royal Children's Hospital, Melbourne, Australia.

Aim: This systematic review investigated the availability of assessment tools to evaluate bimanual skills in young children (<= 3y) with hemiplegic cerebral palsy. Evidence for validity, reliability, and clinical utility of the identified instruments was sought. Method: Ten electronic databases and grey literature were searched (earliest 1806) to February 2009 to identify articles that met criteria related to the child's age and diagnosis, and included a discrete bimanual assessment. Further searches for evidence of psychometric properties of each identified assessment were undertaken. For quality criteria, we evaluated the internal validity of each study and appraised the validity and reliability of identified assessments. Results: From 1435 papers retrieved, 15 were eligible for inclusion, and 11 assessments of bimanual performance were identified. Ten assessments had inadequate evidence for reliability and validity. Only the Assisting Hand Assessment had evidence for reliability and validity for its intended purposes. Interpretation: Reliability and validity are fundamental considerations when developing or selecting assessments. Additional considerations for assessing young children include the following: (1) standardized administration and scoring; (2) items that capture the complexity of bimanual behaviour; and (3) protocols and items targeted within a small age range to meet specific developmental needs. A validated assessment of younger infants is needed to support

early intervention during this period of rapid brain development.

PMID: 20059510 [PubMed - as supplied by publisher]

## 12. Dev Med Child Neurol. 2010 Jan 5. [Epub ahead of print]

### **Enabling self-directed computer use for individuals with cerebral palsy: a systematic review of assistive devices and technologies.**

Davies TC, Mudge S, Ameratunga S, Stott NS.

Department of Surgery, University of Auckland, Auckland, New Zealand.

**Aim:** The purpose of this study was to systematically review published evidence on the development, use, and effectiveness of devices and technologies that enable or enhance self-directed computer access by individuals with cerebral palsy (CP). **Methods:** Nine electronic databases were searched using keywords 'computer', 'software', 'spastic', 'athetoid', and 'cerebral palsy'; the reference lists of articles thus identified were also searched. Thirty articles were selected for review, with 23 reports of development and usability testing of devices and seven evaluations of algorithms to increase computer recognition of input and cursor movements. **Results:** Twenty-four studies had fewer than 10 participants with CP, with a wide age range of 5 to 77 years. Computer task performance was usually tested, but only three groups sought participant feedback on ease and comfort of use. International standards exist to evaluate effectiveness of non-keyboard devices, but only one group undertook this testing. None of the study designs were higher than American Academy for Cerebral Palsy and Developmental Medicine level IV. **Interpretation:** Access solutions for individuals with CP are in the early stages of development. Future work should include assessment of end-user comfort, effort, and performance as well as design features. Engaging users and therapists when designing and evaluating technologies to enhance computer access may increase acceptance and improve performance.

PMID: 20059508 [PubMed - as supplied by publisher]

## 13. Physiother Theory Pract. 2010 Jan;26(1):56-61.

### **Description of a multifaceted rehabilitation program including overground gait training for a child with cerebral palsy: A case report.**

Farrell E, Naber E, Geigle P.

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This case describes the outcomes of a multifaceted rehabilitation program including body weight-supported overground gait training (BWSOGT) in a nonambulatory child with cerebral palsy (CP) and the impact of this treatment on the child's functional mobility. The patient is a nonambulatory 10-year-old female with CP who during an inpatient rehabilitation stay participated in direct, physical therapy 6 days per week for 5 weeks. Physical therapy interventions included stretching of her bilateral lower extremities, transfer training, bed mobility training, balance training, kinesiotaping, supported standing in a prone stander, two trials of partial weight-supported treadmill training, and for 4 weeks, three to five times per week, engaged in 30 minutes of BWSOGT using the Up n' go gait trainer, Lite Gait Walkable, and Rifton Pacer gait trainer. Following the multifaceted rehabilitation program, the patient demonstrated increased step initiation, increased weight bearing through bilateral lower extremities, improved bed mobility, and increased participation in transfers. The child's Gross Motor Functional Measure (GMFM) scores increased across four dimensions and her Physical Abilities and Mobility Scale (PAMS) increased significantly. This case report illustrates that a multifaceted rehabilitation program including BWSOGT was an effective intervention strategy to improve functional mobility in this nonambulatory child with CP.

PMID: 20067354 [PubMed - in process]

**14. Physiother Theory Pract. 2010 Jan;26(1):22-39.****Occurrence of gross motor behaviors and attainment of motor objectives in children with cerebral palsy participating in conductive education.**

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This exploratory study investigated the frequency of occurrence of gross motor behaviors by nine children with cerebral palsy (CP) participating in an 11-month conductive education (CE) program and the attainment of their gross motor objectives. The intervention team determined gross motor objectives for each child. Activities to achieve those objectives were fully integrated into the child's daily routines. Interval by interval recording was used to observe eight stability, seven mobility, and six transfer behaviors during four school days for each child. The inter-rater reliability using a kappa statistic was 0.73-0.93 for the observed behaviors. An independent evaluator determined that the children achieved 83% of their gross motor objectives for the first term and 89% for the second term of the year. Of the objectives initially not achieved, three related to stair climbing, an activity not observed being practiced. Stability behaviors, mainly sitting, occurred at substantially higher rates than all mobility and transfer behaviors. All stability and transfer objectives that were practiced were achieved. The children spent the majority of their day in sitting. While the children achieved the majority of their motor objectives, the limited active mobility seen in this and other preschools warrants further investigation.

PMID: 20067351 [PubMed - in process]

**15. Arq Neuropsiquiatr. 2009 Dec;67(4):1057-61.****Classification of cerebral palsy: association between gender, age, motor type, topography and Gross Motor Function.'**

Pfeifer LI, Silva DB, Funayama CA, Santos JL.

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The goal of this study was to assess the relation between gender, age, motor type, topography and gross motor function, based on the Gross Motor Function System of children with cerebral palsy. Trunk control, postural changes and gait of one hundred children between 5 months and 12 years old, were evaluated. There were no significant differences between gender and age groups ( $p=0.887$ ) or between gender and motor type ( $p=0.731$ ). In relation to body topography most children (88%) were spastic quadriplegic. Most hemiplegic children were rated in motor level I, children with diplegia were rated in motor level III, and quadriplegic children were rated in motor level V. Functional classification is necessary to understand the differences in cerebral palsy and to have the best therapeutic planning since it is a complex disease which depends on several factors.

PMID: 20069219 [PubMed - in process]

**16. Dent Assist. 2009 Nov-Dec;78(6):7-8, 10-1, 34 passim.****Treating the special needs patient with a developmental disability: cerebral palsy, autism and Down syndrome.**

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PMID: 20070003 [PubMed - in process]

**17. Srp Arh Celok Lek. 2009 Nov-Dec;137(11-12):697-701.****Paralytic dislocations of the hip in adolescence--orthopaedic treatment [Article in Serbian]**

[No authors listed]

Paralytic dislocation of the hip in adolescence is not typical, but presents a serious problem whether diagnosed primarily in adolescence or due to the lack of treatment or failed treatment in earlier age. It is characteristic of cerebral palsy and myelomeningocele. If the paralytic dislocation of the hip in adolescence is asymmetric, then pelvic obliquity, leg-length discrepancy, imbalance in sitting position, scoliosis and secondary spondylosis with all its consequences ensue. Complications like hip pains due to secondary arthrosis and walking ability impairment are frequent in ambulatory patients. The dislocation is the result of muscle imbalances in the hip region. The diagnosis is based on illness history, clinical examination, neurological examination and radiography. Treatment is mostly operative, except in cases of pelvic symmetry and absence of difficulties. Pelvic and/or femoral osteotomy with or without open reduction of the hip is done in ambulatory patients with cerebral palsy. Soft-tissue surgery, hip flexors release and tenotomy of the hip adductors, are done in non-ambulatory patients with cerebral palsy. In patients with myelomeningocele soft-tissue surgery, hip flexors release and tractus iliotibialis resection on the lower side of the pelvis, are done regardless of the ability to walk. The same bone surgery procedures as in cerebral palsy are done only in ambulatory patients with unilateral dislocations if soft-tissue surgery failed.

PMID: 20069932 [PubMed - in process]

**18. Assist Technol. 2009 Winter;21(4):208-17.****Effects of assistive technology on functional decline in people aging with a disability.**

Wilson DJ, Mitchell JM, Kemp BJ, Adkins RH, Mann W.

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This study used a randomized control group design to investigate the impact of an assistive technology and home modification intervention on function for individuals who are aging with a disability. There were 91 participants with polio, rheumatoid arthritis, cerebral palsy, spinal cord injury, stroke, and other impairments. Outcome data were collected at 12 and 24 months through in-home interviews using the Older Americans Resources and Services Instrument (OARS) and the Functional Independence Measure (FIM), and through monthly telephone contact on the hours of in-home care, hospitalizations, and acquisition of AT. The treatment group received an in-home evaluation of their equipment and home modification needs. All recommended AT and home modifications were provided and paid for in full or in part by the study. The control group received the standard community-available health care. A significant "group by time" interaction for the FIM suggested a slower decline in function for the treatment group over 2 years. Further analyses found that the treatment group was more likely to use equipment to maintain independence vs. personal assistance. This study supports the value of assistive technology for adults aging with a disability and suggests that it be provided earlier in the aging process.

PMID: 20066887 [PubMed - in process]

**19. Orthopade. 2010 Jan 14. [Epub ahead of print]****Measures to improve gait in patients with cerebral palsy. [Article in German]**

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Gait disorders in patients with cerebral palsy result in excessive energy consumption due to spasticity and faulty biomechanics. Instrumented gait analysis shows these problems best and provides the optimal base for the orthopaedic treatment. Modern therapy options consist of muscle lengthenings, muscle shortenings, corrections of torsions and stabilisations of joints. Especially at the foot level, conservative and operative means can be used depending on the individual situation. The aim is to rebalance muscle strength and length and to restore the lever



arms. As many procedures as possible are combined in multilevel corrections in order to keep the total rehabilitation for the patient as short as possible.

PMID: 20069272 [PubMed - as supplied by publisher]

## 20. Orthopade. 2010 Jan 14. [Epub ahead of print]

### **Neuro-orthopaedic approach to the upper extremity : State-of-the-art surgical procedures. [Article in German]**

Manolikakis G, Schörle CM.

Abteilung für infantile Zerebralparese, Orthopädisch-Unfallchirurgische Klinik Wichernhaus im Krankenhaus Rummelsberg, Rummelsberg 71, 90592, Schwarzenbruck, Deutschland, Manolikakis.Georg@rummelsberger.net.

The operative treatment of the upper extremity of cerebral palsy patients has despite the different conservative possibilities a firm place in the interdisciplinary treatment concept. It remains in comparison to the lower extremity selective, and the spectrum of indications is narrower. The analysis of the individual functional and/or cosmetic impairment requires a differentiated treatment concept. In the operative repertoire there are predominantly soft tissue operations in the foreground, mostly in the form of multilevel interventions. Based on a detailed preoperative evaluation, differentiated surgical techniques, and many years of surgical experience very good cosmetic (97.6%) and good functional (68.4%) results can be achieved.

PMID: 20069271 [PubMed - as supplied by publisher]

## Epidemiology / Aetiology / Diagnosis & Early Treatment

### 21. Stroke. 2010 Jan 14. [Epub ahead of print]

#### **Human Neural Stem Cell Grafts Modify Microglial Response and Enhance Axonal Sprouting in Neonatal Hypoxic-Ischemic Brain Injury.**

Daadi MM, Davis AS, Arac A, Li Z, Maag AL, Bhatnagar R, Jiang K, Sun G, Wu JC, Steinberg GK.

From the Department of Neurosurgery and Stanford Stroke Center, Stanford University School of Medicine, Stanford, Calif; and Department of Radiology and Molecular Imaging Program, Stanford University School of Medicine, Stanford, Calif.

**BACKGROUND AND PURPOSE:** Hypoxic-ischemic (HI) brain injury in newborn infants represents a major cause of cerebral palsy, development delay, and epilepsy. Stem cell-based therapy has the potential to rescue and replace the ischemic tissue caused by HI and to restore function. However, the mechanisms by which stem cell transplants induce functional recovery are yet to be elucidated. In the present study, we sought to investigate the efficacy of human neural stem cells derived from human embryonic stem cells in a rat model of neonatal HI and the mechanisms enhancing brain repair. **METHODS:** The human neural stem cells were genetically engineered for in vivo molecular imaging and for postmortem histological tracking. Twenty-four hours after the induction of HI, animals were grafted with human neural stem cells into the forebrain. Motor behavioral tests were performed the fourth week after transplantation. We used immunocytochemistry and neuroanatomical tracing to analyze neural differentiation, axonal sprouting, and microglia response. Treatment-induced changes in gene expression were investigated by microarray and quantitative polymerase chain reaction. **RESULTS:** Bioluminescence imaging permitted real time longitudinal tracking of grafted human neural stem cells. HI transplanted animals significantly improved in their use of the contralateral impeded forelimb and in the Rotorod test. The grafts showed good survival, dispersion, and differentiation. We observed an increase of uniformly distributed microglia cells in the grafted side. Anterograde neuroanatomical tracing demonstrated significant contralesional sprouting. Microarray analysis revealed upregulation of genes involved in neurogenesis, gliogenesis, and neurotrophic support. **CONCLUSIONS:** These results suggest that human neural stem cell transplants enhance endogenous brain repair through multiple modalities in response to HI.

PMID: 20075340 [PubMed - as supplied by publisher]

## **22. Acta Paediatr. 2010 Jan 8. [Epub ahead of print]**

### **Complications affecting preterm neonates from 1991 to 2006: what have we gained?**

Groenendaal F, Termote J, van der Heide-Jalving M, van Haastert I, de Vries L.

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**Aim:** In this study, we determined whether outcome of preterm neonates has improved over a period of 16 years. **Study design:** Inborn neonates with a gestational age of 25.0-29.9 weeks were included. Patients with severe congenital malformations were excluded. Mortality and morbidity (chronic lung disease; CLD, intraventricular haemorrhage: IVH grade III or IV, cystic periventricular leukomalacia: cPVL, perforated necrotizing enterocolitis: NEC, severe retinopathy of prematurity needing surgery: ROP and cerebral palsy: CP) were compared in three periods (period 1: 1991-1996 n = 434; period 2: 1997-2001 n = 356; period 3: 2002-2006 n = 422). **Results:** Infant mortality decreased from 15.2% to 10.9%. CLD did not differ significantly between periods (14.1-14.8%). Perforated NEC decreased from 2.8% to 1.6%. IVH grade III and IV both remained at 5.7% in period 3, whereas cPVL decreased significantly from 4.5% to 1.6%. Cerebral palsy decreased from 5.8% to 3.5% in period 3. Two neonates in each period were in need of surgery for ROP. **Conclusion:** Inborn preterm patients showed an improved survival and a significant reduction in cPVL and CP. Perforated NEC showed a trend to decrease. CLD and IVH grade III and IV remain a matter of concern.

PMID: 20064132 [PubMed - as supplied by publisher]

## **23. Dev Med Child Neurol. 2010 Jan 5. [Epub ahead of print]**

### **Apolipoprotein E genotype and cerebral palsy.**

Blackman JA.

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## **24. Dev Med Child Neurol. 2010 Jan 5. [Epub ahead of print]**

### **Assisted reproductive technologies and risk of cerebral palsy among singletons in Australia.**

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## **25. Neurology. 2010 Jan 5;74(1):42-9. Epub 2009 Nov 25.**

### **Prediction of pathology in primary progressive language and speech disorders.**

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**OBJECTIVE:** Frontotemporal lobar degeneration (FTLD) encompasses a variety of clinicopathologic entities. The

antemortem prediction of the underlying pathologic lesions is reputed to be difficult. This study sought to characterize correlations between 1) the different clinical variants of primary progressive language and speech disorders and 2) the pathologic diagnosis. **METHODS:** The latter was available for 18 patients having been prospectively monitored in the Lille Memory Clinic (France) between 1993 and 2008. **RESULTS:** The patients were diagnosed with progressive anarthria (n = 5), agrammatic progressive aphasia (n = 6), logopenic progressive aphasia (n = 1), progressive jargon aphasia (n = 2), typical semantic dementia (n = 2), and atypical semantic dementia (n = 2). All patients with progressive anarthria had a tau pathology at postmortem evaluation: progressive supranuclear palsy (n = 2), Pick disease (n = 2), and corticobasal degeneration (n = 1). All patients with agrammatic primary progressive aphasia had TDP-43-positive FTLN (FTLN-TDP). The patients with logopenic progressive aphasia and progressive jargon aphasia had Alzheimer disease. Both cases of typical semantic dementia had FTLN-TDP. The patients with atypical semantic dementia had tau pathologies: argyrophilic grain disease and corticobasal degeneration. **CONCLUSIONS:** The different anatomic distribution of the pathologic lesions could explain these results: opercular and subcortical regions in tau pathologies with progressive anarthria, the left frontotemporal cortex in TDP-43-positive frontotemporal lobar degeneration (FTLN-TDP) with agrammatic progressive aphasia, the bilateral lateral and anterior temporal cortex in FTLN-TDP or argyrophilic grain disease with semantic dementia, and the left parietotemporal cortex in Alzheimer disease with logopenic progressive aphasia or jargon aphasia. These correlations have to be confirmed in larger series.

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## 26. Neuropsychology. 2010 Jan;24(1):90-100.

### **Difference rather than delay in development of elementary visuomotor processes in children born preterm without cerebral palsy: a quasi-longitudinal study.**

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Follow-up studies of preterm children without serious neonatal medical complications have consistently found poor visuomotor and visuospatial skills. In the first round of current follow-up study, we found a deficit in elementary visuomotor processes in preterm children without Cerebral Palsy (CP). To determine whether the development of these processes was delayed or different, we carried out a quasi-longitudinal study in which kinematic characteristics of pointing movements in 7- to 11-year-old preterm born children without CP and in an age-matched full-term group were analyzed. Multi-level analysis suggested a difference rather than a delay in the preterm born group: we found a regression around 8 years of age in the control but not in the preterm group. To our knowledge, this study is the first to provide longitudinal data confirming this regression in the development of movement control in typically developing children. Our results are also consistent in suggesting that elementary visuomotor processes are less efficient in preterm born children without CP: their movements were either slower or less accurate. While these differences were subtle, they persisted until 11 years of age. Copyright 2009 APA, all rights reserved.

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