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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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This issue covers the period 14 December 2009 to 10 January 2010

Interventions

1. *Disabil Rehabil.* 2010;32(4):344-51.

Course of health-related quality of life in 9-16-year-old children with cerebral palsy: Associations with gross motor abilities and mental health.

Janssen CG, Voorman JM, Becher JG, Dallmeijer AJ, Schuengel C.

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Purpose. To chart the 3-year course of health-related quality of life (HRQoL) of 9-13-year-old children with cerebral palsy (CP), and to determine its relationship with gross motor abilities and mental health. **Methods.** Children (n = 91; 58 boys, mean age 11 years, age ranging from 8 years and 6 months to 13 years and 8 months) and parents were assessed annually with the TNO-AZL questionnaires for children's health-related quality of life as a dependent variable, and the gross motor function measure for children with CP and the child behaviour check list as independent variables. **Results.** The children reported lower HRQoL compared with children in the general population, but reported a higher HRQoL than their parents. The HRQoL remained fairly stable over the 3 years, except for an increase in the autonomy domain. The HRQoL was moderately associated with gross motor abilities, and negatively associated with internalising mental health problems. Externalising problems were only negatively associated with parent-reported HRQoL. **Conclusions.** Children with CP are more resilient and positive about their HRQoL than their parents think they are. In general, mental health in children with CP appeared to be important in understanding their perceived QoL, in addition to the severity of the CP itself.

PMID: 20055573 [PubMed - in process]

2. *J Med Speech Lang Pathol.* 2009;March 2009:nihpa57357.

Early Feeding Abilities in Children with Cerebral Palsy: A Parental Report Study.

Wilson EM, Hustad KC.

Waisman Center, University of Wisconsin-Madison.

PURPOSE: The goals of this study were to 1) describe the feeding skills of young children with cerebral palsy (CP); and 2) elucidate the type and severity of feeding problems for children with and without oral-motor involvement. **METHOD:** Parents of 37 children (16 females, 21 males) with CP, who ranged in age from 11-58 months (mean age = 41 months), completed questionnaires regarding their child's past and current feeding abilities. Children were also clinically evaluated to determine whether each had evidence of oral-motor involvement. **RESULTS:** Children with CP and oral-motor involvement had significantly more difficulty with self-feeding, increased frequency of coughing and choking, increased prevalence of swallowing evaluation and feeding therapy, and were

introduced to solid food at a later age relative to children with CP who did not have oral-motor involvement. Both groups of children were similar in their history of tube feeding, bottle feeding, difficulty with solid foods, use of adaptive equipment, duration of mealtimes, and presence of choking, coughing, and gagging. **CONCLUSIONS:** Children with and without oral-motor involvement initially presented with similar feeding difficulties. However, feeding problems appeared to resolve to a greater extent in children without oral-motor involvement. The difficulties identified early in life, for children with oral-motor involvement, appeared to persist with development.

PMID: 20046974 [PubMed]

3. Growth hormone revisited. [Article in Spanish]

Devesa J, Devesa P, Reimunde P.

Departamento de Fisiología, Facultad de Medicina, Santiago de Compostela, España; Centro Médico Proyecto Foltra, Cacheiras, Teo, A Coruña, España.

Growth hormone (GH) is a pleiotropic hormone, expressed at pituitary and peripheral level, which plays a number of different roles far beyond of those classically described. Among these effects it is remarkable the neurotropic role of GH: the hormone increases the proliferation and survival of neural precursors in response to neurological injuries. At the cardiovascular level, GH improves the lipidic profile and decreases the factors of cardiac risk; the hormone recovers the endothelial function, improves the cardiac function and potentiates revascularisation in ischemic territories. Differently to that occurring with autocrine GH, exogenous GH administration does not seem to be related to oncogenesis. According to its effects, there are multiple potential clinical applications of GH: acute treatment of brain injury, due to its antiapoptotic effect; central or peripheral neural regeneration; acute treatment of perinatal anoxia, prevention cerebral palsy; revascularisation of ischemic areas; decrease of the time of bone consolidation after a bone fracture; and torpid ulcer healing. Copyright © 2009 Elsevier España, S.L. All rights reserved.

PMID: 20045134 [PubMed - as supplied by publisher]

4. Br J Anaesth. 2009 Dec 30. [Epub ahead of print]

Effects of magnesium sulphate on intraoperative neuromuscular blocking agent requirements and postoperative analgesia in children with cerebral palsy.

Na HS, Lee JH, Hwang JY, Ryu JH, Han SH, Jeon YT, Do SH.

Department of Anesthesiology and Pain Medicine, Seoul National University Bundang Hospital, Seongnam, Gyeonggi-do, Republic of Korea.

BACKGROUND: In this double-blind, randomized, placebo-controlled study, we evaluated the effects of magnesium sulphate on neuromuscular blocking agent requirements and analgesia in children with cerebral palsy (CP). **METHODS:** We randomly divided 61 children with CP undergoing orthopaedic surgery into two groups. The magnesium group (Group M) received magnesium sulphate 50 mg kg⁻¹ i.v. as a bolus and 15 mg kg⁻¹ h⁻¹ by continuous infusion during the operation. The control group (Group S) received the same amount of isotonic saline. Rocuronium was administered 0.6 mg kg⁻¹ before intubation and 0.1 mg kg⁻¹ additionally when train-of-four counts were 2 or more. I.V. fentanyl and ketorolac were used to control postoperative pain. Total infused analgesic volumes and pain scores were evaluated at postoperative 30 min, and at 6, 24, and 48 h. **RESULTS:** The rocuronium requirement of Group M was significantly less than that of Group S [0.29 (0.12) vs 0.42 (0.16) mg kg⁻¹ h⁻¹, P<0.05]. Cumulative analgesic consumption in Group M was significantly less after operation at 24 and 48 h (P<0.05), and pain scores in Group M were lower than in Group S during the entire postoperative period (P<0.05). Serum magnesium concentrations in Group M were higher until 24 h after operation (P<0.05). The incidence of postoperative nausea and vomiting and rescue drug injections was similar in the two groups. No shivering or adverse effects related to hypermagnesaemia were encountered. **CONCLUSIONS:** I.V. magnesium sulphate reduces rocuronium requirements and postoperative analgesic consumption in children with CP.

PMID: 20042475 [PubMed - as supplied by publisher]

5. Dev Med Child Neurol. 2009 Dec 23. [Epub ahead of print]**Functional taping: a promising technique for children with cerebral palsy.**

Iosa M, Morelli D, Nanni MV, Veredice C, Marro T, Medici A, Paolucci S, Mazzà C.

Fondazione Santa Lucia - IRCCS, Rome, Italy.

PMID: 20041935 [PubMed - as supplied by publisher]

6. Chang Gung Med J. 2009 Nov-Dec;32(6):628-35.**Follow-up of developmental profiles in children with spastic quadriplegic cerebral palsy.**

Chen KH, Chen CY, Hsu HC, Chen CL, Lin CH, Hsieh WC, Chen CM, Hong JP.

Department of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital at Chiayi, Chang Gung University College of Medicine, Gueishan Township, Taoyuan County 333, Taiwan (R.O.C.).

BACKGROUND: The aim of this study was to investigate longitudinal changes in the developmental profiles of children with spastic quadriplegic (SQ) cerebral palsy (CP). Additionally, the relationship of developmental functions between the initial and final stages was determined. **METHODS:** This prospective study enrolled forty-six children with SQ CP between 2-6 years old and assessed their developmental profiles using the Chinese Child Developmental Inventory on the initial and final assessments. The interval between two assessments was 1.0 +/- 0.3 years. Eight developmental domains, including gross motor, fine motor, expressive language, concept comprehension, situation comprehension, self help, personal social and general development, were evaluated and qualified by the development quotient (DQ). The DQ change index (%) was calculated to evaluate the differences in each domain between the two assessments. The paired t test was used to compare differences in each domain between the two assessments. Pearson's correlation was used to analyze the relationship of each domain between the final and initial assessments. **RESULTS:** Children with SQ CP had lower DQs than normal children in all developmental functions on both assessments (23 - 66%). The DQ distributions were lowest in the gross motor and self help domains, higher in the fine motor, situation comprehension, and personal social domains, and highest in the expressive language, concept comprehension, and general development domains. Except for the fine motor and concept comprehension domains, the DQs of the developmental functions were significantly decreased on the final assessment ($p < 0.05$). **CONCLUSION:** These findings suggest preschool children with SQ CP had impairments in the full spectrum of developmental profiles. The course of developmental profiles evolves with age. Most developmental functions did not increase proportionally with increasing age in children with SQ CP.

PMID: 20035642 [PubMed - in process]

7. NeuroRehabilitation. 2009;25(4):289-96.**"Patternizing" standards of sit-to-stand movements with support in cerebral palsy.**

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OBJECTIVE: By utilizing "patternizing" standards, this study attempted to obtain objective evaluation index of sit-to-stand (STS) movements of children with cerebral palsy (CP). In hopes that this understanding can lead to a standardized and effective physical therapy treatment of CP STS movements. **DESIGN:** The subjects were 50 children with CP, aged from three years and two months to twelve years and four months, mean age nine years and eleven months. The control group consisted of ten healthy children, aged from four years and five months to eleven years and ten months, mean age seven years and two months. In the analysis, firstly, pictures of the subjects' (CP and control group) STS movements were taken from the side with one digital video camera. Next, these STS movements were classified into two phases (first phase, sitting position to hip off the seat; second phase, hip off the seat to standing position), and the state of the subjects' extremities was evaluated by 15 items. Based on these 15

items, characteristics of STS movements were identified and recorded as YES or NO. Finally, using SPSS (version 13), cluster analysis was conducted. RESULTS: The subjects' STS movements were classified into five aggregate groups. CONCLUSION: From these findings, it was possible to distinguish the characteristics and differences of STS movements in healthy children and CP subjects. Moreover, the CP subjects were also able to be classified into four groups based on their shared characteristics of STS movements.

PMID: 20037222 [PubMed - in process]

8. J Hand Surg Am. 2009 Dec 18. [Epub ahead of print]

Follow-Up Motion Laboratory Analysis for Patients With Spastic Hemiplegia Due to Cerebral Palsy: Analysis of the Flexor Carpi Ulnaris Firing Pattern Before and After Tendon Transfer Surgery.

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PURPOSE: To compare the preoperative and postoperative pattern of firing of the flexor carpi ulnaris (FCU) in a grasp and release functional activity for children treated with an FCU to extensor carpi radialis brevis tendon transfer for wrist flexion deformity associated with spastic hemiplegia from cerebral palsy. **METHODS:** Seven children, evaluated by a preoperative EMG video analysis and treated with an FCU to extensor carpi radialis brevis transfer, had a follow-up postoperative EMG/video motion laboratory analysis at an average follow-up of 3.5 years (range, 1.0-6.8 years). Each preoperative and postoperative EMG/video was reviewed for the task of lifting heavy cans, as described by Jebson et al. The EMG activity of the FCU was described as active or relaxed during grasp and during release. **RESULTS:** Preoperatively, the most common pattern was to activate the FCU during grasp and to relax the FCU during release (4 patients). Postoperatively, 6 patients activated the FCU during grasp and relaxed the FCU during release; 1 patient activated the FCU during both grasp and release. **CONCLUSIONS:** Of the 7 patients studied, the FCU changed phase from preoperative to postoperative in only 1. This study concludes that most commonly the FCU does not predictably change phase when transferred from a position of wrist flexion to wrist extension. **TYPE OF STUDY/LEVEL OF EVIDENCE:** Therapeutic IV. Copyright © 2010 American Society for Surgery of the Hand. Published by Elsevier Inc. All rights reserved.

PMID: 20022711 [PubMed - as supplied by publisher]

9. Phys Ther. 2009 Dec 18. [Epub ahead of print]

Can Strength Training Predictably Improve Gait Kinematics? A Pilot Study on the Effects of Hip And Knee Extensor Strengthening on Lower-Extremity Alignment in Cerebral Palsy.

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Background: Computer simulations have demonstrated that excessive hip and knee flexion during gait, as frequently seen in ambulatory children with cerebral palsy (CP), can reduce the ability of muscles to provide antigravity support and increase the tendency of hip muscles to internally rotate the thigh. These findings suggest that therapies for improving upright posture during gait also may reduce excessive internal rotation. **Objective:** The goal of this study was to determine whether strength training can diminish the degree of crouched, internally rotated gait in children with spastic diplegic CP. **Design:** This was a pilot prospective clinical trial. **METHODS:** Eight children with CP participated in an 8-week progressive resistance exercise program, with 3-dimensional gait analysis and isokinetic testing performed before and after the program. Secondary measures included passive range of motion, the Ashworth Scale, and the PedsQL CP Module. To identify factors that may have influenced outcome, individual and subgroup data were examined for patterns of change within and across variables. **RESULTS:** Strength (force-generating capacity) increased significantly in the left hip extensors, with smaller, nonsignificant mean increases in the other 3 extensor muscle groups, yet kinematic and functional outcomes were inconsistent. The first reported subject-specific computer simulations of crouch gait were created for one child who showed substantial benefit to

examine the factors that may have contributed to this outcome. Limitations The sample was small, with wide variability in outcomes. CONCLUSIONS: Strength training may improve walking function and alignment in some patients for whom weakness is a major contributor to their gait deficits. However, in other patients, it may produce no change or even undesired outcomes. Given the variability of outcomes in this and other strengthening studies in CP, analytical approaches to determine the sources of variability are needed to better identify those individuals who are most likely to benefit from strengthening.

PMID: 20022999 [PubMed - as supplied by publisher]

10. Child Care Health Dev. 2009 Dec 16. [Epub ahead of print]

Is there a relationship between foetal position and both preferred lying posture after birth and pattern of subsequent postural deformity in non-ambulant people with cerebral palsy?

Porter D, Michael S, Kirkwood C.

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Background: A pattern of postural deformity was observed in a previous study that included an association between direction of spinal curvature and direction of windsweeping with more windswept deformities occurring to the right and lateral spinal curvatures occurring convex to the left. The direction of this pattern was found to be associated with preferred lying posture in early life. The aim of this study was to test the association between foetal position and both the preferred lying posture after birth, and the direction of subsequent postural deformity in non-ambulant children with cerebral palsy (CP). Methods: A retrospective cohort study was carried out involving 60 participants at level five on the gross motor function classification for CP. Foetal position during the last month of pregnancy was taken from antenatal records and parents were interviewed to identify preferred lying posture in the first year of life. At the time of the physical assessment ages ranged from 1 year and 1 month to 19 years with a median age of 13 years and 1 month. Results: Foetal presentation was found to be associated with the preferred lying posture with participants carried in a left occipito-anterior/lateral position more likely to adopt a supine head right lying posture, and vice versa. An association was also observed between the foetal position and asymmetrical postural deformity occurring later in life with participants carried in a left occipito-anterior/lateral presentation more likely to have a convex left spinal curve, a lower left pelvic obliquity, and a windswept hip pattern to the right. Conclusions: Clinicians should be aware of the association between foetal presentation, asymmetrical lying posture, and the direction of subsequent postural deformity for severely disabled children. A hypothesis is described that might help to explain these findings.

PMID: 20030660 [PubMed - as supplied by publisher]

11. Child Care Health Dev. 2009 Dec 16. [Epub ahead of print]

Goal-setting in paediatric rehabilitation: perceptions of parents and professional.

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Background: In paediatric rehabilitation, there is a belief in goal-setting as a fundamental component of decision-making that encourages collaboration and motivation, and improves outcomes. This study aimed to explore parents' and professionals' perceptions of setting and implementing goals within a family centred rehabilitation programme for preschoolers with cerebral palsy (CP). Methods: Parents and service providers of 13 preschoolers with CP, classified in Gross Motor Function Classification System level I-III, participated in two-step focus group interviews. Results: Three major themes emerged, each with two subthemes: (1) 'Goals enhance competence' with the subthemes 'parents as drivers', and 'awareness through observation'; (2) 'Goals direct attention' with the subthemes 'goals as valuable means' and 'collaboration through participation', and (3) 'Goals enter everyday life' with the subthemes 'goals as activities' and 'training vs. everyday practise'. A fourth theme 'child perspective' with the subthemes 'follow-up initiative', 'capture mastery', and 'create learning opportunities' was both an exclusive theme and integrated in the other three main themes. Conclusions: Active involvement of parents throughout the process of

setting and implementing goals seemed to increase their feeling of competency and partnership with professionals. Concrete goals based on families' preferences and concerns, participatory observation, and discussions with professionals, came out as valuable means for practice of functional tasks within home environments.

PMID: 20030659 [PubMed - as supplied by publisher]

12. Eur J Phys Rehabil Med. 2009 Dec;45(4):501-6. Epub 2009 Jan 21.

Long lasting benefits following the combination of static night upper extremity splinting with botulinum toxin A injections in cerebral palsy children.

Kanellopoulos AD, Mavrogenis AF, Mitsiokapa EA, Panagopoulos D, Skouteli H, Vrettos SG, Tzanos G, Pappagelopoulos PJ.

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AIM: Botulinum toxin A injections and orthotics have been used to manage upper extremity spasticity in hemiplegic children. The authors performed a study to evaluate the necessity and effectiveness of a static night splint following outpatient botulinum toxin A treatment in children with upper limb spastic cerebral palsy. **METHODS:** Twenty children with upper limb spastic cerebral palsy were treated with botulinum toxin A injections. A static night splint was applied in half of them. Objective assessment of upper limb function was performed at baseline, at 2 and 6 months after botulinum toxin A injection using the Quality of Upper Extremity Skills Test. **RESULTS:** After botulinum toxin A treatment, both groups showed an improvement on their previous functional level of the injected upper extremity. At 2 months, children in group A showed a 15.4% improvement, whereas children in group B improved by 12.2% from baseline; these were not statistically significant ($P=0.326$). At 6 months, group A still maintained a 15.9% improvement in function compared to group B which differed only by 4.2% from prebotulinum toxin A baseline; these differences were statistically significant ($P=0.000$). Complications related to the botulinum toxin A injection were not observed. **CONCLUSIONS:** Static night splinting following botulinum toxin A injections has shown a definite treatment effect in reducing spasticity and improving function in children with upper limb spastic cerebral palsy.

PMID: 20032908 [PubMed - in process]

13. Eur J Phys Rehabil Med. 2009 Dec;45(4):493-500. Epub 2009 Nov 24.

A modified constraint-induced movement therapy (CIT) program improves paretic arm use and function in children with cerebral palsy.

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AIM: Constraint-induced movement therapy (CIT) is a rehabilitation intervention put forward by Taub and colleagues for sensorimotor disorders in children with hemiparesis, comprising consisting of the restraint of the unaffected arm and concurrent intensive training of the affected arm for six hours/day for two weeks. The aim of this study was to evaluate the effectiveness of a modified CIT program (mCIT) characterized by restraining the unaffected hand with a cotton mitten during daily activities and a reduced intensity training program for two h/week for five weeks. **METHODS:** Ten children (age: 1-9 years) with hemiparetic cerebral palsy were enrolled in a randomized, cross-over study in which the effects of a mCIT and a conventional physiotherapy program were compared. The amount of use and the functional performance of the affected arm were evaluated by means of two specifically devised tests (Use and Function Test). A further test evaluated functional performance during bimanual tasks. These measures showed a good inter-rater and inter-session reliability. All tests were administered before, at the end and four weeks after treatment. **RESULTS:** Significant differences between the two therapeutic approaches were evidenced in both affected arm use ($P=0.008$) and function ($P=0.018$). These improvements maintained at the follow-up (Use Test $P=0.07$; paretic arm function $P=0.012$). Bimanual function performance showed a trend towards improvement in both post-treatment and follow-up testing. The conventional physiotherapy group did not show any improvement in any outcome measure. **CONCLUSIONS:** The mCIT program proposed in the present study showed

to be a promising rehabilitative procedure in children with congenital arm paresis after cerebral palsy.

PMID: 20032907 [PubMed - in process]

14. Gait Posture. 2009 Oct;30(3):265-9. Epub 2009 Jul 24.

The gait profile score and movement analysis profile.

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Murdoch Childrens Research Institute, Royal Children's Hospital, Department of Mechanical and Manufacturing Engineering, The University of Melbourne, Australia.

The Gait Deviation Index (GDI) has been proposed as an index of overall gait pathology. This study proposes an interpretation of the difference measure upon which the GDI is based, which naturally leads to the definition of a similar index, the Gait Profile Score (GPS). The GPS can be calculated independently of the feature analysis upon which the GDI is based. Understanding what the underlying difference measure represents also suggests that reporting a raw score, as the GPS does, may have advantages over the logarithmic transformation and z-scaling incorporated in the GDI. It also leads to the concept of a Movement Analysis Profile (MAP) to summarise much of the information contained within kinematic data. A validation study on all children attending a paediatric gait analysis service over 3 years (407 children) provides evidence to support the use of the GPS through analysis of its frequency distribution across different Gross Motor Function Classification System (GMFCS) and Gillette Functional Assessment Questionnaire (FAQ) categories, investigation of intra-session variability, and correlation with the square root of GGI. Correlation with GDI confirms the strong relationship between the two measures. The study concludes that GDI and GPS are alternative and closely related measures. The GDI has prior art and is particularly useful in applications arising out of feature analysis such as cluster analysis or subject matching. The GPS will be easier to calculate for new models where a large reference dataset is not available and in association with applications using the MAP.

PMID: 19632117 [PubMed - indexed for MEDLINE]

15. J Biomech. 2009 Dec 14. [Epub ahead of print]

Joint moment contributions to swing knee extension acceleration during gait in children with spastic hemiplegic cerebral palsy.

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Inadequate peak knee extension during the swing phase of gait is a major deficit in individuals with spastic cerebral palsy (CP). The biomechanical mechanisms responsible for knee extension have not been thoroughly examined in CP. The purpose of this study was to assess the contributions of joint moments and gravity to knee extension acceleration during swing in children with spastic hemiplegic CP. Six children with spastic hemiplegic CP were recruited (age=13.4±4.8 years). Gait data were collected using an eight-camera system. Induced acceleration analysis was performed for each limb during swing. Average joint moment and gravity contributions to swing knee extension acceleration were calculated. Total swing and stance joint moment contributions were compared between the hemiplegic and non-hemiplegic limbs using paired t-tests ($p < 0.05$). Swing limb joint moment contributions from the hemiplegic limb decelerated swing knee extension significantly more than those of the non-hemiplegic limb and resulted in significantly reduced knee extension acceleration. Total stance limb joint moment contributions were not statistically different. Swing limb joint moment contributions that decelerated knee extension appeared to be the primary cause of inadequate knee extension acceleration during swing. Stance limb muscle strength did not appear to be the limiting factor in achieving adequate knee extension in children with CP. Recent research has shown that the ability to extend the knee during swing is dependent on the selective voluntary motor control of the limb. Data from individual participants support this concept. Copyright © 2009 Elsevier Ltd. All rights reserved.

PMID: 20015495 [PubMed - as supplied by publisher]

16. Acta Paediatr.. [Epub ahead of print]**Pain in children with cerebral palsy: a cross-sectional multicentre European study.**

Parkinson K, Gibson L, Dickinson H, Colver A.

Institute of Health and Society, Newcastle University, Newcastle upon Tyne, UK.

Aim: To determine the prevalence and associations of self-reported and parent-reported pain in children with cerebral palsy (CP) of all severities. **Method:** Cross-sectional design using a questionnaire; analysis using ordinal regression. Children aged 8-12 years were randomly selected from population-based registers of children with CP in eight European regions; a further region recruited 75 children from multiple sources. Outcome measures were pain in the previous week among children who could self-report and parents' perception of their child's pain in the previous 4 weeks. **Results:** Data on pain were available from 490 children who could self-report and parents of 806 children (those who could and could not self-report). The estimated population prevalence of self-reported pain in the previous week was 60% (95% CI: 54-65%) and that of parent-reported pain in the previous 4 weeks was 73% (95% CI: 69-76%). In self-reporting children, older children reported more pain but pain was not significantly associated with severity of impairment. In parent reports, severity of child impairment, seizures and parental unemployment were associated with more frequent and severe pain. **Conclusion:** Pain in children with CP is common. Clinicians should enquire about pain and consider appropriate physical, therapeutic or psychological management.

PMID: 20003101 [PubMed - as supplied by publisher]

17. Childs Nerv Syst. 2009 Dec;25(12):1593-1603.**Incidence of spinal abnormalities in patients with spastic diplegia 17 to 26 years after selective dorsal rhizotomy.**

Langerak NG, Vaughan CL, Hoffman EB, Figaji AA, Fieggen AG, Peter JC.

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INTRODUCTION: The aim of this study was to evaluate the mechanical status of the spine in patients with spastic diplegia 17-26 years after selective dorsal rhizotomy (SDR). **METHODS:** We compared original radiographic reports from our earlier short-term follow-up study with current X-rays. In addition, we obtained magnetic resonance images (MRI) of the spine and additional information regarding back pain and clinical assessments. **RESULTS:** Thirty patients (17 males and 13 females; median age 26.8 years) participated in the current study, with median follow-up times of 4.0 and 21.4 years. Comparison of the X-ray results showed respectively: scoliosis 0% and 57%; kyphosis 0% and 7%; lordosis 21% and 40%; spondylolysis 18% and 37%; and spondylolisthesis grade I occurred in one patient. The only statistically significant difference was found for scoliosis ($p < 0.01$). The majority had Cobb angles < 30 degrees with only two patients with curves of 35 degrees. MRI scans showed spinal stenosis in 27%, black discs in 10%, and disc protrusion in 3%. Daily back pain was reported in 17%, while 23% reported "moderate disability" as a result of back and leg pain. No patient to date has required any surgical intervention on the spine. **CONCLUSIONS:** Except for spondylolisthesis, spinal deformities did appear to progress with time. However, this increase was not marked, and the development of relatively mild scoliosis was the only statistically significant increase. This group of patients requires continued follow-up. Further studies are required to ascertain the natural history of spinal deformity in adults with spastic diplegia who have not had SDR.

PMID: 19784657 [PubMed - indexed for MEDLINE]

18. Dev Med Child Neurol. [Epub ahead of print]**Predicting school readiness from neurodevelopmental assessments at age 2 years after respiratory distress syndrome in infants born preterm.**

Patrianakos-Hoobler AI, Msall ME, Huo D, Marks JD, Plesha-Troyke S, Schreiber MD.

Department of Pediatrics, University of Chicago Comer Children's Hospital and LaRabida Children's Hospital, Chicago, IL, USA.

Aim: To determine whether neurodevelopmental outcomes at the age of 2 years accurately predict school readiness in children who survived respiratory distress syndrome after preterm birth. **Method:** Our cohort included 121 preterm infants who received surfactant and ventilation and were enrolled in a randomized controlled study of inhaled nitric oxide for respiratory distress syndrome. Abnormal outcomes at the age of 2 years were defined as neurosensory disability (cerebral palsy, blindness, or bilateral hearing loss) or delay (no neurosensory disability but Bayley Scales of Infant Development mental or performance developmental index scores <70). School readiness (assessed at a mean age of 5y 6mo, SD 1y) was determined using neurodevelopmental assessments of motor, sensory, receptive vocabulary, perceptual, conceptual, and adaptive skills. **Results:** The mean birthweight of the cohort (57 males, 64 females) was 987g (SD 374), and the mean gestational age was 27.3 weeks (SD 2.6). At the age of 2 years, the neurodevelopmental classification was 'disabled' in 11% and 'delayed' in 23%. At the age of 5 years 6 months, intensive special education was required for 11% and some special education for 21%. Disability and delay at the age of 2 years were 92% and 50% predictive of lack of school readiness respectively, whereas only 15% of children who were normal at the age of 2 years were not school ready at the later assessment. Children with delay at 2 years were more likely to need special education if they were socially disadvantaged. Interpretation Without preschool developmental supports, preterm survivors living in poverty will require more special education services.

PMID: 20002128 [PubMed - as supplied by publisher]

19. Dev Med Child Neurol.. [Epub ahead of print]

Leisure activity preferences for 6- to 12-year-old children with cerebral palsy.

Majnemer A, Shikako-Thomas K, Chokron N, Law M, Shevell M, Chilingaryan G, Poulin C, Rosenbaum P.

School of Physical & Occupational Therapy, Faculty of Medicine, McGill University, Montreal, Quebec, Canada.

Aim: The objective was to describe leisure activity preferences of children with cerebral palsy (CP) and their relationship to participation. Factors associated with greater interest in leisure activities were identified. **Method:** Fifty-five school-aged children (36 males, 19 females; mean age 9y 11mo; range 6y 1mo-12y 11mo) with CP (Gross Motor Function Classification System [GMFCS]) level I 62%, level II 22%, level III-IV 16%; 33.3% hemiplegia, 29.6% diplegia, 25.9% quadriplegia, 11.2% other) who could complete the Preferences for Activities of Children (PAC) were recruited. **Results:** Social and recreational activities were most preferred, and self-improvement activities were least preferred. Younger age, higher motivation, and IQ predicted interest in active-physical activities ($r(2)=0.39$). Negative reaction to failure was associated with less preference for social activities ($r(2)=0.16$), whereas increased prosocial behaviours were related to greater preference for recreational ($r(2)=0.13$) and self-improvement activities; the latter is also predicted by older age ($r(2)=0.24$). Interest in skill-based activities was greater in females and in children who were highly motivated, younger, and had greater motor limitations ($r(2)=0.51$). The findings suggest that personal factors and functional abilities influence leisure activity preferences. High preference for certain activities was not always associated with involvement in these activities. Interpretation: Determination of preferences is inherent to child-centred practice and should, therefore, be part of the evaluation process. Rehabilitation strategies can minimize barriers to leisure participation, such as fear of failure, low motivation, or environmental obstacles.

PMID: 20002127 [PubMed - as supplied by publisher]

20. Dev Med Child Neurol.. [Epub ahead of print]

Relationship between gross motor capacity and daily-life mobility in children with cerebral palsy.

Smits DW, Gorter JW, Ketelaar M, VAN Schie PE, Dallmeijer AJ, Lindeman E, Jongmans MJ.

Centre of Excellence for Rehabilitation Medicine Utrecht, Rehabilitation Centre De Hoogstraat, Utrecht, the Netherlands.

Aim: The aim of this study was to examine the relationship between gross motor capacity and daily-life mobility in

children with cerebral palsy (CP) and to explore the moderation of this relationship by the severity of CP. Method: Cross-sectional analysis in a cohort study with a clinic-based sample of children with CP (n=116; 76 males, 40 females; mean age 6y 3mo, SD 12mo, range 4y 8mo-7y 7mo) was performed. Gross motor capacity was assessed by the Gross Motor Function Measure (GMFM-66). Daily-life mobility was assessed using the Pediatric Evaluation of Disability Inventory (PEDI): Functional Skills Scale (FSS mobility) and Caregiver Assistance Scale (CAS mobility). Severity of CP was classified by the Gross Motor Function Classification System (48% level I, 17% level II, 15% level III, 8% level IV, 12% level V), type of motor impairment (85% spastic, 12% dyskinetic, 3% ataxic), and limb distribution (36% unilateral, 49% bilateral spastic). Results: Scores on the GMFM-66 explained 90% and 84% respectively, of the variance of scores on PEDI-FSS mobility and PEDI-CAS mobility. Limb distribution moderated the relationship between scores on the GMFM-66 and the PEDI-FSS mobility, revealing a weaker relationship in children with unilateral spastic CP (24% explained variance) than in children with bilateral spastic CP (91% explained variance). Interpretation: In children aged 4 to 7 years with unilateral spastic CP, dissociation between gross motor capacity and daily-life mobility can be observed, just as in typically developing peers.

PMID: 20002126 [PubMed - as supplied by publisher]

21. Dev Med Child Neurol. 2009 Dec;51(12):928. Epub 2009 Oct 7.

Ultrasound imaging: a promising method for assessment of body composition.

Kuperminc M.

Department of Pediatrics, University of Virginia, Charlottesville, USA.

Comment on:

* Dev Med Child Neurol. 2009 Dec;51(12):943-8.

PMID: 19811521 [PubMed - indexed for MEDLINE]

22. Dev Med Child Neurol. 2009 Dec;51(12):1003. Epub 2009 Oct 6.

Current and future uses of the Gross Motor Function Classification System: the need to take account of other factors to explain functional outcomes.

Morris C.

Comment on:

* Dev Med Child Neurol. 2009 Apr;51(4):328-9.

* Dev Med Child Neurol. 2008 Dec;50(12):957.

PMID: 19807771 [PubMed - indexed for MEDLINE]

23. Dev Med Child Neurol.. [Epub ahead of print]

Book Review: Improving Hand Function in Children with Cerebral Palsy: Theory, Evidence and Intervention. Clinics in Developmental Medicine No. 178.

Gordon A.

The Murdoch Childrens Research Institute, Royal Children's Hospital Melbourne, Melbourne, Victoria, Australia.

PMID: 20002124 [PubMed - as supplied by publisher]

28. Dev Med Child Neurol. [Epub ahead of print]**Attentional and executive impairments in children with spastic cerebral palsy.**

Bottcher L, Flachs EM, Uldall P.

Department of Psychology, University of Copenhagen, Copenhagen, Denmark.

Aim: Children with cerebral palsy (CP) are reported to have learning and social problems. The aim of the present study was to examine whether children with CP have impairments in attention or executive function. **Method:** We examined attention and executive function with standardized neuropsychological measures in a group of children with unilateral (n=15) or bilateral (n=18) spastic CP (14 females, 19 males, mean age 11y 4mo, SD 1y 1mo, range 9y 1mo-13y 7mo; Gross Motor Function Classification System level I n=22, II n=3, III n=6, and IV n=2). Performance was compared with test norms. **Results:** Verbal cognitive functioning fell within the normal range, whereas sustained (p=0.001) and divided attention (p<0.001) were found to be impaired. Greater impairment was observed in executive function in general (p<0.001) and in inhibition (p=0.038) and shifting (p<0.001) in particular. No significant difference was found between types of CP (unilateral and bilateral). Performance of all timed tasks was slower than the test norm (p<0.00). **Interpretation:** The finding of slower performances across tasks may indicate a general impairment in efficiency of information processing in relation to white-matter lesions. Impairments in attention and executive functions are present in children with CP and may help to explain why these children have increased social and learning problems.

PMID: 20002117 [PubMed - as supplied by publisher]

29. Dev Med Child Neurol.. [Epub ahead of print]**Book Review: Finnie's Handling the Young Child with Cerebral Palsy at Home.**

Windsor J.

Chailey Heritage Clinical Services, Southdowns Health NHS Trust, Nr Lewes, UK.

PMID: 20002111 [PubMed - as supplied by publisher]

30. Phys Ther. 2009 Nov;89(11):1142-3; author reply 1144.**Invited commentary.**

Charles J, Wolf SL.

Division of Physical Therapy, Emory University School of Medicine, 1441 Clifton Rd NE, Atlanta, GA 30322, USA. jcharl3@emory.edu

Comment on:

* Phys Ther. 2009 Nov;89(11):1126-41.

PMID: 19884638 [PubMed - indexed for MEDLINE]

31. Assist Technol. 2009 Fall;21(3):161-8; quiz 169-71.**RESNA position on the application of wheelchair standing devices.**

Arva J, Paleg G, Lange M, Lieberman J, Schmeler M, Dicianno B, Babinec M, Rosen L.

TiSport LLC, Kennewick, Washington, USA. jarva@tilite.com

This document, approved by the Rehabilitation Engineering & Assistive Technology Society of North America (RESNA) Board of Directors in March 2007, shares typical clinical applications and provides evidence from the literature supporting the use of wheelchair standers.

PMID: 19908680 [PubMed - indexed for MEDLINE]

32. Women Health. 2009 Sep;49(6):555-72.

Experiences of mistreatment among women with cerebral palsy.

Freeborn D, Curry MA.

Brigham Young University, College of Nursing, Provo, Utah, USA.

Abuse and mistreatment of women with disabilities is a complex problem that affects their health and well-being. Previous studies have focused on heterogeneous groups of women with disabilities, with only small numbers of women with cerebral palsy included, but different disabilities may play specific roles in relation to abuse. Exploring mistreatment of women with cerebral palsy is important in determining the relationship between mistreatment and a specific disability. The aim of this article was to describe experiences and meanings of mistreatment among women with cerebral palsy. The feminist biographical method was used to provide an in-depth exploration of women's storied lives, uncover the meaning of women's lives from their own perspective, and provide understanding of women whose stories are seldom told. A sample of eight participants participated in two in-depth, audio-recorded interviews. Two major themes and five subthemes emerged. The meaning of mistreatment included participants' definition of mistreatment and their explanation for mistreatment. Outcomes of mistreatment were divided into emotional, social, and physical outcomes. Health care providers need to understand the meaning and outcomes of mistreatment in their patients' lives to begin to address mistreatment, listen to patients, advocate when needed, and provide appropriate health care.

PMID: 20013521 [PubMed - in process]

33. Zhongguo Zhen Jiu. 2009 Aug;29(8):683-8.

Systematic evaluation of acupuncture for treatment of post-stroke spastic paralysis [Article in Chinese]

Qi YZ, Fu LX, Xiong J, Wang ZL, Mou J, Lu YM.

Tianjin University of TCM, Tianjin, China.

OBJECTIVE: To evaluate the effects of acupuncture on post-stroke spastic paralysis. **METHODS:** A systematic evaluation including all the relevant randomized controlled trials (RCTs) or quasi-RCTs of acupuncture and moxibustion for treatment of post-stroke spastic paralysis were carried out according to the method recommended by the Cochrane Collaboration. **RESULTS:** Nine hundred and seventy-eight patients being included in fourteen papers met the enrolled criteria. However, their methodological quality was relatively poor. Meta-analysis of nine trials indicated that there was no significant difference between the treatment groups and the control groups in Ashworth scores, Carr-Shepherd scores, nerve defect scores and hip adductor tension scores. Whereas the Fugel-Meyer scores in one trial and the Barthel scores in three trials were better in the treatment groups than those of the control group. **CONCLUSION:** A reliable conclusion can not be drawn from the present data because of the defects in methodological quality and insufficient numbers of trials, especially lack the long-term terminal outcomes, although it appears a tendency that acupuncture can improve the conditions of post-stroke spastic paralysis. Therefore, it is necessary to perform more multi-central RCTs of high quality in future.

PMID: 19947279 [PubMed - indexed for MEDLINE]

34. PLoS One.;4(12):e8218.**A wireless brain-machine interface for real-time speech synthesis.**

Guenther FH, Brumberg JS, Wright EJ, Nieto-Castanon A, Tourville JA, Panko M, Law R, Siebert SA, Bartels JL, Andreasen DS, Ehirim P, Mao H, Kennedy PR.

Department of Cognitive and Neural Systems and Sargent College of Health and Rehabilitation Sciences, Boston University, Boston, Massachusetts, United States of America. guenther@cns.bu.edu

BACKGROUND: Brain-machine interfaces (BMIs) involving electrodes implanted into the human cerebral cortex have recently been developed in an attempt to restore function to profoundly paralyzed individuals. Current BMIs for restoring communication can provide important capabilities via a typing process, but unfortunately they are only capable of slow communication rates. In the current study we use a novel approach to speech restoration in which we decode continuous auditory parameters for a real-time speech synthesizer from neuronal activity in motor cortex during attempted speech. **METHODOLOGY/PRINCIPAL FINDINGS:** Neural signals recorded by a Neurotrophic Electrode implanted in a speech-related region of the left precentral gyrus of a human volunteer suffering from locked-in syndrome, characterized by near-total paralysis with spared cognition, were transmitted wirelessly across the scalp and used to drive a speech synthesizer. A Kalman filter-based decoder translated the neural signals generated during attempted speech into continuous parameters for controlling a synthesizer that provided immediate (within 50 ms) auditory feedback of the decoded sound. Accuracy of the volunteer's vowel productions with the synthesizer improved quickly with practice, with a 25% improvement in average hit rate (from 45% to 70%) and 46% decrease in average endpoint error from the first to the last block of a three-vowel task. **CONCLUSIONS/SIGNIFICANCE:** Our results support the feasibility of neural prostheses that may have the potential to provide near-conversational synthetic speech output for individuals with severely impaired speech motor control. They also provide an initial glimpse into the functional properties of neurons in speech motor cortical areas.

PMID: 20011034 [PubMed - in process]

Epidemiology / Aetiology / Diagnosis & Early Treatment

35. Folia Neuropathol. 2009;47(4):327-37.**Alterations in glutamate transport and group I metabotropic glutamate receptors in the rat brain during acute phase of experimental autoimmune encephalomyelitis.**

Sulkowski G, Dabrowska-Bouta B, Kwiatkowska-Patzer B, Struzyńska L.

Laboratory of Pathoneurochemistry, Department of Neurochemistry, Mossakowski Medical Research Centre, Polish Academy of Sciences, 5 Pawińskiego Str., 02-106 Warsaw, Poland. Phone number: +48 22 608 65 30, Fax number: +48 22 608 66 23, Email: sulgrzeg@cmdik.pan.pl.

Experimental autoimmune encephalomyelitis (EAE) is an animal model that mimics many aspects of multiple sclerosis (MS). In MS the immune system attacks the white matter of the brain and spinal cord, leading to disability and paralysis. Neurons, oligodendrocytes and myelin are lost due to the release of cytotoxic cytokines, autoantibodies and toxic amounts of the excitatory neurotransmitter glutamate. This study was designed to determine the changes in: a) glutamate transport in nerve endings and astroglial fraction, b) level of excitatory amino acid transporters (EAATs) and c) level of group I metabotropic glutamate receptors (mGluR G I) protein in the acute phase of EAE (12 d.p.i. - day post immunization), in the peak of neurological deficits. We have found that glutamate uptake in synaptosomes and GPV fraction increases by about 30% and 15%, respectively, compared to controls. We also observed an increase in KCl-dependent glutamate release from synaptosomes and GPV fraction obtained from EAE rats by about 20%. Western blots analysis of protein expression shows elevation of group I metabotropic glutamate receptors (mGluR G I) and excitatory amino acid transporters (EAATs) in EAE rats during the acute phase of the disease (12 d.p.i), when the level of proinflammatory cytokines (IL-1b , IL-6, TNF-a) rises. The results suggest that during the inflammatory conditions in the acute phase of EAE, disturbances in glutamate transport take place that may lead to the excitotoxicity.

PMID: 20054785 [PubMed - in process]

36. Pediatrics. 2009 Dec;124(6):1619-26.**Outcome of term infants using apgar scores at 10 minutes following hypoxic-ischemic encephalopathy.**

Laptook AR, Shankaran S, Ambalavanan N, Carlo WA, McDonald SA, Higgins RD, Das A; Hypothermia Subcommittee of the NICHD Neonatal Research Network.
Collaborators (100)

Fanaroff AA, Walsh MC, Newman N, Wilson-Costello D, Siner B, Hensman A, Vohr B, Noel L, Cotten CM, Auten K, Goldstein R, Lohmeyer M, Stoll BJ, Jain L, Hale E, Lemons JA, Appel DD, Miller L, Dusick A, Richard L, Stevenson DK, VanMeurs K, Ball MB, Hintz SR, Carlo WA, Collins M, Cosby S, Peralta-Carcelen M, Phillips V, Donovan EF, Grisby C, Alexander B, Shively J, Mincey H, Steichen J, Gratton T, Finer NN, Kaegi D, Henderson C, Rich W, Arnell K, Vaucher YE, Fuller M, Duara S, Everett R, Bauer CR, Guillet R, Reubens L, Myers G, Hust D, Laptook AR, Madison S, Hensley G, Miller N, Heyne R, Broyles S, Hickman J, Tyson JE, McDavid G, Akpa EG, Franco CY, Cluff PA, Lis AE, Morris BH, Bradt PJ, Shankaran S, Bara R, Muran G, Johnson Y, Kennedy D, Ehrenkranz RA, Gettner P, Romano E, Oh W, Fanaroff AA, Goldberg RN, Stoll BJ, Lemons JA, Stevenson DK, Carlo WA, Donovan EF, Finer NN, Duara S, Phelps DL, Laptook AR, Tyson JE, O'Shea TM, Shankaran S, Ehrenkranz RA, Jobe A, Poole WK, Hastings B, Petrie CM, Higgins RD, Wright LL, McClure E, D'Alton M, Poole WK, Fletcher JC, Gleason CA.

Department of Pediatrics, Women & Infants' Hospital of Rhode Island, Providence, Rhode Island 02906, USA. alaptook@wihri.org

OBJECTIVE: The objective of this study was to determine whether Apgar scores at 10 minutes are associated with death or disability in early childhood after perinatal hypoxic-ischemic encephalopathy. **METHODS:** This was a secondary analysis of infants who were enrolled in the Eunice Kennedy Shriver National Institute of Child Health and Human Development Neonatal Research Network hypothermia trial. Infants who were born at ≥ 36 weeks' gestation and had clinical and/or biochemical abnormalities at birth and encephalopathy at < 6 hours were studied. Logistic regression and classification and regression-tree analysis were used to determine associations between Apgar scores at 10 minutes and neurodevelopmental outcome, adjusting for covariates. Death or disability (moderate or severe) at 18 to 22 months of age was the measured outcome. **RESULTS:** Twenty of 208 infants were excluded (missing data). More than 90% of the infants had Apgar scores of 0 to 2 at 1 minute, and Apgar scores at 5 and 10 minutes shifted to progressively higher values; at 10 minutes, 27% of infants had Apgar scores of 0 to 2. After adjustment, each point decrease in Apgar score at 10 minutes was associated with a 45% increase in the odds of death or disability. Death or disability occurred in 76%, 82%, and 80% of infants with 10-minute Apgar scores of 0, 1, and 2, respectively. Classification and regression-tree analysis indicated that Apgar scores at 10 minutes were discriminators of outcome. **CONCLUSIONS:** Apgar scores at 10 minutes provide useful prognostic data before other evaluations are available for infants with hypoxic-ischemic encephalopathy. Death or moderate/severe disability is common but not uniform with Apgar scores of < 3 ; caution is needed before adopting a specific time interval to guide duration of resuscitation.

PMID: 19948631 [PubMed - indexed for MEDLINE]

37. Acta Paediatr. 2010 Jan 5. [Epub ahead of print]**Predicting neurodevelopmental impairment in preterm infants by standardized neurological assessments at 6 and 12 months corrected age.**

Grimmer I, Metze BC, Walch E, Scholz T, Bühner C.

Departments of Neonatology and Social Pediatrics, Charité University Medical Center, Berlin, Germany.

Aim: Neurodevelopmental impairment in very preterm infants can be reasonably diagnosed by 18-24 months corrected age, whereas the predictive value of earlier assessments is debated. We hypothesized that neurological findings at 6 and 12 months indicative of subsequent cerebral palsy predict 18-24 months' neurodevelopmental impairment. **Methods:** Neurodevelopmental examinations (Griffiths scales) at 20 months of age in 561 preterm infants (birth weight < 1500 g) were compared with results of standardized neurological examinations (Early Motor Pattern Profile; EMPP) and Griffiths scales at 6 ($n = 451$) and 12 months ($n = 496$) corrected age. **Results:** Griffiths developmental quotients at 20 months were weakly but significantly related to EMPP scores at 6 ($R(s) = 0.328$) and 12 months ($R(s) = 0.493$). Areas under receiver operator characteristic curves for the EMPP to predict neurodevelop-

mental impairment (Griffiths scores ≤ 75) at 20 months were 0.772 (0.890) at 6 (12) months, compared to 0.915 (0.962) for Griffiths scores. By contrast, EMPP and Griffiths scores had equal power to predict inability to walk unaided at 2 years of age (EMPP 6/12 months: 0.946/0.983; Griffiths 6/12 months: 0.935/0.985). Conclusion: Neurological examinations with the EMPP at 6 and 12 months corrected age are of limited value to predict neurodevelopmental impairment at 20 months.

PMID: 20055777 [PubMed - as supplied by publisher]

38. Nat Neurosci. 2010 Jan;13(1):105-11. Epub 2009 Dec 6.

Collective dynamics in human and monkey sensorimotor cortex: predicting single neuron spikes.

Truccolo W, Hochberg LR, Donoghue JP.

Department of Neuroscience, Brown University, Providence, Rhode Island, USA. wilson_truccolo@brown.edu

Coordinated spiking activity in neuronal ensembles, in local networks and across multiple cortical areas, is thought to provide the neural basis for cognition and adaptive behavior. Examining such collective dynamics at the level of single neuron spikes has remained, however, a considerable challenge. We found that the spiking history of small and randomly sampled ensembles (approximately 20-200 neurons) could predict subsequent single neuron spiking with substantial accuracy in the sensorimotor cortex of humans and nonhuman behaving primates. Furthermore, spiking was better predicted by the ensemble's history than by the ensemble's instantaneous state (Ising models), emphasizing the role of temporal dynamics leading to spiking. Notably, spiking could be predicted not only by local ensemble spiking histories, but also by spiking histories in different cortical areas. These strong collective dynamics may provide a basis for understanding cognition and adaptive behavior at the level of coordinated spiking in cortical networks.

PMID: 19966837 [PubMed - indexed for MEDLINE]

39. Best Pract Res Clin Obstet Gynaecol.. [Epub ahead of print]

Magnesium in obstetrics.

James MF.

Department of Anaesthesia, University of Cape Town Medical School, Anzio Road, Observatory 7925, Cape Town, South Africa.

Magnesium is a critical physiological ion, and magnesium deficiency might contribute to the development of pre-eclampsia, to impaired neonatal development and to metabolic problems extending into adult life. Pharmacologically, magnesium is a calcium antagonist with substantial vasodilator properties but without myocardial depression. Cardiac output usually increases following magnesium administration, compensating for the vasodilatation and minimising hypotension. Neurologically, the inhibition of calcium channels and antagonism of the N-methyl-D-aspartic acid (NMDA) receptor raises the possibility of neuronal protection, and magnesium administration to women with premature labour may decrease the incidence of cerebral palsy. It is the first-line anticonvulsant for the management of pre-eclampsia and eclampsia, and it should be administered to all patients with severe pre-eclampsia or eclampsia. Magnesium is a moderate tocolytic but the evidence for its effectiveness remains disputed. The side effects of magnesium therapy are generally mild but the major hazard of magnesium therapy is neuromuscular weakness.

PMID: 20005782 [PubMed - as supplied by publisher]

40. Arch Dis Child. 2010 Jan;95(1):25.**Maternal genitourinary infection and cerebral palsy.**

[No authors listed]

PMID: 20040681 [PubMed - in process]

41. J Comp Pathol. 2009 Dec 28. [Epub ahead of print]**Cerebral Phaeohyphomycosis in a Green Iguana (*Iguana iguana*).**

Olias P, Hammer M, Klopfleisch R.

Department of Veterinary Pathology, Freie Universität Berlin, Robert-von-Ostertag-Strasse 15, 14163 Berlin.

Cerebral phaeohyphomycosis was diagnosed in a 4-year-old green iguana (*Iguana iguana*) with paroxysmal spastic paralysis of all limbs and circling motion. Formalin-fixed tissues were collected at necropsy examination and submitted for evaluation. The left cerebrum and the left ventricle were replaced by a solid brown coloured mass. Microscopical examination revealed the presence of necrotizing and granulomatous encephalitis affecting the cerebrum, cerebellum and brainstem, with severe vasculitis and intralésional dematiaceous fungal hyphae. No other lesions or fungi were found in other organs. Fungi were identified as *Oidiodendron* spp. by sequence analysis of the internal transcribed spacer (ITS) region 1 extracted from formalin-fixed and paraffin wax-embedded brain tissue. This case represents the first report of phaeohyphomycosis with tropism for the central nervous system in a reptile. In the absence of fresh tissue, the diagnosis in such cases may be assisted by molecular analysis of fixed tissue specimens. Copyright © 2009 Elsevier Ltd. All rights reserved.

PMID: 20040390 [PubMed - as supplied by publisher]

42. Dev Med Child Neurol. 2009 Dec 9. [Epub ahead of print]**Cerebral palsy and assisted reproductive technologies: a case-control study.**

Reid SM, Jaques AM, Susanto C, Breheny S, Reddihough DS, Halliday J.

Developmental Disability Research, Murdoch Childrens Research Institute, Melbourne, Victoria, Australia.

Aim: To determine whether assisted reproductive technologies (ART) were more likely to be the method of conception in singletons with cerebral palsy (CP) than in those without CP. **Method:** Singletons with CP born between 1991 and 2004 were selected from the Victorian Cerebral Palsy Register and matched for birth year to two singletons randomly selected from the Victorian Perinatal Data Collection Unit. Data from both sources were linked to records from three ART centres. Conditional logistic regression was used to assess the association between CP and aspects of conception using ART. Multivariate models were adjusted for parity, previous miscarriages, sex, gestational age, birthweight, and weight for gestational age. **Results:** We identified 1241 singletons with CP (males n=721 [58%], females n=420 [42/100]; motor type: spastic [87%; unilateral 37%; bilateral 63%], ataxic n=60 [5/100], dyskinetic n=46 [4/100], hypotonic n=29 [2/100], unknown n=25 [2/100]). Gross Motor Function Classification System levels were I n=363 [29/100], II n=297 [24/100], III n=137 [11/100], IV n=160 [13/100], V n=192 [15/100], and unknown n=92 [7/100]). Sixteen (1.3/100) of the children with CP and 25 (1.0/100) of 2482 children without CP were conceived using ART. There was no significant increase in the odds of children with CP being conceived using ART (adjusted odds ratio 1.19, 95% confidence interval (CI) 0.63, 2.24) nor in the odds of them being conceived by a subfertile couple without ART (adjusted odds ratio 2.7, 95% CI 0.87, 8.36). **Interpretation:** Singleton conception using ART is not strongly associated with an increased risk of CP.

PMID: 20015250 [PubMed - as supplied by publisher]

43. J Perinatol.. [Epub ahead of print]**Early cortisol values and long-term outcomes in extremely low birth weight infants.**

Aucott SW, Watterberg KL, Shaffer ML, Donohue PK.

Division of Neonatology, Department of Pediatrics, Johns Hopkins University School of Medicine, Baltimore, MD, USA.

Objective: Both excess and insufficient levels of glucocorticoid in extremely low birth weight (ELBW) infants have been associated with adverse hospital outcomes, whereas excess glucocorticoid exposure has been associated with long-term adverse neurodevelopment. Our objective was to evaluate the relationship between neonatal cortisol concentrations and long-term outcomes of growth and neurodevelopment. **Study Design:** As part of a multicenter randomized trial of hydrocortisone treatment for prophylaxis of relative adrenal insufficiency, cortisol concentrations were obtained at 12 to 48 h of postnatal age and at days 5 to 7 on 350 intubated ELBW infants, of whom 252 survived and returned for neurodevelopmental follow-up at 18 to 22 months corrected age. Cortisol values from each time point were divided into quartiles. Growth and neurodevelopmental outcome were compared for each quartile. **Result:** Median cortisol value was 16.0 mug per 100 ml at baseline for all infants, and 13.1 mug per 100 ml on days 5 to 7 in the placebo group. Outcomes did not differ in each quartile between treatment and placebo groups. Low cortisol values at baseline or at days 5 to 7 were not associated with impaired growth or neurodevelopment at 18 to 22 months corrected age. High cortisol values were associated with an increase in cerebral palsy, related to the increased incidence of severe intraventricular hemorrhage (IVH) and periventricular leukomalacia. **Conclusion:** Low cortisol concentrations were not predictive of adverse long-term outcomes. High cortisol concentrations, although predictive of short-term adverse outcomes such as IVH and periventricular leukomalacia, did not additionally predict adverse outcome. Further analysis into identifying factors that modulate cortisol concentrations shortly after birth could improve our ability to identify those infants who are most likely to benefit from treatment with hydrocortisone. *Journal of Perinatology* advance online publication, 10 December 2009;(2009) 0, 000-000. doi:10.1038/jp.2009.191.

PMID: 20010616 [PubMed - as supplied by publisher]

44. Dev Med Child Neurol.. [Epub ahead of print]**Apolipoprotein E genotype and cerebral palsy.**

Braga LW, Borigato EV, Speck-Martins CE, Imamura EU, Gorges AM, Izumi AP, Dantas RC, Nunes LG.

Neuropsychology Department, SARA Network of Rehabilitation Hospitals, Brasilia DF, Brazil.

Aim: Apolipoprotein E (APOE, protein; [ApoE, gene]) is a lipid transport protein abundantly present in brain cells. We investigated whether the APOE genotype is associated with cerebral palsy (CP) and whether patients with CP with comorbid conditions and more severe neurological deficits are likely to have a particular genotype. **Method:** In a cross-sectional study, 243 individuals with spastic CP (135 males, 108 females; mean age at data collection 11 year ([SD 6y 7mo], 34% with hemiplegia, 37% with diplegia, 29% with triplegia/tetraplegia; 44% with mild motor involvement), 31% with moderate motor involvement, 25% with severe motor involvement, were compared with healthy individuals matched by age, race, and sex to analyse the association between APOE genotype and the incidence of CP. Associations between the APOE genotype and the incidence of comorbidities and neurological deficits were studied in the group with CP. **Results:** The APOE epsilon2epsilon3 genotype was significantly more prevalent in the group with CP (11%) than the comparison group (5%) (odds ratio [OR] 2.8; 95% confidence interval [CI] 1.01-7.66). The presence of the epsilon2 allele raised the probability of having CP (OR 3.2; 95% CI 1.27-8.27). The presence of ApoE epsilon4 was not significantly different among groups. No relation was found between APOE genotype and severity of neurological deficit or distribution of motor involvement. Four patients with CP presented the epsilon4epsilon4 genotype, and all exhibited epilepsy and microcephaly. Eleven of 12 individuals with CP and macrocephaly carried the epsilon3epsilon3 genotype. **Interpretation** A higher prevalence of the APOE epsilon2 genotype was found among those with CP. The association of microcephaly and epilepsy with the epsilon4epsilon4 genotype and the association of macrocephaly with epsilon3 demand further investigation.

PMID: 20002130 [PubMed - as supplied by publisher]

45. Dev Med Child Neurol.. [Epub ahead of print]**Predictive value of definitely abnormal general movements in the general population.**

Bouwstra H, Dijk-Stigter GR, Grooten HM, Janssen-Plas FE, Koopmans AJ, Mulder CD, van Belle A, Hadders-Algra M.

Beatrix Children's Hospital - Developmental Neurology, University Medical Centre Groningen, Groningen, the Netherlands.

Aim: Definitely abnormal general movements in populations of high-risk infants predict serious neurodevelopmental impairment. This study aimed to assess predictive values of definitely abnormal general movements at 3 months for serious neurodevelopmental impairment in a representative sample of the general population. **Method:** A prospective cohort study of 455 3-month-old infants was performed (241 females, 214 males; mean birthweight 3452g, SD 604g; mean gestational age 39.4wks, SD 1.96; n=32 born preterm). At enrolment, general movement quality was assessed by means of video recording. At 4 years, all participants were reassessed by well-baby health clinicians; if serious neurodevelopmental impairment was identified, clinical records were reviewed. Predictive values of definitely abnormal general movement quality for major neurodevelopmental impairment were calculated. **Results:** Five children were diagnosed as having a major neurodevelopmental disorder with serious implications for daily life, including three children with cerebral palsy (CP). Three out of the five had shown definitely abnormal general movements; they had lesions involving the periventricular white matter. Two children did not show definitely abnormal general movements; one had unilateral spastic CP due to a cortical lesion and the other had ataxia due to cerebellar atrophy. The positive predictive value of definitely abnormal general movements for major neurodevelopmental impairment was 18/100, and for CP it was 12/100. Negative predictive values approached 100%. **Interpretation:** The good predictive value of general movement assessment in high-risk populations cannot be generalized to the general population.

PMID: 20002118 [PubMed - as supplied by publisher]

46. Dev Med Child Neurol.. [Epub ahead of print]**Prevalence of motor-skill impairment in preterm children who do not develop cerebral palsy: a systematic review.**

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Aim: Motor skill impairment is a common negative outcome in children born preterm who do not develop cerebral palsy (CP). This study aimed to conduct a systematic review of current data to provide an accurate estimate of the prevalence of non-CP motor impairment in preterm children at school age. **Method:** We searched the Medline, PubMed, and PsycInfo databases and relevant journals to identify all studies published post-1990 that reported the prevalence of motor impairment in school-aged children born preterm (<37wks' gestation) using standardised motor assessment batteries. We applied a range of exclusionary criteria, with 11 studies included in the final analyses. We identified two levels of motor impairment commonly reported - mild-moderate and moderate - and conducted a random effects meta-analysis to produce a prevalence estimate for each. **Results:** The pooled estimate for mild-moderate impairment in preterm children was 40.5/100. and for moderate motor impairment the estimate was 19.0/100. There was also a trend for lower motor impairment levels in samples born before 1990 compared with those born after 1990. **Interpretation** Children born preterm are at increased risk of motor impairment, with prevalence three to four times greater than in the general population. This highlights the need for improved surveillance and intervention strategies in this group of children.

47. Neuropediatrics. 2009 Aug;40(3):112-119. Epub 2009 Dec 17.**Outcome of Extremely Premature Infants at Early School Age: Health-Related Quality of Life and Neurosensory, Cognitive, and Behavioral Outcomes in a Population-Based Sample in Northern Germany.**

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PURPOSE: The study aimed at collecting regional data to support and establish evidence-based decision-making. **METHODS:** We investigated a cohort of 154 preterm infants with gestational age <27+0 weeks born between 1997 and 1999 in a defined region of Northern Germany regarding neurosensory and cognitive outcomes, overall disability status, behavioral problems, and health-related quality of life at the age of seven to nine years (mean: eight years, SD seven months). **RESULTS:** 92 (60%) infants survived, 75 of these 92 (82%) were followed-up. Rates of disability were high: only 27 (36%) showed 'no dysfunction' of neurosensory status, 33 (44%) 'mild dysfunction', 5 (7%) 'moderate dysfunction' and 10 (13%) 'severe dysfunction', including 8 (11%) with non-ambulatory cerebral palsy. 19 (26%) were mentally retarded. Parents reported behavioral problems in 21 (28%), health-related quality of life was lower in preterm infants compared to a representative normal sample. In multivariate analyses IVH III-IV/ PVL was an independent risk factor for adverse outcomes. Behavior problems were predicted by low IQ and lower educational level of the mother. **CONCLUSIONS:** Overall our results confirm high levels of mortality and morbidity in extremely immature infants. Regional data should include mortality, morbidity and health-related quality of life to adequately inform parents about the prognosis. © Georg Thieme Verlag KG Stuttgart · New York.

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48. Cerebrovasc Dis. 2009;28(4):341-8. Epub 2009 Jul 24.**Recovery after ischemic stroke: criteria for good outcome by level of disability at day 7.**

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BACKGROUND: Ischemic stroke is a leading cause of morbidity. Assessing the chances of recovery is critical to optimize poststroke care. **METHODS:** We used a cohort of patients from the Virtual International Stroke Trial Archive that participated in acute stroke trials (control arm) and were followed for 90 days. The cohort was grouped by day 7 (D7) modified Rankin scale (mRS) scores. Variables that were associated with good outcome (mRS 0-2 at 90 days) in the univariate analysis were entered into a logistic regression model to determine the independent good outcome criteria for each D7 mRS tier. **RESULTS:** We analyzed 1,798 patients. The independent good outcome criteria identified for different mRS tiers were: D7 mRS of 3: age < or =70, 0-2 vascular risk factors, D7 NIH Stroke Scale (NIHSS) arm strength < or =1, D7 NIHSS language score = 0; D7 mRS of 4: age < or =70, male, D7 NIHSS facial palsy < or =1, D7 NIHSS visual = 0, D7 NIHSS leg strength < or =1, D7 NIHSS dysarthria = 0; D7 mRS of 5: age < or =70, IV tPA treatment, D7 NIHSS dysarthria = 0, D7 NIHSS leg strength < or =2. For each mRS tier, we observed a graded increase in the percentage of the primary and secondary end points with increase in the number of criteria. **CONCLUSIONS:** We identified clinical variables that predict good outcome, are specific to each day 7 mRS tier, and enable easy and informative assessment of the patient's likelihood of achieving varying degrees of recovery at day 90. These results may be useful in both clinical practice and research but require validation in an independent patient cohort. Copyright 2009 S. Karger AG, Basel.

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