

Monday 14 March 2011

This free weekly bulletin lists the latest research on cerebral palsy (CP), as indexed in the NCBI, PubMed (Medline) and Entrez (GenBank) databases. These articles were identified by a search using the key term "cerebral palsy".

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Interventions

1. Am J Intellect Dev Disabil. 2011 Jan;116(1):36-47.

Secondary conditions in people with developmental disability.

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The authors investigated secondary conditions in people with developmental disabilities in terms of (a) the average number of conditions experienced and overall health and independence, (b) their degree and nature, and (c) gender differences. Information was obtained by a questionnaire completed by the caregivers for 659 people with developmental disabilities. Participants experienced an average of 11.3 secondary conditions. Secondary conditions causing significant limitations were reading difficulties, communication, physical fitness-conditioning, personal hygiene-appearance, weight, dental and oral hygiene, and memory problems. Some gender differences emerged in overall health scores and limitations due to secondary conditions.

PMID: 21291309 [PubMed - indexed for MEDLINE]

2. Augment Altern Commun. 2010 Dec;26(4):230-41.

An activity systemic approach to augmentative and alternative communication.

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The purpose of this paper is to discuss and highlight how Cultural-Historical Activity Theory (CHAT) can contribute to the understanding of the different factors at play when a person is using augmentative and alternative communication (AAC). It is based on data from a 3-year project concerning activity-based vocabulary design of voice output communication aids (VOCAs). Four persons who used AAC and their assistants were interviewed about shopping activities and their views about a vocabulary that included pre-stored phrases. A CHAT model, the Activity Diamond, was applied in an analysis of the data. The result was a multiplicity of human, artifactual, and natural factors, in which six themes were identified: Attitude/Preference, Expectation/Trust, Goal/Power, Place/Space, Time/Learning, and Usability/Accessibility. The themes are exemplified and discussed in relation to AAC.

PMID: 21091301 [PubMed - indexed for MEDLINE]

3. BMC Neurol. 2011 Mar 9;11(1):32. [Epub ahead of print]

Individualized, home-based interactive training of cerebral palsy children delivered through the Internet.

Bilde PE, Kliim-Due M, Rasmussen B, Petersen LZ, Petersen TH, Nielsen JB.

Background: The available health resources limit the amount of therapy that may be offered to children with cerebral palsy and the amount of training in each session may be insufficient to drive the neuroplastic changes which are necessary for functional improvements to take place. The aim of this pilot study was to provide proof of concept that individualized and supervised interactive home-based training delivered through the internet may provide an efficient way of maintaining intensive training of children with cerebral palsy over prolonged periods. **Methods:** 9 children (aged 9-13 years) with cerebral palsy were included in the study. Motor, perceptual and cognitive abilities were evaluated before and after 20 weeks of home-based training delivered through the internet. **Results:** The children and their families reported great enthusiasm with the training system and all experienced subjective improvements in motor abilities and self-esteem. The children on average trained for 68 hours during a 20 week period equalling just over 30 minutes per day. Significant improvements in functional muscle strength measured as the frontal and lateral step-up and sit-to-stand tests were observed. Assessment of Motor and processing skills also showed significant increases. Endurance measured as the Bruce test showed a significant improvement, whereas there was no significant change in the 6 min walking test. Balance (Romberg) was unchanged. Visual perceptual abilities increased significantly. **Conclusions:** We conclude that it is feasible to deliver interactive training of children with cerebral palsy at home through the internet and thereby ensure more intensive and longer lasting training than what is normally offered to this group.

PMID: 21392370 [PubMed - as supplied by publisher]

4. Child Care Health Dev. 2011 Mar 11. doi: 10.1111/j.1365-2214.2011.01214.x. [Epub ahead of print]

A single case study of a family-centred intervention with a young girl with cerebral palsy who is a multimodal communicator.

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Background: This paper describes the impact of a family-centred intervention that used video to enhance communication in a young girl with cerebral palsy. This single case study describes how the video-based intervention worked in the context of multimodal communication, which included high-tech augmentative and alternative communication (AAC) device use. This paper includes the family's perspective of the video intervention and they describe the impact of it on their family. **Methods:** This single case study was based on the premise that the video interaction guidance intervention would increase attentiveness between participants during communication. It tests a hypothesis that eye gaze is a fundamental prerequisite for all communicative initiatives, regardless of modality in the child. Multimodality is described as the range of communicative behaviours used by the child and these are coded as AAC communication, vocalizations (intelligible and unintelligible), sign communication, nodding and pointing. Change was analysed over time with multiple testing both pre and post intervention. Data were analysed within INTERACT, a computer software to analyse behaviourally observed data. Behaviours were analysed for frequency and duration, contingency and co-occurrence. **Results:** Results indicated increased duration of mother's and girl's eye gaze, increased frequency and duration in AAC communication by the girl and significant change in frequency [$\chi^2(5, n = 1) = 13.25, P < 0.05$] and duration [$\chi^2(5, n = 1) = 12.57, P < 0.05$] of the girl's multimodal communicative behaviours. Contingency and co-occurrence analysis indicated that mother's eye gaze followed by AAC communication was the most prominent change between the pre- and post-intervention assessments. **Conclusions:** There was a trend for increased eye gaze in both mum and girl and AAC communication in the girl following the video intervention. The family's perspective concurs with the results.

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PMID: 21392057 [PubMed - as supplied by publisher]

5. Child Care Health Dev. 2011 Mar 11. doi: 10.1111/j.1365-2214.2011.01212.x. [Epub ahead of print]**Systematic review of the efficacy of parenting interventions for children with cerebral palsy.**

Whittingham K, Wee D, Boyd R.

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This systematic review aims to evaluate the efficacy of parenting interventions (i.e. behavioural family intervention and parent training) with parents of children with cerebral palsy (CP) on child behavioural outcomes and parenting style/skill outcomes. The following databases were searched: Medline (1950-April 2010), PubMed (1951-April 2010), PsycINFO (1840-April 2010), CINAHL (1982-April 2010) and Web of Science (1900-April 2010). No randomized clinical trials of parenting interventions with parents of children with CP were identified. Three studies were identified that involved the examination of a targeted parenting intervention via a pre-post design. Interventions utilized included the implementation of parenting interventions in conjunction with behavioural intervention and oral motor exercises for children with CP and feeding difficulties, the Hanen It Takes Two to Talk programme and a Functional Communication Training programme for parents. All studies found changes in relevant child behavioural outcomes. The studies reviewed suggest that parenting interventions may be an effective intervention for parents of children with CP. However, the current research is limited to pre-post designs of targeted parenting interventions (e.g. parenting interventions focused upon communication). A randomized controlled trial of parenting interventions for families of children with CP is urgently needed to address this paucity in the literature and provide families of children with CP with an evidence-based intervention to address child behavioural and emotional problems as well as parenting challenges.

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PMID: 21392055 [PubMed - as supplied by publisher]

6. Child Care Health Dev. 2011 Mar 11. doi: 10.1111/j.1365-2214.2011.01211.x. [Epub ahead of print]**Professional background and the comprehension of family-centredness of rehabilitation for children with cerebral palsy.**

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Arcada, University of Applied Sciences, Helsinki, Finland The Social Insurance Institution, Helsinki, Finland Department of Women's and Children's Health, Karolinska Institutet, and Neuropediatric Research Unit, Astrid Lindgren Children's Hospital, Stockholm, Sweden.

Background: Children with cerebral palsy have difficulties in several areas of functioning, and they need long-lasting rehabilitation with a clear focus on the individual's needs. Finnish guidelines emphasize family-centred service. The values of family-centred service are widely known, but how the principles of family-centred service are adopted in clinical practice is not well documented. The objective of this study was to analyse the family-centred behaviour of professionals working with children and adolescents with cerebral palsy. **Methods:** A translated version of the Measure of Processes of Care for Service Providers (MPOC-SP) questionnaire was used to evaluate the family-centred service. The questionnaire was sent to all the professionals in the multidisciplinary rehabilitation teams at all the hospitals and governmental special schools treating children and adolescents with cerebral palsy in Finland (n= 327). Furthermore, 438 physiotherapy service providers working in the children's home region were invited to participate. **Results:** A total of 201 multidisciplinary team members and 311 physiotherapy service providers completed the questionnaire. Both the team members and the service providers generally rated their family-centred behaviour positively. There was statistically significant difference in how the team members in the multidisciplinary teams self-assessed their family-centred service. Physiotherapists working in multidisciplinary teams rated their family-centred service higher than physiotherapy service providers. The professional's apprehension of family-centred service increased with work experience. **Conclusions:** Professional background and professional context seem to affect the apprehension of family-centred service. Also work experience and being part of a multidisciplinary team have an influence on how the professionals embrace the family-centred service delivered. The MPOC-SP can be used to identify areas for improvement.

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PMID: 21392054 [PubMed - as supplied by publisher]

7. Conf Proc IEEE Eng Med Biol Soc. 2010;2010:4347-50.

Reconstructing grasping motions from high-frequency local field potentials in primary motor cortex.

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Recent developments in neural interface systems hold the promise to restore movement in people with paralysis. In search of neural signals for control of neural interface systems, previous studies have investigated primarily single and multiunit activity, as well as low frequency local field potentials (LFPs). In this paper, we investigate the information content about grasping motion of a broad band high frequency LFP (200 Hz - 400 Hz) by classifying discrete grasp aperture states and decoding continuous aperture trajectories. LFPs were recorded via 96-microelectrode arrays in the primary motor cortex (M1) of two monkeys performing free 3-D reaching and grasping towards moving objects. Our results indicate that broad band high frequency LFPs could serve as useful signals for restoring a motor function such as grasp control.

PMID: 21096002 [PubMed - indexed for MEDLINE]PMCID: PMC3048029

8. J Child Neurol. 2011 Mar;26(3):389-93.

Maintained hand function and forearm bone health 14 months after an in-home virtual-reality videogame hand telerehabilitation intervention in an adolescent with hemiplegic cerebral palsy.

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Virtual reality videogames can be used to motivate rehabilitation, and telerehabilitation can be used to improve access to rehabilitation. These uses of technology to improve health outcomes are a burgeoning area of rehabilitation research. So far, there is a lack of reports of long-term outcomes of these types of interventions. The authors report a 15-year-old boy with hemiplegic cerebral palsy and epilepsy because of presumed perinatal stroke who improved his plegic hand function and increased his plegic forearm bone health during a 14-month virtual reality videogame hand telerehabilitation intervention. A total of 14 months after the intervention ended, repeat evaluation demonstrated maintenance of both increased hand function and forearm bone health. The implications of this work for the future of rehabilitation in children with neurological disabilities are discussed in this article.

PMID: 21383228 [PubMed - in process]

9. Pediatr Phys Ther. 2010 Winter;22(4):361-77.

Effectiveness of treadmill training in children with motor impairments: an overview of systematic reviews.

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PURPOSE: The purpose of this review was to synthesize current evidence from systematic reviews on the effectiveness of treadmill training (TT), including partial body-weight support (PBWS) TT (PBWSTT), TT only, robotic-assist PBWSTT, and mixed TT, in children with motor impairments. **METHODS:** Systematic literature searches

were conducted in 10 databases through May 2010. Two reviewers independently selected titles, s ($k = 0.78$), and full-text articles ($k = 1.0$). Of the 1166 titles retrieved, 5 studies met the inclusion criteria. Quality of included studies was assessed using AMSTAR criteria. RESULTS: Results of each systematic review were tabulated on the basis of levels of evidence, with outcomes categorized according to the International Classification of Functioning, Disability, and Health framework. Conflicting interpretations of outcomes were found between reviews, yet conclusions were similar. CONCLUSIONS: TT demonstrates encouraging results, but more rigorous research is needed before clinicians can be confident of its effectiveness and clinical guidelines can be developed.

PMID: 21068636 [PubMed - indexed for MEDLINE]

Epidemiology / Aetiology / Diagnosis & Early Treatment

10. Am J Obstet Gynecol. 2011 Mar;204(3):202.e1-4.

Magnesium for fetal neuroprotection.

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Available evidence now suggests that magnesium sulfate administered to mothers prior to early preterm delivery reduces the risk of cerebral palsy in surviving neonates. The American College of Obstetricians and Gynecologists along with the Society for Maternal-Fetal Medicine state that physicians who choose to administer magnesium sulfate for neuroprotection should do so in accordance with one of the larger randomized trials. Due to the heterogeneity of the methods, many clinicians may find it difficult to proceed with a therapeutic protocol that adheres to the available literature. Here, we present one reasonable approach that identifies the specific patients who qualify for magnesium sulfate therapy, and it outlines a treatment algorithm while addressing retreatment and concomitant tocolysis.

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PMID: 21376159 [PubMed - in process]

11. Biol Psychiatry. 2011 Mar 4. [Epub ahead of print]

Early, Time-Dependent Disturbances of Hippocampal Synaptic Transmission and Plasticity After In Utero Immune Challenge.

Escobar M, Crouzin N, Cavalier M, Quentin J, Roussel J, Lanté F, Batista-Novais AR, Cohen-Solal C, De Jesus Ferreira MC, Guiramand J, Barbanel G, Vignes M.

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BACKGROUND: Maternal infection during pregnancy is a recognized risk factor for the occurrence of a broad spectrum of psychiatric and neurologic disorders, including schizophrenia, autism, and cerebral palsy. Prenatal exposure of rats to lipopolysaccharide (LPS) leads to impaired learning and psychotic-like behavior in mature offspring, together with an enduring modification of glutamatergic excitatory synaptic transmission. The question that arises is whether any alterations of excitatory transmission and plasticity occurred at early developmental stages after in utero LPS exposure. METHODS: Electrophysiological experiments were carried out on the CA1 area of hippocampal slices from prenatally LPS-exposed male offspring from 4 to 190 days old to study the developmental profiles of long-term depression (LTD) triggered by delivering 900 shocks either single- or paired-pulse (50-msec interval) at 1 Hz and the N-methyl-D-aspartate receptor (NMDAr) contribution to synaptic transmission. RESULTS: The age-dependent drop of LTD is accelerated in prenatally LPS-exposed animals, and LTD is transiently converted into a slow-onset long-term potentiation between 16 and 25 days old. This long-term potentiation depends on Group I metabotropic glutamate receptors and protein kinase A activations and is independent of NMDAr. Maternal LPS challenge also leads to a rapid developmental impairment of synaptic NMDAr. This was associated with a concomitant reduced expression of GluN1, without any detectable alteration in the developmental switch of NMDAr GluN2 sub-

units. **CONCLUSIONS:** Aberrant forms of synaptic plasticity can be detected at early developmental stages after prenatal LPS challenge concomitant with a clear hypo-functioning of the NMDAR in the hippocampus. This might result in later-occurring brain dysfunctions.

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12. Brain. 2011 Mar 7. [Epub ahead of print]

Motor pathway injury in patients with periventricular leucomalacia and spastic diplegia.

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Periventricular leucomalacia has long been investigated as a leading cause of motor and cognitive dysfunction in patients with spastic diplegic cerebral palsy. However, patients with periventricular leucomalacia on conventional magnetic resonance imaging do not always have motor dysfunction and preterm children without neurological abnormalities may have periventricular leucomalacia. In addition, it is uncertain whether descending motor tract or overlying cortical injury is related to motor impairment. To investigate the relationship between motor pathway injury and motor impairment, we conducted voxelwise correlation analysis using tract-based spatial statistics of white matter diffusion anisotropy and voxel-based-morphometry of grey matter injury in patients with periventricular leucomalacia and spastic diplegia ($n = 43$, mean 12.86 ± 4.79 years, median 12 years). We also evaluated motor cortical and thalamocortical connectivity at resting state in 11 patients using functional magnetic resonance imaging. The functional connectivity results of patients with spastic diplegic cerebral palsy were compared with those of age-matched normal controls. Since γ -aminobutyric acid(A) receptors play an important role in the remodelling process, we measured neuronal γ -aminobutyric acid(A) receptor binding potential with dynamic positron emission tomography scans ($n = 27$) and compared the binding potential map of the patient group with controls ($n = 20$). In the current study, white matter volume reduction did not show significant correlation with motor dysfunction. Although fractional anisotropy within most of the major white matter tracts were significantly lower than that of age-matched healthy controls ($P < 0.05$, family wise error corrected), fractional anisotropy mainly within the bilateral corticospinal tracts and posterior body and isthmus of the corpus callosum showed more significant correlation with motor dysfunction ($P < 0.03$) than thalamocortical pathways ($P < 0.05$, family-wise error corrected). Cortical volume of the pre- and post-central gyri and the paracentral lobule tended to be negatively correlated with motor function. The motor cortical connectivity was diminished mainly within the bilateral somatosensory cortex, paracentral lobule, cingulate motor area and visual cortex in the patient group. Thalamovisual connectivity was not diminished despite severe optic radiation injury. γ -aminobutyric acid(A) receptor binding potential was focally increased within the lower extremity homunculus, cingulate cortex, visual cortex and cerebellum in the patient group ($P < 0.05$, false discovery rate corrected). In conclusion, descending motor tract injury along with overlying cortical volume reduction and reduced functional connectivity appears to be a leading pathophysiological mechanism of motor dysfunction in patients with periventricular leucomalacia. Increased regional γ -aminobutyric acid(A) receptor binding potential appears to result from a compensatory plasticity response after prenatal brain injury.

PMID: 21385750 [PubMed - as supplied by publisher]

13. Int J Dev Neurosci. 2011 Mar 4. [Epub ahead of print]

Mild musculoskeletal and locomotor alterations in adult rats with white matter injury following prenatal ischemia.

Delcour M, Russier M, Xin D, Massicotte VS, Barbe MF, Coq JO.

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Early brain injury including white matter damage (WMD) appears strongly correlated to perinatal hypoxia-ischemia

and adverse neurological outcomes in preterm survivors. Indeed, WMD has been widely associated with subtle to major motor disturbances, sensory, behavioral and cognitive impairments in preterm infants who afterward develop cerebral palsy (CP). Prenatal ischemia (PI) has been shown to reproduce the main features of WMD observed in preterm infants. The present study was aimed at determining in adult rats the impact of PI on brain axons, musculoskeletal histology and locomotor activity. PI was induced by unilateral intra-uterine artery ligation at E17 in pregnant rats. We found axonal degeneration and reactive astrogliosis in several white matter regions of adult PI rats. We found mild myopathic and secondary joint changes, including increased variability in myofiber size in several hindlimb muscles, decreased myofibers numbers but increased Pax 7 cells and myofiber size in the gastrocnemius, and mild knee and ankle chondromalacia. Although treadmill locomotion appeared normal, several kinematic parameters, such as stride length, amplitude, velocity and leg joint angles were altered in adult PI rats compared to shams. Using intra- and inter-group variability of kinematic parameters, PI seemed to impair the maturation of locomotion on the treadmill. In addition, PI rats exhibited spontaneous hyperactivity in open-field test. Musculoskeletal changes appeared concomitant with mild impairments in gait and posture. Our rodent model of WMD based on PI reproduces the mild motor deficits and musculoskeletal changes observed in many preterm infants with a perinatal history of hypoxia-ischemia, and contributes towards a better understanding of the interplay between brain injury, musculoskeletal histopathology and gait disturbances encountered subsequently.

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PMID: 21382470 [PubMed - as supplied by publisher]

14. *Int J Dev Neurosci.* 2011 Mar 4. [Epub ahead of print]

Intrauterine inflammation, insufficient to induce parturition, still evokes fetal and neonatal brain injury.

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Exposure to prenatal inflammation is a known risk factor for long term neurobehavioral disorders including cerebral palsy, schizophrenia, and autism. Models of systemic inflammation during pregnancy have demonstrated an association with an immune response and adverse neurobehavioral outcomes for the exposed fetus. Yet, the most common route for an inflammatory exposure to a fetus is from intrauterine inflammation as occurs with chorioamnionitis. The aims of this study were to assess the effect of intrauterine inflammation on fetal and neonatal brain development and to determine if the gestational age of exposure altered the maternal or fetal response to inflammation. CD-1 timed pregnant mice on embryonic day 15 (E15) and E18.5 were utilized for this study. Dams were randomized to receive intrauterine infusion of lipopolysaccharide (LPS, 50 micrograms/dam) or normal saline. Different experimental groups were used to assess both acute and long-term outcomes. For each gestational age and each treatment group, fetal brains, amniotic fluid, maternal serum and placentas were collected 6 hours after intrauterine infusion. Rates of preterm birth, maternal morbidity and litter size were assessed. IL6 levels were assayed in maternal serum and amniotic fluid. An immune response was determined in the fetal brains and placentas by QPCR. Cortical cultures were performed to assess for fetal neuronal injury. Gene expression changes in postnatal day 7 brains from exposed and unexposed pups was determined. In the preterm period, low dose LPS resulted in a 30% preterm birth rate. Litter sizes were not different between the groups at either gestational age. IL6 levels were not significantly increased in maternal serum at either gestational time period. Low dose LPS increased IL6 levels in the amniotic fluid from exposed dams in the term but not preterm period. Regardless of gestational age of exposure, low dose intrauterine LPS activated an immune response in the placenta and fetal brain. Exposure to intrauterine LPS significantly decreased dendritic counts in cortical cultures from both the preterm and term period. Exposure to intrauterine inflammation altered gene expression patterns in the postnatal brain; this effect was dependent on gestational age of exposure. In conclusion, intrauterine inflammation, even in the absence of preterm parturition, can evoke fetal brain injury as evidenced by alterations in cytokine expression and neuronal injury. Despite an absent or limited maternal immune response in low dose intrauterine inflammation, the immune system in the placenta is activated which is likely sufficient to induce a fetal immune response and subsequent brain injury. Changes in the fetal brain lead to changes in gene expression patterns into the neonatal period. Subclinical intrauterine inflammation can lead to fetal brain injury and is likely to be mechanistically associated with long term adverse outcomes for exposed offspring.

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15. Pediatrics. 2011 Mar 7. [Epub ahead of print]

Neurologic Outcomes at School Age in Very Preterm Infants Born With Severe or Mild Growth Restriction.

Guellec I, Lapillonne A, Renolleau S, Charlaluk ML, Roze JC, Marret S, Vieux R, Monique K, Ancel PY; the EPI-PAGE Study Group.

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Objective: To determine whether mild and severe growth restriction at birth among preterm infants is associated with neonatal mortality and cerebral palsy and cognitive performance at 5 years of age and school performance at 8 years of age. **Methods:** All 2846 live births between 24 and 32 weeks' gestation from 9 regions in France in 1997 were included in a prospective observational study (the EPIPAGE [Étude Epidémiologique sur les Petits Ages Gestationnels] study) and followed until 8 years of age. Infants were classified as "small-for-gestational-age" (SGA) if their birth weight for gestational age was at the <10th centile, "mildly-small-for-gestational-age" (M-SGA) if birth weight was at the ≥10th centile and <20th centile, and "appropriate-for-gestational-age" (AGA) if birth weight was at the ≥20th centile. **Results:** Among the children born between 24 and 28 weeks' gestation, the mortality rate increased from 30% in the AGA group to 42% in the M-SGA group and to 62% in the SGA group ($P < .01$). Birth weight was not significantly associated with any cognitive, behavioral, or motor outcomes at the age of 5 or any school performance outcomes at 8 years. For the children born between 29 and 32 weeks' gestation, SGA children had a higher risk for mortality (adjusted odds ratio [aOR]: 2.79 [95% confidence interval (CI): 1.50-5.20]), minor cognitive difficulties (aOR: 1.73 [95% CI: 1.12-2.69]), inattention-hyperactivity symptoms (aOR: 1.78 [95% CI: 1.10-2.89]), and school difficulties (aOR: 1.74 [1.07-2.82]) compared with AGA children. Being born M-SGA was associated with an increased risk for minor cognitive difficulties (aOR: 1.87 [95% CI: 1.24-2.82]) and behavioral difficulties (aOR: 1.66 [95% CI: 1.04-2.62]). **Conclusions:** In preterm children, growth restriction was associated with mortality, cognitive and behavioral outcomes, as well as school difficulties.

PMID: 21382951 [PubMed - as supplied by publisher]

16. Phys Occup Ther Pediatr. 2011 Mar 11. [Epub ahead of print]

The Evolving Practice of Developmental Care in the Neonatal Unit: A Systematic Review.

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Many neonatal intensive care units (NICUs) are experiencing changes in their approaches to preterm infant care as they consider and incorporate the philosophy of individualized developmental care. The aim of this systematic review is to research current literature documenting the short-term effects of developmental care and the Newborn Individualized Developmental Care and Assessment Program (NIDCAP). The following databases were reviewed: PubMed, CINAHL, and PsychINFO by using the keywords developmental care, individualized care, preterm infant, early intervention, and NIDCAP. Fifty-four articles were found with a total of 15 matching the selection criteria. All 15 articles were assessed using a research design developed by the American Academy for Cerebral Palsy and Developmental Medicine (AAPDM). Twelve of the 15 articles contained strong Levels of Evidence (I or II). Our findings suggest evidence supporting developmental care and NIDCAP, however, further research documenting outcomes for preterm infants receiving developmental care and/or NIDCAP is needed.

PMID: 21391836 [PubMed - as supplied by publisher]

17. Zhongguo Yi Xue Ke Xue Yuan Xue Bao. 2011 Feb 10;33(1):14-17.

Clinical Analysis of Misdiagnosis in 70 Children with Primary Hypothyroidism.

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Objective: To analyze the causes of misdiagnosis of primary hypothyroidism (PH), with an attempt to reduce the misdiagnosis or mistreatment. **Methods:** Totally 70 PH children with a history of misdiagnosis but whose conditions were confirmed in Peking Union Medical College Hospital and the First Hospital of Jilin University from July 2000 to May 2009 were enrolled in this study. The clinical data were collected and the causes of misdiagnoses were analyzed. **Results** Of these 70 patients, 19 were misdiagnosed as anaemia and dystrophy, 18 as pituitary tumors, 10 as adiposities, 6 as myocarditis or pericardial effusion, 4 as Downs syndrome, 3 as hepatitis, 3 as amyasthenia, 3 as cerebral palsy, 2 as cystis thyrolingualis, and 2 as congenital megacolon. The duration of misdiagnoses ranged from 6 to 72 months. The clinical manifestations of these patients were complicated, involving multiple organs and systems. **Conclusions** PH has complicated clinical manifestations and individual variations, and therefore can be easily misdiagnosed. Good knowledge, sufficient history-taking, and cautious physical examinations can help avoid misdiagnosis. Neonatal screening is helpful for diagnosis and treatment of congenital hypothyroidism.

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