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Interventions and Management

1. J Pediatr Orthop. 2014 Jun 10. [Epub ahead of print]

Classifying Cerebral Palsy: Are We Nearly There?

Mandaleson A1, Lee Y, Kerr C, Graham HK.

BACKGROUND: Cerebral palsy (CP) is the most common cause of physical disability in childhood in developed countries and encompasses a wide range of clinical phenotypes. Classification of CP according to movement disorder or topographical distribution is widely used. However, these classifications are not reliable nor do they accurately predict musculoskeletal pathology. More recently, the Gross Motor Function Classification System (GMFCS) has been introduced and its validity, reliability, and clinical utility have been confirmed. In 2005 it was suggested that children should be described and classified according to the GMFCS in all outcome studies involving children with CP, in the Journal of Pediatric Orthopaedics (JPO). This study aimed to describe utilization of the GMFCS in 3 journals: Journal of Bone and Joint Surgery (JBJS Am), JPO, and Developmental Medicine and Child Neurology (DMCN), over a 7-year period (2005 to 2011), and any relationship to the journal's impact factor. A secondary aim was to establish if differences in methodological quality existed between those studies utilizing GMFCS and those that did not. **METHODS:** A targeted literature search of the 3 selected journals using the term "cerebral palsy" was conducted using the Medline database. Utilization of the GMFCS was assessed using report of these data in the methods or results section of the retrieved papers. The Methodological Index for Non-Randomized Studies (MINORS) was employed to evaluate the quality of papers published in JPO. **RESULTS:** One hundred and fifty-four studies met the inclusion criteria and in 85 (68%) the GMFCS was used. Of these, 112 were published in JPO, of which 51 (46%) utilized the GMFCS, compared with 72% for JBJS Am, and 88% for DMCN. In the JPO, utilization of the GMFCS improved from 13% to 80%, over the 7-year study period. **CONCLUSIONS:** Utilization of the GMFCS has increased rapidly over the past 7 years in the JPO but there is room for further improvement.

LEVEL OF EVIDENCE: Not applicable.

[PMID: 24919134](https://pubmed.ncbi.nlm.nih.gov/24919134/) [PubMed - as supplied by publisher]

2. Dev Med Child Neurol. 2014 Jun 12. doi: 10.1111/dmcn.12505. [Epub ahead of print]

Meaningfulness of mean group results for determining the optimal motor rehabilitation program for an individual child with cerebral palsy.

Damiano DL.

As research on the efficacy or effectiveness of interventions to improve motor functioning in cerebral palsy (CP) has accumulated and been incorporated into systematic reviews, the foundation for evidence-based practice in CP is growing. To determine whether an intervention is effective, clinical trials report mean group differences. However, even if a statistically significant mean group effect is found, this does not imply that this intervention was effective for each study participant or ensure positive outcomes for all with CP. A personalized approach to medical care is currently being advocated based primarily on increasingly recognized genetic variations in individual responses to medications and other therapies. A similar approach is also warranted, and perhaps more justifiable, in CP which includes a heterogeneous group of disorders. Even interventions deemed highly effective in CP demonstrate a range of individual responses along a continuum from a negative or negligible response to a strong positive effect, the bases for which remain incompletely understood. This narrative review recommends that the next critical step in advancing evidence-based practice is to implement research strategies to identify patient factors that predict treatment responses so we can not only answer the question 'what works', but also 'what works best, for whom'.

Published 2014. This article is a U.S. Government work and is in the public domain in the USA.

[PMID: 24919877](#) [PubMed - as supplied by publisher]

3. J Phys Ther Sci. 2014 May;26(5):737-40. doi: 10.1589/jpts.26.737. Epub 2014 May 29.

Kinetic Relationships between the Hip and Ankle Joints during Gait in Children with Cerebral Palsy: A Pilot Study.

Ishihara M1, Higuchi Y2.

Purpose: The purpose of this study was to evaluate kinetic relationships between the ankle and hip joints during gait, in the late stance, in children with spastic cerebral palsy (CP). **[Subjects]** The subjects were 3 ambulant children with spastic hemiplegic CP (aged 10, 13, and 14: CP group) and 3 typically developing children with the same ages (control). **[Methods]** A three-dimensional gait analysis including force data was performed to compare the peak moment, power, and ankle/hip power ratio between the hemiplegic (uninvolved and hemiplegic) and the control groups. In the statistical analysis, mean values from 5 gait cycles for each of 3 conditions (uninvolved, hemiplegic and control) were used. The three conditions were compared by performing a Kruskal-Wallis test and Steel-Dwass multiple comparisons. **[Results]** The peak moments of ankle plantar flexors in the 10-year-old case, were significantly lower on the uninvolved and hemiplegic sides compared with the control group, respectively. The peak flexion moments of the hip on the hemiplegic side were significantly higher compared with the control in the 14- and 13-year-old cases. The peak of ankle power generation (A2) in the 13- and 10-year-old cases were significantly lower on the uninvolved and hemiplegic sides, respectively, compared with the control. The peaks of hip flexor power generation (H3) in the 14- and 13-year-old cases were significantly higher on the uninvolved and hemiplegic sides, respectively. The A2/H3 ratios were significantly lower on the uninvolved and hemiplegic sides compared with the control, and the ratio for the hemiplegic side was lower than that for the uninvolved side. **[Conclusion]** This study shows that propulsion of walking is generated by hip, rather than the ankle, on both the hemiplegic and involved sides.

[PMID: 24926141](#) [PubMed]

4. Arch Phys Med Rehabil. 2014 Jun 4. pii: S0003-9993(14)00409-2. doi: 10.1016/j.apmr.2014.05.014. [Epub ahead of print]

Noninvasive And Painless Magnetic Stimulation Of Nerves Improved Brain Motor Function And Mobility In A Cerebral Palsy Case.

Flamand VH1, Schneider C2.

Motor deficits in cerebral palsy disturb functional independence. This study tested whether noninvasive and painless repetitive peripheral magnetic stimulation could improve motor function in a 7-year-old boy with spastic hemiparetic cerebral palsy. Stimulation was applied over different nerves of the lower limbs for five sessions. We measured the concurrent after-effects of this intervention on ankle motor control, gait (walking velocity, stride length, cadence, cycle duration) and function of brain motor pathways. We observed a decrease of ankle plantar flexors resistance to stretch and an increase of active dorsiflexion range of movement along with improvements of corticospinal control of ankle dorsiflexors. Joint mobility changes were still present 15 days after the end of stimulation, when all gait parameters were also improved. Resistance to stretch was still lower than pre-stimulation values 45 days after the end of stimulation. This case illustrates the sustained effects of repetitive peripheral magnetic stimulation on brain plasticity, motor function and gait, and suggests a potential impact for physical rehabilitation in cerebral palsy.

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[PMID: 24907638](#) [PubMed - as supplied by publisher]

5. Dev Med Child Neurol. 2014 Jun 11. doi: 10.1111/dmcn.12503. [Epub ahead of print]

Measurement of habitual physical activity and sedentary behaviour of youth with cerebral palsy: work in progress.

Gorter JW1, Timmons BW.

[PMID: 24917247](#) [PubMed - as supplied by publisher]

6. Am J Phys Med Rehabil. 2014 Jun 10. [Epub ahead of print]

A Descriptive Comparison of Sprint Cycling Performance and Neuromuscular Characteristics in Able-Bodied Athletes and Paralympic Athletes with Cerebral Palsy.

Runciman P1, Derman W, Ferreira S, Albertus-Kajee Y, Tucker R.

OBJECTIVE: This study investigated the sprint cycling performance and neuromuscular characteristics of Paralympic athletes with cerebral palsy (CP) during a fatiguing maximal cycling trial compared with those of able-bodied (AB) athletes. **DESIGN:** Five elite athletes with CP and 16 AB age- and performance-matched controls performed a 30-sec Wingate cycle test. Power output (W/kg) and fatigue index (%) were calculated. Electromyography was measured in five bilateral muscles and expressed in mean amplitude (mV) and median frequency (Hz). **RESULTS:** Power output was significantly higher in the AB group (10.4 [0.5] W/kg) than in the CP group (9.8 [0.5] W/kg) ($P < 0.05$). Fatigue index was statistically similar between the AB (27% [0.1%]) and CP (25% [0.1%]) groups. Electromyographic mean amplitude and frequency changed similarly in all muscle groups tested, in both affected and nonaffected sides, in the CP and AB groups ($P < 0.05$). Neuromuscular irregularities were identified in the CP group. **CONCLUSIONS:** The similarity in fatigue between the CP and AB groups indicates that elite athletes with CP may have a different exercise response to others with CP. The authors propose that this may result from high-level training over many years. This has rehabilitative implications, as it indicates near-maximal adaptation of the CP body toward normal levels.

[PMID: 24919082](#) [PubMed - as supplied by publisher]

7. J Child Neurol. 2014 Jun 5. pii: 0883073814535491. [Epub ahead of print]**Pediatric Aquatic Therapy on Motor Function and Enjoyment in Children Diagnosed With Cerebral Palsy of Various Motor Severities.**

Lai CJ1, Liu WY2, Yang TF3, Chen CL4, Wu CY5, Chan RC6.

This study investigates the effects of pediatric aquatic therapy on motor function, enjoyment, activities of daily living, and health-related quality of life for children with spastic cerebral palsy of various motor severities. Children with spastic cerebral palsy were assigned to a pediatric aquatic therapy group (n = 11; mean age = 85.0 ± 33.1 months; male : female = 4 : 7) or a control group (n = 13; mean age = 87.6 ± 34.0 months; male : female = 9 : 4). The statistic results indicate that the pediatric aquatic therapy group had greater average 66-item Gross Motor Function Measure following intervention than the control group ($\chi^2 = 0.308$, $P = .007$), even for children with Gross Motor Function Classification System level IV (5.0 vs 1.3). The pediatric aquatic therapy group had higher Physical Activity Enjoyment Scale scores than the control group at post-treatment ($P = .015$). These findings demonstrate that pediatric aquatic therapy can be an effective and alternative therapy for children with cerebral palsy even with poor Gross Motor Function Classification System level.

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[PMID: 24907137](#) [PubMed - as supplied by publisher]**8. J Child Neurol. 2014 Jun 5. pii: 0883073814533422. [Epub ahead of print]****Promoting Leisure Participation as Part of Health and Well-Being in Children and Youth With Cerebral Palsy.**

Shikako-Thomas K1, Kolehmainen N2, Ketelaar M3, Bult M4, Law M5.

Participation in leisure is a human right and is central to the health of children and youth. The World Health Organization's International Classification of Functioning, Disability and Health for Children and Youth supported a change in thinking about what outcomes are most relevant in the context of children's health and places participation as one of the constituent elements of health. Participation is also a fundamental rehabilitation and health promotion outcome for children with cerebral palsy as identified by youth, parents, and health professionals. Several studies have identified individual and environmental factors related to participation in leisure; new studies are now determining the best interventions to promote participation. This article summarizes recent findings and proposes important topics for neurologists to consider in exploring leisure pursuits with children with cerebral palsy and their families and in working with rehabilitation professionals to promote engagement in leisure opportunities as part of integrated care.

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[PMID: 24907136](#) [PubMed - as supplied by publisher]**9. Arch Phys Med Rehabil. 2014 Jun 11. pii: S0003-9993(14)00417-1. doi: 10.1016/j.apmr.2014.04.031. [Epub ahead of print]****Long-term trajectories of health-related quality of life in individuals with cerebral palsy: a multi-center longitudinal study.**

Tan SS1, van Meeteren J2, Ketelaar M3, Schuengel C4, Reinders-Messelink HA5, Raat H6, Dallmeijer AJ7, Roebroek ME2; PERRIN+ study group.

OBJECTIVE: To 1) determine the long-term trajectory of Health-Related Quality of Life (HR-QoL) for the dimensions of physical complaints, motor-, psychological- and social functioning for groups of individuals with CP aged 1-24 years, 2) assess the variability in HR-QoL within individuals with CP over time, 3) assess the variability in HR-QoL between individuals with CP and 4) compare the HR-QoL in individuals with CP to reference data of typically developing individuals. **DESIGN:** Multicentre prospective longitudinal study **SETTING:** rehabilitation

departments of three university medical centers and various rehabilitation centers in the Netherlands
SUBJECTS: 424 Dutch individuals with CP aged 1-24 years
INTERVENTIONS: Not applicable
MAIN MEASURES: The HR-QoL dimensions of physical complaints, motor-, psychological- and social functioning. Each individual visited the rehabilitation department for 3 or 4 measurements. The time between measurements was 1 or 2 years.
RESULTS: Individuals with CP experience a HR-QoL which on the average remains fairly stable over time. Variability in HR-QoL within individuals with CP was similar to that within typically developing individuals. Variability between individuals with CP could be explained by type of CP (motor functioning), GMFCS-level (physical complaints, motor and social functioning) and intellectual disability (physical complaints and social functioning). Finally, individuals with CP experienced a lower HR-QoL compared to typically developing individuals, especially for the dimensions of motor and social functioning.
CONCLUSIONS: Many changes take place in the psychosocial development of the individual with CP which accordingly change their expectations and those of their caregivers, peers and professionals. As a result, perceived physical complaints, motor-, psychological- and social functioning remain fairly stable over many years.

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10. J Pediatr Rehabil Med. 2014 Jan 1;7(1):53-61. doi: 10.3233/PRM-140273.

Follow-up of individuals with cerebral palsy through the transition years and description of adult life: The Swedish experience.

Alriksson-Schmidt A1, Hägglund G1, Rodby-Bousquet E2, Westbom L3.

OBJECTIVE: To describe the process of providing healthcare through the transition years to individuals with cerebral palsy (CP) and to present data on living arrangements, education/occupation status, and use of personal assistance in young Swedish adults with CP. **METHODS:** A descriptive cross-sectional study of 102 participants (63 males) participating in a standardized follow-up program called CPUP. Data were analyzed in relation to the Gross Motor Function Classification System (GMFCS) and the Manual Ability Classification System (MACS). **RESULTS:** Of the participants, 58 "lived with parents", 29 reported "independent living", and 15 reported "special service housing". Living arrangements differed among GMFCS levels ($p < 0.001$) and 14 of 20 with severe disabilities lived with their parents. Thirty-four of 70 reported personal assistance; use of assistance correlated ($p < 0.001$) with GMFCS ($r^2 = 0.71$) and MACS ($r^2 = 0.70$). Thirty five were "students", 20 "employed", 36 in "daily activities", and 9 were "unemployed". Of those employed, 18 had GMFCS levels I-II. **CONCLUSION:** Some young adults with CP and severe functional limitations manage independent living - however, many still live with their parents. Although many are students, a large number are unemployed. There is disconnect between the pediatric and adult healthcare systems. CPUP may facilitate in making the transition smoother.

[PMID: 24919938](#) [PubMed - in process]

11. J Pediatr Rehabil Med. 2014 Jan 1;7(1):17-31. doi: 10.3233/PRM-140276.

Opportunities lost and found: Experiences of patients with cerebral palsy and their parents transitioning from pediatric to adult healthcare.

DiFazio RL1, Harris M1, Vessey JA2, Glader L3, Shanske S1.

PURPOSE: To describe and define the experiences of adults with cerebral palsy (CP) and parents of adults with CP who have been involved in a transfer of physiatry care from pediatric to adult healthcare and to explore their experiences more generally in the transition from pediatric to adult services. **METHODS:** A qualitative research approach was used. Semi-structured focus group interviews were conducted with adults with CP ($n=5$) and parents of adults with CP ($n=8$) to explore the health care transition (HCT) process from pediatric to adult healthcare. Four key content domains were used to facilitate the focus groups; 1) Transition Planning, 2) Accessibility of Services, 3) Experience with Adult Providers, and 4) Recommendations for Improving the Transition Process. Conventional content analysis was used to analyze the data. **RESULTS:** Four themes emerged from the focus groups; Lost in Transition, Roadmap to Care, List of None, and One Stop Shopping. Participants felt lost in the HCT process,

requested a transparent transition plan, expressed concern regarding access to adult healthcare, and made recommendations for improvements. **CONCLUSION:** Challenges in transitioning from pediatric to adult health care were identified by all participants and several strategies were recommended for improvement.

[PMID: 24919935](#) [PubMed - in process]

12. Arch Phys Med Rehabil. 2014 Jun 5. pii: S0003-9993(14)00413-4. doi: 10.1016/j.apmr.2014.05.018. [Epub ahead of print]

Changes in Gross Motor Function and Health-Related Quality of Life in Adults with Cerebral Palsy: an 8-year follow-up study.

Usuba K1, Oddson B2, Gauthier A2, Young NL3.

OBJECTIVE: To describe changes in gross motor function and Health-Related Quality of Life (HRQoL) in adults with Cerebral Palsy (CP). **DESIGN:** An 8-year follow-up survey **SETTING:** Participants who completed baseline survey in 2003 were invited. **PARTICIPANTS:** The sample of adults with CP (n=54, Response Rate=37%) included a "Younger Group" (Group 1; n=31; age 23-27y; 15 females) and an "Older Group" (Group 2; n=23; age 33-42; 10 females) **INTERVENTIONS:** Not applicable **MAIN OUTCOME MEASURES:** Gross Motor Function Classification System (GMFCS), Self-Rated Health (SRH), Health Utility Index Mark III (HUI3), and Assessment of Quality of Life (AQoL). **RESULTS:** Eight years after the initial survey, 27% of participants in combined group had deteriorations on the GMFCS, 52% on the SRH, 44% on the HUI3, and 25% on the AQoL. Members of group 1 reported stable scores as they crossed the transition to adulthood, while many of the group 2 experienced declines with relative risk of 1.47 (95%CI: 0.16-2.24) on GMFCS, 1.36 (95%CI: 0.83-2.23) on SRH, 1.19 (95%CI: 0.66-2.15) on HUI3, and 3.17 (95%CI: 1.12-9.00) on AQoL. **CONCLUSION:** While much attention has focused on the transitions of persons with CP during their late teens and early 20's, this research found that deteriorations in GMFCS and HRQoL were most evident in adults in their late 20's and 30's. More detailed longitudinal studies are required to evaluate the longer-term health outcomes among persons with CP into their 30's and beyond.

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13. Int J Speech Lang Pathol. 2014 Jun 9:1-10. [Epub ahead of print]

Consonant production and overall speech characteristics in school-aged children with cerebral palsy and speech impairment.

Nordberg A1, Miniscalco C, Lohmander A.

The aim of the present study was to investigate the speech characteristics of school-aged children with cerebral palsy (CP) and speech impairment at various cognitive levels. Nineteen children with a mean age of 11;2 years (9;2-12;9 years) with spastic, dyskinetic, and ataxic CP and speech impairment participated. Phonetic transcription of oral consonants, ratings of hypernasality, and severity of overall dysarthria, together with free field descriptions of respiration, voice quality, and prosody, were performed independently by two speech-language pathologists. The non-verbal cognitive level was also studied. More than half of the children had large problems with the articulation of consonants, and the children with ataxic CP were most affected. The majority was rated as having dysarthria, mostly mild, but hypernasality was rare. Gross motor problems were not significantly associated with the articulation of consonants or the severity of dysarthria, whereas non-verbal cognitive level was. This underlines the importance of taking non-verbal cognitive level into account, when designing individual speech treatment programs for this group of children. Finally, a careful examination of the articulation of consonants is recommended in order to study speech production thoroughly in children with CP.

[PMID: 24910255](#) [PubMed - as supplied by publisher]

14. Int J Speech Lang Pathol. 2014 Jun 9:1-9. [Epub ahead of print]**Motor speech impairment, activity, and participation in children with cerebral palsy.**

Mei C1, Reilly S, Reddihough D, Mensah F, Morgan A.

The present study used a population-based sample of children with cerebral palsy (CP) to estimate the prevalence of motor speech impairment and its association with activity and participation. A sample of 79 Victorian children aged 4 years 11 months to 6 years 5 months was recruited through the Victorian CP Register. The presence of motor speech impairment was recorded using the Viking Speech Scale (VSS). Activity and participation outcomes included speech intelligibility (the National Technical Institute for the Deaf rating scale, NTID), the Functional Communication Classification System (FCCS) and Communication Function Classification System (CFCS). A parent completed rating scale was used to examine the association between motor speech impairment and participation. Ninety per cent (71/79) of children demonstrated a motor speech impairment. Strong associations were found between the VSS and NTID ($< .001$), CFCS ($< .001$), and FCCS levels ($< .001$). VSS levels III-IV were significantly associated with restrictions in home, school, and community-based participation as perceived by parents. Although some diversity in activity and participation outcomes was observed within specific VSS levels, the results of this study suggested that children with mild motor speech impairments are more likely to demonstrate superior activity and participation outcomes compared to children with moderate or severe deficits.

[PMID: 24910254](#) [PubMed - as supplied by publisher]

15. Neuropsychiatr Dis Treat. 2014 May 29;10:971-5. doi: 10.2147/NDT.S59600. eCollection 2014.**Epileptic and cognitive changes in children with cerebral palsy: an Egyptian study.**

El-Tallawy HN, Farghaly WM, Shehata GA, Badry R, Rageh TA.

BACKGROUND: Cerebral palsy (CP) is the most frequent cause of motor handicap among children. **AIM OF THE STUDY:** We aim to study the relation of epilepsy in children with CP to various risk factors that affect the development of seizures. **PATIENTS AND METHODS:** In a cross-sectional, descriptive, population-based, case-control study, 98 children with CP (48 children with CP with epilepsy, and 50 children with CP without epilepsy) were compared with 180 children without CP or seizures. The children lived in two regions in Egypt: the Al-Kharga District-New Valley and El-Quseir city-Red Sea. These cases were subjected to meticulous neurological assessment, brain magnetic resonance imaging, electroencephalography, and Stanford-Binet (4th edition) examination. Multinomial logistic regression was used to assess the risk factors. **RESULTS:** Epilepsy was diagnosed in 48.9% of all cases of CP. Mental subnormality was observed more frequently in children with epilepsy than in those without epilepsy (84.6% versus 66.7%). The frequency of epilepsy was highest in patients with the spastic quadriplegic type of illness (58.3%). Multinomial logistic regression revealed that prematurity (< 32 weeks of pregnancy), low birth weight (< 2.5 kg at birth), neonatal seizures, jaundice, and cyanosis were significantly associated with CP with epilepsy. **CONCLUSION:** CP is associated with a high percentage of seizure disorders. Prematurity, low birth weight, neonatal seizures, cyanosis, and jaundice are significant risk factors among patients with CP with epilepsy compared to patients with CP without epilepsy or a healthy control group.

[PMID: 24920910](#) [PubMed] Free full text

16. Phys Occup Ther Pediatr. 2014 Jun 12. [Epub ahead of print]**Balancing Hope and Realism in Family-Centered Care: Physical Therapists' Dilemmas in Negotiating Walking Goals with Parents of Children with Cerebral Palsy.**

LeRoy K1, Boyd K, De Asis K, Lee RW, Martin R, Teachman G, Gibson BE.

The aims of this study were to explore physical therapists' beliefs about the value of walking for children with cerebral palsy (CP), how these beliefs inform therapy choices, and to describe how physical therapists engage families in decision-making regarding walking goals. Eight physical therapists who had experience working with children with CP each participated in a qualitative, one-to-one interview exploring their walking-related values, beliefs, and decision-making practices. The physical therapists' accounts demonstrated that they balanced their

beliefs and professional expertise with families' goals in order to preserve families' hopes and maintain rapport, while also ensuring evidence-based and efficacious treatment plans were implemented. Participants experienced internal conflict when attempting to balance the principles of family-centered care with their personal beliefs and expertise. Further research will augment these findings and contribute to ongoing debates regarding rehabilitation best practices and family-centered care.

[PMID: 24921633](#) [PubMed - as supplied by publisher]

17. *Zhonghua Yi Shi Za Zhi*. 2008 Jul;38(3):158-62.

Retrospect of the history of cerebral palsy cognition [Article in Chinese]

Chen SJ1, Wang XL.

Throughout the cognition history of cerebral palsy, though these literature and art works related to the description of cerebral palsy, yet it only shows that it was an "old disease". The real initiative medical study of cerebral palsy started at mid 19th century. In the mid to late 19th century, Little, Osler, and Freud, the three scholars, perfected the denomination of cerebral palsy, the brain-derived concept, pathogenic classification, diverse clinical characteristics of dyskinesia--oriented manifestations, thus established the basic framework for the study of cerebral palsy.

[PMID: 24915654](#) [PubMed - in process]

Prevention and Cure

18. *Am J Obstet Gynecol*. 2014 Jun 6. pii: S0002-9378(14)00576-6. doi: 10.1016/j.ajog.2014.06.015. [Epub ahead of print]

What is the optimal gestational age for women with gestational diabetes type A1 to deliver?

Niu B1, Lee VR2, Cheng YW3, Frias AE2, Nicholson JM4, Caughey AB2.

OBJECTIVE: Gestational diabetes type A1 (A1GDM), also known as diet-controlled gestational diabetes, is associated with an increase in adverse perinatal outcomes such as macrosomia and Erb's palsy. However, it remains unclear when to deliver these women because optimal timing of delivery requires balancing neonatal morbidities from early term delivery against the risk of IUFD. We sought to determine the optimal gestational age (GA) for women with A1GDM to deliver. **STUDY DESIGN:** A decision-analytic model was built to compare the outcomes of delivery at 37 through 41 weeks in a theoretical cohort of 100,000 women with A1GDM. Strategies involving expectant management until a later GA accounted for probabilities of spontaneous delivery, indicated delivery, and IUFD during each week. GA associated risks of neonatal complications included cerebral palsy, infant death, and Erb's palsy. Probabilities were derived from the literature, and total quality-adjusted life years (QALYs) were calculated. Sensitivity analyses were used to investigate the robustness of the baseline assumptions. **RESULTS:** Our model showed that induction at 38 weeks maximized QALYs. Within our cohort, delivery at 38 weeks would prevent 48 stillbirths but lead to 12 more infant deaths compared to 39 weeks. Sensitivity analysis revealed that 38 weeks remains the optimal timing of delivery until IUFD rates fall below 0.3-fold of our baseline assumption at which expectant management until 39 weeks is optimal. **CONCLUSION:** By weighing the risks of IUFD against infant deaths and neonatal morbidities from early term delivery, the ideal GA for women with A1GDM to deliver is 38 weeks.

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[PMID: 24912097](#) [PubMed - as supplied by publisher]

19. BMC Infect Dis. 2014 Jun 12;14(1):327. [Epub ahead of print]**Invasive candidiasis in low birth weight preterm infants: risk factors, clinical course and outcome in a prospective multicenter study of cases and their matched controls.**

Barton M, O'Brien K, Robinson JL, Davies DH, Simpson K, Asztalos E, Langley JM, Le Saux N, Sauve R, Synnes A, Tan B, de Repentigny L, Rubin E, Hui C, Kovacs L, Richardson SE.

BACKGROUND: This multicenter prospective study of invasive candidiasis (IC) was carried out to determine the risk factors for, incidence of, clinical and laboratory features, treatment and outcome of IC in infants of birth weight <1250 g. **METHODS:** Neonates <1250 g with IC and their matched controls (2:1) were followed longitudinally and descriptive analysis was performed. Survivors underwent neurodevelopmental assessment at 18 to 24 months corrected age. Neurodevelopmental impairment (NDI) was defined as blindness, deafness, moderate to severe cerebral palsy, or a score <70 on the Bayley Scales of Infant Development 2nd edition. Multivariable analyses were performed to determine risk factors for IC and predictors of mortality and NDI. **RESULTS:** Cumulative incidence rates of IC were 4.2%, 2.2% and 1.5% for birth-weight categories <750 g, <1000 g, <1500 g, respectively. Forty nine infants with IC and 90 controls were enrolled. Necrotizing enterocolitis (NEC) was the only independent risk factor for IC ($p = 0.03$). CNS candidiasis occurred in 50% of evaluated infants, while congenital candidiasis occurred in 31%. Infants with CNS candidiasis had a higher mortality rate (57%) and incidence of deafness (50%) than the overall cohort of infants with IC. NDI (56% vs. 33%; $p = 0.017$) and death (45% vs. 7%; $p = 0.0001$) were more likely in cases than in controls, respectively. IC survivors were more likely to be deaf (28% vs. 7%; $p = 0.01$). IC independently predicted mortality ($p = 0.0004$) and NDI ($p = 0.018$). **CONCLUSION:** IC occurred in 1.5% of VLBW infants. Preceding NEC increased the risk of developing IC. CNS candidiasis is under-investigated and difficult to diagnose, but portends a very poor outcome. Mortality, deafness and NDI were independently significantly increased in infants with IC compared to matched controls.

[PMID: 24924877](#) [PubMed - as supplied by publisher]

20. Dev Med Child Neurol. 2014 Jun;56(6):587-94.**Motor impairment in very preterm-born children: links with other developmental deficits at 5 years of age.**

Van Hus JW, Potharst ES, Jeukens-Visser M, Kok JH, Van Wassenaer-Leemhuis AG.

AIM: To elucidate the relation between motor impairment and other developmental deficits in very preterm-born children without disabling cerebral palsy and term-born comparison children at 5 years of (corrected) age. **METHOD:** In a prospective cohort study, 165 children (81 very preterm-born and 84 term-born) were assessed with the Movement Assessment Battery for Children - 2nd edition, Touwen's neurological examination, the Wechsler Preschool and Primary Scale of Intelligence, processing speed and visuomotor coordination tasks of the Amsterdam Neuropsychological Tasks, and the Strengths and Difficulties Questionnaire. **RESULTS:** Motor impairment (=15th centile) occurred in 32% of the very preterm-born children compared with 11% of their term-born peers ($p=0.001$). Of the very preterm-born children with motor impairment, 58% had complex minor neurological dysfunctions, 54% had low IQ, 69% had slow processing speed, 58% had visuomotor coordination problems, and 27%, 50%, and 46% had conduct, emotional, and hyperactivity problems respectively. Neurological outcome (odds ratio [OR]=41.7, 95% confidence intervals [CI] 7.5–232.5) and Full-scale IQ (OR=7.3, 95% CI 1.9–27.3) were significantly and independently associated with motor impairment. Processing speed (OR=4.6, 95% CI 1.8–11.6) and attention (OR=3.2, 95% CI 1.3–7.9) were additional variables associated with impaired manual dexterity. These four developmental deficits mediated the relation between preterm birth and motor impairment. **INTERPRETATION:** Complex minor neurological dysfunctions, low IQ, slow processing speed, and hyperactivity/inattention should be taken into account when very preterm-born children are referred for motor impairment.

Comment in: Motor impairment in very preterm infants: implications for clinical practice and research.

[Dev Med Child Neurol. 2014]

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21. J AAPOS. 2014 Jun;18(3):241-7. doi: 10.1016/j.jaapos.2014.01.014.**Retinopathy of prematurity and brain damage in the very preterm newborn.**

Allred EN1, Capone A Jr2, Fraioli A3, Dammann O4, Droste P5, Duker J6, Gise R7, Kuban K8, Leviton A9, O'Shea TM10, Paneth N11, Petersen R1, Trese M2, Stoessel K12, Vanderveen D1, Wallace DK13, Weaver G10.

PURPOSE: To explain why very preterm newborns who develop retinopathy of prematurity (ROP) appear to be at increased risk of abnormalities of both brain structure and function. **METHODS:** A total of 1,085 children born at <28 weeks' gestation had clinically indicated retinal examinations and had a developmental assessment at 2 years corrected age. Relationships between ROP categories and brain abnormalities were explored using logistic regression models with adjustment for potential confounders. **RESULTS:** The 173 children who had severe ROP, defined as prethreshold ROP (n = 146) or worse (n = 27) were somewhat more likely than their peers without ROP to have brain ultrasound lesions or cerebral palsy. They were approximately twice as likely to have very low Bayley Scales scores. After adjusting for risk factors common to both ROP and brain disorders, infants who developed severe ROP were at increased risk of low Bayley Scales only. Among children with prethreshold ROP, exposure to anesthesia was not associated with low Bayley Scales. **CONCLUSIONS:** Some but not all of the association of ROP with brain disorders can be explained by common risk factors. Most of the increased risks of very low Bayley Scales associated with ROP are probably not a consequence of exposure to anesthetic agents.

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22. J Paediatr Child Health. 2014 Jun 9. doi: 10.1111/jpc.12656. [Epub ahead of print]**Enterovirus infections are associated with white matter damage in neonates.**

Wu T1, Fan XP, Wang WY, Yuan TM.

AIM: To explore the imaging findings of neonatal infants infected with enteroviruses. **METHODS:** A retrospective study was conducted on 12 patients who were diagnosed with encephalitis caused by enterovirus. Clinical presentation, cranial ultrasonography (cUS), magnetic resonance imaging (MRI) findings and neurodevelopment outcome of 12 cases were analysed. **RESULTS:** Twelve infants, with a gestational age of 35 to 39 weeks, presented at 36 to 41 weeks postmenstrual age with clinical symptoms of enterovirus infections. Ten of 12 neonatal infants had a fever and 4 of 12 presented with a sepsis-like illness. cUS in one preterm infant showed periventricular echogenicity. Neonatal MRI confirmed white matter changes in 12 infants. Follow-up of infants were 18 months. Outcome was variable with cerebral palsy in 2 infants and normal neurodevelopment outcome in 10 infants. **CONCLUSIONS:** Enterovirus may cause severe central nervous system infection in the neonatal period. The neuroimaging studies are informative and should be a part of care for infants with enteroviruses.

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23. J Paediatr Child Health. 2014 Jun 9. doi: 10.1111/jpc.12618. [Epub ahead of print]**Feasibility of trialling cord blood stem cell treatments for cerebral palsy in Australia.**

Crompton KE1, Elwood N, Kirkland M, Clark P, Novak I, Reddihough D.

AIM: Umbilical cord blood may have therapeutic benefit in children with cerebral palsy (CP), but further studies are required. On first appearance it seems that Australia is well placed for such a trial because we have excellence in CP research backed by extensive CP registers, and both public and private cord blood banks. We aimed to examine the possibilities of conducting a trial of autologous umbilical cord blood cells (UCBCs) as a treatment for children with CP in Australia. **METHODS:** Data linkages between CP registers and cord blood banks were used to

estimate potential participant numbers for a trial of autologous UCBCs for children with CP. RESULTS: As of early 2013, one Victorian child with CP had cord blood stored in the public bank, and between 1 and 3 children had their cord blood stored at Cell Care Australia (private cord blood bank). In New South Wales, we counted two children on the CP register who had their stored cord blood available in early 2013. We estimate that there are between 10 and 24 children with CP of any type who have autologous cord blood available across Australia. CONCLUSIONS: In nations with small populations like Australia, combined with Australia's relatively low per capita cord blood storage to date, it is not currently feasible to conduct trials of autologous UCBCs for children with CP. Other options must be explored, such as allogeneic UCBCs or prospective trials for neonates at risk of CP.

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24. J Trop Pediatr. 2014 Jun 13. pii: fmu031. [Epub ahead of print]

Infectious Causes of Childhood Disability: Results from a Pilot Study in Rural Bangladesh.

Khandaker G1, Muhit M2, Rashid H3, Khan A4, Islam J4, Jones C5, Booy R6.

PURPOSE: To identify the contribution of infectious aetiologies to major childhood disabilities in Bangladesh. METHODS: Active community-based survey was conducted for severe childhood disability using the Key Informants Method between September 2011 and March 2012 in a rural sub-district of Bangladesh. RESULTS: We screened 1069 children and identified 859 with severe disabilities. The mean age of the disabled children was 8.5 year and 42.9% were girls. The major forms of impairments/conditions were cerebral palsy (n = 324, 37.7%), hearing impairment (n = 201, 23.4%), physical impairment (n = 147, 17.1%), visual impairment (n = 49, 5.7%), cerebral palsy with epilepsy (n = 39, 4.5%) and epilepsy (n = 41, 4.7%). Congenital rubella syndrome was identified in 1.1% (n = 9). 7.1% disabilities resulted from clinically confirmed infections, and another 10.8% originated from probable infections; thus a total of 17.9% disabilities were related to an infectious origin. CONCLUSIONS: Infectious diseases appear to be one of the major causes of severe childhood disability in rural Bangladesh.

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