

Monday 22 January 2018

Cerebral Palsy Alliance is delighted to bring you this free weekly bulletin of the latest published research into cerebral palsy. Our organisation is committed to supporting cerebral palsy research worldwide - through information, education, collaboration and funding. Find out more at research.cerebralpalsy.org.au

Professor Nadia Badawi AM

Macquarie Group Foundation Chair of Cerebral Palsy

[Subscribe to CP Research News](#)

Please note: This research bulletin represents only the search results for cerebral palsy and related neurological research as provided by the PubCrawler service. The articles listed below do not represent the views of Cerebral Palsy Alliance.

Interventions and Management

1. Genetic Variation in the Dopamine System Influences Intervention Outcome in Children with Cerebral Palsy.

Diaz Heijtz R, Almeida R, Eliasson AC, Forssberg H.

EBioMedicine. 2018 Jan 9. pii: S2352-3964(17)30509-1. doi: 10.1016/j.ebiom.2017.12.028. [Epub ahead of print]

BACKGROUND: There is large variation in treatment responses in children with cerebral palsy. Experimental and clinical results suggest that dopamine neurotransmission and brain-derived neurotrophic factor (BDNF) signalling are involved in motor learning and plasticity, which are key factors in modern habilitation success. We examined whether naturally occurring variations in dopamine and BDNF genes influenced the treatment outcomes. **METHODS:** Thirty-three children (18-60months of age) with spastic unilateral cerebral palsy were enrolled in the study. Each child had participated in a training programme consisting of active training of the involved hand for 2h every day during a 2-month training period. The training outcome was measured using Assisting Hand Assessment before and after the training period. Saliva was collected for genotyping of COMT, DAT, DRD1, DRD2, DRD3, and BDNF. Regression analyses were used to examine associations between genetic variation and training outcome. **FINDINGS:** There was a statistically significant association between variation in dopamine genes and treatment outcome. Children with a high polygenic dopamine gene score including polymorphisms of five dopamine genes (COMT, DAT, DRD1, DRD2, and DRD3), and reflecting higher endogenous dopaminergic neurotransmission, had the greatest functional outcome gains after intervention. **INTERPRETATION:** Naturally occurring genetic variation in the dopamine system can influence treatment outcomes in children with cerebral palsy. A polygenic dopamine score might be valid for treatment outcome prediction and for designing individually tailored interventions for children with cerebral palsy.

[PMID: 29339100](#)

2. Effect of rhythmic auditory cueing on gait in cerebral palsy: a systematic review and meta-analysis.

Ghai S, Ghai I, Effenberg AO.

Neuropsychiatr Dis Treat. 2017 Dec 22;14:43-59. doi: 10.2147/NDT.S148053. eCollection 2018.

Auditory entrainment can influence gait performance in movement disorders. The entrainment can incite neurophysiological and musculoskeletal changes to enhance motor execution. However, a consensus as to its effects based on gait in people with cerebral palsy is still warranted. A systematic review and meta-analysis were carried out to analyze the effects of rhythmic auditory cueing on spatiotemporal and kinematic parameters of gait in people with cerebral palsy. Systematic identification of published literature was performed adhering to Preferred Reporting Items for Systematic Reviews and Meta-Analyses and American Academy for Cerebral Palsy and Developmental Medicine guidelines, from inception until July 2017, on online databases: Web of Science, PEDro, EBSCO, Medline, Cochrane, Embase and ProQuest. Kinematic and spatiotemporal gait parameters were evaluated in a meta-analysis across studies. Of 547 records, nine studies involving 227 participants (108 children/119 adults) met our inclusion criteria. The qualitative review suggested beneficial effects of rhythmic auditory cueing on gait performance among all included studies. The meta-analysis revealed beneficial effects of rhythmic auditory cueing on

gait dynamic index (Hedge's $g=0.9$), gait velocity (1.1), cadence (0.3), and stride length (0.5). This review for the first time suggests a converging evidence toward application of rhythmic auditory cueing to enhance gait performance and stability in people with cerebral palsy. This article details underlying neurophysiological mechanisms and use of cueing as an efficient home-based intervention. It bridges gaps in the literature, and suggests translational approaches on how rhythmic auditory cueing can be incorporated in rehabilitation approaches to enhance gait performance in people with cerebral palsy.

[PMID: 29339922](#)

3. A community-based exercise program to increase participation in physical activities among youth with disability: a feasibility study.

Shields N, van den Bos R, Buhler-Smith K, Prendergast L, Taylor N.

Disabil Rehabil. 2018 Jan 17;1-8. doi: 10.1080/09638288.2017.1422034. [Epub ahead of print]

PURPOSE: To evaluate the feasibility of a student-mentored community-based exercise program for youth with disability. **METHOD:** Nineteen youth (nine female; mean age 18 years) with disability (seven cerebral palsy, six Down syndrome, three spina bifida, two autism spectrum disorder, one spinal cord injury) were recruited. Each participant was matched with a student mentor and exercised twice a week for 12 weeks at their local gymnasium. Five domains of feasibility were assessed: demand, implementation, practicality, limited efficacy testing, and acceptability. **RESULTS:** Demand comprised 55 expressions of interest. Demonstrating evidence of implementation, 91% of scheduled sessions were attended and training fidelity (comparing training load in weeks 1 and 12) showed exercise intensity significantly increased for strength and aerobic exercises. The program was practical with no major and 17 minor adverse events (e.g., muscle soreness). Limited efficacy testing was demonstrated by increased arm (4 kg, 95% CI: 1-7) and leg strength (43 kg, 95% CI: 24-62), walking endurance (80 m, 95% CI: 24-137), and improvement in three dimensions of health-related quality of life (autonomy, physical, and psychological well-being). The program was accepted very positively by participants. **CONCLUSIONS:** A student-mentored community-based exercise program feasibly engages youth with disability in community-based exercise. Implications for Rehabilitation A 12-week community-based student-mentored exercise program for youth with disability is feasible. Exercising in a real-world setting with a student mentor has a positive effect on physical and psychological well-being of youth with disability.

[PMID: 29343130](#)

4. Participation in physical activities for children with cerebral palsy: feasibility and effectiveness of physical activity on prescription.

Lauruschkus K, Hallström I, Westbom L, Tornberg Å, Nordmark E.

Arch Physiother. 2017 Nov 28;7:13. doi: 10.1186/s40945-017-0041-9. eCollection 2017.

BACKGROUND: Children with cerebral palsy (CP) are less physically active and more sedentary than other children which implies risk factors for their physical and mental health. Physical activity on prescription (PAP) is an effective intervention to promote a lifestyle change towards increased physical activity in adults in general. Knowledge is lacking about the use of PAP in children with CP. Therefore, the aim of this study was to evaluate the feasibility of PAP for children with CP and its effectiveness on participation in physical activity and sedentary behaviour. **METHODS:** Eleven children with CP, aged 7-11 years, participated in PAP, consisting of a written agreement between each child, their parents and the physiotherapist and based on Motivational Interviewing (MI), Canadian Occupational Performance Measure (COPM) and Goal Attainment Scaling (GAS). Individual goals, gross motor function and physical activity were assessed at baseline, at 8 and/or 11 months using COPM, GAS, logbooks, Gross Motor Function Measure (GMFM-66), physical activity questionnaires, physical activity and heart rate monitors and time-use diaries. At 8 and 11 months the feasibility of the intervention and costs and time spent for the families and the physiotherapist were evaluated by questionnaires. **RESULTS:** The intervention was feasible according to the feasibility questionnaire. Each child participated in 1-3 self-selected physical activities during 3-6 months with support from the physiotherapist, and clinically meaningful increases from baseline of COPM and GAS scores were recorded. Being physically active at moderate-vigorous levels varied between less than 30 and more than 240 minutes/day, and the median for the whole group was 84 minutes/day at baseline and 106 minutes/day at 8 months. **CONCLUSIONS:** The intervention PAP seems to be feasible and effective for children with CP, involving both every day and organised physical activities to promote an active lifestyle through increased participation, motivation, and engagement in physical activities. Further research of PAP is needed, preferably in a long term randomised controlled trial and including health economic analysis to show costs and benefits. **TRIAL REGISTRATION:** ISRCTN76366356, retrospectively registered.

[PMID: 29340207](#)

5. Hidden Medical Devices in the School Setting: What the School Nurse Needs to Know About the Safe Use of Baclofen Pumps.

Obst B, Roesler M.

NASN Sch Nurse. 2018 Jan 1;1942602X17750452. doi: 10.1177/1942602X17750452. [Epub ahead of print]

One of the "hidden" medical devices in the school setting is the baclofen pump, which is used for the treatment of spasticity. The goals of spasticity treatment are to decrease muscle tone, deformity, and pain in order to maximize function and ease of care for both child and caregiver. The use of an intrathecal baclofen pump, often for children with cerebral palsy, spinal cord injury, brain injury, or stroke, has been effective in spasticity treatment. It is important for school nurses to be aware of the safety implications associated with this type of device. The Specialized Health Needs Interagency Collaboration (SHNIC) program at the Kennedy Krieger Institute has compiled education and materials that explain the use of baclofen pumps in children with spasticity and the role of the school nurse in providing staff training, developing emergency care plans, and creating a safe school environment for children with special health needs.

[PMID: 29351050](#)

6. Intrathecal baclofen therapy in children: an analysis of individualized goals.

Liew PY, Stewart K, Khan D, Arnup SJ, Scheinberg A.

Dev Med Child Neurol. 2018 Jan 19. doi: 10.1111/dmcn.13660. [Epub ahead of print]

AIM: To determine whether intrathecal baclofen (ITB) therapy improves performance and performance satisfaction in goal areas identified by patients' parents. METHOD: This study formed part of an ongoing multicentre national audit involving six paediatric ITB pump implant centres across Australia. The Canadian Occupational Performance Measure was the primary outcome measure utilized at baseline, 6 months, and 12 months after pump implants in paediatric patients receiving ITB therapy for the first time between 31st December 2009 and 31st December 2014. RESULTS: Twenty-five children had goals identified (mean age 11y 1mo), 19 had a diagnosis of cerebral palsy and 22 were at Gross Motor Function Classification System level IV, V, or equivalent. Strong evidence for an improvement in goal performance (2.33, 95% CI 1.70, 2.96, $p < 0.001$) and performance satisfaction scores (3.08, 95% CI 2.28, 3.88, $p < 0.001$) were demonstrated at 6 months, compared to baseline. The differences were clinically significant and were sustained to 12 months. INTERPRETATION: ITB therapy in paediatric patients with hypertonia results in clinically significant improvements in average performance and performance satisfaction scores. WHAT THIS PAPER ADDS: The most commonly identified goals of parents of children treated with intrathecal (ITB) therapy were: improving ease of dressing, positioning, and transfers. ITB therapy is effective in improving performance and performance satisfaction in children with hypertonia. Score improvements are mainly evident within the first 6 months of therapy.

[PMID: 29349778](#)

7. Visual dependence affects postural sway responses to continuous visual field motion in individuals with cerebral palsy.

Yu Y, Lauer RT, Tucker CA, Thompson ED, Keshner EA.

Dev Neurorehabil. 2018 Jan 17;1-11. doi: 10.1080/17518423.2018.1424265. [Epub ahead of print]

The current study aimed to explore the impact of visual dependence on sensorimotor coupling of postural sway and visual motion in adults and teens with spastic cerebral palsy (CP). We hypothesized that individuals with CP would exhibit greater magnitudes of sway than healthy individuals, and the presence of visual dependence (VD) would produce instability in the direction of visual motion. Participants stood in a virtual environment in which the visual scene remained static or continuously rotated 30 degree/second in pitch-up or pitch-down. Increased center of pressure and center of mass responses were observed in the direction of visual scene motion in those with CP. Those with VD exhibited reduced frequency responses in anterior-posterior direction than those who were visually independent. VD suggests deficient sensorimotor integration that could contribute to postural instability and reduced motor function. Individuals with CP who are visually dependent may benefit from more sensory focused rehabilitation strategies.

[PMID: 29341797](#)

8. Vitamin D and iron deficiencies in children and adolescents with cerebral palsy.

[Article in English, Spanish]

Le Roy C, Barja S, Sepúlveda C, Guzmán ML, Olivarez M, Figueroa MJ, Alvarez M.

Neurologia. 2018 Jan 13. pii: S0213-4853(17)30372-9. doi: 10.1016/j.nrl.2017.11.005. [Epub ahead of print]

INTRODUCTION: Children and adolescents with cerebral palsy (CP) are at a greater risk of malnutrition and micronutrient deficiencies. Two deficiencies that we can study and treat are vitamin D (VD) and iron deficiencies; however, no studies have described these deficiencies in Chile. **OBJECTIVE:** To describe the status of VD and iron in patients with CP and evaluate the relationship with certain factors associated with deficiencies of these micronutrients. **PATIENTS AND METHOD:** We performed a descriptive, cross-sectional study including 69 patients aged between 2 and 21 years, from two public hospitals. Data were obtained on demographic variables, motor function, use of feeding tube, and pharmacological treatment. We performed a nutritional assessment according to patterns of CP and determined 25-hydroxyvitamin D (25[OH]D) ferritin, and albumin levels. **RESULTS:** Patients' mean age was 11.1±4.9 years; 43 (62.3%) were male; and 56 (81.2%) had moderate-to-severe CP. Thirty-five (50.7%) used a nasogastric tube and/or gastrostomy; 15.4% were underweight and 73.8% were eutrophic, all with normal height. Twenty (29%) and 4 patients (6.2%) received VD and iron supplementation, respectively. Albuminaemia was normal in all patients. Mean 25(OH)D level was 24.3±8.8 ng/mL; 33 patients (47.8%) had insufficiency and 21 (30.4%) deficiency; 36 patients (52.2%) had low ferritin levels. There was no association between 25(OH)D level and the other variables studied. Low ferritin levels were found to be associated with older age ($P=.03$), being male ($P=.006$), and feeding tube use ($P=.006$). **CONCLUSIONS:** The patients studied mainly had moderate-to-severe CP, with a high frequency of suboptimal VD values and low plasma ferritin; few patients received VD and/or iron supplementation. We suggest monitoring 25(OH)D and ferritin levels due to the high rate of deficiency of these nutrients; public hospitals should be equipped with drugs to treat these deficiencies.

[PMID: 29342407](#)

9. Quantitative sensory testing profiles in children, adolescents and young adults (6-20 years) with cerebral palsy: Hints for a neuropathic genesis of pain syndromes.

Blankenburg M, Junker J, Hirschfeld G, Michel E, Aksu F, Wager J, Zernikow B.

Eur J Paediatr Neurol. 2017 Dec 30. pii: S1090-3798(17)30226-X. doi: 10.1016/j.ejpn.2017.12.015. [Epub ahead of print]

INTRODUCTION: Many patients with cerebral palsy (CP) suffer chronic pain as one of the most limiting factors in their quality of life. In CP patients, pain mechanisms are not well understood, and pain therapy remains a challenge. Quantitative sensory testing (QST) might provide unique information about the functional status of the somatosensory system and therefore better guide pain treatment. **OBJECTIVES:** To understand better the underlying pain mechanisms in pediatric CP patients, we aimed to assess clinical and pain parameters, as well as QST profiles, which were matched to the patients' cerebral imaging pathology. **PATIENTS AND METHODS:** Thirty CP patients aged 6-20 years old (mean age 12 years) without intellectual impairment underwent standardized assessments of QST. Cerebral imaging was reassessed. QST results were compared to age- and sex-matched controls (multiple linear regression; Fisher's exact test; linear correlation analysis). **RESULTS:** CP patients were less sensitive to all mechanical and thermal stimuli than healthy controls but more sensitive to all mechanical pain stimuli (each $p < 0.001$). Fifty percent of CP patients showed a combination of mechanical hypoesthesia, thermal hypoesthesia and mechanical hyperalgesia; 67% of CP patients had periventricular leukomalacia (PVL), which was correlated with mechanical ($r = 0.661$; $p < 0.001$) and thermal ($r = 0.624$; $p = 0.001$) hypoesthesia. **CONCLUSION:** The combination of mechanical hypoesthesia, thermal hypoesthesia and mechanical hyperalgesia in our CP patients implicates lemniscal and extralemniscal neuron dysfunction in the thalamus region, likely due to PVL. We suspect that extralemniscal tracts are involved in the original of pain in our CP patients, as in adults.

[PMID: 29337004](#)

10. 'Total Pain' in Children with Severe Neurological Impairment.

Warlow TA, Hain RDW.

Children (Basel). 2018 Jan 18;5(1). pii: E13. doi: 10.3390/children5010013.

Many children with palliative care needs experience difficulty in managing pain. Perhaps none more so than those with severe neurological impairment. For many years; behaviours in these children were misunderstood. As a result; pain was poorly recognised and inadequately managed. Significant advances have been made in the assessment and management of pain in this

challenging group of patients. We summarise these advances; drawing on our own experience working with infants; children and young adults with palliative care needs within a UK tertiary paediatric palliative care service. We expand on the recent understanding of 'Total Pain'; applying a holistic approach to pain assessment and management in children with severe neurological impairment.

[PMID: 29346304](#)

11. Developmental Disability at School Age and Difficulty Obtaining Follow-up Data.

Doyle LW, Anderson PJ, Burnett A, Callanan C, McDonald M, Hayes M, Opie G, Carse E, Cheong JL; Victorian Infant Collaborative Study (VICS) Group.

Pediatrics. 2018 Jan 12. pii: e20173102. doi: 10.1542/peds.2017-3102. [Epub ahead of print]

BACKGROUND: The relationship of developmental disability rates with difficulty obtaining follow-up data is unclear. With this study, we aimed to determine if children who attended research follow-up assessments with more difficulty had more disability at school age, compared with those who attended with less difficulty, and to establish the relationship between follow-up and disability rates. **METHODS:** Two groups, comprising 219 consecutive survivors born at <28 weeks' gestation or at <1000 g birth weight in the state of Victoria, Australia, in 2005, and 218 term-born, normal birth weight controls were assessed at 8 years of age for neurodevelopmental disability (any of IQ <-1 SD, cerebral palsy, blindness, or deafness). Children were classified as either more or less difficult to get to attend by research nurses involved in the study. **RESULTS:** The follow-up rate was 87% for both groups. Overall, children who attended with more difficulty had higher rates of neurodevelopmental disability (42%; 19 of 45) than those who attended with less difficulty (20%; 66 of 328) (odds ratio: 3.09, 95% confidence interval: 1.58 to 6.01; $P = .001$). As the follow-up rate rose among the 3 individual hospitals involved in the assessments, so did the rate of neurodevelopmental disability ($P = .025$). **CONCLUSIONS:** Children who attend with more difficulty have higher rates of neurodevelopmental disability at school age than those who attend with less difficulty, and disability rates rise with higher follow-up rates. Rates of neurodevelopmental disability will be underestimated if researchers are not persistent enough to obtain high follow-up rates.

[PMID: 29330314](#)

12. Caregiver Difficulties Scale (CDS): Translation and Psychometric Evaluation Among Iranian Mothers of Cerebral Palsy Children.

Farajzadeh A, Amini M, Maroufizadeh S, Wijesinghe CJ.

Occup Ther Health Care. 2018 Jan;32(1):28-43. doi: 10.1080/07380577.2017.1422607.

The aim of this study was to investigate of psychometric properties of the Caregiver Difficulties Scale (CDS) for Iranian caregivers of children with cerebral palsy (CP). After a forward-backward translation, the Persian version of CDS (P-CDS) was administered to 151 Iranian mothers of CP children. The confirmatory factor analysis (CFA) was applied to measure the factor structure of P-CDS. The reliability was evaluated by examining internal consistency and test-retest method over a 2-week period using Cronbach's alpha and the intraclass correlation coefficient (ICC), respectively. The construct validity was assessed by measuring the association between the scores of the P-CDS and Caregiver Burden Scale (CBS), World Health Organization Quality of Life (WHOQOL-BREF), the Beck Depression Index (BDI II), and the Fatigue Severity Scale (FSS). The fit indices showed that the original model of CDS was relatively adequate ($\chi^2/df = 2.03$, CFI = 0.90, TLI = 0.88 and RMSEA = 0.08). All domains of P-CDS met the minimum reliability standards (Cronbach's alpha and ICC > 0.7). All subscales of P-CDS were positively correlated with the CBS, BDI-II and FSS and negatively correlated with the WHOQOL-BREF. The results showed that P-CDS is a valid and reliable measure for assessing the burden of care in Iranian mothers of CP children.

[PMID: 29351517](#)

13. Closing the knowledge gap in Mexico: towards evidence-based medicine in childhood disability.

Valverde-Diaz ME, Carranza-Del Rio J.

Dev Med Child Neurol. 2018 Feb;60(2):113-114. doi: 10.1111/dmcn.13638.

[No abstract available]

[PMID: 29336074](#)

Prevention and Cure

14. Cerebral palsy and genomics: an international consortium.

MacLennan AH, Krueger MC, Baynam G, Moreno-De-Luca A, Wilson YA, Zhu C, Wintle RF, Gecz ; members of the International Cerebral Palsy Genomics Consortium.

Dev Med Child Neurol. 2018 Feb;60(2):209-210. doi: 10.1111/dmcn.13643.

[No abstract available]

[PMID: 29336076](#)

15. Neurodevelopmental outcome in very preterm and very-low-birthweight infants born over the past decade: a meta-analytic review.

Pascal A, Govaert P, Oostra A, Naulaers G, Ortibus E, Van den Broeck C.

Dev Med Child Neurol. 2018 Jan 19. doi: 10.1111/dmcn.13675. [Epub ahead of print]

AIM: The purpose of this systematic review was to provide an up-to-date global overview of the separate prevalences of motor and cognitive delays and cerebral palsy (CP) in very preterm (VPT) and very-low-birthweight (VLBW) infants. **METHOD:** A comprehensive search was conducted across four databases. Cohort studies reporting the prevalence of CP and motor or cognitive outcome from 18 months corrected age until 6 years of VPT or VLBW infants born after 2006 were included. Pooled prevalences were calculated with random-effects models. **RESULTS:** Thirty studies were retained, which included a total of 10 293 infants. The pooled prevalence of cognitive and motor delays, evaluated with developmental tests, was estimated at 16.9% (95% confidence interval [CI] 10.4-26.3) and 20.6% (95% CI 13.9-29.4%) respectively. Mild delays were more frequent than moderate-to-severe delays. Pooled prevalence of CP was estimated to be 6.8% (95% CI 5.5-8.4). Decreasing gestational age and birthweight resulted in higher prevalences. Lower pooled prevalences were found with the Third Edition of the Bayley Scales of Infant Development than with the Second Edition. **INTERPRETATION:** Even though neonatal intensive care has improved over recent decades, there is still a wide range of neurodevelopmental disabilities resulting from VPT and VLBW births. However, pooled prevalences of CP have diminished over the years. **WHAT THIS PAPER ADDS:** The Bayley Scales of Infant and Toddler Development, Third Edition reported lower pooled prevalences of motor and cognitive delays than the Second Edition. The pooled prevalence of cerebral palsy in infants born extremely preterm was reduced compared with previous meta-analyses.

[PMID: 29350401](#)

16. T2 Relaxometry MRI Predicts Cerebral Palsy in Preterm Infants.

Chen LW, Wang ST, Huang CC, Tu YF, Tsai YS.

AJNR Am J Neuroradiol. 2018 Jan 18. doi: 10.3174/ajnr.A5501. [Epub ahead of print]

BACKGROUND AND PURPOSE: T2-relaxometry brain MR imaging enables objective measurement of brain maturation based on the water-macromolecule ratio in white matter, but the outcome correlation is not established in preterm infants. Our study aimed to predict neurodevelopment with T2-relaxation values of brain MR imaging among preterm infants. **MATERIALS AND METHODS:** From January 1, 2012, to May 31, 2015, preterm infants who underwent both T2-relaxometry brain MR imaging and neurodevelopmental follow-up were retrospectively reviewed. T2-relaxation values were measured over the periventricular white matter, including sections through the frontal horns, midbody of the lateral ventricles, and centrum semiovale. Periventricular T2 relaxometry in relation to corrected age was analyzed with restricted cubic spline regression. Prediction of cerebral palsy was examined with the receiver operating characteristic curve. **RESULTS:** Thirty-eight preterm infants were enrolled for analysis. Twenty patients (52.6%) had neurodevelopmental abnormalities, including 8 (21%) with developmental delay without cerebral palsy and 12 (31.6%) with cerebral palsy. The periventricular T2-relaxation values in relation to age were curvilinear in preterm infants with normal development, linear in those with developmental delay without cerebral palsy, and flat in those with cerebral palsy. When MR imaging was performed at >1 month corrected age, cerebral palsy could be predicted with T2 relaxometry of the periventricular white matter on sections through the midbody of the lateral ventricles (area under the receiver operating characteristic curve = 0.738; cutoff value of >217.4 with 63.6% sensitivity and 100.0% specificity). **CONCLUSIONS:** T2-relaxometry brain MR imaging could provide prognostic prediction of neurodevelopmental outcomes in premature infants. Age-dependent and area-selective interpretation in preterm brains should be emphasized.

[PMID: 29348132](#)

17. Relationship between very early brain structure and neuromotor, neurological and neurobehavioral function in infants born <31 weeks gestational age.

George JM, Fiori S, Fripp J, Pannek K, Guzzetta A, David M, Ware RS, Rose SE, Colditz PB, Boyd RN.

Early Hum Dev. 2018 Jan 13;117:74-82. doi: 10.1016/j.earlhumdev.2017.12.014. [Epub ahead of print]

AIM: This study aimed to examine associations between structural MRI and concurrent motor, neurological and neurobehavioral measures at 30-32 weeks postmenstrual age (PMA; 'Early'), and at term equivalent age ('Term'). **METHOD:** In this prospective cohort study, infants underwent Early MRI (n = 119; 73 male; median 32 weeks 1 day PMA) and Term MRI (n = 102; 61 male; median 40 weeks 4 days PMA) at 3 T. Structural images were scored generating white matter (WM), cortical gray matter, deep gray matter, cerebellar and global brain abnormality scores. Clinical measures were General Movements Assessment (GMs), Hammersmith Neonatal Neurological Examination (HNNE) and NICU Neonatal Neurobehavioral Scale (NNNS). The Premie-Neuro was administered Early and the Test of Infant Motor Performance (TIMP) and a visual assessment at Term. **RESULTS:** Early MRI cerebellar scores were strongly associated with neurological components of HNNE (reflexes), NNNS (Hypertonicity), the Premie-Neuro neurological subscale (regression coefficient $\beta = -0.06$; 95% confidence interval CI = -0.09, -0.04; $p < .001$) and cramped-synchronized GMs ($\beta = 1.10$; 95%CI = 0.57, 1.63; $p < .001$). Term MRI WM and global scores were strongly associated with the TIMP (WM $\beta = -1.02$; 95%CI = -1.67, -0.36; $p = .002$; global $\beta = -1.59$; 95% CI = -2.62, -0.56; $p = .001$). **INTERPRETATION:** Brain structure on Early and Term MRI was associated with concurrent motor, neurological and neurobehavioral function in very preterm infants.

[PMID: 29339258](#)

18. Antenatal magnesium sulfate is beneficial or harmful in very preterm and extremely preterm neonates: a new insight.

Garg BD.

J Matern Fetal Neonatal Med. 2018 Jan 17:1-7. doi: 10.1080/14767058.2018.1424823. [Epub ahead of print]

AIMS: To evaluate whether antenatal MgSO₄ is beneficial or harmful in very preterm and extremely preterm neonates. **MATERIALS AND METHODS:** We retrieved published literature through searches of PubMed or Medline, CINAHL, and the Cochrane Library. Results were restricted to systematic reviews, meta-analysis, randomized controlled trials (RCTs), and relevant observational studies. **RESULTS:** Evidence revealed that antenatal MgSO₄ has neuroprotective role in preterm neonates and it decreased the risk of cerebral palsy and gross motor dysfunction. Evidences regarding association of antenatal MgSO₄ with feed intolerance, NEC and SIP were from cohort studies and controversial. **CONCLUSIONS:** We should continue use antenatal MgSO₄ to all eligible patients according to protocol till the more robust evidence will suggest association with gastrointestinal complications. In the meantime, we should have a high index of suspicion of gastrointestinal complications in extremely preterms particularly <26 weeks of gestation.

[PMID: 29301419](#)