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Interventions and Management

1. The effectiveness of Baby-CIMT in infants younger than 12 months with clinical signs of unilateral-cerebral palsy; an explorative study with randomized design.

Eliasson AC, Nordstrand L, Ek L, Lennartsson F, Sjöstrand L, Tedroff K, Krumlinde-Sundholm L.

Res Dev Disabil. 2017 Nov 23;72:191-201. doi: 10.1016/j.ridd.2017.11.006. [Epub ahead of print]

AIM: To explore the effectiveness of baby-CIMT (constraint-induced movement therapy) and baby-massage for improving the manual ability of infants younger than 12 months with unilateral cerebral palsy (CP). **METHOD:** Infants eligible for inclusion were 3-8 months old with asymmetric hand function and at high risk of developing unilateral CP. Thirty-seven infants were assigned randomly to receive baby-CIMT or baby-massage. At one year of age 31 children were diagnosed with unilateral CP, 18 (8 boys, 6.1±1.7months) of these had received baby-CIMT and 13 (8 boys, 5.0±1.6months) baby-massage. There were two 6-week training periods separated by a 6-week pause. The Hand Assessment for Infants (HAI), Assisting Hand Assessment (AHA), the Parenting Sense of Competence Scale (PSCS) and a questionnaire concerning feasibility were applied. **RESULTS:** There was improvement in the "Affected hand score" of HAI from median 10 (6;13 IQR) to 13 (7;17 IQR) raw score in the baby-CIMT group and from 5 (4;11 IQR) to 6 (3;12 IQR) for baby-massage with a significant between group difference ($p=0.041$). At 18-month of age, the median AHA score were 51 (38;72 IQR) after baby-CIMT ($n=18$) compared to 24 (19;43 IQR) baby-massage ($n=9$). The PSCS revealed an enhanced sense of competence of being a parent among fathers in the baby-CIMT group compared to fathers in the baby-massage ($p=0.002$). Parents considered both interventions to be feasible. **CONCLUSION:** Baby-CIMT appears to improve the unimanual ability of young children with unilateral CP more than massage.

[PMID: 29175749](#)

2. The effects of task-oriented training on hand dexterity and strength in children with spastic hemiplegic cerebral palsy: a preliminary study.

Moon JH, Jung JH, Hahm SC, Cho HY.

J Phys Ther Sci. 2017 Oct;29(10):1800-1802. doi: 10.1589/jpts.29.1800. Epub 2017 Oct 21.

[Purpose] The purpose of this study was to investigate the effects of task-oriented training (TOT) on hand dexterity and strength in children with spastic hemiplegic cerebral palsy. [Subjects and Methods] Twelve children with spastic hemiplegic cerebral palsy were randomly assigned to either the TOT group ($n=6$) or the control group ($n=6$). In both groups, conventional occupational therapy was performed 40-min/day, 2 times a week, for 4 weeks. In the TOT group, TOT was additionally performed for 20 min, and the control group received usual care. The box and block test (BBT) was performed to assess hand dexterity. Hand strength was also assessed using hand dynamometer. [Results] After intervention, the TOT group showed a significant improvement of hand dexterity. In the control group, BBT and grip strength were not significantly improved after intervention. [Conclusion] In clinical settings, we suggest that TOT may be used as an intervention to improve hand dexterity in children with spastic hemiplegic cerebral palsy.

[PMID: 29184291](#)

3. Corticospinal tract diffusion properties and robotic visually guided reaching in children with hemiparetic cerebral palsy.

Kuczynski AM, Dukelow SP, Hodge JA, Carlson HL, Lebel C, Semrau JA, Kirton A.

Hum Brain Mapp. 2017 Nov 29. doi: 10.1002/hbm.23904. [Epub ahead of print]

Perinatal stroke is the leading cause of hemiparetic cerebral palsy (CP), resulting in life-long disability. In this study, we examined the relationship between robotic upper extremity motor impairment and corticospinal tract (CST) diffusion properties. Thirty-three children with unilateral perinatal ischemic stroke (17 arterial, 16 venous) and hemiparesis were recruited from a population-based research cohort. Bilateral CSTs were defined using diffusion tensor imaging (DTI) and four diffusion metrics were quantified: fractional anisotropy (FA), mean (MD), radial (RD), and axial (AD) diffusivities. Participants completed a visually guided reaching task using the KINARM robot to define 10 movement parameters including movement time and maximum speed. Twenty-six typically developing children underwent the same evaluations. Partial correlations assessed the relationship between robotic reaching and CST diffusion parameters. All diffusion properties of the lesioned CST differed from controls in the arterial group, whereas only FA was reduced in the venous group. Non-lesioned CST diffusion measures were similar between stroke groups and controls. Both stroke groups demonstrated impaired reaching performance. Multiple reaching parameters of the affected limb correlated with lesioned CST diffusion properties. Lower FA and higher MD were associated with greater movement time. Few correlations were observed between non-lesioned CST diffusion and unaffected limb function though FA was associated with reaction time ($R = -0.39$, $p < .01$). Diffusion properties of the lesioned CST are altered after perinatal stroke, the degree of which correlates with specific elements of visually guided reaching performance, suggesting specific relevance of CST structural connectivity to clinical motor function in hemiparetic children.

[PMID: 29193460](#)

4. Manual Dexterity and Intralimb Coordination Assessment to Distinguish Different Levels of Impairment in Boccia Players with Cerebral Palsy.

Roldan A, Sabido R, Barbado D, Caballero C, Reina R.

Front Neurol. 2017 Nov 10;8:582. doi: 10.3389/fneur.2017.00582. eCollection 2017.

BACKGROUND: Boccia is a paralympic sport played by athletes with severe neurological impairments affecting all four limbs. Impaired manual dexterity (MD) and intralimb coordination (ILC) may limit individuals' ability to perform certain activities such as grasping, releasing, or manipulating objects, which are essential tasks for daily life or to participate in para sports such as boccia. However, there are currently no specific instruments available to assess hand-arm coordination in boccia players with severe cerebral palsy (CP). **PURPOSE:** To design new sport-specific coordination tests to assess impaired MD and ILC in boccia players; afterward, quantify to what extent their coordination is impaired compared to a control group (CG) without neurological impairments. **METHODS:** Seventy-three recreational boccia players with severe CP (BC1: age = 34.01 ± 16.43 years; BC2: age = 33.97 ± 14.29 years), and 19 healthy adults (age = 27.89 ± 7.08 years) completed the test battery. The Box and Block test (BBT) and Box and Ball test (BBLT) were used to assess MD and four tapping tests to assess upper ILC. **RESULTS:** Both MD tests were able to discriminate between sport classes. Boccia players obtained better scores in the BBLT in comparison to the BBT, showing that the BBLT had more appropriate testing features. On the other hand, only one of the ILC tests was able to discriminate between sport classes, displaying the highest practical significance ($d = -1.12$). Participants with CP scored significantly worse in all the coordination tests compared to the CG. **CONCLUSION:** Using sport-specific equipment facilitated grasp function during the MD assessment. Regarding the ILC, the type of movement (continuous vs. discrete) seems to be more relevant for classification than the movement direction (vertical vs. horizontal) or the presence of a ball.

[PMID: 29176957](#)

5. Effect of physiotherapeutic intervention on the gait after the application of botulinum toxin in children with cerebral palsy: systematic review.

Fonseca PR Jr, Franco de Moura RC, Galli M, Santos Oliveira C.

Eur J Phys Rehabil Med. 2017 Nov 29. doi: 10.23736/S1973-9087.17.04940-1. [Epub ahead of print]

BACKGROUND: Cerebral palsy is a group of movement and posture development disorders. 90% of this population has gait impairment, often due to the presence of spasticity. A number of studies emphasize the importance of combined physical therapy with botulinum toxin A treatment. However, no consensus can be reached concerning the content of the physiotherapy programme after treatment with botulinum toxin A. **AIM:** The purpose of the present study was to investigate, through a

systematic review of the literature, the effects of physiotherapeutic intervention on gait after botulinum toxin application in children with cerebral palsy. **METHODS:** Pubmed, Scielo, Cochrane Library, OTseeker and PEDro databases were searched for randomized trial published between January 2000 and January 2017. **RESULTS:** Sixty-eight articles were identified, four of which met the eligibility criteria and were selected for the present systematic review. A table was created showing the main characteristics of the studies (groups, inclusion criteria, dosage, injection site, physiotherapeutic intervention, evaluation and outcomes). **CONCLUSIONS:** This study offers a view on the increase in the therapeutic effectiveness of botulinum toxin A on the lower limbs when used in conjunction with a physiotherapeutic intervention, with improvements in mobility, gait pattern, range of motion and spasticity, which are maintained after the end of the physical therapy protocol. **CLINICAL REHABILITATION IMPACT:** The use of botulinum toxin A on the lower limbs when used in conjunction with a physiotherapeutic intervention, can improve muscle tone, allowing a combined treatment and intended to provide improvement of motor ability and functional skills, and potentially, delay the need for surgery.

[PMID: 29185676](#)

6. Effects of 4 weeks of dynamic neuromuscular stabilization training on balance and gait performance in an adolescent with spastic hemiparetic cerebral palsy.

Kim DH, An DH, Yoo WG.

J Phys Ther Sci. 2017 Oct;29(10):1881-1882. doi: 10.1589/jpts.29.1881. Epub 2017 Oct 21.

[Purpose] The purpose of this study investigated the effects of 4 weeks of dynamic neuromuscular stabilization training on balance ability. [Subject and Methods] An adolescent with spastic hemiparetic cerebral palsy was recruited. The subject performed 4 weeks of dynamic neuromuscular stabilization training. We assessed the balance subtest of the Bruininks-Oseretsky Test of Motor Proficiency-Second Edition, the 10-meter walk test, and the 6-min walk test. [Results] The balance subtest scores were improved significantly after training. [Conclusion] This study suggests that 4 weeks of dynamic neuromuscular stabilization training is effective for improving balance and gait performance in spastic hemiparetic cerebral palsy.

[PMID: 29184312](#)

7. THE EFFECT OF ADAPTED SPORTS IN QUALITY OF LIFE AND BIOPSYCHOSOCIAL PROFILE OF CHILDREN AND ADOLESCENTS WITH CEREBRAL PALSY.

[Article in English, Portuguese; Abstract available in Portuguese from the publisher]

Feitosa LC, Muzzolon SRB, Rodrigues DCB, Crippa ACS, Zonta MB.

Rev Paul Pediatr. 2017 Oct-Dec;35(4):429-435. doi: 10.1590/1984-0462/2017;35;4;00001.

OBJECTIVE: The participation in sports and recreational activities promotes inclusion and the quality of life (QOL) for people with some type of disability. This study aims to evaluate and describe the effect of adapted sports (AS) on the QOL and biopsychosocial profile of children/adolescents with cerebral palsy (CP). **METHODS:** Forty-seven children/adolescents with CP were evaluated and referred to AS (soccer and swimming). The QOL was evaluated by the Pediatric Outcome Data Collection Instrument (PODCI) and the biopsychosocial profile by the Behavior Checklist for Children/Adolescents (CBCL). These instruments considered the influence of gender, age, race, social income, education and topography of spasticity. **RESULTS:** Seventeen children/adolescents who practiced AS were re-evaluated after one year. There was significant improvement in the dimensions of transfers and mobility ($p=0.009$), upper extremity function ($p=0.021$) and global function ($p=0.004$) of IARRP. There was significant improvement considering the attention disorder syndrome ($p=0.026$), and the attention deficit hyperactivity disorders ($p=0.008$) in the Diagnostic and Statistical Manual of Mental Disorders (DSM)-oriented analysis (CBCL). Children/adolescents with diplegia obtained greater benefit than those with hemiplegia in relation to the comfort and pain ($p=0.02$) and global dimension ($p=0.027$) (PODCI). The boys had higher scores in total competence ($p=0.048$); the extremely poor group obtained higher levels in the breaking rules syndrome ($p=0.008$). **CONCLUSIONS:** The AS had a positive effect on the QOL and biopsychosocial profile of children/adolescents with CP in this sample, especially considering the global and upper extremity function, capacity for transfers and mobility, and benefits in the problems related to difficulties in attention.

[PMID: 29185624](#)

8. Results of multilevel surgery in diplegic cerebral palsy at skeletal maturity: new evidence.

Theologis T.

Dev Med Child Neurol. 2017 Nov 27. doi: 10.1111/dmcn.13627. [Epub ahead of print]

[This commentary is on the original article by Dreher et al.]

[PMID: 29178160](#)

9. The effect of hip reconstruction on gross motor function levels in children with cerebral palsy.

Cobanoglu M, Cullu E, Omurlu I.

Acta Orthop Traumatol Turc. 2017 Nov 23. pii: S1017-995X(16)30360-1. doi: 10.1016/j.aott.2017.11.001. [Epub ahead of print]

OBJECTIVE: The aim of this study was to determine whether the hip reconstruction has an effect on gross motor function classification system (GMFCS) levels in patients with hip instability in cerebral palsy (CP). **METHODS:** A total of 45 hips of 30 patients (mean age: 8.7 (4-17) years) with CP operated due to hip instability with a minimum of 2 years of follow-up were included into the study. Migration index was used for classification of the severity of hip instability. Clinical evaluation included sitting and walking ability, existence of pressure sores, difficulty in perineal care, and hip pain. The functional gains from the surgery were evaluated with changes in GMFCS levels. Wilcoxon T test, chi-square test and Spearman correlation test were used. **RESULTS:** Mean follow-up time was 57 (24-132) months. The distribution of preoperative GMFCS was level I in 1 patient, level II in 4 patients, level III in 5 patients, level IV in 9 patients and level V in 11 patients. The complaints resolved in 25 patients, and persisted in 5 postoperatively. There was no correlation between the changes in GMFCS levels and the postoperative complaints ($p = 0.504$). The GMFCS levels did not change in 20 patients, improved in 8, and worsened in 2. There were no significant differences between the preoperative and postoperative GMFCS levels ($p = 0.052$). Positive correlations were found between the preoperative GMFCS-MI, the type of CP-MI respectively ($p = 0.001$, $p = 0.015$). **CONCLUSION:** There was an improvement in preoperative complaints. GMFCS levels remained stable after surgery. Relief in symptoms was not consistent with the changes in GMFCS in children with cerebral palsy after hip reconstruction.

[PMID: 29174477](#)

10. Vertical and Horizontal Jump Capacity in International Cerebral Palsy Football Players.

Reina R, Iturricastillo A, Sabido R, Campayo-Piarnas M, Yanci J.

Int J Sports Physiol Perform. 2017 Nov 28;1-23. doi: 10.1123/ijsp.2017-0321. [Epub ahead of print]

PURPOSE: the aims of the present study were to evaluate the reliability and validity of vertical and horizontal jump tests in football players with cerebral palsy (FPCP), and to analyze the jump performance differences between current IFCPF functional classes (i.e. FT5-FT8). **METHODS:** One hundred and thirty-two international para-footballers (25.8 ± 6.7 years; 70.0 ± 9.1 kg; 175.7 ± 7.3 cm; 22.8 ± 2.8 kg·m⁻²; 10.7 ± 7.5 years training experience) participated in the study. The participants were classified according to the IFCPF Classification Rules (i.e. FT5-FT8), and a group of 39 players without CP was included in the study as a control group (CG). Football players' vertical and horizontal jump performance was assessed. **RESULTS:** All the tests showed good to excellent relative intra-session reliability scores, both in FPCP and in the CG (ICC=.78-.97, SEM<10.5%). Significant between-group differences ($p<.001$) were obtained in the counter-movement jump (CMJ), standing broad jump (SBJ), four bounds for distance (4B), triple hop for distance dominant leg (THd) and non-dominant leg (THnd). The CG performed higher/farther jumps with regard to all the FPCP classes, obtaining significant differences and moderate to large effect sizes ($.85 < ES < 5.54$, $p < .01$). Players in FT8 class (less severe impairments) had significantly higher scores in all the jump tests compared to players in the lower classes ($ES = \text{moderate to large}$, $p < .01$). **CONCLUSIONS:** the vertical and horizontal jump tests performed in this study could be applied to the classification procedures and protocols for cerebral palsy football players.

[PMID: 29182436](#)

11. Lower limb muscle volume estimation from maximum cross-sectional area and muscle length in cerebral palsy and typically developing individuals.

Vanmechelen IM, Shortland AP, Noble JJ.

Clin Biomech (Bristol, Avon). 2017 Nov 14;51:40-44. doi: 10.1016/j.clinbiomech.2017.11.004. [Epub ahead of print]

BACKGROUND: Deficits in muscle volume may be a significant contributor to physical disability in young people with cerebral palsy. However, 3D measurements of muscle volume using MRI or 3D ultrasound may be difficult to make routinely in the clinic. We wished to establish whether accurate estimates of muscle volume could be made from a combination of anatomical cross-sectional area and length measurements in samples of typically developing young people and young people with bilateral cerebral palsy. **METHODS:** Lower limb MRI scans were obtained from the lower limbs of 21 individuals with cerebral palsy (14.7±3years, 17 male) and 23 typically developing individuals (16.8±3.3years, 16 male). The volume, length and anatomical cross-sectional area were estimated from six muscles of the left lower limb. **FINDINGS:** Analysis of Covariance demonstrated that the relationship between the length*cross-sectional area and volume was not significantly different depending on the subject group. Linear regression analysis demonstrated that the product of anatomical cross-sectional area and length bore a strong and significant relationship to the measured muscle volume (R² values between 0.955 and 0.988) with low standard error of the estimates of 4.8 to 8.9%. **INTERPRETATION:** This study demonstrates that muscle volume may be estimated accurately in typically developing individuals and individuals with cerebral palsy by a combination of anatomical cross-sectional area and muscle length. 2D ultrasound may be a convenient method of making these measurements routinely in the clinic.

[PMID: 29179032](#)

12. Are mechanically sensitive regulators involved in the function and (patho)physiology of cerebral palsy-related contractures?

Pingel J, Suhr F.

J Muscle Res Cell Motil. 2017 Nov 30. doi: 10.1007/s10974-017-9489-1. [Epub ahead of print]

Skeletal muscle tissue is mechanosensitive, as it is able to sense mechanical impacts and to translate these into biochemical signals making the tissue adapt. Among its mechanosensitive nature, skeletal muscle tissue is the largest metabolic organ of the human body. Disturbances in skeletal muscle mechanosensing and metabolism cause and contribute to many diseases, i.e. muscular dystrophies/myopathies, cardiovascular diseases, COPD or diabetes mellitus type 2. A less commonly focused muscle-related disorder is clinically known as muscle contractures that derive from cerebral palsy (CP) conditions in young and adults. Muscle contractures are characterized by gradually increasing passive muscle stiffness resulting in complete fixation of joints. Different mechanisms have been identified in CP-related contractures, i.e. altered calcium handling, altered metabolism or altered titin regulation. The muscle-related extracellular matrix (ECM), specifically collagens, plays a role in CP-related contractures. Herein, we focus on mechanically sensitive complexes, known as costameres (Cstms), and discuss their potential role in CP-related contractures. We extend our discussion to the ECM due to the limited knowledge of its role in CP-related contractures. The aims of this review are (1) to summarize CP-related contracture mechanisms, (2) to raise novel hypotheses on the genesis of contractures with a focus on Cstms, and (3) to stimulate novel approaches to study CP-related contractures.

[PMID: 29190010](#)

13. [Administering BARS in children with ataxia in a children rehabilitation center in Chiapas, Mexico].

[Article in Spanish; Abstract available in Spanish from the publisher]

Perdomo-Rebollo FG, Kleinert-Altamirano API.

Rev Med Inst Mex Seguro Soc. 2017 Nov-Dec;55(6):715-719.

BACKGROUND: Ataxias are an heterogeneous group of diseases with different etiologies. Scales are used to understand better its natural history and evaluate properly drug efficacy in clinical trials. SARA and ICARS scales have been the most studied and validated so far. BARS scale is based on a modified form of the ICARS scale and is valid, reliable and sufficiently fast for clinical purposes. **METHODS:** Cross-sectional, descriptive and correlational study. Kruskal-Wallis test was used. We administered BARS to children from 4 to 18 years of age, with ataxic syndrome, without cognitive impairment, in active status, from February, 2007 to September, 2014, at the CRIT (Centro de Rehabilitación Infantil Teletón) from Chiapas, Mexico. **RESULTS:** 14 children were included. The main BARS score was 17.9/30; 4H syndrome with the worst score was 27.6/30; ataxia telangiectasia 15.6/30; ataxic cerebral palsy 12/30; and others 16.1/30. Kruskal-Wallis test did not show a significant statistically difference when comparing the etiology with BARS score (p = 0.068). **CONCLUSIONS:** BARS items were an easy way to assess ataxic clinic in children; worse condition was found in neurodegenerative ataxias and better results in ataxic cerebral palsy.

[PMID: 29190864](#)

14. The integration of probabilistic information during sensorimotor estimation is unimpaired in children with Cerebral Palsy.

Chambers C, Sokhey T, Gaebler-Spira D, Kording KP.

PLoS One. 2017 Nov 29;12(11):e0188741. doi: 10.1371/journal.pone.0188741. eCollection 2017.

BACKGROUND: It is important to understand the motor deficits of children with Cerebral Palsy (CP). Our understanding of this motor disorder can be enriched by computational models of motor control. One crucial stage in generating movement involves combining uncertain information from different sources, and deficits in this process could contribute to reduced motor function in children with CP. Healthy adults can integrate previously-learned information (prior) with incoming sensory information (likelihood) in a close-to-optimal way when estimating object location, consistent with the use of Bayesian statistics. However, there are few studies investigating how children with CP perform sensorimotor integration. We compare sensorimotor estimation in children with CP and age-matched controls using a model-based analysis to understand the process. **METHODS AND FINDINGS:** We examined Bayesian sensorimotor integration in children with CP, aged between 5 and 12 years old, with Gross Motor Function Classification System (GMFCS) levels 1-3 and compared their estimation behavior with age-matched typically-developing (TD) children. We used a simple sensorimotor estimation task which requires participants to combine probabilistic information from different sources: a likelihood distribution (current sensory information) with a prior distribution (learned target information). In order to examine sensorimotor integration, we quantified how participants weighed statistical information from the two sources (prior and likelihood) and compared this to the statistical optimal weighting. We found that the weighing of statistical information in children with CP was as statistically efficient as that of TD children. **CONCLUSIONS:** We conclude that Bayesian sensorimotor integration is not impaired in children with CP and therefore, does not contribute to their motor deficits. Future research has the potential to enrich our understanding of motor disorders by investigating the stages of motor processing set out by computational models. Therapeutic interventions should exploit the ability of children with CP to use statistical information.

[PMID: 29186196](#)

15. Relationship between gross motor function and the function, activity and participation components of the International Classification of Functioning in children with spastic cerebral palsy.

Lee BH.

J Phys Ther Sci. 2017 Oct;29(10):1732-1736. doi: 10.1589/jpts.29.1732. Epub 2017 Oct 21.

[Purpose] This study aimed to evaluate the relationship between gross motor function, measured using the Gross Motor Function Measure (GMFM), Gross Motor Function Classification System (GMFCS), Manual Ability Classification System (MACS), and Functional Independence Measure for Children (WeeFIM), and Function, and Activity and Participation components of the International Classification of Functioning, Disability, and Health-Child and Youth Check List (ICF-CY) in children with spastic cerebral palsy (CP). [Subjects and Methods] Seventy-seven children with spastic CP participated in the study. The GMFM, GMFCS, MACS, and WeeFIM were administered in their entirety to patients without orthoses or mobility aids. The ICF-CY was used to evaluate the degree of disability and health. [Results] The score of the ICF component of Activity and Participation had a significantly strong correlation with the scores of GMFM, GMFCS, MACS, WeeFIM, and ICF component of Function. [Conclusion] When establishing a treatment plan for children with spastic CP, the children's physical abilities, and their limitation in activity, performance, and participation, which would be measured using the ICF-CY, should be taken into consideration.

[PMID: 29184279](#)

16. Initial psychometric validation of the questionnaire on pain caused by spasticity (QPS).

Geister TL, Bushnell DM, Yang J, Zhang Y, Martin ML, Heilbronn A, Liu Z.

Health Qual Life Outcomes. 2017 Nov 28;15(1):229. doi: 10.1186/s12955-017-0804-8.

BACKGROUND: The Questionnaire on Pain caused by Spasticity (QPS) is a modular patient- and observer-reported outcome measure of spasticity-related pain (SRP) in children with cerebral palsy (CP). Originally developed for an English-speaking population, we conducted a psychometric validation of a recently developed Chinese language version of the QPS. **METHODS:** This was a prospective, observational study involving 137 children/adolescents with CP and upper and/or lower limb spasticity and their parents at three sites in China. Six QPS modules were used, three each for upper and lower limb SRP assessment: a patient self-report module; an interviewer-administered module used by site staff based on the cognitive, communicative, and motor abilities of a patient; and a parent/caregiver module administered for all children as an observer-reported outcome to complement the patient-reported outcome. If no assessment by the patient was possible because of age or

cognitive impairments, only the parent/caregiver module was completed. Two visits with a 3-week interval provided data to evaluate and establish administrative ease of use, scoring of the QPS (factor analyses, Rasch analyses), reliability (Cronbach's α , intraclass correlation coefficient), validity (correlations with quality of life [PedsQL™], motor impairment [Gross Motor Function Classification System, Gross Motor Function Measure-66, Manual Ability Classification System], and spasticity [Ashworth Scale, Modified Tardieu Scale]). **RESULTS:** For most children, clinic staff reported no difficulties associated with general QPS use or deciding which module to use. Children (and parents) who reported more demanding activities also reported higher levels of associated SRP (or observed SRP behavior). Activity-related SRP items were combined for a total QPS score. Cronbach's α was low for child self-report, but was acceptable for interviewer-administered and parent reports on SRP. Test-retest reliability was high for all modules. Moderate-strong associations were frequently seen between QPS and quality of life, and were particularly strong in the child self-report group. Relatively weak associations were observed between QPS and motor impairment and spasticity. **CONCLUSIONS:** This first study was successful in providing initial evidence for the psychometric properties. Clinic staff were able to administer the QPS modules easily, and both children and parents were able to complete the designated QPS appropriately.

[PMID: 29183328](#)

17. Prevalence of Dysphagia in People With Intellectual Disability: A Systematic Review.

Robertson J, Chadwick D, Baines S, Emerson E, Hatton C.

Intellect Dev Disabil. 2017 Dec;55(6):377-391. doi: 10.1352/1934-9556-55.6.377.

Janet Robertson, Lancaster University, United Kingdom; Darren Chadwick, University of Wolverhampton, United Kingdom; Susannah Baines, Lancaster University, United Kingdom; Eric Emerson, Lancaster University, United Kingdom and University of Sydney, Australia; and Chris Hatton, Lancaster University, United Kingdom. Abstract: Dysphagia (feeding and swallowing disorder) is associated with serious health complications and psychosocial sequelae. This review summarizes international research relating to the prevalence of dysphagia in people with intellectual disability. Studies published from 1990 to July 2016 were identified using Medline, Cinahl, PsycINFO, Web of Science, email requests, and cross-citations. Twenty studies were identified. Dysphagia in people with intellectual disability appears to be associated with more severe levels of intellectual disability, comorbid cerebral palsy, and motor impairments. However, further research with representative samples of people with intellectual disability using adequate methods of assessment are required in order to provide more precise prevalence estimates and clarify factors that may be associated with dysphagia in this population.

[PMID: 29194030](#)

18. A report on the oral health status of children with cerebral palsy in Dubai, United Arab Emirates.

Halabi MA, Rashid MB.

Spec Care Dentist. 2017 Dec 1. doi: 10.1111/scd.12253. [Epub ahead of print]

[No abstract is available for this article.]

[PMID: 29194720](#)

Prevention and Cure

19. Diagnostic accuracy of early magnetic resonance imaging to determine motor outcomes in infants born preterm: a systematic review and meta-analysis.

George JM, Pannek K, Rose SE, Ware RS, Colditz PB, Boyd RN.

Dev Med Child Neurol. 2017 Nov 29. doi: 10.1111/dmcn.13611. [Epub ahead of print]

AIM: To examine the diagnostic ability of early magnetic resonance imaging (MRI; <36wks postmenstrual age) to detect later adverse motor outcomes or cerebral palsy (CP) in infants born preterm. **METHOD:** Studies of infants born preterm with MRI earlier than 36 weeks postmenstrual age and quantitative motor data or a diagnosis of CP at or beyond 1 year corrected age were identified. Study details were extracted and meta-analyses performed where possible. Quality of included studies was evaluated with the QUADAS-2 (a revised tool for the quality assessment of diagnostic accuracy studies). **RESULTS:** Thirty-one articles met the inclusion criteria, five of which reported diagnostic accuracy and five reported data sufficient for

calculation of diagnostic accuracy. Early structural MRI global scores detected a later diagnosis of CP with a pooled sensitivity of 100% (95% confidence interval [CI] 86-100) and a specificity of 93% (95% CI 59-100). Global structural MRI scores determined adverse motor outcomes with a pooled sensitivity of 89% (95% CI 44-100) and a specificity of 98% (95% CI 90-100). White matter scores determined adverse motor outcomes with a pooled sensitivity of 33% (95% CI 20-48) and a specificity of 83% (95% CI 78-88). INTERPRETATION: Early structural MRI has reasonable sensitivity and specificity to determine adverse motor outcomes and CP in infants born preterm. Greater reporting of diagnostic accuracy in studies examining relationships with motor outcomes and CP is required to facilitate clinical utility of early MRI. WHAT THIS PAPER ADDS: Early magnetic resonance imaging (MRI) has reasonable sensitivity and specificity to determine later adverse motor outcomes and cerebral palsy (CP). Detection of infants who progressed to CP was stronger than motor outcomes. Global MRI scores determined adverse motor outcomes more accurately than white matter scores. Few studies report diagnostic accuracy of early MRI findings. Diagnostic accuracy is required to draw clinically meaningful conclusions from early MRI studies.

[PMID: 29193032](#)

20. Neurodevelopmental and Behavioral Outcomes in Extremely Premature Neonates With Ventriculomegaly in the Absence of Periventricular-Intraventricular Hemorrhage.

Pappas A, Adams-Chapman I, Shankaran S, McDonald SA, Stoll BJ, Laptook AR, Carlo WA, Van Meurs KP, Hintz SR, Carlson MD, Brumbaugh JE, Walsh MC, Wyckoff MH, Das A, Higgins RD; Eunice Kennedy Shriver National Institute of Child Health and Human Development Neonatal Research Network.

JAMA Pediatr. 2017 Nov 27. doi: 10.1001/jamapediatrics.2017.3545. [Epub ahead of print]

IMPORTANCE: Studies of cranial ultrasonography and early childhood outcomes among cohorts of extremely preterm neonates have linked periventricular-intraventricular hemorrhage and cystic periventricular leukomalacia with adverse neurodevelopmental outcomes. However, the association between nonhemorrhagic ventriculomegaly and neurodevelopmental and behavioral outcomes is not fully understood. **OBJECTIVE:** To characterize the outcomes of extremely preterm neonates younger than 27 weeks' gestational age who experienced nonhemorrhagic ventriculomegaly that was detected prior to 36 weeks' postmenstrual age. **DESIGN, SETTING, AND PARTICIPANTS:** This longitudinal observational study was conducted at 16 centers of the Eunice Kennedy Shriver National Institute of Child Health and Human Development Neonatal Research Network. Infants born prior to 27 weeks' gestational age in any network facility between July 1, 2006, and June 30, 2011, were included if they had a cranial ultrasonogram performed prior to 36 weeks' postmenstrual age. Comparisons were made between those with ventriculomegaly and those with normal cranial sonograms. Data analysis was completed from August 2013 to August 2017. **MAIN OUTCOMES AND MEASURES:** The main outcome was neurodevelopmental impairment, defined as a Bayley Scales of Infant and Toddler Development III cognitive score less than 70, moderate/severe cerebral palsy, a Gross Motor Function Classification System score of level 2 or more, vision impairment, or hearing impairment. Secondary outcomes included Bayley Scales of Infant and Toddler Development III subscores, components of neurodevelopmental impairment, behavioral outcomes, and death/neurodevelopmental impairment. Logistic regression was used to evaluate the association of ventriculomegaly with adverse outcomes while controlling for potentially confounding variables and center differences as a random effect. Linear regression was used similarly for continuous outcomes. **RESULTS:** Of 4193 neonates with ultrasonography data, 300 had nonhemorrhagic ventriculomegaly (7%); 3045 had normal cranial ultrasonograms (73%), 775 had periventricular-intraventricular hemorrhage (18.5%), and 73 had cystic periventricular leukomalacia (1.7%). Outcomes were available for 3008 of 3345 neonates with ventriculomegaly or normal scans (90%). Compared with normal cranial ultrasonograms, ventriculomegaly was associated with lower gestational age, male sex, and bronchopulmonary dysplasia, late-onset sepsis, meningitis, necrotizing enterocolitis, and stage 3 retinopathy of prematurity. After adjustment, neonates with ventriculomegaly had higher odds of neurodevelopmental impairment (odds ratio [OR], 3.07; 95% CI, 2.13-4.43), cognitive impairment (OR, 3.23; 95% CI, 2.09-4.99), moderate/severe cerebral palsy (OR, 3.68; 95% CI, 2.08-6.51), death/neurodevelopmental impairment (OR, 2.17; 95% CI, 1.62-2.91), but not death alone (OR, 1.09; 95% CI, 0.76-1.57). Behavioral outcomes did not differ. **CONCLUSIONS AND RELEVANCE:** Nonhemorrhagic ventriculomegaly is associated with increased odds of neurodevelopmental impairment among extremely preterm neonates.

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