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NEWS
Cerebral Palsy Research

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Interventions and Management

1. Improvements in Kinematic Performance After Home-Based Bimanual Intensive Training for Children with Unilateral Cerebral Palsy.

Hung YC, Ferre CL, Gordon AM.

Phys Occup Ther Pediatr. 2017 Jul 28:1-12. doi: 10.1080/01942638.2017.1337663. [Epub ahead of print]

AIMS: To evaluate the effects of home-based intensive bimanual training for children with unilateral spastic cerebral palsy (USCP) on bimanual coordination using 3-D kinematic analyses. METHODS: Seven children with USCP (aged 29-54 months, MACS level: I-III) received 90 hours (2 hrs/day, 5days/week for 9 weeks) of Home Hand-Arm Bimanual Intensive Training (H-HABIT) provided by trained caregivers. A bimanual drawer-opening task was evaluated with eight infrared cameras using VICON workstation4.6 before and after training to assess improvements in bimanual coordination. RESULTS: H-HABIT training significantly decreased the time between one hand opening the drawer and the other hand manipulating its contents ($p < 0.05$) and increased the percentage of time when both hands were moving simultaneously ($p = 0.001$), which are indicators of improved temporal bimanual coordination. In addition, participants demonstrated a 26% decrease in trunk displacement ($p < 0.05$), a 30% increase in upper arm joint excursion ($p < 0.01$), and a 25% increase in elbow extension ($p < 0.05$) for the affected side. All the improvements were maintained at 6-month posttest. CONCLUSIONS: H-HABIT improved not only temporal, but also quality of movement during a bimanual task for seven children with USCP. Thus, H-HABIT could be an alternative or adjunctive treatment for children with USCP.

PMID: 28753082

2. Effects of Robot-Assisted Training for the Unaffected Arm in Patients with Hemiparetic Cerebral Palsy: A Proof-of-Concept Pilot Study.

Picelli A, La Marchina E, Vangelista A, Chemello E, Modenese A, Gandolfi M, Ciceri EFM, Bucci A, Zoccatelli G, Saltuari L, Waldner A, Baricich A, Santamato A, Smania N.

Behav Neurol. 2017;2017:8349242. doi: 10.1155/2017/8349242. Epub 2017 Jul 6.

On a voluntary basis, 10 adolescents with hemiparesis due to cerebral palsy and 11 neurologically healthy control subjects participated in this proof-of-concept pilot study. The aim was to examine the effects of robot-assisted training for the unaffected arm in patients with hemiparetic cerebral palsy. Baseline comparison between the unaffected arm of the hemiparetic patients with cerebral palsy and the dominant arm of healthy control subjects showed significant differences on the Jebsen-Taylor Hand Function test and action planning ability tests. Within-group comparison after ten 30-minute sessions (five days a week for two consecutive weeks) of robot-assisted training for the unaffected arm showed significant improvements in patients with cerebral palsy on the Jebsen-Taylor Hand Function test (performed at both hands) and action planning ability test (evaluated at the unaffected arm). Our findings are in line with previous evidences of action planning deficits at the unaffected arm in patients with hemiparetic cerebral palsy and support the hypothesis that robot-assisted

training for the unaffected arm may be useful to improve manual dexterity and action planning in patients with hemiparesis due to cerebral palsy.

PMID: 28744066

3. Evaluation of speed-accuracy trade-off in a computer task in individuals with cerebral palsy: a cross-sectional study.

Fernani DCGL, Prado MTA, da Silva TD, Massetti T, de Abreu LC, Magalhães FH, Dawes H, de Mello Monteiro CB.

BMC Neurol. 2017 Jul 27;17(1):143. doi: 10.1186/s12883-017-0920-4.

BACKGROUND: Individuals with Cerebral Palsy (CP) present with sensorimotor dysfunction which make the control and execution of movements difficult. This study aimed to verify the speed-accuracy trade-off in individuals with CP. METHODS: Forty eight individuals with CP and 48 with typical development (TD) were evaluated (32 females and 64 males with a mean age of 15.02 ± 6.37 years: minimum 7 and maximum 30 years). Participants performed the "Fitts' Reciprocal Aiming Task v.1.0 (Horizontal)" on a computer with different sizes and distance targets, composed by progressive indices of difficulty (IDs): ID2, ID4a and ID4b. RESULTS: There were no statistical differences between the groups in relation to the slope of the curve (b1) and dispersion of the movement time (r2). However, the intercept (b0) values presented significant differences ($F(1.95) = 11.3$; $p = .001$]), with greater movement time in the CP group compared to the TD group. It means that for individuals with CP, regardless of index difficulty, found the task more difficult than for TD participants. Considering CP and TD groups, speed-accuracy trade-off was found when using different indices of difficulty (ID2 and ID4). However, when the same index of difficulty was used with a larger target and longer distance (ID4a) or with a narrow target and shorter distance (ID4b), only individuals with CP had more difficulty performing the tasks involving smaller targets. Marginally significant inverse correlations were identified between the values of b1 and age ($r = -0.119$, $p = .052$) and between r2 and Gross Motor Function Classification System ($r = -0.280$, $p = .054$), which did not occur with the Manual Ability Classification System. CONCLUSION: We conclude that the individuals with CP presented greater difficulty when the target was smaller and demanded more accuracy, and less difficulty when the task demanded speed. It is suggested that treatments should target tasks with accuracy demands, that could help in daily life tasks, since it is an element that is generally not considered by professionals during therapy.

PMID: 28750603

4. Coaction of individual and environmental factors: a review of intensive therapy paradigms for children with unilateral spastic cerebral palsy.

Ferre CL, Gordon AM.

Dev Med Child Neurol. 2017 Jul 27. doi: 10.1111/dmcn.13497. [Epub ahead of print]

Evidence-based treatment approaches for children with unilateral spastic cerebral palsy are expanding and being modified to fit the constraints of families and the child receiving treatment. In this review, we first provide an overview of a theoretical framework that considers the intricate interactions between the individual child and the environment in which treatment is provided. Next, we describe intensive interventions that have strong support for their efficacy. We also highlight the heterogeneity with which children respond to these approaches. Individual characteristics that might affect responsiveness are summarized. We propose that a one-size-fits-all approach may not be as efficacious as approaches based on the specific brain damage and resulting development of the corticospinal tract. Finally, we review evidence suggesting that the environment can be structured to promote opportunities for intensive practice and self-generated movement-two important aspects of efficacious treatments. Emphasis is placed on intensive home programs delivered by caregivers.

PMID: 28749087

5. The Reliability of the Segmental Assessment of Trunk Control (SATCo) in Children with Cerebral Palsy.

Hansen L, Erhardsen KT, Bencke J, Magnusson SP, Curtis DJ.

Phys Occup Ther Pediatr. 2017 Jul 27:1-14. doi: 10.1080/01942638.2017.1337662. [Epub ahead of print]

AIMS: To assess the live-versus-video, intrarater interday and interrater interday reliability of the test Segmental Assessment of Trunk Control (SATCo), which seeks to estimate the degree of sitting trunk control in children with cerebral palsy (CP). METHOD: Thirty-one children with CP between 9 months and 16 years of age (22 males, mean age 8y 10mo [SD 3y 5mo], Gross Motor Function Classification System level I [n = 13], II [n = 4], III [n = 4], IV [n = 3], and V [n = 7]) were included. Children were tested twice by two raters and tests were video recorded. Wilcoxon Signed-Rank Test, ICC [2,1] and a descriptive measure for absolute reliability were applied. RESULTS: No systematic differences were found between live-versus-video, between raters or days ($p > 0.05$) except for one analysis. All ICC values were excellent (ICC ≥ 0.9) except for one analysis for which it was good (ICC = 0.73). Complete agreement between scores was seen in 75% of all cases while 22% differed by one segmental level. Only 3% showed disagreement above one segmental level. CONCLUSIONS: SATCo is a clinically applicable assessment tool. Relative reliability is excellent and absolute agreement is good. Modifications regarding testing method could potentially improve the reliability and the value of the test in research and in clinical practice.

PMID: 28749721

6. Development of Child and Family-Centered Engagement Guidelines for Clinical Administration of the Challenge to Measure Advanced Gross Motor Skills: A Qualitative Study.

Gibson BE, Mistry B, Wright FV.

Phys Occup Ther Pediatr. 2017 Jul 28:1-10. doi: 10.1080/01942638.2017.1341967. [Epub ahead of print]

AIMS: This article describes a qualitative study aimed at producing child-centered guidelines for the administration of a measure of children's advanced gross motor skills, the Challenge. The purpose of the guidelines is to promote collaborative interpretation and application of results. METHODS: The study was conducted in three Canadian cities and included 31 children with cerebral palsy (GMFCS Level I or II) ages 8 to 18 and one parent/caregiver per child (N = 62 participants). Following Challenge administration, each child and one of their caregivers took part in separate qualitative interviews. Analyses were oriented to exploring understandings of the purposes of testing, impressions of the child's performance, and perceptions of how results might inform activity choices and interventions. RESULTS: Three themes were generated: investments in doing well; I know my child/myself; and caregivers' interpretations of child's performance. Themes were then integrated with principles of child and family-centered care to develop The Challenge Engagement Guidelines directed at reducing test anxiety and enhancing shared decision making. CONCLUSIONS: The Guidelines are the first of their kind to integrate child and family-centered principles into the administration protocol of a motor measure. Although developed for the Challenge, the principles have applicability to other rehabilitation measures.

PMID: 28753053

7. The criterion validity and intra-rater reliability of the Japanese version of the Functional Mobility Scale in children with cerebral palsy.

Himuro N, Nishibu H, Abe H, Mori M.

Res Dev Disabil. 2017 Jul 20;68:20-26. doi: 10.1016/j.ridd.2017.07.004. [Epub ahead of print]

OBJECTIVE: The purpose of this study was to develop a Japanese version of the Functional Mobility Scale (FMS), and examine the criterion validity and intra-rater reliability of the FMS in Japan. METHODS: The translation of the FMS was performed according to international standards for the translation of measurements. For criterion validity, 111 children with cerebral palsy (mean age; 12year 1mo±3year 7mo; range 5-18) were rated the Japanese version of the FMS and Gross Motor Function Classification System (GMFCS). For intra-rater reliability, the Japanese version of the FMS was rated twice by 24 parents of children with cerebral palsy by interview and/or telephone with a one- to two-week interval between assessments. RESULTS: The criterion validity was confirmed with a strong correlation between GMFCS level and FMS scores (r2=-0.71 to -0.75). For intra-rater reliability, there was a substantial to excellent level of agreement (kappa=0.72-0.87). CONCLUSION: The study provides evidence of the criterion validity and intra-rater reliability of the Japanese version of the FMS as a measurement of mobility in children with cerebral palsy.

PMID: 28735158

8. Longitudinal assessment of gait quality in children with bilateral cerebral palsy following repeated lower limb intramuscular Botulinum toxin-A injections.

Read FA, Boyd RN, Barber LA.

Res Dev Disabil. 2017 Jul 20;68:35-41. doi: 10.1016/j.ridd.2017.07.002. [Epub ahead of print]

BACKGROUND: Serial lower limb intramuscular Botulinum toxin-A (BoNT-A) injections are administered to children with bilateral spastic cerebral palsy (BCP) to reduce spasticity, improve walking and functional mobility, and delay the need for orthopaedic surgery. Gait quality is clinically assessed following BoNT-A with 2D video gait assessments (2DVGA) using the Edinburgh Visual Gait Score (EVGS). AIM: To determine the effect of three consecutive treatment cycles of lower limb intramuscular BoNT-A injections on gait quality using the EVGS in children with BCP by retrospectively reviewing repeated 2DVGA measures. METHODS AND PROCEDURES: Seventeen children with BCP and dynamic equinus (8 females and 9 males, age mean (SD), 4.0 (2.2) years, GMFCS I=2 and II=15) were included in the study after a retrospective audit of the records of the Queensland Children's Gait Laboratory (QCGL), Children's Health Queensland, Brisbane. The medical records of children who attended the QCGL between January 2001 and January 2016 were searched for eligibility. Children who had undertaken pre- and post-treatment 2DVGA for the first three lower limb BoNT-A treatment cycles (6 assessments) were reviewed using the EVGS. BoNT-A treatments were administered 7.7 (2.3) months apart and post-BoNT-A reviews occurred 12.6 (6.7) weeks after injection. Mixed-effects linear regression assessed the change from baseline to each subsequent assessment ($p<0.05$). OUTCOMES AND RESULTS: EVGS reduced significantly by a mean of 2.4 points from pre- to post-BoNT-A in the first treatment cycle ($p=0.001$). Compared to baseline, mean total EVGS reduced significantly during the second (pre-BoNT-A -1.7 ($p=0.020$), post BoNT-A -2.8 ($p<0.001$)) and third (pre-BoNT-A -2.6 ($p=0.001$), post BoNT-A -2.4 ($p=0.002$)) treatment cycles. There was no difference in EVGS between post-BoNT-A in the first treatment cycle and scores for the second and third treatment cycles. CONCLUSIONS AND IMPLICATIONS: Improvements in gait quality were statistically significant, but did not reach the EVGS smallest real difference value of 4 points. Repeated lower limb intramuscular BoNT-A injections to improve gait quality in children with BCP should be reconsidered.

PMID: 28735160

9. Robotic Gait Training For Indiviuals With Cerebral Palsy: A Systematic Review And Meta-Analysis.

da Silveira Carvalho I, Pinto SM, Chagas DDV, Praxedes Dos Santos JL, de Sousa Oliveira T, Batista LA.

Arch Phys Med Rehabil. 2017 Jul 24. pii: S0003-9993(17)30474-4. doi: 10.1016/j.apmr.2017.06.018. [Epub ahead of print]

OBJECTIVE: To identify the effects of robotic gait training practices in individuals with cerebral palsy. DATA SOURCES: The search was performed in the following electronic databases: PubMed, EMBASE (Excerpta Medical), MEDLINE (OvidSP), CDSR (Cochrane database of systematic reviews), Web of Science, Scopus, Compendex, IEEE Xplore, ScienceDirect, Academic Search Premier, and PEDro. STUDY SELECTION: Studies were included if they fulfilled the following criteria: (1) they investigated the effects of robotic gait training, (2) they involved patients with cerebral palsy, and (3) they enrolled patients classified between levels I and IV using the Gross Motor Function Classification System. DATA EXTRACTION: The information was extracted from the selected articles using the descriptive-analytical method. The "Critical Review Form for Quantitative Studies" was used to quantitate the presence of critical components in the articles. To perform the meta-analysis, the effects of the intervention were quantified by effect size (Cohen's d). DATA SYNTHESIS: Of the 133 identified studies, 10 met the inclusion criteria. The meta-analysis showed positive effects on gait speed (0.21 [-0.09, 0.51]), endurance (0.21 [-0.06, 0.49]), and gross motor function in dimension D (0.18 [-0.10, 0.45]) and dimension E (0.12 [- 0.15, 0.40]). CONCLUSION: The results obtained suggest that this training benefits people with cerebral palsy, specifically by increasing walking speed and endurance and improving gross motor functions. For future studies, we suggest investigating device configuration parameters and conducting a large number of randomized controlled trials with larger sample sizes and individuals with homogeneous impairment.

PMID: 28751254

10. Crouch severity is a poor predictor of elevated oxygen consumption in cerebral palsy.

Steele KM, Shuman BR, Schwartz MH.

J Biomech. 2017 Jul 5. pii: S0021-9290(17)30346-9. doi: 10.1016/j.jbiomech.2017.06.036. [Epub ahead of print]

Children with cerebral palsy (CP) expend more energy to walk compared to typically-developing peers. One of the most prevalent gait patterns among children with CP, crouch gait, is often singled out as especially exhausting. The dynamics of crouch gait increase external flexion moments and the demand on extensor muscles. This elevated demand is thought to dramatically increase energy expenditure. However, the impact of crouch severity on energy expenditure has not been investigated among children with CP. We evaluated oxygen consumption and gait kinematics for 573 children with bilateral CP. The average net nondimensional oxygen consumption during gait of the children with CP (0.18±0.06) was 2.9 times that of speed-matched typically-developing peers. Crouch severity was only modestly related to oxygen consumption, with measures of knee flexion angle during gait explaining only 5-20% of the variability in oxygen consumption. While knee moment and muscle activity were moderately to strongly correlated with crouch severity (r2=0.13-0.73), these variables were only weakly correlated with oxygen consumption (r2=0.02-0.04). Thus, although the dynamics of crouch gait increased muscle demand, these effects did not directly result in elevated energy expenditure. In clinical gait analysis, assumptions about an individual's energy expenditure should not be based upon kinematics or kinetics alone. Identifying patient-specific factors that contribute to increased energy expenditure may provide new pathways to improve gait for children with CP.

PMID: 28734543

11. Hip internal rotation in cerebral palsy: does femoral derotation osteotomy influence abductor insufficiency?

Dohin B.

Dev Med Child Neurol. 2017 Jul 27. doi: 10.1111/dmcn.13527. [Epub ahead of print]

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

PMID: 28749032

12. Intra-operatively measured spastic semimembranosus forces of children with cerebral palsy.

Yucesoy CA, Temelli Y, Ateş F.

J Electromyogr Kinesiol. 2017 Jul 12;36:49-55. doi: 10.1016/j.jelekin.2017.07.003. [Epub ahead of print]

The knee kept forcibly in a flexed position is typical in cerebral palsy. Using a benchmark, we investigate intra-operatively if peak spastic hamstring force is measured in flexed knee positions. This tests the assumed shift of optimal length due to adaptation of spastic muscle and a decreasing force trend towards extension. Previously we measured spastic gracilis (GRA) and semitendinosus (ST) forces. Presently, we studied spastic semimembranosus (SM) and tested the following hypotheses: spastic SM forces are (1) high in flexed and (2) low in extended positions. We compared the data to those of GRA and ST to test (3) if percentages of peak force produced in flexed positions are different. During muscle lengthening surgery of 8 CP patients (9years, 4months; GMFCS levels=II-IV; limbs tested=13) isometric SM forces were measured from flexion (120°) to full extension (0°). Spastic SM forces were low in flexed knee positions (only 4.2% (3.4%) and 10.7% (9.7%) of peak force at KA=120° and KA=90° respectively, indicating less force production compared to the GRA or ST) and high in extended knee positions (even 100% of peak force at KA=0°). This indicates an absence of strong evidence for a shift of optimal muscle length of SM towards flexion.

PMID: 28735102

13. Strategies to decrease injection site pain in botulinum toxin therapy.

Paracka L, Kollewe K, Wegner F, Dressler D.

J Neural Transm (Vienna). 2017 Jul 24. doi: 10.1007/s00702-017-1764-1. [Epub ahead of print]

Botulinum toxin is now used for numerous indications including dystonias, spasticity, cerebral palsy, hyperhidrosis, cosmetics and chronic migraine. It has to be injected into its target tissues thus causing injection site pain. We wanted to compare the efficacy of various analgesic interventions suggested for reduction of injection site pain. In 13 healthy controls, pain thresholds in the fingertips II and III bilaterally were determined by the Mechanical Pain Threshold Test and the Repetitive Pain Stimulation Test at baseline and under nitrous oxide/oxygen, ice spray, local anaesthetic cream and forearm ischaemia. All interventions studied produce statistically significant and robust elevations of the pain threshold in both tests. Nitrous oxide/oxygen had stronger effects than the other interventions, although this superiority was statistically significant only in the Repetitive Pain Stimulation Test and not against ice spray. Also considering duration, localisation and penetration depth of analgesic effects, hyperhidrosis treatment may benefit from nitrous oxide/oxygen, ice spray and local anaesthetic cream. In palmar hyperhidrosis, forearm ischaemia is possible and also reduces botulinum toxin washout. Cosmetic indications may also benefit from nitrous oxide/oxygen and local anaesthetic cream. For botulinum toxin therapy of spasticity, dystonia and tremor, only nitrous oxide/oxygen may offer intramuscular analgesic effect. Its systemic and prolonged effect is also an advantage in injections in several body parts. Future studies are necessary to test the influence of penetration depth and combinations of analgesic interventions.

PMID: 28741118

14. Cerebral palsy and Adeli method: is it worth a try?

Cossu G, Messerer M.

Childs Nerv Syst. 2017 Jul 26. doi: 10.1007/s00381-017-3552-5. [Epub ahead of print]

[No abstract available]

PMID: 28748263

15. Self-efficacy of physical education teachers in including students with cerebral palsy in their classes.

Hutzler Y, Barak S.

Res Dev Disabil. 2017 Jul 21;68:52-65. doi: 10.1016/j.ridd.2017.07.005. [Epub ahead of print]

Children with cerebral palsy (CP) are often mainstreamed into the general education system, but are likely to be excluded from physical education (PE) classes. A questionnaire was constructed and utilized to measure PE teachers' self-efficacy (SE) toward inclusion of students with CP in each of three mobility categories (independent, using assistive devices, using wheelchair mobility) and the impact of experience and training on teachers' SE. Participants in the study were 121 PE teachers from different parts of Israel (mean age: 41.02±9.33 years; range: 25.00-59.00 years). Exploratory factor analysis was used to determine the structure of the sub-scales' factors' structure and Cronbach's Alpha reliability was satisfactory (range 0.872-0.941). Independent t-tests were calculated in order to compare the SE of teachers with and without adapted PE experience. Repeated Analysis of Variance was performed to measure within-group differences in SE. Results revealed that the PE teachers' SE in teaching students who use mobility assistive devices or wheelchairs was significantly lower compared to teaching those who walk and run unaided ($F=19.11$; $p<0.001$). The teachers' SE towards including CP children who independently ambulate was influenced ($p<0.05$; $d=0.94$) by the teacher's experience (elementary school practicum). SE in the mobility with assistive device group was also significantly influenced ($p<0.05$; $d=0.1$) by teaching experience (previous experience and having a specialization in adapted PE). Finally, SE when teaching the wheelchair mobility group was influenced by having an adapted PE specialization ($p<0.05$; $d=0.82$). Specialized training in this particular area should be enhanced to increase teachers' SE and enable greater participation of children with CP in general physical education classes.

PMID: 28738221

16. Growth charts for cerebral palsy: still imperfect, but gaining in value.

Day SM.

Dev Med Child Neurol. 2017 Jul 27. doi: 10.1111/dmcn.13522. [Epub ahead of print]

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

PMID: 28749084

17. Changes in White Matter Integrity following Intensive Voice Treatment (LSVT LOUD®) in Children with Cerebral Palsy and Motor Speech Disorders.

Reed A, Cummine J, Bakhtiari R, Fox CM, Boliek CA.

Dev Neurosci. 2017 Jul 28. doi: 10.1159/000478724. [Epub ahead of print]

Preliminary evidence suggests that intensive voice and speech treatment based on activity-dependent neuroplasticity principles holds promise for affecting positive change in children with cerebral palsy (CP) and motor speech disorders. Diffusion tensor imaging (DTI) allows researchers to make inferences about the integrity of white matter tracks and provides a sensitive measure of neuroplasticity. Previous treatment studies looking at the effects of training on white matter integrity have shown positive results, but these studies have been limited to gross motor function. Eight children with motor speech disorders and CP (3 females; age 8-16 years) and an age- and sex-matched group of typically developing (TD) children participated. Each child with CP completed a full dose of LSVT LOUD® and a 12-week maintenance program. Participants attended 3 recording sessions: before and after treatment, and after the maintenance period. TD children were tested at the same 3 time points. Recording sessions for both groups of children included measures of white matter integrity using DTI and acoustic measures of voice and speech. Fractional anisotropy (FA) was measured for 2 motor tracts and 5 association tracts. In children with CP, we observed an increase in FA in several motor and association tracts immediately following treatment and 12 weeks after treatment. Acoustic data on untrained tasks were correlated with changes in FA detected immediately following treatment and after the 12-week maintenance program. These findings suggest that long-term practice of skills attained during the treatment phase enhances white matter tract integrity in speech production networks.

PMID: 28750368

18. Exploring quality of life of children with cerebral palsy and intellectual disability: What are the important domains of life?

Davis E, Reddihough D, Murphy N, Epstein A, Reid SM, Whitehouse A, Williams K, Leonard H, Downs J.

Child Care Health Dev. 2017 Jul 26. doi: 10.1111/cch.12501. [Epub ahead of print]

BACKGROUND: Although it is estimated that half of all children with cerebral palsy also have comorbid intellectual disability, the domains of quality of life (QOL) important for these children are not well understood. The aim of this study was to identify important domains of QOL for these children and adolescents. METHODS: Due to the children's communication impairments, qualitative semi-structured interviews were conducted with 18 parents. The children (9 males) had a median age of 12 (range 7 to 17) years at interview and nearly two thirds were classified as Gross Motor Function Classification System IV or V. A grounded theory approach was used to identify domains of QOL. RESULTS: The 11 domains identified as important to QOL were physical health, body comfort, behaviour and emotion, communication, predictability and routine, movement and physical activity, nature and outdoors, variety of activity, independence and autonomy, social connectedness, and access to services. CONCLUSIONS: The domains of QOL that emerged from this study will be useful for professionals who support children with cerebral palsy and their families. They will also be important for developing a QOL instrument essential for informing the development of interventions and their monitoring and evaluation.

PMID: 28748578

19. Parent-child interactions and children with cerebral palsy: An exploratory study investigating emotional availability, functional ability, and parent distress.

Barfoot J, Meredith P, Ziviani J, Whittingham K.

Child Care Health Dev. 2017 Jul 23. doi: 10.1111/cch.12493. [Epub ahead of print]

BACKGROUND: Emotionally available parent-child relationships are supportive of child health and development. When a child has cerebral palsy, a range of child and parent factors can potentially impact the parent-child relationship; however, little research has specifically addressed this question. The aim of this study is to investigate links between parent-child emotional availability and both child functional abilities and parent distress in a sample of parents and children with cerebral palsy. METHODS: Twenty-three mothers (mean age 37.3+/-5.7 years) and their children (mean age 4.9+/-3.3 years) with cerebral palsy completed a 20 min videoed parent-child interaction, scored using the Emotional Availability Scales. Parents also completed the Depression Anxiety Stress Scale, the Paediatric Evaluation of Disability Inventory, and the Strengths and Difficulties Questionnaire. Correlational analyses were conducted, and qualitative observations were made. RESULTS: Parent-child dyads in which the parent reported depressive symptoms scored poorer on all aspects of parent-child emotional availability. Where parents reported experiencing anxiety or stress, increased parent hostility and decreased child responsiveness was found. There was no relationship between child functional abilities and either parent distress or parent-child emotional availability. Parent sensitivity, structuring, and nonintrusiveness were negatively associated with child peer problems. Both child responsiveness and child involvement were negatively associated with hyperactivity/inattention. Observations of video footage suggested that parent implementation of therapy strategies impacted negatively on parent-child emotional availability for some dyads. CONCLUSION: Findings from this study are consistent with the wider literature showing a link between parental depression and the parent-child relationship and extend this link to the cerebral palsy population. The importance of routine screening for parental mental health problems in early childhood intervention is highlighted by these findings. In addition, this study emphasizes the need to better understand how therapists support parents to implement therapeutic strategies to minimize negative impact on the developing parent-child relationship.

PMID: 28737004

20. Parents' Perception of Receiving Family-Centered Care for Their Children with Physical Disabilities: A Meta-Analysis.

Almasri NA, An M, Palisano RJ.

Phys Occup Ther Pediatr. 2017 Jul 28:1-17. doi: 10.1080/01942638.2017.1337664. [Epub ahead of print]

AIMS: Understanding parent perceptions of family-centered care (FCC) is important to improve processes and outcomes of children's services. OBJECTIVE: A systematic review and meta-analysis of research on the Measures of Processes of Care (MPOC-20) were performed to determine the extent parents of children with physical disabilities perceive they received FCC. METHODS: A comprehensive literature search was conducted using four databases. A total of 129 studies were retrieved; 15 met the criteria for the synthesis. Meta-analysis involving 2,582 mothers and fathers of children with physical disabilities mainly cerebral palsy was conducted for the five scales of the MPOC-20. RESULTS: Aggregated mean ratings varied from 5.0 to 5.5 for Providing Specific Information about the Child; Coordinated and Comprehensive Care; and Respectful and Supportive Care (relational behaviors) and Enabling and Partnership (participatory behaviors) indicating that, on average, parents rated FCC as having been provided to "a fairly great extent." The aggregated mean rating was 4.1 for Providing General Information, indicating FCC was provided "to a moderate extent." CONCLUSIONS: Service providers are encouraged to focus on child and family needs for general information. Research is needed to better understand parent perspectives of service provider participatory behaviors which are important for engaging families in intervention processes.

PMID: 28753054

21. Perspectives on rehabilitation of children with cerebral palsy: exploring a cross-cultural view of parents from India and Canada using the international classification of functioning, disability and health.

Jindal P, MacDermid JC, Rosenbaum P, DiRezze B, Narayan A.

Disabil Rehabil. 2017 Jul 26:1-11. doi: 10.1080/09638288.2017.1356383. [Epub ahead of print]

PURPOSE: To explore parents' perspectives on rehabilitation of their child with cerebral palsy and their information needs. METHODS: Semistructured interviews were conducted with parents of children with CP from India (n = 11) and Canada (n = 7). Data were analyzed through an interpretive description approach using the International Classification of Functioning, Disability and Health framework. RESULTS: Body Structure and Function: Indian parents were more focused on fixing body structure and function challenges, and independent walking, than Canadian parents. Activity and Participation: All Canadian children were actively involved in school and fun activities in the community. Due to lack of accessible services, Indian children had less school and community participation. Environmental factors: accessible communities, occupational therapy services and greater use of assistive devices enabled Canadian children. Social and cultural beliefs, lack of access to services and inaccessible communities were the barriers experienced by Indian parents. Information needs: both groups needed information to make their child more functional. CONCLUSION: Canadian parents experience a more enabling environment and express a more social view of their child's health, suggesting both education on the International Classification of Functioning, Disability and Health principles and services are needed to better enable and empower Indian parents. There remains a need for healthcare professionals and services in both countries to be more family-centered. Implications for rehabilitation To help parents in rehabilitating their children with cerebral palsy (CP), in India, there is a need to (1) incorporate ICF education into medical curricula and clinical practice; (2) increase the availability of skilled healthcare professionals and centers; (3) make infrastructural and policy reforms to make the society more accessible for the disabled children. Education, counseling and awareness about CP might help both groups of parents, society, and HCPs to change their beliefs and attitudes regarding CP and its rehabilitation. Both countries would benefit from user-friendly and transparent policies. This will help parents to become more aware of them and use them in the rehabilitation process.

PMID: 28747138

22. Health beliefs regarding pediatric cerebral palsy among caregivers in Botswana: A qualitative study.

Patel P, Baier J, Baranov E, Khurana E, Gambrah-Sampaney C, Johnson A, Monokwane B, Bearden DR.

Child Care Health Dev. 2017 Jul 25. doi: 10.1111/cch.12490. [Epub ahead of print]

BACKGROUND: Cerebral palsy (CP) is the most common motor disability worldwide with an incidence of 2.5 per 1,000 births globally. Health beliefs among caregivers may be major drivers of health-related behaviours and service utilization, but little is known regarding health beliefs around CP in Africa. METHODS: Between July 2013 and September 2015, children with CP were identified in Gaborone, Botswana, and their caregivers were invited to participate in a qualitative study utilizing semistructured in-person one-on-one interviews. Interview questions addressed their understanding of CP, challenges of caring for a handicapped child, and community response to children with CP. RESULTS: Sixty-two caregivers participated in the study. Common themes elicited were variable knowledge about CP, financial and physical burden, lack of therapies and educational resources, and the impact of stigma. Caregivers in Botswana generally subscribed to a biomedical explanation of CP but expressed concerns regarding more stigmatizing folks beliefs expressed in the community. CONCLUSION: Health beliefs regarding CP in Botswana likely have a significant impact on utilization of healthcare resources. Information from this study should inform future educational interventions for caregivers of children with CP.

PMID: 28744889

23. Impact of Non-medical Out-of-pocket Expenses on Families of Children With Cerebral Palsy Following Orthopaedic Surgery.

Vessey JA, DiFazio RL, Strout TD, Snyder BD.

J Pediatr Nurs. 2017 Jul 24. pii: S0882-5963(17)30117-3. doi: 10.1016/j.pedn.2017.07.006. [Epub ahead of print]

PURPOSE: Limited research has been conducted on the non-medical out-of-pocket expenses (NOOPEs) incurred by families of children with chronic health conditions. The study objectives were to: 1) calculate the estimated NOOPEs incurred by

families during hospitalization of their child, 2) identify predictors of high NOOPEs, and 3) assess the impact of the child's chronic health condition on the family's finances. DESIGN AND METHODS: Prospective observational study. Parents were included if their child was 3-20years old, had severe, non-ambulatory cerebral palsy (CP), and scheduled for hip or spine surgery. Parents reported all NOOPEs incurred during their child's hospitalization using the Family Expense Diary. Families completed the subscales of the Impact on Family Scale and the Assessment of Caregivers Experience with Neuromuscular Disease. Descriptive and univariate and multiple hierarchical regression models were used in the analysis. RESULTS: Fifty two parents participated. The total NOOPEs ranged from $193.00 to $7192.71 (M=$2001.92) per hospitalization representing an average of 4% of the family's annual earned income. Caregiver age (F=8.393, p<0.001), income (F=7.535, p<0.001), and distance traveled to the hospital (F=4.497, p=0.039) were significant predictors of high NOOPEs. The subscale scores indicated that a child's chronic health condition had a significant impact on family finances. CONCLUSIONS AND PRACTICE IMPLICATIONS: Hospitalization is associated with numerous NOOPEs that create additional financial demands for families caring for a child with severe CP. NOOPEs should be addressed when preparing families for their children's planned hospital admissions, especially those families of CSHCN who experience significant financial impacts secondary to their children's care.

PMID: 28751137

Prevention and Cure

24. Early surgery and neurodevelopmental outcomes of children born extremely preterm.

Hunt RW, Hickey LM, Burnett AC, Anderson PJ, Cheong JLY, Doyle LW, Hunt RW; Victorian Infant Collaborative Study group.

Arch Dis Child Fetal Neonatal Ed. 2017 Jul 22. pii: fetalneonatal-2017-313161. doi: 10.1136/archdischild-2017-313161. [Epub ahead of print]

OBJECTIVES: To (1) compare the neurodevelopmental outcomes at 8 years of age of children born extremely preterm (EP) who underwent surgical procedures during the course of their initial hospital admission with those who did not and (2) compare the outcomes across eras, from 1991 to 2005. DESIGN: Prospective observational cohort studies conducted over three different eras (1991-1992, 1997 and 2005). Surviving EP children, who required surgical intervention during the primary hospitalisation, were assessed for general intelligence (IQ) and neurosensory status at 8 years of age. Major neurosensory disability comprised any of moderate/severe cerebral palsy, IQ less than -2 SD relative to term controls, blindness or deafness. RESULTS: Overall, 29% (161/546) of survivors had surgery during the newborn period, with similar rates in each era. Follow-up rates at 8 years were high (91%; 499/546), and 17% (86/499) of survivors assessed had a major neurosensory disability. Rates of major neurosensory disability were substantially higher in the surgical group (33%; 52/158) compared with those who did not have surgery (10%; 34/341) (OR 4.28, 95% CI 2.61 to 7.03). Rates of disability in the surgical group did not improve over time. After adjustment for relevant confounders, no specific surgical procedure was associated with increased risk of disability. IMPLICATIONS AND RELEVANCE: Major neurosensory disability at 8 years was higher in children born EP who underwent surgery during their initial hospital admission compared with those who did not. The rates of major neurosensory disability in the surgical cohort are not improving over time.

PMID: 28735268

25. Mitochondria, Bioenergetics and Excitotoxicity: New Therapeutic Targets in Perinatal Brain Injury.

Leaw B, Nair S, Lim R, Thornton C, Mallard C, Hagberg H.

Front Cell Neurosci. 2017 Jul 12;11:199. doi: 10.3389/fncel.2017.00199. eCollection 2017.

Injury to the fragile immature brain is implicated in the manifestation of long-term neurological disorders, including childhood disability such as cerebral palsy, learning disability and behavioral disorders. Advancements in perinatal practice and improved care mean the majority of infants suffering from perinatal brain injury will survive, with many subtle clinical symptoms going undiagnosed until later in life. Hypoxic-ischemia is the dominant cause of perinatal brain injury, and constitutes a significant socioeconomic burden to both developed and developing countries. Therapeutic hypothermia is the sole validated clinical

intervention to perinatal asphyxia; however it is not always neuroprotective and its utility is limited to developed countries. There is an urgent need to better understand the molecular pathways underlying hypoxic-ischemic injury to identify new therapeutic targets in such a small but critical therapeutic window. Mitochondria are highly implicated following ischemic injury due to their roles as the powerhouse and main energy generators of the cell, as well as cell death processes. While the link between impaired mitochondrial bioenergetics and secondary energy failure following loss of high-energy phosphates is well established after hypoxia-ischemia (HI), there is emerging evidence that the roles of mitochondria in disease extend far beyond this. Indeed, mitochondrial turnover, including processes such as mitochondrial biogenesis, fusion, fission and mitophagy, affect recovery of neurons after injury and mitochondria are involved in the regulation of the innate immune response to inflammation. This review article will explore these mitochondrial pathways, and finally will summarize past and current efforts in targeting these pathways after hypoxic-ischemic injury, as a means of identifying new avenues for clinical intervention.

PMID: 28747873

26. Connexin hemichannel blockade improves survival of striatal GABA-ergic neurons after global cerebral ischaemia in term-equivalent fetal sheep.

Galinsky R, Davidson JO, Lear CA, Bennet L, Green CR, Gunn AJ.

Sci Rep. 2017 Jul 24;7(1):6304. doi: 10.1038/s41598-017-06683-1.

Basal ganglia injury at term remains a major cause of disability, such as cerebral palsy. In this study we tested the hypotheses that blockade of astrocytic connexin hemichannels with a mimetic peptide would improve survival of striatal phenotypic neurons after global cerebral ischaemia in term-equivalent fetal sheep, and that neuronal survival would be associated with electrophysiological recovery. Fetal sheep (0.85 gestation) were randomly assigned to receive a short or long (1 or 25 h) intracerebroventricular infusion of a mimetic peptide or vehicle, starting 90 minutes after 30 minutes of cerebral ischaemia. Sheep were killed 7 days after ischaemia. Cerebral ischaemia was associated with reduced numbers of calbindin-28k, calretinin, parvalbumin and GAD positive striatal neurons ($P < 0.05$ ischaemia + vehicle, $n = 6$ vs. sham ischaemia, $n = 6$) but not ChAT or nNOS positive neurons. Short infusion of peptide ($n = 6$) did not significantly improve survival of any striatal phenotype. Long infusion of peptide ($n = 6$) was associated with increased survival of calbindin-28k, calretinin, parvalbumin and GAD positive neurons ($P < 0.05$ vs. ischaemia + vehicle). Neurophysiological recovery was associated with improved survival of calbindin-28k, calretinin and parvalbumin positive striatal neurons ($P < 0.05$ for all). In conclusion, connexin hemichannel blockade after cerebral ischaemia in term-equivalent fetal sheep improves survival of striatal GABA-ergic neurons.

PMID: 28740229

27. Neurodevelopmental Outcome of Asymptomatic Hypoglycemia Compared With Symptomatic Hypoglycemia and Euglycemia in High-Risk Neonates.

Mahajan G, Mukhopadhyay K, Attri S, Kumar P.

Pediatr Neurol. 2017 Jun 7. pii: S0887-8994(17)30282-5. doi: 10.1016/j.pediatrneurol.2017.05.028. [Epub ahead of print]

AIMS: We assessed the neurodevelopmental outcome at one year of age of children with asymptomatic neonatal hypoglycemia and compared their outcome with that of symptomatic hypoglycemic and euglycemic neonates. METHOD: Seventy two hypoglycemic (plasma glucose less than 50 mg/dL) neonates, both symptomatic ($n = 27$) and asymptomatic ($n = 45$), and 70 weight- and gestation-matched euglycemic neonates of gestational age greater than 32 weeks were enrolled during the first week of life then assessed for neurodevelopmental outcome at corrected age six and 12 months ($n = 67$ and 62 in hypoglycemia group and 63 and 54 in euglycemia group, with the rest lost to follow-up, and death = 1). RESULTS: At one year, 8% (five of 62, four in symptomatic and one in asymptomatic group) of hypoglycemic neonates developed cerebral palsy. Mean motor and mental development quotients were significantly lower at corrected ages six and 12 months in any hypoglycemia ($P < 0.001$) and if blood glucose was less than 40 mg/dL ($P < 0.001$) when compared with euglycemia. Symptomatic infants had lower motor development quotient ($P = 0.004$ and 0.003) and mental development quotient ($P = 0.001$ and 0.001) at corrected ages six and 12 months than asymptomatic infants, and asymptomatic infants had lower motor development quotient ($P \leq 0.001$ and 0.004) and mental development quotient ($P = 0.001$ and 0.004) than the euglycemic group at corrected ages six and 12 months, respectively. Blood glucose of less than 40 mg/dL had high sensitivity (83% for motor development quotient and 81% for mental development quotient) for development quotient scores of less than 85. CONCLUSION: Hypoglycemia, both

symptomatic and asymptomatic, leads to adverse neurodevelopmental outcome when compared with euglycemia, although it was worse in the symptomatic group and at blood glucose less than 40 mg/dL.

PMID: 28739364

28. Gender Affects Long-Term Neurologic Outcome of Neonates.

Freud A, Sheiner E, Wainstock T, Landau D, Walfisch A.

Pediatr Neurol. 2017 Apr 24. pii: S0887-8994(17)30211-4. doi: 10.1016/j.pediatrneurol.2017.04.020. [Epub ahead of print]

OBJECTIVE: We evaluated the possible association between fetal gender and long-term pediatric neurological morbidity. METHODS: We performed a population-based retrospective cohort analysis comparing the risk of long-term neurological morbidity (up to age 18 years) of children born during the years 1991 to 2013 according to their gender. Neurological morbidity evaluated included hospitalizations in childhood involving pervasive developmental disorder, obstructive sleep apnea, cerebral palsy, epilepsy, and infantile spasms and disorders of eating as recorded in the hospital files. Multiple pregnancies and fetal congenital malformations were excluded. Kaplan-Meier survival curves were constructed to compare the cumulative neurological morbidity over the study period. A Cox proportional hazards model was used to control for obstetrical confounders, including gestational age at birth, birth weight, and maternal factors. RESULTS: During the study period, 240,953 newborns were included in the long-term analysis: 51.0% (n = 122,840) males and 49.0% (n = 118,113) females. Neurologic hospitalizations (up to age 18 years) were significantly more common in males compared with females (1.1% vs 0.8%, respectively, odds ratio 1.31, 95% confidence interval 1.2 to 1.4, $P < 0.001$). Specifically, pervasive developmental disorder and obstructive sleep apnea were found to be significantly more common in males, and cerebral palsy reached borderline significance (0.1% vs 0.04%, odds ratio 1.39, 95% confidence interval 0.9 to 1.9, $P = 0.06$). The Kaplan-Meier survival curves demonstrated males to have a significantly higher cumulative incidence of total neurological morbidity as well as of pervasive developmental disorder and obstructive sleep apnea (all log-rank test P values <0.001). In the Cox regression model, male gender exhibited an independent association with long-term neurological morbidity, while adjusting for birth weight, gestational age, and other confounding variables (adjusted hazard ratio 1.29, 95% confidence interval 1.2 to 1.4, $P < 0.001$). CONCLUSION: Males are at an increased risk for pediatric neurological morbidity independent of gestational age at birth and birth weight.

PMID: 28739361

29. Continual conscious bioluminescent imaging in freely moving somatotransgenic mice.

Karda R, Perocheau DP, Suff N, Ng J, Delhove JMKM, Buckley SMK, Richards S, Counsell JR, Hagberg H, Johnson MR, McKay TR, Waddington SN.

Sci Rep. 2017 Jul 25;7(1):6374. doi: 10.1038/s41598-017-06696-w.

Luciferase bioimaging in living animals is increasingly being applied in many fields of biomedical research. Rodent imaging usually involves anaesthetising the animal during data capture, however, the biological consequences of anaesthesia have been largely overlooked. We have evaluated luciferase bioimaging in conscious, unrestrained mice after neonatal intracranial or intravascular administration of lentiviral, luciferase reporter cassettes (biosensors); we present real-time analyses from the first day of life to adulthood. Anaesthetics have been shown to exert both neurotoxic and neuroprotective effects during development and in models of brain injury. Mice subjected to bioimaging after neonatal intracranial or intravascular administration of biosensors, targeting the brain and liver retrospectively showed no significant difference in luciferase expression when conscious or unconscious throughout development. We applied conscious bioimaging to the assessment of NFκB and STAT3 transcription factor activated reporters during the earliest stages of development in living, unrestrained pups. Our data showed unique longitudinal activities for NFκB and STAT3 in the brain of conscious mice. Conscious bioimaging was applied to a neonatal mouse model of cerebral palsy (Hypoxic-Ischaemic Encephalopathy). Imaging of NFκB reporter before and after surgery showed a significant increase in luciferase expression, coinciding with secondary energy failure, in lesioned mice compared to controls.

PMID: 28743959

30. Computer-based video analysis identifies infants with absence of fidgety movements.

Støen R, Songstad NT, Silberg IE, Fjørtoft T, Jensenius AR, Adde L.

Pediatr Res. 2017 Jul 26. doi: 10.1038/pr.2017.121. [Epub ahead of print]

BackgroundAbsence of fidgety movements (FMs) at 3 months' corrected age is a strong predictor of cerebral palsy (CP) in high-risk infants. This study evaluates the association between computer-based video analysis and the temporal organization of FMs assessed with the General Movement Assessment (GMA).MethodsInfants were eligible for this prospective cohort study if referred to a high-risk follow-up program in a participating hospital. Video recordings taken at 10-15 weeks post term age were used for GMA and computer-based analysis. The variation of the spatial center of motion, derived from differences between subsequent video frames, was used for quantitative analysis.ResultsOf 241 recordings from 150 infants, 48 (24.1%) were classified with absence of FMs or sporadic FMs using the GMA. The variation of the spatial center of motion (CSD) during a recording was significantly lower in infants with normal (0.320; 95% confidence interval (CI) 0.309, 0.330) vs. absence of or sporadic (0.380; 95% CI 0.361, 0.398) FMs (P<0.001). A triage model with CSD thresholds chosen for sensitivity of 90% and specificity of 80% gave a 40% referral rate for GMA.ConclusionQuantitative video analysis during the FMs' period can be used to triage infants at high risk of CP to early intervention or observational GMA.Pediatric Research advance online publication, 26 July 2017; doi:10.1038/pr.2017.121.

PMID: 28745715

31. Perinatal Chikungunya Virus-Associated Encephalitis Leading to Postnatal-Onset Microcephaly and Optic Atrophy.

Ramos R, Viana R, Brainer-Lima A, Florêncio T, Carvalho MD, van Der Linden V, Amorim A, Rocha MÂ, Medeiros F.

Pediatr Infect Dis J. 2017 Jul 21. doi: 10.1097/INF.0000000000001690. [Epub ahead of print]

Chikungunya virus is capable of affecting the nervous system of children and adults. We describe a case of sepsis and encephalitis triggered by this agent in a newborn whose mother developed symptoms of acute infection two days before delivery. Consequently, the infant had severe encephalitis that evolved with postnatal-onset microcephaly, bilateral optic atrophy, epilepsy and cerebral palsy.

PMID: 28737626

32. Adverse events in women and children who have received intrapartum antibiotic prophylaxis treatment: a systematic review.

Seedat F, Stinton C, Patterson J, Geppert J, Tan B, Robinson ER, McCarthy ND, Uthman OA, Freeman K, Johnson SA, Fraser H, Brown CS, Clarke A, Taylor-Phillips S.

BMC Pregnancy Childbirth. 2017 Jul 26;17(1):247. doi: 10.1186/s12884-017-1432-3.

BACKGROUND: Adverse events from intrapartum antibiotic prophylaxis (IAP) are poorly documented yet essential to inform clinical practice for neonatal group B Streptococcus (GBS) disease prevention. In this systematic review, we appraised and synthesised the evidence on the adverse events of IAP in the mother and/or her child. METHODS: We searched MEDLINE, MEDLINE In-Process & Other Non-Indexed Citations, EMBASE, Cochrane, and Science Citation Index from date of inception until October 16th 2016. Reference lists of included studies and relevant systematic reviews were hand-searched. We included primary studies in English that reported any adverse events from intrapartum antibiotics for any prophylactic purpose compared to controls. The search was not restricted to prophylaxis for GBS but excluded women with symptoms of infection or undergoing caesarean section. Two reviewers assessed the methodological quality of studies, using the Cochrane Risk of Bias tool, and the Risk of Bias Assessment Tool for Nonrandomised Studies. Results were synthesised narratively and displayed in text and tables. RESULTS: From 2364 unique records, 30 studies were included. Despite a wide range of adverse events reported in 17 observational studies and 13 randomised controlled trials (RCTs), the evidence was inconsistent and at high risk of bias. Only one RCT investigated the long-term effects of IAP reporting potentially serious outcomes such as cerebral palsy; however, it had limited applicability and unclear biological plausibility. Seven observational studies showed that IAP for maternal GBS colonisation alters the infant microbiome. However, study populations were not followed through to clinical outcomes, therefore clinical significance is unknown. There was also observational evidence for increased antimicrobial

resistance, however studies were at high or unclear risk of bias. CONCLUSIONS: The evidence base to determine the frequency of adverse events from intrapartum antibiotic prophylaxis for neonatal GBS disease prevention is limited. As RCTs may not be possible, large, better quality, and longitudinal observational studies across countries with widespread IAP could fill this gap.

PMID: 28747160

33. [Differential diagnosis of paroxysms of tonic muscle tension in children of early age with delay of psychomotor development and abnormal neurologic status].

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

Mironov MB, Bobylova MY, Nekrasova IV, Krasilschikova TM, Gunchenko MM, Sarzhina MN, Petrukhin AS, Burd SG, Batisheva TT.

Zh Nevrol Psikhiatr Im S S Korsakova. 2017;117(6):4-9. doi: 10.17116/jnevro2017117614-9.

AIM: To study neurologic status, results of video-EEG monitoring and magnetic resonance imaging in children under 3 years old with paroxysms of tonic muscle tension. MATERIAL AND METHODS: One hundred and forty-six infants and young children with motor disturbances and different variants of clinically similar epileptic seizures, hyperkinesis and stereotypes were examined. RESULTS AND CONCLUSION: Cerebral palsy (91%), genetic and chromosomal abnormalities (6%), brain malformations (2%) were identified. Neurological status was characterized by pseudobulbar syndrome (100% of cases), hemiparesis (1%), tetraparesis (81%), diffuse muscular hypotonia (18%), intellectual and speech development delay (76%), autistic behavior (16%). During the prolong video-EEG monitoring, paroxysmal tonic muscle tensions were recorded in all patients: epileptic seizures were observed in 113 patients (77.40%), non-epileptic paroxysms in 51 (34.93%). The combination of epileptic and non-epileptic paroxysms was observed in 18 patients (12.33%). In 4 patients (2.75%), it was not possible to determine the genesis of paroxysms even during the prolong video-EEG-monitoring because of myographic artefacts. Five clinical and electroencephalographic combinations of dystonic attacks, epileptic seizures and epileptiform activity were identified. These data allow improving the diagnosis of epilepsy and avoiding unnecessary treatment with antiepileptic drugs. Our study has shown a high diagnostic value of video-EEG monitoring with the inclusion of sleep in patients with paroxysmal conditions in infancy and early childhood.

PMID: 28745663

34. The fetuses-at-risk approach: survival analysis from a fetal perspective.

Joseph KS, Kramer MS.

Acta Obstet Gynecol Scand. 2017 Jul 25. doi: 10.1111/aogs.13194. [Epub ahead of print]

Several phenomena in contemporary perinatology create challenges for analyzing pregnancy outcomes. These include recent increases in iatrogenic delivery at late preterm and early term gestation which are incongruent with the belief that stillbirth and neonatal death risk decrease exponentially with advancing gestational age. Perinatal epidemiologists have also puzzled over the paradox of intersecting birth weight- and gestational age-specific perinatal mortality curves for decades. For example, neonatal mortality rates among preterm infants of women who smoke are substantially lower than neonatal mortality rates among preterm infants of non-smoking women, whereas the reverse pattern occurs at term gestation. This mortality crossover is observed across several contrasts (women with hypertensive disorders of pregnancy vs normotensive women, older vs younger women, twins vs singletons, etc.) and outcomes (stillbirth, neonatal death, sudden infant death syndrome and cerebral palsy), and irrespective of how advancing "maturity" is defined (birth weight or gestational age). One approach proposed to address and explain these unexpected phenomena is the fetuses-at-risk model. This formulation involves a reconceptualization of the denominator for perinatal outcome rates from births to surviving fetuses. In this overview of the fetuses-at-risk model, we discuss the central tenets of the births-based and the fetuses-based formulations. We also describe the extension of the fetuses-at-risk approach to outcomes into and beyond the neonatal period and to a multivariable adaptation. Finally, we provide a substantive context by discussing biological mechanisms underlying the fetuses-at-risk model and contemporary obstetric phenomena that are better understood from that model than from one based on births. This article is protected by copyright. All rights reserved.

PMID: 28742216