Cerebral palsy research news

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Interventions and Management

1. Parent-Reported Outcomes of Early Childhood Selective Dorsal Rhizotomy for the Treatment of Spastic Diplegia
T S Park, Susan Joh, Deanna M Walter, Nicole L Meyer

Cureus. 2021 Jun 8;13(6):e15530. doi: 10.7759/cureus.15530. eCollection 2021 Jun.

Background: A selective dorsal rhizotomy (SDR) is employed to treat spastic cerebral palsy. The surgical techniques and patient care protocols vary among hospitals. One of the variations is the age cut-off for SDR. We have been advocating SDR to be performed early - especially at ages 2 and 3. With this study, we are reporting the feasibility and parent-reported surgical outcomes of receiving SDR at an early age for the treatment of spastic diplegia. Objectives: Our aim is to examine the safety and benefits of receiving SDR at the ages of 2 and 3 for the treatment of spastic diplegia. Methods: The Institutional Review Board (IRB) of Washington University School of Medicine approved this retrospective quality of life survey and chart review (approval #202009056). The subjects of this study were children and teens (ages: 3.9-18.1) with spastic diplegic cerebral palsy who underwent SDR at ages 2 or 3 between years 2005 and 2019 at St. Louis Children's Hospital. Only domestic patients that were minors at the time of the study were selected to be participants in compliance with IRB regulations to protect patient health information that could potentially be breached by sending information to an incorrect or dated email. Thus, all contact was made through postal mail. The study included 141 patients from a total of 362 eligible patients. Parents of eligible patients were sent the research survey via postal mail. Only patients who responded to the survey were included in this study. The survey included questions on demographic information, quality of life, health perception, motor and ambulatory functions, braces and orthotics, pain issues, side effects of SDR, and post-SDR treatment. Results: The study included 141 diplegic patients. Of all patients at the time of the study, 91% reported an improvement in walking, 92% in standing, and 89% in sitting. In daily life activities, 87% of patients became more independent after SDR. 65% of patients were able to walk without a walking aid and about 4% were not able to walk. 11% of all patients relied mostly on a wheelchair. Moreover, 43% of patients were able to run independently. Regarding post-SDR orthopedic surgery, 48% of patients received at least one type of orthopedic surgery, with Achilles tendon lengthening, hamstring lengthening, and calf muscle release being the most common types. Conclusions: SDR performed at an early age through a single-level laminectomy was proved feasible and safe. A follow-up until the adult age (18 years) showed improvements in walking and other motor functions. The results support the implementation of early-age SDR for the treatment of spastic diplegia.

PMID: 34268050

2. 'Life-changing surgery': English-language news media representation of selective dorsal rhizotomy
Simon Paul Paget, Lani Campbell, Anneliese Blaxland, Jennifer Lewis, Angela Mary Morrow, Neil Wimalasundera

Child Care Health Dev. 2021 Jul 12. doi: 10.1111/cch.12894. Online ahead of print.

Background: Selective dorsal rhizotomy (SDR) is a neurosurgical intervention to reduce spasticity in children with cerebral palsy. Parents researching SDR for their child may be influenced by framing of SDR in news media articles they read. This study examined framing of SDR in English-language news media. Methods: Content analysis of English-language news media articles including the search term 'rhizotomy' in the Factiva database published July 2015 to July 2018 in online or print form in Canada, New Zealand, Australia, United States of America and the United Kingdom. Results: One hundred and eighty-six articles were identified describing 91 different children (45 male), almost all with cerebral palsy, median age 4 years old. One hundred and twenty-six articles were written prior to surgery; in many articles, SDR surgery involved travel overseas and/or fundraising. SDR was described universally in positive terms with little discussion of risks. Content of articles variably included the specialized nature of SDR, parental frustration with their local health system and their hope for positive outcomes. There was geographical variation in both numbers of articles and content. Conclusions: SDR is a common focus in cerebral palsy news media articles in some countries. Framing in these articles supports SDR as a beneficial and specialized procedure and may lead families to believe they need to work outside their local health systems. As news media are likely an important influence on families' attitudes to SDR, clinicians should be aware of this influence.

PMID: 34251700

3. Transcutaneous Spinal Neuromodulation Reorganizes Neural Networks in Patients with Cerebral Palsy
Parag Gad, Susan Hastings, Hui Zhong, Gaurav Seth, Sachin Kandhari, V Reggie Edgerton

Neurotherapeutics. 2021 Jul 9. doi: 10.1007/s13311-021-01087-6. Online ahead of print.

Spinal neuromodulation and activity-based rehabilitation triggers neural network reorganization and enhances sensory-motor performances involving the lower limbs, the trunk, and the upper limbs. This study reports the acute effects of Transcutaneous Electrical Spinal Cord Neuromodulation (SCONE™, SpineX Inc.) on 12 individuals (ages 2 to 50) diagnosed with cerebral palsy (CP) with Gross Motor Function Classification Scale (GMFCS) levels ranging from I to V. Acute spinal neuromodulation improved the postural and locomotor abilities in 11 out of the 12 patients including the ability to generate bilateral weight bearing stepping in a 2-year-old (GMFCS level IV) who was unable to step. In addition, we observed independent head-control and weight bearing standing with stimulation in a 10-year-old and a 4-year old (GMFCS level V) who were unable to hold their head up or stand without support in the absence of stimulation. All patients significantly improved in coordination of flexor and extensor motor pools and inter and intralimb joint angles while stepping on a treadmill. While it is assumed that the etiologies of the disruptive functions of CP are associated with an injury to the supraspinal networks, these data are consistent with the hypothesis that spinal neuromodulation and functionally focused activity-based therapies can form a functionally improved chronic state of reorganization of the spinal-supraspinal connectivity. We further suggest that the level of reorganization of spinal-supraspinal connectivity with neuromodulation contributed to improved locomotion by improving the coordination patterns of flexor and extensor muscles by modulating the amplitude and firing patterns of EMG burst during stepping.

PMID: 34244928

4. Comparison of Surgical Outcomes for Distal Rectus Femoris Transfer and Resection Surgeries in Children With Cerebral Palsy With Stiff Knee Gait
Jose J Salazar-Torres, Chris Church, Thomas Shields, Nancy Lennon, M Wade Shrader, Julieanne P Sees, Freeman Miller

J Pediatr Orthop. 2021 Jul 19. doi: 10.1097/BPO.0000000000001886. Online ahead of print.

Background: Children with cerebral palsy (CP) often present with a stiff knee gait pattern because of rectus femoris (RF) spasticity and/or contracture. Rectus femoris transfers (RFTs) and resections are surgical procedures aimed at reducing muscle stiffness, thereby improving knee flexion during the swing phase of gait. Previous research has consistently demonstrated objective benefits of rectus transfer using instrumented gait analysis (IGA). Rectus femoris resection (RFR), a relatively simpler procedure, shows similar improvement in knee range of motion during gait. The objective of this study was to compare surgical outcomes between rectus transfers and resections using 3-dimensional IGA. Methods: Children with spastic CP who had RFTs or resections were retrospectively matched by walking speed and preoperative knee kinematics from 3-dimensional IGA (peak and timing of peak knee flexion in swing). Secondary outcomes included knee range of motion and maximum knee extension during gait. Results: Twenty-eight children were included in both the transfer group [age 9.4±2 y; Gross Motor Function Classification System (GMFCS) I (3 children), II (15 children), III (8 children), and IV (2 children)] and the resection group [age 10.6±2.5 y; GMFCS I (1 child), II (14 children), and III (13 children)]. Both surgical groups showed statistically significant short-term postsurgical improvements in peak knee flexion during swing ($P<0.001$ for the transfer group and

P=0.003 for the resection group) and Duncan-Ely test (P=0.004 for the transfer group and P<0.001 for the resection group). Further analysis by GMFCS level showed children at GMFCS levels III/IV had a greater tendency to crouch after RFT when compared with children at GMFCS levels I/II. This tendency was not observed in the RFR group. Conclusions: Both transfer and resection surgeries significantly improved gait kinematics short-term outcomes in children with spastic CP who present with stiff knee gait pattern. Further studies are required to compare long-term outcomes of both surgeries. Level of evidence: Level III-retrospective matched-cohort study.

PMID: 34269745

5. Sit-to-stand training for self-care and mobility in children with cerebral palsy: a randomized controlled trial
Sirawee Chaovalit, Karen J Dodd, Nicholas F Taylor

Dev Med Child Neurol. 2021 Jul 11. doi: 10.1111/dmcn.14979. Online ahead of print.

Aim: To investigate if a sit-to-stand exercise programme for children with cerebral palsy (CP) would improve self-care and mobility. Method: Thirty-eight children with CP (19 males, 19 females; mean age 8y 0mo, SD 2y 4mo, age range 4y 0mo-12y 4mo) classified in Gross Motor Function Classification System (GMFCS) levels III and IV and their caregivers were randomly allocated to sit-to-stand training plus routine physiotherapy (balance and gait training) or routine physiotherapy only (controls). Task-specific sit-to-stand training was completed five times a week for 6 weeks under physiotherapist (twice weekly) and caregiver (three times weekly) supervision. Blinded outcome assessments at week 7 were the self-care and mobility domains of the Functional Independence Measure for Children, Five Times Sit-to-Stand Test (FTSST), and Modified Caregiver Strain Index (MCSI). Results: The sit-to-stand group self-care increased by 2.2 units (95% confidence interval [CI] 1.3-3.1) and mobility increased by 2.2 units (95% CI 1.4-3.0) compared to the control group. In the sit-to-stand group, the FTSST was reduced by 4.0 seconds (95% CI -4.7 to -3.2) and the MCSI was reduced by 0.8 units (95% CI -1.2 to -0.4) compared to the control group. Interpretation: A sit-to-stand exercise programme for children with CP classified in GMFCS levels III and IV improved sit-to-stand performance and resulted in small improvements in self-care and mobility, while reducing caregiver strain.

PMID: 34247394

6. Ophthalmologic characteristics and outcomes of children with cortical visual impairment and cerebral palsy
Michael R West, Mark S Borchert, Melinda Y Chang

J AAPOS. 2021 Jul 13;S1091-8531(21)00176-2. doi: 10.1016/j.jaapos.2021.03.011. Online ahead of print.

Background: Cortical visual impairment (CVI) is the most common cause of pediatric visual impairment in developed countries, and cerebral palsy (CP) is diagnosed in approximately half of children with CVI. It is unknown whether children with CVI who also have CP (CVI+CP) have different characteristics and outcomes (with regard to visual acuity, strabismus, and response to strabismus surgery) than children with CVI without CP (CVI-CP). Methods: The medical records of all children with CVI, with and without CP, evaluated at our institution between 2013 and 2019 were retrospectively reviewed. Presentation and outcomes of children with CVI+CP were compared to those with CVI-CP. Results: A total of 151 children with CVI+CP and 153 children with CVI-CP were included. Children with CVI+CP were more likely to be diagnosed with significant refractive error (53.6% vs 41.2%; P = 0.03), optic atrophy (46.4% vs 32.7%; P = 0.01), and strabismus (82.8% vs 72.5%; P = 0.03) at presentation. Good ocular alignment after strabismus surgery was achieved in 30% of children with CVI+CP and 63.6% of children with CVI-CP (P = 0.48). Of 9 children with long-term (≥8 years) postoperative follow-up, 100% of CVI-CP patients achieved good outcomes compared with 0% of CVI+CP patients (P = 0.0079). Visual acuity at presentation and the percentage of patients who experienced improvement in visual acuity did not differ between groups. Conclusions: In our study cohort, children with CVI+CP had a higher likelihood of ophthalmic comorbidities and may have worse long-term strabismus surgery outcomes than children with CVI-CP.

PMID: 34271208

7. Voice Quality of Children With Cerebral Palsy
Ignatius S B Nip, Marc Garellek

J Speech Lang Hear Res. 2021 Jul 14;1-9. doi: 10.1044/2021_JSLHR-20-00633. Online ahead of print.

Purpose: Many children with cerebral palsy (CP) are described as having altered vocal quality. The current study utilizes psychoacoustic measures, namely, low-amplitude (H1*-H2*) and high-amplitude (H1*-A2*) spectral tilt and cepstral peak prominence (CPP), to identify the vocal fold articulation characteristics in this population. Method: Eight children with CP and eight typically developing (TD) peers produced vowel singletons [i, ɑ, u] and a story retell task with the same vowels in the words "beets, Bobby, boots." H1*-H2*, H1*-A2*, and CPP were extracted from each vowel. Results were analyzed with mixed linear models to identify the effect of Group (CP, TD), Task (vowel singleton, story retell), and Vowel [i, ɑ, u] on the dependent variables. Results: Children with CP have lower spectral tilt values (H1*-H2* and H1*-A2*) and lower CPP values than their TD peers. For both groups, vowel singletons were associated with lower CPP values as compared to story retell. Finally, the vowel [ɑ] was associated with higher spectral tilt and higher CPP values as compared to [i, u]. Conclusions: Children with CP have more constricted and creaky vocal quality due to lower spectral tilt and greater noise. Unlike adults, children demonstrate poorer vocal fold articulation when producing vowel singletons as compared to story retell. Finally, low vowels like [ɑ] seem to be produced with less constriction and noise as compared to high vowels.

PMID: 34260269

8. Nutritional screening of children and adolescents with cerebral palsy: a scoping review
Sarah J Sørensen, Ghita Brekke, Karin Kok, Jette L Sørensen, Alfred P Born, Christian Mølgaard, Christina E Høi-Hansen

Review Dev Med Child Neurol. 2021 Jul 11. doi: 10.1111/dmcn.14981. Online ahead of print.

Aim: To examine nutritional screening methods for children and adolescents with cerebral palsy. Method: A scoping review was performed using established methodologies. In June 2020 we searched PubMed, Embase, CINAHL Complete, and the Cochrane Central Register of Controlled Trials to identify articles on tools/methods for nutritional screening of our target groups. Results: Thirty studies were included, containing various tools/methods used to identify under- and/or overnutrition by weight/height, circumferences, skinfolds, questionnaires, and/or technically advanced or invasive methods. Questionnaires, weight/height, circumferences, and skinfolds were considered feasible based on clinical utility, whereas bioelectrical impedance analysis and blood samples were not. Interpretation: We identified two screening tools for undernutrition that include no physical measurements, but did not find any screening tools for overweight and obesity. Most of the studies recommended one or more methods, indicating that determining nutritional status most likely includes a combination of methods, not all of which may be feasible in clinical practice.

PMID: 34247401

9. Children with cerebral palsy; a cross-sectional study of their sleep and their caregiver's sleep quality, psychological health and wellbeing
Cathryne P Lang, Amanda Boucaut, Max Guppy, Leanne M Johnston

Child Care Health Dev. 2021 Jul 15. doi: 10.1111/cch.12897. Online ahead of print.

Background: Children with cerebral palsy (CP) are more likely to experience sleep problems. Their sleep difficulties have been shown to be related to poorer sleep quality for their parents and caregivers. While poor sleep has been linked with poorer psychological health in other populations, few studies have focused on the potential effects of children's and caregivers' sleep disturbance on caregivers' psychological health and wellbeing in families of children with CP. This study investigated the association between caregivers' psychological health and wellbeing and their sleep quality and the sleep of their children with CP. Method: 94 caregivers (86% mothers; age range = 29-76 years) of children with CP aged 4 to 14 years of varying physical abilities (Gross Motor Function Classification Scale expanded and revised - level I (24), II (20), III (16), IV (10), V (24)) were recruited from a state-wide rehabilitation service. Caregivers completed the Depression, Anxiety and Stress Scale-21, Warwick -Edinburgh Mental Wellbeing Scale, Resilience Scale, Pediatric Sleep Questionnaire, Pittsburgh Sleep Quality Index, and a demographic questionnaire. Results: Sleep problems were reported for 55% of children. Poor sleep quality was reported by

71% of caregivers. While 25% of caregivers reported positive wellbeing and 86% reported high to very high levels of resilience, 44% reported poor psychological health. Child sleep problems were related to poorer caregiver sleep quality (r=0.47, p<0.001). Poorer caregiver sleep quality was related to poorer caregiver psychological health (r=0.43-0.51, all p<0.001) and wellbeing (r=-0.48, p<0.001), but not resilience (r=0.18, p=0.11). Conclusions: High numbers of children with CP and their caregivers experience poor sleep that extends far past infancy. Poor sleep quality is associated with poorer psychological health and wellbeing for caregivers. Further development of responsive support services that address caregivers' sleep is essential.

PMID: 34265112

10. Solution-Focused Coaching for Friendship in Pediatric Rehabilitation: A Case Study of Goal Attainment, Client Engagement, and Coach Stances
Gillian King, Sarah Keenan

Phys Occup Ther Pediatr. 2021 Jul 15;1-18. doi: 10.1080/01942638.2021.1947435. Online ahead of print.

Aims: To examine goal attainment, engagement, and the stances used by coaches providing a solution-focused coaching intervention (SFC-peds) for young people with cerebral palsy pursuing friendship goals. Methods: The case study involved two clients with cerebral palsy (a young child and his mother, and a youth) and their service providers. An interpretive descriptive approach was used to analyze quantitative and qualitative data. Friendship goal attainment was assessed by the Canadian Occupational Performance Measure and goal attainment scaling, and client engagement was assessed using the Pediatric Rehabilitation Intervention Measure of Engagement-Service Provider version. Information from post-intervention client interviews was used to identify coach stances and relationships with client engagement. Results: Participants met their friendship goals and were considered to be highly engaged by their coaches. Four coach stances were identified: Respectful Inquiry, a Strengths Presupposition, Implementation Curiosity, and Inspiring Commitment. These stances, and aligned tactics, engaged clients on affective, cognitive, and behavioral levels, and impacted the client's stance toward their goal. Conclusions: SFC-peds appears to be an effective and engaging approach for young people with disabilities working on friendship goals. The findings illustrate how the coach's stances and tactics engage clients, thus impacting the client's own stances toward change.

PMID: 34266361

11. Personalisation of a virtual gaming system for children with motor impairments: performance and usability
Sarit Tresser, Tsvi Kuflik, Irina Levin, Patrice L Weiss

Disabil Rehabil Assist Technol. 2021 Jul 16;1-7. doi: 10.1080/17483107.2021.1936222. Online ahead of print.

Purpose: To demonstrate the potential role of virtual game personalisation for use as a therapeutic modality to improve upper extremity function in children with cerebral palsy (CP). Methods: The study tested a convenience sample of 60 typically developing children (TD) aged 6-10 years and 20 children with CP aged 7-11 years. Children participated in a single 30-min session when they played the game in accuracy mode (virtual targets are hit as they become progressively larger or smaller) or dwell mode (virtual targets are hit when the users remains on them for progressively shorter or longer durations). These two modes can be played in conventional (non-personalised), personalised and with and without arm weights conditions; weights were used for the TD group in order to ensure that game play would be sufficiently challenging as to require personalisation. We measured performance variables (frequency of changes in game level difficulty and accuracy as measured by percent success of hitting the virtual targets) in each condition and usability variables (self-reported perceived effort and enjoyment). Results: Comparisons between the usability of the conventional and personalised conditions among typically developing children showed that although children self-reported significantly more effort while playing the personalised game, the level of enjoyment remained high (no significant differences between conventional and personalised game play conditions). In addition, comparisons between playing the personalised game with and without weights by typically developing children, indicated that percent success was significantly higher for the game played without weights, suggesting that the system is sensitive to dynamic changes in performance. Comparisons between the TD and CP groups showed that when the game was played in personalised dwell mode (hovering over the target for several seconds) children with CP progressed significantly less quickly through different difficulty levels compared to typically developing children. In contrast, no significant differences were found in accuracy mode (immediate response on target hit), between the TD and CP groups in any of the experimental conditions. Discussion: The personalised game approach was shown to be enjoyable for both groups of users and able to change the level of difficulty in real time. The results suggest that this approach to gaming can provide motor challenges while preserving a high

level of enjoyment. Conclusion: Personalised virtual therapy shows promise as a tool for upper extremity therapy for children with motor impairment. Implications for Rehabilitation: In recent years, there has been an increase in the use of assistive technologies including virtual gaming in the general area of health care and clinical practice. Virtual gaming provides an interactive, real-time experiences that are flexible and ecologically valid ways to improve specific cognitive and motor abilities. Personalisation of virtual games entails dynamic adaptation of the parameters in real time according to the user's functional level).The results have demonstrated that personalised virtual gaming is enjoyable and feasible for typically developing children and children with cerebral palsy. The results suggest that this approach to gaming can provide motor challenges while preserving a high level of enjoyment.

PMID: 34270909

12. Treatment of spasticity in children and adolescents with cerebral palsy in Northern Europe: a CP-North registry study

Gunnar Hägglund, Sandra Julsen Hollung, Matti Ahonen, Guro L Andersen, Guðbjörg Eggertsdóttir, Mark S Gaston, Reidun Jahnsen, Ira Jeglinsky-Kankainen, Kirsten Nordbye-Nielsen, Ilaria Tresoldi, Ann I Alriksson-Schmidt

BMC Neurol. 2021 Jul 12;21(1):276. doi: 10.1186/s12883-021-02289-3.

Background: Spasticity is present in more than 80% of the population with cerebral palsy (CP). The aim of this study was to describe and compare the use of three spasticity reducing methods; Botulinum toxin-A therapy (BTX-A), Selective dorsal rhizotomy (SDR) and Intrathecal baclofen therapy (ITB) among children and adolescents with CP in six northern European countries. Methods: This registry-based study included population-based data in children and adolescents with CP born 2002 to 2017 and recorded in the follow-up programs for CP in Sweden, Norway, Denmark, Iceland and Scotland, and a defined cohort in Finland. Results: A total of 8,817 individuals were included. The proportion of individuals treated with SDR and ITB was significantly different between the countries. SDR treatment ranged from 0% (Finland and Iceland) to 3.4% (Scotland) and ITB treatment from 2.2% (Sweden) to 3.7% (Denmark and Scotland). BTX-A treatment in the lower extremities reported 2017-2018 ranged from 8.6% in Denmark to 20% in Norway ($p < 0.01$). Mean age for undergoing SDR ranged from 4.5 years in Norway to 7.3 years in Denmark ($p < 0.01$). Mean age at ITB surgery ranged from 6.3 years in Norway to 10.1 years in Finland ($p < 0.01$). Mean age for BTX-A treatment ranged from 7.1 years in Denmark to 10.3 years in Iceland ($p < 0.01$). Treatment with SDR was most common in Gross Motor Function Classification System (GMFCS) level III, ITB in level V, and BTX-A in level I. The most common muscle treated with BTX-A was the calf muscle, with the highest proportion in GMFCS level I. BTX-A treatment of hamstring and hip muscles was most common in GMFCS levels IV-V in all countries. Conclusion: There were statistically significant differences between countries regarding the proportion of children and adolescents with CP treated with the three spasticity reducing methods, mean age for treatment and treatment related to GMFCS level. This is likely due to differences in the availability of these treatment methods and/or differences in preferences of treatment methods among professionals and possibly patients across countries.

PMID: 34253183

13. Risks of covid-19 hospital admission and death for people with learning disability: population based cohort study using the OpenSAFELY platform

Elizabeth J Williamson, Helen I McDonald, Krishnan Bhaskaran, Alex J Walker, Sebastian Bacon, Simon Davy, Anna Schultze, Laurie Tomlinson, Chris Bates, Mary Ramsay, Helen J Curtis, Harriet Forbes, Kevin Wing, Caroline Minassian, John Tazare, Caroline E Morton, Emily Nightingal, Amir Mehrkar, Dave Evans, Peter Inglesby, Brian MacKenna, Jonathan Cockburn, Christopher T Rentsch, Rohini Mathur, Angel Y S Wong, Rosalind M Eggo, William Hulme, Richard Croker, John Parry, Frank Hester, Sam Harper, Ian J Douglas, Stephen J W Evan, Liam Smeeth, Ben Goldacre, Hannah Kuper

BMJ. 2021 Jul 14;374:n1592. doi: 10.1136/bmj.n1592.

Objective: To assess the association between learning disability and risk of hospital admission and death from covid-19 in England among adults and children. Design: Population based cohort study on behalf of NHS England using the OpenSAFELY platform. Setting: Patient level data were obtained for more than 17 million people registered with a general practice in England that uses TPP software. Electronic health records were linked with death data from the Office for National Statistics and hospital admission data from NHS Secondary Uses Service. Participants: Adults (aged 16-105 years) and children (<16 years) from two cohorts: wave 1 (registered with a TPP practice as of 1 March 2020 and followed until 31 August 2020); and wave 2 (registered 1 September 2020 and followed until 8 February 2021). The main exposure group consisted of people on a general practice learning disability register; a subgroup was defined as those having profound or severe learning disability. People with Down's syndrome and cerebral palsy were identified (whether or not they were on the learning disability register).

Main outcome measure: Covid-19 related hospital admission and covid-19 related death. Non-covid-19 deaths were also explored. Results: For wave 1, 14 312 023 adults aged ≥16 years were included, and 90 307 (0.63%) were on the learning disability register. Among adults on the register, 538 (0.6%) had a covid-19 related hospital admission; there were 222 (0.25%) covid-19 related deaths and 602 (0.7%) non-covid deaths. Among adults not on the register, 29 781 (0.2%) had a covid-19 related hospital admission; there were 13 737 (0.1%) covid-19 related deaths and 69 837 (0.5%) non-covid deaths. Wave 1 hazard ratios for adults on the learning disability register (adjusted for age, sex, ethnicity, and geographical location) were 5.3 (95% confidence interval 4.9 to 5.8) for covid-19 related hospital admission and 8.2 (7.2 to 9.4) for covid-19 related death. Wave 2 produced similar estimates. Associations were stronger among those classified as having severe to profound learning disability, and among those in residential care. For both waves, Down's syndrome and cerebral palsy were associated with increased hazards for both events; Down's syndrome to a greater extent. Hazard ratios for non-covid deaths followed similar patterns with weaker associations. Similar patterns of increased relative risk were seen for children, but covid-19 related deaths and hospital admissions were rare, reflecting low event rates among children. Conclusions: People with learning disability have markedly increased risks of hospital admission and death from covid-19, over and above the risks observed for non-covid causes of death. Prompt access to covid-19 testing and healthcare is warranted for this vulnerable group, and prioritisation for covid-19 vaccination and other targeted preventive measures should be considered.

PMID: 34261639

14. Erratum: Recessive COL4A2 Mutation Leads to Intellectual Disability, Epilepsy, and Spastic Cerebral Palsy
No authors listed

Published Erratum Neurol Genet. 2021 Jul 1;7(4):e611. doi: 10.1212/NXG.0000000000000611. eCollection 2021 Aug.

PMID: 34250229

15. Second trimester maternal serum biomarkers and the risk of cerebral palsy
Monique Peris, Susan M Reid, Stephen Dobie, Leo Bonacquisto, Daisy A Shepherd, David J Amor

Prenat Diagn. 2021 Jul 16. doi: 10.1002/pd.6011. Online ahead of print.

Aims: To investigate whether second trimester screening (T2MSS) biomarkers are associated with cerebral palsy (CP) and identify CP characteristics associated with abnormal biomarker levels. Method: In this retrospective case-control data linkage study, we linked mothers of 129 singleton CP cases from a population register to their 2TMSS records and selected 10 singleton pregnancy controls per case (n=1290). We compared mean and abnormal levels of alpha-fetoprotein (AFP), beta subunit of human chorionic gonadotrophin (β-hCG), estriol (UE3) and inhibin between cases and controls and within CP subgroups. Results: Compared to control pregnancies, CP pregnancies had higher mean levels of AFP (1.10 vs 1.01 MoM, p=0.01) and inhibin (1.10 vs 0.98 MoM, p=<0.01). CP pregnancies were 2.5 times more likely to be associated with high levels of AFP (OR 2.52 [95% CI 1.30, 4.65]; p<0.01) and 2.6 times for inhibin (OR 2.63 [95% CI 1.37, 4.77]; p<0.01), and 6.8 times when AFP and inhibin were both elevated (OR 6.75 [95% CI 2.41, 18.94]; p<0.01). In CP cases, high AFP and high inhibin levels were associated with preterm birth and low birthweight. Interpretation: Abnormal second-trimester biomarker levels suggest abnormal placentation plays a role in the causal pathway of some CP cases.

PMID: 34270813

16. Morbidity and mortality in extremely premature infants with a birth weight ≤ 500 grams
Sascha Meyer, Sebastian Maas, Johannes Bay, Michael Zemlin, Martin Poryo

Acta Paediatr. 2021 Jul 16. doi: 10.1111/apa.16033. Online ahead of print.

In their retrospective analysis including 59 preterm infants with a birth weight ranging from 318 to 500 g (56% of neonates ≤3rd percentile) and gestational age from 23 to 29 weeks, Goeral et al. demonstrated that 88% received standard care; and survival rate was 37% for all live births and 42% for infants with standard care [1]. Neurodevelopmental outcome assessment was available in 91% of patients (Bayley Scales of Infant Development at two years) with 50% demonstrating a favourable mental development (normal or mild impairment), 75% a favourable motor development, and 45% a favourable outcome in both outcome subcategories. When additionally considering visual and hearing disability and, or, cerebral palsy level ≥2 according to the Gross Motor Function Classification System (GMFCS) 35% had a good neurodevelopmental outcome.

PMID: 34270129

17. 2020 edition of the Rourke Baby Record: What is new in preventive care of children up to 5 years of age?
Patricia Li, Anne Rowan-Legg, Bruce Kwok, Imaan Bayoumi, Stephani Arulthas, Emmanuela Tedone, Denis Leduc, James Rourke, Leslie Rourke

Can Fam Physician. 2021 Jul;67(7):488-498. doi: 10.46747/cfp.6707488.

Objective: To update primary care providers practising well-child and well-baby clinical care on the evidence that contributed to the recommendations of the 2020 edition of the Rourke Baby Record (RBR). Quality of evidence: Pediatric preventive care literature was searched from June 2016 to May 2019, primary research studies were reviewed and critically appraised using the GRADE (Grading of Recommendations Assessment, Development and Evaluation) methodology, and recommendations were updated where there was support from the literature. Main message: Notable changes in the 2020 edition of the RBR include the recommendations to limit or avoid consumption of highly processed foods high in dietary sodium, to ensure safe sleep (healthy infants should sleep on their backs and on a firm surface for every sleep, and should sleep in a crib, cradle, or bassinette in the parents' room for the first 6 months of life), to not swaddle infants after they attempt to roll, to inquire about food insecurity, to encourage parents to read and sing to infants and children, to limit screen time for children younger than 2 years of age (although it is accepted for videocalling), to educate parents on risks and harms associated with e-cigarettes and cannabis, to avoid pesticide use, to wash all fruits and vegetables that cannot be peeled, to be aware of the new Canadian Caries Risk Assessment Tool, to note new red flags for cerebral palsy and neurodevelopmental problems, and to pay attention to updated high-risk groups for lead and anemia screening. Conclusion: The RBR endeavours to guide clinicians in providing evidence-informed primary care to Canadian children. The revisions are rigorously considered and are based on appraisal of a growing, albeit still limited, evidence base for pediatric preventive care.

PMID: 34261708

18. Review of Tone Management for the Primary Care Provider
Samuel G McClugage 3rd, David F Bauer

Review Pediatr Clin North Am. 2021 Aug;68(4):929-944. doi: 10.1016/j.pcl.2021.04.018.

Movement disorders in a pediatric population represent a spectrum of secondary functional deficits affecting ease of care, ambulation, and activities of daily living. Cerebral palsy represents the most common form of movement disorder seen in the pediatric population. Several medical and surgical options exist in the treatment of pediatric spasticity and dystonia, which can have profound effects on the functionality of these patients. Given the complex medical and surgical problems in these patients, children are well served by a multidisciplinary team of practitioners, including physical therapists, physical medicine and rehabilitation physicians, and surgeons.

PMID: 34247718

19. Methodological quality of systematic reviews on interventions for children with cerebral palsy: the evidence pyramid paradox
Stefano Negrini, Pierre Côté, Carlotte Kiekens

Dev Med Child Neurol. 2021 Jul 11. doi: 10.1111/dmcn.14988. Online ahead of print.

PMID: 34247397