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NEWS
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Professor Nadia Badawi AM
Macquarie Group Foundation Chair of Cerebral Palsy

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Interventions and Management

1. Clinicoecon Outcomes Res. 2015 Apr 1;7:185-93. doi: 10.2147/CEOR.S76141. eCollection 2015.

Budget impact analysis of botulinum toxin A therapy for upper limb spasticity in the United Kingdom.

Abogunrin S1, Hortobagyi L2, Remak E3, Dinet J4, Gabriel S5, Bakheit AM6.

BACKGROUND: Botulinum toxin A (BoNT-A) is an effective treatment for patients with upper limb spasticity (ULS), which is a debilitating feature of upper motor neuron lesions. BoNT-A preparations available in the UK are associated with different costs. METHODS: We developed a budget impact model to assess the effect of changing market shares of different BoNT-A formulations - abobotulinumtoxinA, onabotulinumtoxinA, and incobotulinumtoxinA - and best supportive care, from the UK payer perspective, over a 5-year time horizon. Epidemiological and resource use data were derived from published literature and clinical expert opinion. One-way sensitivity analyses were performed to determine parameters most influential on budget impact. RESULTS: Base-case assumptions showed that an increased uptake of abobotulinumtoxinA resulted in a 5-year savings of £6,283,829. Treatment with BoNT-A costs less than best supportive care per patient per year, although treating a patient with onabotulinumtoxinA (£20,861) and incobotulinumtoxinA (£20,717) cost more per patient annually than with abobotulinumtoxinA (£19,800). Sensitivity analyses showed that the most influential parameters on budget were percentage of cerebral palsy and stroke patients developing ULS, and the prevalence of stroke. CONCLUSION: Study findings suggest that increased use of abobotulinumtoxinA for ULS in the UK could potentially reduce total ULS cost for the health system and society.

PMID: 25878510 [PubMed] PMCID: PMC4386804 Free full text

2. J Neurosci. 2015 Apr 15;35(15):6179-94. doi: 10.1523/JNEUROSCI.3757-14.2015.

Control of autophagosome axonal retrograde flux by presynaptic activity unveiled using botulinum neurotoxin type a.

Wang T1, Martin S1, Papadopulos A1, Harper CB1, Mavlyutov TA2, Niranjan D3, Glass NR4, Cooper-White JJ5, Sibarita JB6, Choquet D7, Davletov B8, Meunier FA9.

Botulinum neurotoxin type A (BoNT/A) is a highly potent neurotoxin that elicits flaccid paralysis by enzymatic cleavage of the exocytic machinery component SNAP25 in motor nerve terminals. However, recent evidence suggests that the neurotoxic activity of BoNT/A is not restricted to the periphery, but also reaches the CNS after retrograde axonal transport. Because BoNT/A is internalized in recycling synaptic vesicles, it is unclear which compartment facilitates this transport. Using live-cell confocal and single-molecule imaging of rat hippocampal neurons cultured in microfluidic devices, we show that the activity-dependent uptake of the binding domain of the

BoNT/A heavy chain (BoNT/A-Hc) is followed by a delayed increase in retrograde axonal transport of BoNT/A-Hc carriers. Consistent with a role of presynaptic activity in initiating transport of the active toxin, activity-dependent uptake of BoNT/A in the terminal led to a significant increase in SNAP25 cleavage detected in the soma chamber compared with nonstimulated neurons. Surprisingly, most endocytosed BoNT/A-Hc was incorporated into LC3-positive autophagosomes generated in the nerve terminals, which then underwent retrograde transport to the cell soma, where they fused with lysosomes both in vitro and in vivo. Blocking autophagosome formation or acidification with wortmannin or bafilomycin A1, respectively, inhibited the activity-dependent retrograde trafficking of BoNT/A-Hc. Our data demonstrate that both the presynaptic formation of autophagosomes and the initiation of their retrograde trafficking are tightly regulated by presynaptic activity.

PMID: 25878289 [PubMed - in process]

3. Zhongguo Zhong Xi Yi Jie He Za Zhi. 2015 Feb;35(2):151-6.

Effect of acupuncture on early cerebral palsy infants with parafunctional sitting position: a multi-centre, randomized, control research [Article in Chinese]

Zhang HY, Sun QY, Yang KP, Chen YX, Wang Q, Wang X, Liu Y.

OBJECTIVE: To study the clinical effect of development theory based acupuncture on early cerebral palsy (CP) infants with parafunctional sitting position. METHODS: Totally 120 early CP infants were randomly assigned to two groups equally, the treatment group and the control group. All received acupuncture combined with training rehabilitation. Patients in the treatment group adopted acupuncture based on infants development theory, while those in the control group were treated by head acupuncture. Sitting functional points in Gross motor function measure (GMFM) 88 were observed in different groups and infant patients of various types before and after treatment. Root mean square (RMS) signals of sitting correlated muscles (latissimus dorsi, erector spinae, rectus abdominis) were recorded by surface electromyography (sEMG). The effective rate was evaluated by Nimodipine method. RESULTS: Compared with before treatment, sitting functional points were significantly improved in the two groups (P<0.01). After treatment, it was higher in the treatment group than in the control group (P<0.01). The advance amplitude was higher in CP infants of the spastic type and the hypotonic type than other types (P<0.01). Along with sitting process, latissimus dorsi RMS signals were gradually tapered, erector spinae RMS signals were gradually enhanced, and rectus abdominis RMS signals were slightly weakened. Compared with the control group, latissimus dorsi RMS signals obviously decreased, and erector spinae RMS signals obviously increased in the treatment group after treatment (all P<0.01). The total effective rate was higher in the treatment group than in the control group (89.29% vs. 77.78%, P<0.05). CONCLUSION: Infants development theory based acupuncture could effectively elevate dorsi-extensor muscles force, improve sitting position of 8 months to 1 year old CP infants with parafunctional sitting position.

PMID: 25881458 [PubMed - in process]

4. J Pediatr Orthop. 2015 Apr 13. [Epub ahead of print]

What's New in the Management of Neuromuscular Scoliosis.

Brooks JT1, Sponseller PD.

BACKGROUND: Patients with neuromuscular scoliosis (NMS) can pose treatment challenges related to medical comorbidities and altered spinopelvic anatomy. We reviewed the recent literature regarding evaluation and management of NMS patients and explored areas where further research is needed. METHODS: We searched the PubMed database for all papers related to the treatment of NMS published from January 1, 2011 through July 31, 2014, yielding 70 papers. RESULTS: A total of 39 papers contributed compelling new findings. Steroid treatment has been most promising in patients with Duchenne muscular dystrophy, leading to a significantly lower death rate, better pulmonary function, and longer independent ambulation. Growing rods in early-onset NMS were shown to result in significant improvements in major Cobb angles and pelvic obliquity, with low complication rates in patients with spinal muscular atrophy but high infection rates in those with cerebral palsy. Early reports of magnetic growing rods in NMS patients are favorable. Intraoperative neural monitoring is variable in this patient population; however,

use of transcranial motor-evoked potentials in NMS patients seems to be safe. Blood loss is the highest in NMS patients when compared with all other diagnostic categories. However, tranexamic acid seems to significantly lower intraoperative blood loss. In a multicenter study, patients diagnosed with NMS had the highest surgical-site infection rate at 13.1%. Best-practice guidelines have been created regarding prevention of infection in NMS patients. Preoperative nutritional optimization and postoperative nutritional supplementation seem to help with lowering the infection rate in these patients. CONCLUSIONS: There have been major advances in the management of NMS patients, but many challenges remain. Further multicenter studies and randomized clinical trials are needed, particularly in the areas of infection prophylaxis, nutritional optimization, improvement in intraoperative neural monitoring, and prevention of proximal junctional kyphosis.

LEVEL OF EVIDENCE: Level 4-literature review.

PMID: 25887834 [PubMed - as supplied by publisher]

5. Pak J Med Sci. 2015 Jan-Feb;31(1):189-93. doi: 10.12669/pjms.311.5709.

Spinal anaesthesia for orthopaedic surgery in children with cerebral palsy: Analysis of 36 patients.

Onal O1, Apiliogullari S2, Gunduz E3, Celik JB4, Senaran H5.

BACKGROUND AND OBJECTIVE: Cerebral palsy is one of the most common childhood neuromuscular diseases in the world. Spinal anaesthesia in children is an evolving technique with many advantages in perioperative management. The aim of this retrospective study was to provide first-hand reports of children with cerebral palsy who underwent orthopaedic surgery under spinal anaesthesia. METHODS: Records of the children with cerebral palsy who underwent orthopaedic surgery under spinal anaesthesia between May 2012 and June 2013 at Selcuk University Hospital were investigated. In all patients, lumbar puncture was performed in lateral decubitus position with mask sevoflurane-nitrous oxide anaesthesia. In patients who were calm prior the spinal block, inhalation anaesthesia was terminated. In patients who were restless before the spinal block, anaesthesia was combined with light sevoflurane anaesthesia and a laryngeal mask. From anaesthesia records, the number of attempts required to complete the lumbar puncture, and the success rates of spinal anaesthesia and perioperative complications were noted. Data were expressed as numbers and percentages. RESULTS: The study included 36 patients (20 girls and 16 boys). The mean age was 71 months. The rate of reaching subarachnoid space on first attempt was 86%. In all patients, spinal anaesthesia was considered successful. In 26 patients, laryngeal mask and light sevoflurane anaesthesia were required to maintain ideal surgical conditions. No major perioperative complications were observed. CONCLUSION: Spinal anaesthesia alone or combined with light sevoflurane anaesthesia is a reliable technique with high success rates in children with cerebral palsy undergoing orthopaedic surgery.

PMID: 25878641 [PubMed] PMCID: PMC4386184

6. Spine (Phila Pa 1976). 2015 Apr 15;40(8):E504-9. doi: 10.1097/BRS.0000000000000811.

Although inconvenient, baclofen pumps do not complicate scoliosis surgery in patients with cerebral palsy.

Yaszay B1, Scannell BP, Bomar JD, Sponseller PD, Shah SA, Asghar J, Samdani AF, Bastrom TP, Newton PO; Harms Study Group.

STUDY DESIGN: Retrospective review of prospectively collected data. OBJECTIVE: To compare patients with operative cerebral palsy with and without an intrathecal baclofen pump (ITB) to determine whether an ITB increases the complexity of scoliosis surgery and/or increases the risk of wound complications. SUMMARY OF BACKGROUND DATA: Options for baclofen pump placement include before, during, or after scoliosis surgery. There is some concern that prior placement of an ITB and catheter can further complicate cerebral palsy scoliosis surgery and increase the risk for wound complications. METHODS: Prospectively collected cases from a multicenter cerebral palsy scoliosis database were reviewed for patients who underwent posterior spinal instrumentation and fusion for a major coronal deformity. These patients were then divided on the basis of whether they had ITB at the time of initial scoliosis surgery. The 2 groups were compared to determine differences in demographics, operative parameters, radiographical outcomes, and rates of wound complications. RESULTS: Of 187 patients identified, 32 had an ITB previously placed (ITB group) and 155 did not (non-ITB group). Both groups

were similar in regard to age, sex, Gross Motor Function Classification Scale score, and preoperative Cobb magnitude. When comparing operative parameters, there were no differences in the total operating room time (ITB = 375 ± 127 min, non-ITB = 423 ± 178 min; P = 0.149) or total estimated blood loss (ITB = 2323 ± 1489 mL, non-ITB = 2081 ± 1572 mL; P = 0.424). Postoperatively, the 2 groups had similar correction rates (71% vs. 67%, P = 0.303). As for perioperative wound complications, there were no differences in rates (P = 0.546) between the ITB (16%) and non-ITB group (15%). CONCLUSION: Although it may be inconvenient for the surgeon, ITBs do not increase the complexity of surgery or the risk for wound complications. When counseling patients and their caregivers on the timing of pump placement, it does not seem to compromise the care of the patient if the baclofen pump is placed first. Further study is needed to evaluate the safety of pump placement during or after scoliosis surgery.

LEVEL OF EVIDENCE: 4.

PMID: 25868105 [PubMed - in process]

7. J Pediatr Orthop. 2015 Apr 3. [Epub ahead of print]

Guided Growth of the Proximal Femur for Hip Displacement in Children With Cerebral Palsy.

Lee WC1, Kao HK, Yang WE, Ho PC, Chang CH.

BACKGROUND: Guided growth by 1 eccentric transphyseal screw has been used to correct lower limb deformities. Pilot animal studies showed encouraging results in producing varus deformity in the proximal femur. The purpose of this study was to report the preliminary results of guided growth surgery to treat spastic hip displacement. METHODS: This case series study included consecutive patients who received soft-tissue release and guided growth at the proximal femur from January 2004 to May 2012 with minimal 2-year follow-up. Surgical indications were children with spastic cerebral palsy aged 4 to 10 years, a gross motor function classification system level IV or V, and hip displacement on 1 or both sides. Study outcomes were Reimer's migration percentage (MP) and the head-shaft angle (HSA). RESULTS: Nine children with 13 spastic displaced hips received surgery at the age of 6.2 years and were followed up for a mean of 45.6 months. The mean MP improved significantly from 52.2% preoperatively to 45.8% at 3 months, 40.3% at 1 year, and 37.1% at 2 years after operation. HSA was unchanged in the first 3 months, and deceased from 173.3 to 166.4 degrees at 1 year (P<0.01) and to 162.7 degrees at 2 years postoperatively. The screw was usually backed out from the femoral epiphysis in the second postoperative year, and no radiologic bony bar or other surgical complications occurred. CONCLUSIONS: The immediate postoperative improvement of MP was the result of soft-tissue release. From postoperative 3 months to 2 years, the HSA was reduced by 10.6 degrees and the MP further improved by 8.7%. Less surgical dissection, faster recovery of motion, and less comorbidity than varus osteotomy make guided growth surgery a treatment option for coxa valga in spastic hip displacement in nonambulant cerebral palsy children.

LEVEL OF EVIDENCE: Level IV-therapeutic, case series.

PMID: 25887815 [PubMed - as supplied by publisher]

8. J Pediatr Orthop. 2015 Apr 14. [Epub ahead of print]

Salvage Options in the Cerebral Palsy Hip: A Systematic Review.

Kolman SE1, Ruzbarsky JJ, Spiegel DA, Baldwin KD.

BACKGROUND: No preferred procedure exists for the chronically painful, unreconstructable subluxated or dislocated hip in cerebral palsy. The purpose of this study was to compare pain relief and complication rates of salvage procedures in cerebral palsy for ambulatory and nonambulatory populations. METHODS: We searched Medline, Embase, and Cochrane databases using the search terms "cerebral palsy" and "hip dislocation." Inclusion and exclusion criteria were established to maintain data quality for analysis. A systematic review yielded 28 studies. Relevant information for postoperative pain and complications were extracted from each study and described. Our initial search identified 721 articles. Two hundred twenty duplications were excluded. Five hundred one were screened by title and abstract. One hundred articles underwent further full text and reference evaluation, yielding 25 studies. An additional 3 studies were then identified from the list of 25, yielding a total of 28 studies, which met our

inclusion criteria. RESULTS: Among nonambulators, femoral head resection (FHR), valgus osteotomy (VO), and total hip arthroplasty (THA) were found to relieve pain better than arthrodesis [odds ratio (OR) 7.3, 95% confidence interval (CI), 2.2-24.8; OR 5.9, 95% CI, 1.6-22.8; OR 11.7, 95% CI, 1.1-297.5, respectively]. Arthrodesis had a significantly higher complication rate than FHR, VO, THA, and shoulder prosthetic interposition. No significant differences in complication rate were found between FHR and VO. Pain relief rates among nonambulators for FHR, VO, THA, shoulder prosthetic interposition, and arthrodesis were 90.4%, 88.4%, 93.8%, 90.9%, and 56.3%, respectively. Complication rates among nonambulators were 24.0%, 33.3%, 35.3%, 28.6%, and 106.3%, respectively. Comparison of pain relief and complication rates among ambulatory cerebral palsy patients in all procedures except THA was not possible because the populations could not be separated from nonambulators in numbers sufficient to perform statistical analysis. Data were available for 32 confirmed cases of THA in ambulators and was associated with a 93.3% pain relief rate and a 38.2% complication rate. CONCLUSIONS: Among nonambulators, the available literature suggests that FHR, VO, and THA may be superior at relieving pain than arthrodesis. FHR had the lowest absolute percentage of complications; however, no significant differences in complication rate or pain relief were found in nonambulators undergoing FHR or VO. Most of the complications for VO were implant related, and potentially amenable to hardware removal versus complications in FHR, which were related to the procedure itself such as proximal migration and heterotopic bone formation. THA in nonambulators was associated with complications such as dislocation and revision. Arthrodesis in nonambulators was associated with >100% complication rate and inferior pain relief compared with other procedures. Ambulatory patients had excellent pain relief with THA; however, the complication rate is higher than can be expected with non-neurological populations. Insufficient data exist to support use of other salvage procedures in ambulators. These conclusions should be interpreted with caution as all studies involved level IV evidence.

LEVEL OF EVIDENCE: IV (systematic review of level IV studies).

PMID: 25887836 [PubMed - as supplied by publisher]

9. BMC Pediatr. 2015 Apr 1;15(1):30. doi: 10.1186/s12887-015-0347-2.

Optimising motor learning in infants at high risk of cerebral palsy: a pilot study.

Morgan C1,2, Novak I3,4, Dale RC5, Badawi N6.

BACKGROUND: The average age for the diagnosis of cerebral palsy (CP) is 19 months. Recent neuroplasticity literature suggests that intensive, task-specific intervention ought to commence as early as possible and in an enriched environment, during the critical period of neural development. Active motor interventions are effective in some populations, however the effects of active motor interventions on the motor outcomes of infants with CP have not been researched thoroughly, but pilot work is promising. The aim of this study was to determine the short- term effects of "GAME"; a new and novel goal-oriented activity-based, environmental enrichment therapy programme on the motor development of infants at high risk of CP and test study procedures for a randomized controlled trial (RCT). METHODS: Pragmatic 2-group pilot RCT to assess motor outcomes, goal attainment, parent well-being and home environment quality, after 12-weeks of GAME intervention versus standard care. GAME included: creation of movement environments to elicit motor behaviours; parent training in motor learning and task analysis; frequent practice of motor tasks using a programme that was individualised to the child, was varied and focused on self-initiated movement. Data were analyzed using multiple regression. RESULTS: Thirteen infants were consented, randomised, treated and completed the study. At study conclusion, the GAME group (n = 6) demonstrated an advantage in Total Motor Quotient of 8.05 points on the Peabody Developmental Motor Scale-2 (PDMS-2) compared to the standard care group (n = 7) ($p < .001$). No significant differences existed between groups on any other measure. CONCLUSIONS: GAME appears to offer a promising and feasible new motor intervention for CP, with favourable short-term motor outcomes. A pressing need exists for an adequately powered RCT with long-term end points, to determine if GAME may advance these children's motor trajectory.

PMID: 25880227 [PubMed - in process] PMCID: PMC4389951 Free full text

10. Dev Med Child Neurol. 2015 Apr 16. doi: 10.1111/dmcn.12765. [Epub ahead of print]

Should children with cerebral palsy exercise?

Narayanan UG1.

PMID: 25881489 [PubMed - as supplied by publisher]

11. BMC Pediatr. 2015 Mar 17;15(1):22.

Optimising nutrition to improve growth and reduce neurodisabilities in neonates at risk of neurological impairment, and children with suspected or confirmed cerebral palsy.

Andrew MJ1, Parr JR2, Montague-Johnson C3, Braddick O4, Laler K5, Williams N6, Baker B7, Sullivan PB8.

BACKGROUND: Neurological impairment is a common sequelae of perinatal brain injury. Plasticity of the developing brain is due to a rich substrate of developing neurones, synaptic elements and extracellular matrix. Interventions supporting this inherent capacity for plasticity may improve the developmental outcome of infants following brain injury. Nutritional supplementation with combination docosahexaenoic acid, uridine and choline has been shown to increase synaptic elements, dendritic density and neurotransmitter release in rodents, improving performance on cognitive tests. It remains elusive whether such specific 'neurotrophic' supplementation enhances brain plasticity and repair after perinatal brain injury. METHODS/DESIGN: This is a two year double-blind, randomised placebo controlled study with two cohorts to investigate whether nutritional intervention with a neurotrophic dietary supplement improves growth and neurodevelopmental outcomes in neonates at significant risk of neurological impairment (the D1 cohort), and infants with suspected or confirmed cerebral palsy (the D2 cohort). 120 children will be randomised to receive dietetic and nutritional intervention, and either active supplement or placebo. Eligible D1 neonates are those born <30+6 weeks gestation with weight <9th centile, ≤30+6 weeks gestation and Grade II, III or IV Intra-Ventricular Haemorrhage or periventricular white matter injury, or those born at 31-40+28 weeks gestation, with Sarnat grade I or II or III Hypoxic Ischaemic Encephalopathy or neuroimaging changes compatible with perinatal brain injury. Eligible D2 infants are those aged 1-18 months with a suspected or confirmed clinical diagnosis of cerebral palsy. The primary outcome measure is composite cognitive score on the Bayley Scales of Infant and Toddler Development III at 24 months. Secondary outcomes include visuobehavioural and visual neurophysiological assessments, and growth parameters including weight, height, and head circumference. DISCUSSION: This is the first study to supplement neonates and infants with perinatal brain injury with the combination of factors required for healthy brain development, throughout the period of maximal brain growth. A further study strength is the comprehensive range of outcome measures employed. If beneficial, supplementation with brain phosphatide precursors could improve the quality of life of thousands of children with perinatal brain injury.

TRIAL REGISTRATION: Current Controlled trials: ISRCTN39264076 (registration assigned 09/11/2012), ISRCTN15239951 (registration assigned 23/04/2010).

PMID: 25885548 [PubMed - as supplied by publisher] PMCID: PMC4389808

12. BMC Pediatr. 2015 Mar 4;15(1):15.

Prem Baby Triple P: a randomised controlled trial of enhanced parenting capacity to improve developmental outcomes in preterm infants.

Colditz P1,2, Sanders MR3, Boyd R4, Pritchard M5,6, Gray P7, O'Callaghan MJ8, Slaughter V9, Whittingham K10,11, O'Rourke P12, Winter L13,14, Evans T15,16, Herd M17,18, Ahern J19,20, Jardine L21,22.

BACKGROUND: Very preterm birth (<32 weeks gestation) is associated with motor, cognitive, behavioural and educational problems in children and maternal depression and withdrawal. Early interventions that target parenting have the greatest potential to create sustained effects on child development and parental psychopathology. Triple P (Positive Parenting Program) has shown positive effects on child behaviour and adjustment, parenting practices and family functioning. Baby Triple P for Preterm infants, has been developed to target parents of very preterm infants. This study tests the effectiveness of Baby Triple P for Preterm infants in improving child and parent/couple

outcomes at 24 months corrected age (CA). METHODS/DESIGN: Families will be randomised to receive either Baby Triple P for Preterm infants or Care as Usual (CAU). Baby Triple P for Preterm infants involves 4 × 2 hr group sessions at the hospital plus 4 × 30 min telephone consultations soon after transfer (42 weeks C.A.). After discharge participants will be linked to community based Triple P and intervention maintenance up to 24 months C.A. Assessments will be: baseline, post-intervention (6 weeks C.A.), at 12 and 24 months C.A. The primary outcome measure is the Infant Toddler Social & Emotional Assessment (ITSEA) at 24 months C.A. Child behavioural and emotional problems will be coded using the mother-toddler version of the Family Observation Schedule at 24 months C.A. Secondary outcome will be the Bayley Scales of Infant and Toddler Development (BSID III) cognitive development, language and motor abilities. Proximal targets of parenting style, parental self-efficacy, parental mental health, parental adjustment, parent-infant attachment, couple relationship satisfaction and couple communication will also be assessed. Our sample size based on the ITSEA, has 80% power, predicted effect size of 0.33 and an 85% retention rate, requires 165 families are required in each group (total sample of 330 families). DISCUSSION:This protocol presents the study design, methods and intervention to be analysed in a randomised trial of Baby Triple P for Preterm infants compared to Care as Usual (CAU) for families of very preterm infants. Publications of all outcomes will be published in peer reviewed journals according to CONSORT guidelines.

TRIAL REGISTRATION: Australian New Zealand Clinical Trials Registry: ACTRN12612000194864 .

PMID: 25884634 [PubMed - as supplied by publisher] PMCID: PMC4363360

13. BMC Pediatr. 2015 Feb 13;15(1):7.

Scoping review of patient- and family-oriented outcomes and measures for chronic pediatric disease.

Khangura SD1, Karaceper MD2, Trakadis Y3, Mitchell JJ4, Chakraborty P5,6, Tingley K7, Coyle D8, Grosse SD9, Kronick JB10,11, Laberge AM12, Little J13, Prasad C14, Sikora L15, Siriwardena K16, Sparkes R17, Speechley KN18, Stockler S19, Wilson BJ20, Wilson K21, Zayed R22, Potter BK23; Canadian Inherited Metabolic Diseases Research Network (CIMDRN).

BACKGROUND: Improvements in health care for children with chronic diseases must be informed by research that emphasizes outcomes of importance to patients and families. To support a program of research in the field of rare inborn errors of metabolism (IEM), we conducted a broad scoping review of primary studies that: (i) focused on chronic pediatric diseases similar to IEM in etiology or manifestations and in complexity of management; (ii) reported patient- and/or family-oriented outcomes; and (iii) measured these outcomes using self-administered tools. METHODS: We developed a comprehensive review protocol and implemented an electronic search strategy to identify relevant citations in Medline, EMBASE, DARE and Cochrane. Two reviewers applied pre-specified criteria to titles/abstracts using a liberal accelerated approach. Articles eligible for full-text review were screened by two independent reviewers with discrepancies resolved by consensus. One researcher abstracted data on study characteristics, patient- and family-oriented outcomes, and self-administered measures. Data were validated by a second researcher. RESULTS: 4,118 citations were screened with 304 articles included. Across all included reports, the most-represented diseases were diabetes (35%), cerebral palsy (23%) and epilepsy (18%). We identified 43 unique patient- and family-oriented outcomes from among five emergent domains, with mental health outcomes appearing most frequently. The studies reported the use of 405 independent self-administered measures of these outcomes. CONCLUSIONS: Patient- and family-oriented research investigating chronic pediatric diseases emphasizes mental health and appears to be relatively well-developed in the diabetes literature. Future research can build on this foundation while identifying additional outcomes that are priorities for patients and families.

PMID: 25886474 [PubMed - as supplied by publisher] PMCID: PMC4334411

14. Am J Occup Ther. 2015 May-Jun;69(3):6903220050p1-9. doi: 10.5014/ajot.2015.015263.

Parents' understanding of play for children with cerebral palsy.

Graham NE1, Truman J2, Holgate H3.

OBJECTIVE: To present the findings of an exploratory study regarding the experience of play as an everyday occupation for children with severe cerebral palsy from their parents' perspective. METHOD: We took a qualitative methodology and interpretive descriptive approach. After ethical approval, 7 participants were recruited and

completed an interview and contextual information sheet. RESULTS: The interview data led to the exploration of four themes: typical play, burden of play, expanding the concept of play, and therapy and play. These components were interlinked and contributed to parents' understanding of play. CONCLUSION: Occupational therapy practitioners can aim to further understand the importance of affirming typical play, recognizing the burden of play, explaining expanded play, and explaining the importance of play for play's sake.

PMID: 25871596 [PubMed - in process]

15. Am J Phys Med Rehabil. 2015 Apr 16. [Epub ahead of print]

Correlates of a Single-Item Quality-of-Life Measure in People Aging with Disabilities.

Siebens HC1, Tsukerman D, Adkins RH, Kahan J, Kemp B.

OBJECTIVE: Practical quality-of-life (QOL) screening methods are needed to help focus clinical decision-making on what matters to individuals with disabilities. DESIGN: A secondary analysis of a database from a large study of adults aging with impairments focused on four diagnostic groups: cerebral palsy (n = 134), polio (n = 321), rheumatoid arthritis (n = 99), and stroke (n = 82). Approximately 20% of cases were repeated measures of the same individuals 3-5 yrs later. Functional levels, depression, and social interactions were assessed. The single-item, subjective, seven-point Kemp Quality of Life Scale measured QOL. For each diagnostic group, Kemp Quality of Life Scale responses were divided into low, average, and high QOL subgroups. Analysis of variance and Tukey honestly significant difference tests compared clinical characteristics among these subgroups. RESULTS: Duration of disability varied among the four groups. Within each group, QOL subgroups were similar in age, sex, and duration of disability. Low mean QOL was associated with lower functional level, higher depression scores, and lower social interaction ($P < 0.001$) in all four groups. In contrast, high mean QOL was associated with higher social interaction ($P < 0.001$). CONCLUSION: The Kemp Quality of Life Scale relates significantly to clinically relevant variables in adults with impairments. The scale's utility in direct clinical care merits further examination.

PMID: 25888654 [PubMed - as supplied by publisher]

16. Implement Sci. 2015 Feb 6;10(1):16.

Improving allied health professionals' research implementation behaviours for children with cerebral palsy: protocol for a before-after study.

Imms C1,2, Novak I3,4, Kerr C5, Shields N6,7, Randall M8,9, Harvey A10,11, Graham HK12,13,14, Reddihough D15,16.

BACKGROUND: Cerebral palsy is a permanent disorder of posture and movement caused by disturbances in the developing brain. It affects approximately 1 in every 500 children in developed countries and is the most common form of childhood physical disability. People with cerebral palsy may also have problems with speech, vision and hearing, intellectual difficulties and epilepsy. Health and therapy services are frequently required throughout life, and this care should be effective and evidence informed; however, accessing and adopting new research findings into day-to-day clinical practice is often delayed. METHODS/DESIGN: This 3-year study employs a before and after design to evaluate if a multi-strategy intervention can improve research implementation among allied health professionals (AHPs) who work with children and young people with cerebral palsy and to establish if children's health outcomes can be improved by routine clinical assessment. The intervention comprises (1) knowledge brokering with AHPs, (2) access to an online research evidence library, (3) provision of negotiated evidence-based training and education, and (4) routine use of evidence-based measures with children and young people aged 3-18 years with cerebral palsy. The study is being implemented in four organisations, with a fifth organisation acting as a comparison site, across four Australian states. Effectiveness will be assessed using questionnaires completed by AHPs at baseline, 6, 12 and 24 months, and by monitoring the extent of use of evidence-based measures.

Children's health outcomes will be evaluated by longitudinal analyses. DISCUSSION: Government, policy makers and service providers all seek evidence-based information to support decision-making about how to distribute scarce resources, and families are seeking information to support intervention choices. This study will provide knowledge about what constitutes an efficient, evidence-informed service and which allied health interventions are implemented for children with cerebral palsy.

TRIAL REGISTRATION: Trial is not a controlled healthcare intervention and is not registered.

PMID: 25889110 [PubMed - as supplied by publisher]

Prevention and Cure

17. Clin Exp Obstet Gynecol. 2015;42(1):22-5.

Effect of nitric oxide inhalation combined with high-frequency oscillatory ventilation on the prognosis of neonatal severe hypoxemia.

Kang W, Sun H, Chen Y, Xu B, Liu D, Jin J, Guo J, Xiong H.

OBJECTIVE: The current study aimed to analyze the short-term and long-term curative effects of nitric oxide (NO) inhalation combined with high-frequency oscillatory ventilation (HFOV) on neonatal severe hypoxemia. MATERIALS AND METHODS: A total of 98 neonates meeting the inclusion criteria were retrospectively analyzed. The control group comprised of 48 neonates and the NO inhalation group consisted of 50 neonates. In the control group, conventional mechanical ventilation was replaced by HFOV. In the experimental group, NO inhalation combined with HFOV was performed. The death rates within 28 days, mechanical ventilation and oxygen therapy time, and complications in both groups were observed. The survivors in both groups were followed up for 18 months for neural development evaluation. RESULTS: The treatment group showed a significantly lower death rate and noticeably shorter mechanical ventilation and oxygen therapy time than the control group (8% vs. 22.9% with t = 4.20 andp < 0.05; 5.84 ± 3.36 days vs. 8.05 ± 5.48 days with t = 2.42 and p < 0.05; and 8.02 ± 4.31 days vs. 12.45 ± 5.14 days with t = 4.63 and p < 0.001). They did not show significant differences with regards to the complications and the incidences of cerebral palsy, hearing and visual impairments, and severe nervous damage (p > 0.05). CONCLUSION: NO inhalation combined with HFOV significantly decreases the death rate of neonates with severe hypoxemia and reduces their mechanical ventilation and oxygen therapy time. It does not increase early adverse effects or affect long-term neurodevelopment.

PMID: 25864276 [PubMed - in process]

18. J Paediatr Child Health. 2015 Apr 14. doi: 10.1111/jpc.12896. [Epub ahead of print]

Cytomegalovirus-related childhood mortality in Australia 1999-2011.

Smithers-Sheedy H1, Raynes-Greenow C, Badawi N, Khandaker G, Menzies R, Jones CA.

AIM: Cytomegalovirus (CMV) is an important cause of congenital infection, which can result in neonatal deaths or contribute to deaths in later childhood. Post-natally acquired CMV is a less common cause of disease and mortality, and only in preterm infants or immunocompromised children. Here we sought to describe CMV as a direct or secondary contributor to childhood mortality in Australia. METHOD: We searched national mortality data sets between1999 and 2011 for cases <15 years with CMV recorded as an underlying or contributing cause of death. RESULTS: Eighty-three CMV-associated deaths in children <15 years were identified (0.2 cases per 100 000 <15 years; 95% confidence interval 0.16-0.24). Childhood deaths associated with CMV were evenly distributed between males and females, and the majority (n = 57; 68%) occurred in children less than 12 months of age, with 22 cases <1 month of age. Over the 13-year study period, the mortality rate remained stable and CMV resulted in an estimated age-adjusted 5925 years of potential life lost.
CONCLUSIONS: CMV makes a small but important contribution to childhood mortality in Australia. Most CMV-

related deaths occurred in infants <12 months of age. These infant deaths may be an indirect marker of the burden of severe intrauterine CMV disease given the natural history of this infection.

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Closed claims in obstetrics: A study based on French Sham insurance data [Article in French]

Theissen A1, Fuz F2, Carbonne B3, Bonnet L4, Rouquette-Vincenti I4, Niccolai P5, Raucoules-Aime M6.

OBJECTIVE: The aim of this study was to analyze the medicolegal claims related to obstetrics in French hospitals. MATERIAL AND METHODS: We did retrospective study on insurance claims provided by Sham insurances and which has been settled by a court over a 3-year period (2004-2006). RESULTS: We analyzed 66 closed claims that occurred between 1983 and 2005 in French hospitals (54 general hospitals and 12 academic). The average time between the declaration of the claim and the court conviction was 6 years. The average amount of compensation per claim was 500 000 €. The damage occurred during vaginal delivery (n=44), planned (n=5) or unplanned (n=4) cesarean. The more often claims are fetal asphyxia (n=24) or shoulder dystocia (n=8). The consequences are very important: cerebral palsy (16), death of the newborn (12), death of the mother (2) or brachial plexus injuries (6). CONCLUSION: The causes identified by the expert are always multifactorial with generally a misdiagnosis (n=27), a decision making error (n=36), a care error by the midwife (n=21) and/or a delay in medical care (n=13). These data should help strengthen the quality approach in obstetrics.

PMID: 25863577 [PubMed - as supplied by publisher]

20. Niger Postgrad Med J. 2015 Mar;22(1):70-4.

The role of computerized tomographic scan in the management of children with cerebral palsy.

Ibinaiye PO1, Wammanda DR, Okpe M, Kajogbola GA, Gbadamosi AA, Olarinoye-Akorede S.

AIMS AND OBJECTIVES: The aim of this study was to describe the role of computed tomography (CT) scan in the management and evaluation of children with cerebral palsy (CP) and to categorize the CT findings and then relate them to their respective aetiologies, as well as the types of CP. MATERIALS AND METHODS: The CT findings in 32 children consisted of 16 boys and 16 girls with age range of 2-61 months who were diagnosed of CP and with detailed clinical information were analysed. The 84.4% positive CT findings were analyzed to evaluate their relationship with the clinical types, as well as the aetiological basis for the CP. RESULTS: The spastic type found in 78.1% of the total number of children, had the highest positive findings. The yield was increased in children with birth asphyxia (46.9%) and neonatal jaundice (37.5%). The findings were those of cerebral atrophy in 46.9%, infarcts in 12.5%, hydrocephalus in 9.4% and porencephaly 6.3% of cases. Treatable lesions, such as Dandy Walker syndrome, tumour, hydrocephalus and porencephaly were identified in 25% of cases. CONCLUSION: CT scan is no doubt efficacious in the management and evaluation of children with CP.

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