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CP Research News

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1: Gait Posture. 2008 Jun 3. [Epub ahead of print]

Reliability and validity of an activity monitor (IDEEA) in the determination of temporal-spatial gait parameters in individuals with cerebral palsy.

Mackey AH, Stott NS, Walt SE.

Department of Surgery, Faculty of Medical and Health Sciences, University of Auckland, Private Bag 92019, Auckland, New Zealand.

This study evaluated within- and between-session reliability and validity of temporal-spatial gait parameters derived from the intelligent device for energy expenditure and activity (IDEEA) activity monitor (Minisun, Fresno, CA) in subjects with cerebral palsy, using three-dimensional gait analysis (3-DGA) as the criterion standard. Twenty-five subjects with cerebral palsy (mean age 14.1 years, range 8-23) and 30 control subjects (mean age 14.2 years, range 7-24) completed two 3-DGA, 1 week apart with simultaneous IDEEA data collection. The IDEEA had lower within-session reliability than the 3-DGA for both groups, indicated by greater measurement errors and wider repeatability values for all temporal-spatial parameters. Between-session reliability of 3-DGA was high for both groups with intra-class correlation coefficients (ICC) >0.80. The IDEEA monitor showed high between-session reliability for control subjects (ICC 0.71-0.89), but lower reliability in subjects with cerebral palsy, particularly for walking velocity and stride length (ICC 0.53 and 0.62, respectively). Validity comparison between IDEEA and 3-DGA measures using Bland Altman 95% limits of agreement showed a measurement bias, with the IDEEA overestimating step and stride length and underestimating cadence in both subject groups compared to 3-DGA. The 95% limits of agreement were smaller in controls (step +/-0.20m; stride +/-0.27m; walking velocity +/-0.28m/s) than in subjects with cerebral palsy (step +/-0.36m; stride +/-0.37m; velocity +/-0.58m/s). Modifications may be necessary to improve the reliability and validity of the IDEEA in children, particularly for use in neurological conditions.

PMID: 18534854 [PubMed - as supplied by publisher]



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2: Am J Perinatol. 2008 Jun 2. [Epub ahead of print]**Triplet Infants with Birthweight \leq 1250 Grams: How Well Do They Compare with Twin and Singleton Infants at 36 to 48 Months of Age?**

Yee WH, Hicks M, Chen S, Christianson H, Sauve R.

Department of Pediatrics, University of Calgary, Calgary Alberta, Canada.

The purpose of this study was to determine if triplet infants with birthweight \leq 1250 g were at increased risk of long-term disability compared with similar birthweight and gestational age singletons and twins. This was a retrospective cohort study of \leq 1250-g infants admitted to a regional neonatal intensive care unit from 1986 to 2001 with follow-up to 36 to 48 months corrected gestational age. Outcomes studied were cognitive ability, cerebral palsy, and neurosensory impairment at 36 to 48 months. Enrollment was 1717 infants: 59 triplets, 402 twins, and 1256 singletons. Triplet infants differed from twin or singleton infants because they were more likely to have older, married mothers (relative risk [RR] 3.62, 95% CI 1.31, 5.94), be products of assisted reproductive technology pregnancies (RR 29.59, 95% CI 13.97, 62.68), be exposed to antenatal steroids (RR 1.55, 95% CI 1.38, 1.75), and were all delivered by cesarean section. Triplet infants had lower risk of having intraventricular hemorrhage (RR 0.19, 95% CI 0.05, 0.75). The risk of cerebral palsy, cognitive delay, total major disability, or chronic lung disease was similar in triplet and twin infants compared with singleton infants. The lower risk of having intraventricular hemorrhage in triplet infants may have been due to the use of antenatal corticosteroids and cesarean section delivery.

PMID: 18521776 [PubMed - as supplied by publisher]

3: Arch Pediatr Adolesc Med. 2008 Jun;162(6):532-7.**Relationship between site of training and residents' attitudes about neonatal resuscitation.**

Janvier A, Barrington K, Deschênes M, Couture E, Nadeau S, Lantos J.

McGill University, Department of Pediatrics, Montreal, Quebec, Canada.

OBJECTIVE: To determine whether the attitudes of pediatric and obstetric residents concerning the resuscitation of extremely preterm infants, and their knowledge of outcomes, varies according to their center of training and its resuscitation practices. **DESIGN:** Anonymous questionnaire. **SETTING:** Four province of Quebec, Canada, university centers. **PARTICIPANTS:** A total of 165 pediatric and obstetric residents. **INTERVENTIONS:** Survey of attitudes about resuscitation of neonates born between 23 and 27 weeks of gestation, and knowledge of the prevalence of cerebral palsy in survivors. **MAIN OUTCOME MEASURES:** Proportion of residents who would resuscitate a depressed, very preterm infant, and the proportion who overestimated the prevalence of cerebral palsy. **RESULTS:** The percentage of residents who would resuscitate a depressed infant born at 24 weeks varied from 11% to 39% between centers, at 25 weeks between 26% and 69%, and at 26 weeks between 51% and 86%. At the center most likely to intervene for very immature infants, the greatest proportion of residents favored resuscitation at each gestational age. At the least interventionist center, the smallest proportion would resuscitate. The center of training was the only factor related to willingness to resuscitate at 24, 25, 26, and 27 weeks of gestation; not age, years of training, religion, sex, or parental status (whether the person surveyed has children). A total of 53% of residents thought the prevalence of cerebral palsy was 25% or 40% in this population. Residents with a more accurate knowledge of outcome were more likely to want to resuscitate very immature infants. **CONCLUSION:** Different treatment centers may develop their own ethos regarding resuscitation, which then shapes both the way the residents understand epidemiological data and how they make decisions.

PMID: 18524743 [PubMed - in process]

4: *Pediatr Int.* 2008 Jun;50(3):269-75.

Secondary osteoporosis in long-term bedridden patients with cerebral palsy.

Iwasaki T, Takei K, Nakamura S, Hosoda N, Yokota Y, Ishii M.

Department of Pediatrics, Kitasato University School of Medicine, Kanagawa, Japan. tiwasaki@kitasato-u.ac.jp

BACKGROUND: The aim of the present paper was to investigate 20 pediatric patients with cerebral palsy and secondary osteoporosis and consider the efficacy, influence and index of treatment. **METHODS:** A total of 10 boys and 10 girls, age 1-16 years (mean 7.6 years) with secondary osteoporosis and cerebral palsy treated for 6 months, were studied. Bone mineral density (BMD) was measured. The bone turnover markers were measured just before and 4 months after treatment or at the time of early discontinuation of treatment. The treatment was classified into two groups: vitamin D (alfacalcidol) only; and with bisphosphonate (risedronate). **RESULTS:** Monotherapy with alfacalcidol was effective for secondary osteoporosis in children, but when used in combination with risedronate it was even more effective in improving BMD. In the two groups, bone-specific alkaline phosphate (BAP) decreased from pretreatment to post-treatment assessment in all but one case, but there was no significant correlation in the difference in DeltaBAP with DeltaBMD. DeltaBAP assumed changes in BAP in treatment either before or after, and DeltaBMD also assumed changes in BMD. N-telopeptides of type I collagen (NTX)/Cr decreased in all cases. The correlation of DeltaNTX/Cr with DeltaBMD was not significant. The therapy and its efficacy did not correlate to the patients' age, sex, medicine regimen or enteral nutrition. **CONCLUSIONS:** Risedronate therapy is effective for patients presenting with secondary osteoporosis with cerebral palsy. Moreover, it is desirable to treat patients more aggressively from the early stage because risedronate is not affected by the patients' other factors.

PMID: 18533934 [PubMed - in process]

5: *Pediatrics.* 2008 Jun;121(6):1251-2.

Corticosteroid treatment for problematic infantile hemangioma: evidence does not support an increased risk for cerebral palsy.

Greene AK.

Vascular Anomalies Center and Department of Plastic Surgery, Children's Hospital Boston, Harvard Medical School, Boston, Massachusetts, USA. arin.greene@childrens.harvard.edu

PMID: 18519494 [PubMed - in process]

6: *Pediatrics.* 2008 Jun;121(6):1155-64.

Birth weight and gestational age characteristics of children with autism, including a comparison with other developmental disabilities.

Schendel D, Bhasin TK.

National Center on Birth Defects and Developmental Disabilities, Centers for Disease Control and Prevention, 1600 Clifton Rd, Mail Stop E-86, Atlanta, GA 30333, USA. dschendel@cdc.gov

OBJECTIVES: The objectives of this study were to compare the birth weight and gestational age distributions and prevalence rates of autism with those of other developmental disabilities and to estimate the birth weight-and gestational age-specific risks for autism. **METHODS:** For the first objective, a retrospec-

tive cohort of children born in Atlanta, Georgia, in 1981-1993 who survived to 3 years of age was identified through vital records. Children in the cohort who had developmental disabilities (autism, mental retardation, cerebral palsy, hearing loss, or vision impairment) and were still residing in metropolitan Atlanta at 3 to 10 years of age were identified through the Metropolitan Atlanta Developmental Disabilities Surveillance Program. A nested case-control sample from the cohort was used for the second objective; all cohort children identified with autism were case participants, and control participants were cohort children who were not identified as having developmental disabilities or receiving special education services. **RESULTS:** The prevalence of autism in low birth weight or preterm children was markedly lower than those of other developmental disabilities. In multivariate analyses, birth weight of <2500 g and preterm birth at <33 weeks' gestation were associated with an approximately twofold increased risk for autism, although the magnitude of risk from these factors varied according to gender (higher in girls) and autism subgroup (higher for autism accompanied by other developmental disabilities). For example, a significant fourfold increased risk was observed in low birth weight girls for autism accompanied by mental retardation, whereas there was no significantly increased risk observed in low birth weight boys for autism alone. **CONCLUSIONS:** Gender and autism subgroup differences in birth weight and gestational age, resulting in lower gender ratios with declining birth weight or gestational age across all autism subgroups, might be markers for etiologic heterogeneity in autism.

PMID: 18519485 [PubMed - in process]

7: Pediatrics. 2008 Jun;121(6):e1534-40.

Head growth in preterm infants: correlation with magnetic resonance imaging and neurodevelopmental outcome.

Cheong JL, Hunt RW, Anderson PJ, Howard K, Thompson DK, Wang HX, Bear MJ, Inder TE, Doyle LW.

Royal Women's Hospital, Department of Neonatal Services, 132 Grattan St, Carlton 3053, Melbourne, Australia. jeanie.cheong@rwh.org.au

OBJECTIVE: Extremely preterm birth is associated with adverse neurodevelopmental sequelae. Head circumference has been used as a measure of brain growth. There are limited data relating head circumference to MRI. The purpose of this work was to establish the relationship between head circumference with brain MRI at term-equivalent age and to relate head circumference with neurodevelopmental outcome at 2 years. **PATIENTS AND METHODS:** Two hundred and twenty-seven preterm infants (birth weight of <1250 g or <30 weeks' gestation) were recruited. Head circumference was measured at birth, term, and 2 years' corrected age, and z scores were computed. Microcephaly was defined as a head circumference z score of less than -2 SDs for age and gender. MRI scans at term (n = 214) were graded for white and gray matter abnormalities, and segmented volumes were calculated for different tissue types. Outcome at 2 years' corrected age (n = 202) included scores on the Bayley Scales of Infant Development II. **RESULTS:** Microcephaly increased from 7.5% at term to 29.7% at 2 years. There was no significant relationship between head circumference and white or gray matter abnormalities on MRI. There was a strong correlation between head circumference and brain volume at term. At term, microcephalic infants had significantly decreased volumes for total brain tissue and most segmented volumes compared with infants with normal head circumference, but only deep nuclear gray matter volume remained significantly lower when adjusted for total intracranial volume. At 2 years, microcephaly was associated with poorer cognitive and motor development and an increased rate of cerebral palsy. **CONCLUSIONS:** Brain volume is a determinant of head size at term. Microcephaly is associated with a reduction of brain tissue volumes, especially deep nuclear gray matter, which suggests a selective vulnerability. Poor postnatal head growth in preterm infants becomes more evident by 2 years and is strongly associated with poor neurodevelopmental outcome and cerebral palsy.

Publication Types:
Research Support, Non-U.S. Gov't

PMID: 18519457 [PubMed - in process]

8: Gait Posture. 2008 May 29. [Epub ahead of print]

Single-session reliability of discrete gait parameters in ambulatory children with cerebral palsy based on GMFCS level.

Redekop S, Andrysek J, Wright V.

Bloorview Research Institute, Bloorview Kids Rehab, 150 Kilgour Road, Toronto, ON M4G 1R8, Canada.

The single-session reliability of 28 discrete spatiotemporal and kinematic variables was evaluated from computerized gait analysis (CGA) in 33 ambulatory children with cerebral palsy (CP), subcategorized according to Gross Motor Function Classification System (GMFCS) Levels I (n=11), II (n=12) and III (n=10). Nineteen boys and 14 girls participated, mean age=8 years 1 month (S.D.=3 years 0 month). Intraclass correlation coefficients (ICCs) estimated reliability, and the number of strides required to obtain an ICC of at least 0.90 was determined. The reliability of discrete gait parameters was dependent upon GMFCS level, with children in GMFCS Level I exhibiting the highest reliability (ICC range=0.70-0.96). GMFCS Levels II and III had lower levels of reliability with ICC values varying from 0.54 to 0.95 and 0.45 to 0.98, respectively. With the exclusion of pelvis range of motion (ROM), an average of four strides provided a reliability estimate of at least 0.90 for GMFCS Level I, while six strides were needed for children in Levels II and III. On the basis of the intrasession reliability results from the present study, further work is recommended to examine the test-retest reliability of these gait parameters in children with CP.

PMID: 18514523 [PubMed - as supplied by publisher]

9: J Pediatr. 2008 May 29. [Epub ahead of print]

An Algorithm for Identifying and Classifying Cerebral Palsy in Young Children.

Kuban KC, Allred EN, O'Shea M, Paneth N, Pagano M, Leviton A; ELGAN Study Cerebral Palsy-Algorithm Group.

Division of Pediatric Neurology, Department of Pediatrics, Boston Medical Center, Boston University, Boston, MA.

OBJECTIVE: To develop an algorithm on the basis of data obtained with a reliable, standardized neurological examination and report the prevalence of cerebral palsy (CP) subtypes (diparesis, hemiparesis, and quadriparesis) in a cohort of 2-year-old children born before 28 weeks gestation. **STUDY DESIGN:** We compared children with CP subtypes on extent of handicap and frequency of microcephaly, cognitive impairment, and screening positive for autism. **RESULTS:** Of the 1056 children examined, 11.4% (120) were given an algorithm-based classification of CP. Of these children, 31% had diparesis, 17% had hemiparesis, and 52% had quadriparesis. Children with quadriparesis were 9 times more likely than children with diparesis (76% versus 8%) to be more highly impaired and 5 times more likely than children with diparesis to be microcephalic (43% versus 8%). They were more than twice as likely as children with diparesis to have a score <70 on the mental scale of the BSID-II (75% versus 34%) and had the highest rate of the Modified Checklist for Autism in Toddlers positivity (76%) compared with children with diparesis (30%) and children without CP (18%). **CONCLUSION:** We developed an algorithm that classifies CP subtypes, which should permit comparison among studies. Extent of gross motor dysfunction and rates of co-morbidities are highest in children with quadriparesis and lowest in children with diparesis.

PMID: 18534210 [PubMed - as supplied by publisher]

10: N Engl J Med. 2008 May 29;358(22):e26.

Images in clinical medicine. Severe constipation.

Cumbo-Nacheli G.

Wayne State University School of Medicine, Detroit, MI 48201, USA. gcumbona@med.wayne.edu

Publication Types:
Case Reports

PMID: 18509117 [PubMed - indexed for MEDLINE]

11: No To Hattatsu. 2008 May;40(3):241-3.

Pharmacological management of cerebral palsy--focused on botulinum toxin therapy [Article in Japanese]

Nezu A, Osawa M.

anezu@urahp.yokohama-cu.ac.jp

PMID: 18524260 [PubMed - in process]

12: J Pediatr. 2008 Apr 21. [Epub ahead of print]

The Influence of Gestational Age on Severity of Impairment in Spastic Cerebral Palsy.

Hemming K, Colver A, Hutton JL, Kurinczuk JJ, Pharoah PO.

Department of Statistics, University of Warwick, Coventry, UK.

OBJECTIVE: To investigate the association between severity of impairment and gestational age in unilateral and bilateral spastic cerebral palsy, and to determine whether the influence of gestational age is independent of deviations from optimal birth weight. **STUDY DESIGN:** The study group was a United Kingdom cohort of 4772 cases of spastic cerebral palsy born between 1960 and 1997, with information on birth demographics and severity of impairment. Generalized additive models were used to determine the proportions of cases severely impaired, by gestational age, and to determine whether gestational age or deviations from optimal birth weight better predicts severity of impairment. **RESULTS:** For unilateral spastic cerebral palsy, the proportions of severe impairments did not vary with gestational age. In contrast, for bilateral spastic cerebral palsy, the proportions of severe motor or cognitive impairments increased with increasing gestational age (e.g., from 20% to 50% between weeks 30 and 40 for cognitive impairment). For spastic cerebral palsy, gestational age is at least as good as deviation from optimal birth weight in predicting severity. **CONCLUSIONS:** The severity of impairment increases with increasing gestational age in bilateral spastic cerebral palsy. This suggests differing etiologies in term and preterm infants and supports the theory that the developing brain is better able to compensate after a cerebral insult.

PMID: 18534232 [PubMed - as supplied by publisher]

13: J Pediatr. 2008 Apr 8. [Epub ahead of print]

Inconsistencies with Physical Functioning and the Child Health Questionnaire in Children with Cerebral Palsy.

Vargus-Adams JN.

Department of Pediatrics, Division of Pediatric Rehabilitation and Center for Epidemiology and Biostatistics, Cincinnati Children's Hospital Medical Center and the Department of Physical Medicine and Rehabilitation, University of Cincinnati School of Medicine, Cincinnati, OH.

OBJECTIVES: To explore the performance of the Physical Functioning (PF) subscale of the Child Health Questionnaire (CHQ) in children with cerebral palsy (CP). **STUDY DESIGN:** Parents of 177 children and adolescents (age 3 to 18 years) with CP completed the CHQ -Parent Form 50. Severity of CP was assessed using the 5-level Gross Motor Function Classification System (GMFCS), in which higher levels reflect more severe impairment. **RESULTS:** PF scores were negatively correlated with GMFCS classification ($R = -0.62$) and were distributed bimodally in subjects with severe motor impairment. For GMFCS classifications IV and V ($n = 59$), PF scores were very low (means, 9 to 28; medians, 0 to 8); however, 12% of these subjects had excellent PF scores (> 88) despite being nonambulatory. **CONCLUSIONS:** Although the CHQ PF subscale correlated well with the GMFCS, the CHQ questions on physical functioning resulted in unexpected responses in approximately 1 in 8 subjects with severe CP. These unanticipated responses to the PF subscale questions may be due to ambiguity in the questions (which do not differentiate between health problems and disability) or to alternative parental interpretation of physical functioning. Confusion in differentiating health status and functional status may make the CHQ less useful in children with significant disabilities.

PMID: 18534226 [PubMed - as supplied by publisher]

14: J Clin Pediatr Dent. 2008 Spring;32(3):235-8.

Drooling of saliva and its effect on the oral health status of children with cerebral palsy.

Hegde AM, Shetty YR, Pani SC.

Department of Pedodontics and Preventive Children Dentistry, A.B. Shetty Memorial Institute of Dental Sciences, Derlakatte, Mangalore, Karnatak, India. amipedo@yahoo.co.in

OBJECTIVE: The purpose of this study was to assess the prevalence of drooling in individuals with cerebral palsy and assess the effect these factors have on these individuals oral health. **MATERIALS:** A total of 113 individuals with cerebral palsy between the age of 5 and 18 years were examined. The incidence and severity of drooling were determined using the index given by Blasco et al and the oral health was recorded using a modified WHO performa. The data was then subjected to statistical analysis. **RESULTS:** While drooling may not predispose the individual to dental caries individuals with drooling have a poorer oral hygiene score than those without. **CONCLUSIONS:** There is no significant difference in the Dental caries status, Orthodontic findings or the debris component of the Oral Hygiene Index of individuals who drool saliva and those who do not.

PMID: 18524275 [PubMed - in process]

15: Neonatology. 2008;93(4):284-7. Epub 2008 Jun 5.

Evidence-based neonatal drug therapy for prevention of bronchopulmonary dysplasia in very-low-birth-weight infants.

Schmidt B, Roberts R, Millar D, Kirpalani H.

Department of Pediatrics, Children's Hospital of Philadelphia and the University of Pennsylvania, Philadelphia, Pa. 19104, USA. barbara.schmidt@uphs.upenn.edu

Corticosteroids, intramuscular vitamin A and caffeine reduce the risk of bronchopulmonary dysplasia (BPD) in very-low-birth-weight infants. We compared the size of the beneficial drug effects on BPD and evaluated long-term drug safety by estimating the number needed to treat (NNT) and the number needed to harm (NNH) for the outcome of cerebral palsy (CP). When given prophylactically during the first 4 days of life, corticosteroids increase the risk of CP (NNH 22; 95% CI: 12-133). When prescribed between days 7 and 14, corticosteroids reduce the 28-day mortality rate in addition to reducing BPD. Their effect on CP remains uncertain: the limited data available are consistent with a best-case scenario (NNT 15) and a worst-case scenario (NNH 14). Although repeated intramuscular injections of vitamin A during the 1st month of life reduce BPD (NNT 12; 95% CI: 6-94), estimates for CP range from an NNT of 11 to an NNH of 33. Early use of caffeine reduces both BPD and CP. The NNT for BPD is 10 (95% CI: 7-16), while the NNT for CP is 34 (95% CI: 20-132). We conclude that caffeine is the drug of choice for the prevention of BPD in very-low-birth-weight infants. Corticosteroids should be avoided during the first few days of life. However, when given during the 2nd week of life to infants at high risk of BPD corticosteroids may have important short- and long-term benefits. These should be urgently confirmed or refuted in well-designed controlled trials. (c) 2008 S. Karger AG, Basel.

PMID: 18525211 [PubMed - in process]

16: Neuropediatrics. 2007 Oct;38(5):219-27.

Prediction of short-term neurological outcome in full-term neonates with hypoxic-ischaemic encephalopathy based on combined use of electroencephalogram and neuro-imaging.

Leijser LM, Vein AA, Liauw L, Strauss T, Veen S, Wezel-Meijler G.

Department of Pediatrics, Leiden University Medical Center, Leiden, The Netherlands.

BACKGROUND: In infants with hypoxic-ischaemic encephalopathy (HIE), prediction of the prognosis is based on clinical, neuro-imaging and neurophysiological parameters. **METHODS:** EEG, cranial ultrasound, MRI and follow-up findings of 23 infants (GA 35-42 weeks) with HIE were studied retrospectively to assess 1) the contribution of ultrasound, MRI and EEG in predicting outcome, 2) the accuracy of ultrasound as compared to MRI, and 3) whether patterns of brain damage and EEG findings are associated. **RESULTS:** An abnormal EEG background pattern was highly predictive of adverse outcome [positive predictive value (PPV) 0.88]. If combined with diffuse white and deep and/or cortical grey matter changes on ultrasound or MRI, the PPV increased to 1.00. Abnormal neuro-imaging findings were also highly predictive of adverse outcome. Abnormal signal intensity in the posterior limb of the internal capsule, and diffuse cortical grey matter damage were associated with adverse outcome. MRI showed deep grey matter changes more frequently than ultrasound. Severely abnormal neuro-imaging findings were always associated with abnormal EEG background pattern. **CONCLUSIONS:** Both early EEG and neuro-imaging findings are predictive of outcome in infants with HIE. The predictive value of EEG is strengthened by neuro-imaging.

PMID: 18330835 [PubMed - indexed for MEDLINE]

17: Przegl Lek. 2007;64(11):974-7.

Physical and other methods therapy of the spasticity in children [Article in Polish]

Swierczyńska A, Renata K, Jaworek M.

Klinika Neurologii Dziecięcej, Uniwersytet Jagielloński Collegium Medicum, Kraków. neupedkr@cm-uj.krakow.pl

BACKGROUND: Spasticity is a very bothering symptom, which aggravates disability and prevents in many cases a successful treatment. **THE AIM:** The aim of this paper was to remind different methods of treatment of spasticity, with a special attention to neurorehabilitation. **RESULTS:** In the research the complex pathogenesis of spasticity was referred, as well as factors influenced its aggravation and associated symptoms. Methods of evaluation of degree of spasticity were also recalled. The advantage and disadvantage of neurorehabilitation were also discussed. NDT-Bobath method as well as other kinesiotherapy methods were described with the necessity to make individualised program. The methods of rehabilitation which help in the reduction of muscle tone were referred, as well as the importance of botulin toxin, in the context of lack of efficacy of drugs in the reduction of spasticity, which cannot in fact help to reach better results of rehabilitation. The effectiveness of spasticity therapy with baclofen pump and other surgical methods were also mentioned. **CONCLUSIONS:** The decision to treat spasticity must be justified and depended on its intensity. It is necessary to develop new methods to obtain the durable effect of therapy of spasticity.

Publication Types:
English Abstract
Review

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