

Harasimowicz Joanna, Harasimowicz Paweł, Wawryków Agata, Korabiusz Katarzyna, Stecko Monika. Long term evaluation of the development of children with cerebral palsy receiving support neurodevelopmental. Journal of Education, Health and Sport. 2019;9(6):371-375. eISSN 2391-8306. DOI <http://dx.doi.org/10.5281/zenodo.3252729>  
<http://ojs.ukw.edu.pl/index.php/johs/article/view/7044>  
<https://pbn.nauka.gov.pl/sedno-webapp/works/916536>

The journal has had 7 points in Ministry of Science and Higher Education parametric evaluation. Part B item 1223 (26/01/2017).  
1223 Journal of Education, Health and Sport eISSN 2391-8306 7


© The Authors 2019;


This article is published with open access at Licensee Open Journal Systems of Kazimierz Wielki University in Bydgoszcz, Poland  
Open Access. This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author (s) and source are credited. This is an open access article licensed under the terms of the Creative Commons Attribution Non commercial license Share alike. (<http://creativecommons.org/licenses/by-nc-sa/4.0/>) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.


The authors declare that there is no conflict of interests regarding the publication of this paper.


Received: 05.05.2019. Revised: 25.05.2019. Accepted: 23.06.2019.


## Long term evaluation of the development of children with cerebral palsy receiving support neurodevelopmental

Name Joanna Harasimowicz   
ORCID iD <http://orcid.org/0000-0002-1214-2829>  
Affiliation Pomorski Uniwersytet Medyczny w Szczecinie, Studium Doktoranckie Wydziału Nauk o Zdrowiu, ul. Żołnierska 54, 71-210 Szczecin  
Country Poland  
Bio Statement —  
Principal contact for editorial correspondence.

Name Paweł Harasimowicz   
ORCID iD <http://orcid.org/0000-0002-9733-663X>  
Affiliation Pomorski Uniwersytet Medyczny w Szczecinie, Studium Doktoranckie Wydziału Nauk o Zdrowiu, ul. Żołnierska 54, 71-210 Szczecin  
Country Poland  
Bio Statement —

Name Agata Wawryków   
ORCID iD <http://orcid.org/0000-0003-0517-5857>  
Affiliation Pomorski Uniwersytet Medyczny w Szczecinie, Studium Doktoranckie Wydziału Nauk o Zdrowiu, ul. Żołnierska 54, 71-210 Szczecin  
Country Poland  
Bio Statement —

Name Katarzyna Korabiusz   
ORCID iD <http://orcid.org/0000-0003-4512-7550>  
Affiliation Pomorski Uniwersytet Medyczny w Szczecinie, Studium Doktoranckie Wydziału Nauk o Zdrowiu, ul. Żołnierska 54, 71-210 Szczecin  
Country Poland  
Bio Statement —

Name Monika Stecko   
ORCID iD <http://orcid.org/0000-0003-2685-359X>  
Affiliation Pomorski Uniwersytet Medyczny w Szczecinie, Studium Doktoranckie Wydziału Nauk o Zdrowiu, ul. Żołnierska 54, 71-210 Szczecin  
Country Poland  
Bio Statement —

## Abstract

**Objectives:** Recent years show a gradual increase in births of children with cerebral palsy. All children affected by this disease entity should be supported neurodevelopmental. The aim of the work is to assess the long-term development of children with cerebral palsy. It is intended, allowed to increase opportunities and leveling development differences neurological rehabilitation of children covered by unifying therapeutic support and education of parents. An important aspect is the assessment of the effects of neurodevelopmental therapy in the context of the intensity and complexity of the treatment and analysis of the development of motor skills of children covered by development assistance.

**Material and methods:** The study was conducted in a group of 200 children with varying degrees of disability, which support neurodevelopmental held at least once a week and lasted a minimum of 3 months. In order to conduct a thorough analysis were collected details on: birth weight, type of birth, week of pregnancy, Apgar score, the amount of births, intensity and frequency of visits to rehabilitation. Among the patients studied were checked asymmetries and body posture and movement patterns.

**Results:** Compiled results suggest that individually tailored support neurodevelopmental started early, it allows to observe the improvement of the measured parameters in patients with cerebral palsy.

**Conclusions:** Appropriately selected neurodevelopmental therapy, it allows a large extent for the improvement of transport and movement patterns in children under cerebral palsy, so it should be more accessible and previously implemented in order to achieve the best results in supporting patients covered by this disease entity.

**Keywords:** cerebral palsy, neurodevelopmental therapy, development, rehabilitation of children, NDT Bobath, prematurity.

## Introduction:

We call the newborn born at the time who was born between 37 and 41 weeks of pregnancy, while more than 41 weeks, the term - newborn transferred [1]. Among children born at term,

risk factors are birth defects, problems with the placenta, caesarean section, low birth weight, meconium aspiration syndrome, childbirth requires additional instruments, hypoxia during birth, infant respiratory distress syndrome, seizures immediately after birth, low blood sugar blood and infection in the neonate [2]. According to the study, the risk of birth of children with cerebral palsy (CP) increases in the case of premature births or infants with very low birth weight, regardless of the quality of medical care [3,4].

According to WHO (World Health Organization, the World Health Organization) - prematurely born infant is a child who was born between 22 and 37 weeks of pregnancy, while births before 28 completed weeks of pregnancy are called extreme prematurity [5,6]. In Poland, there has been a greater proportion of premature births than in other countries belonging to the European Union. The number of premature babies born in 2004 was 25 475 and accounted for 7.1% of all births [7]. For comparison, in 2010. All of the 413 000 live births in Poland, more than 27 000 babies were born before 37 weeks [8]. Despite the great advances in the care of an infant born prematurely, the incidence of premature does not change [9,10]. The possibility of saving premature specifies 23 weeks of pregnancy,

The most common risk factors for preterm birth, mother's side is: age: <20 years or> 35 years, previous preterm delivery, charged interview maternity, previous miscarriage in the second trimester, infectious diseases and chronic malnutrition, birth defects, cancer, smoking, alcohol consumption, drug use. On the other hand, the part of the fetus are distinguished: intrauterine infection, multiple pregnancy, placental abruption, birth defects, fatal death, polyhydramnios, placenta previa. From the environment is exposure to risk factors, for example. Radioactivity, being in a contaminated environment [6].

#### Aim of the study:

The aim of this study is to analyze the development of motor skills of children covered by development assistance, the assessment of neurodevelopmental therapy in the context of the intensity and complexity of the treatment, and to increase the opportunities and alignment of development disparities among children under neurological rehabilitation, by unifying therapeutic support and parent education.

#### Material and method:

In this paper we analyzed the results of their own research, prospective, which were carried out in the years 2018-2019, among children with cerebral palsy, covered neurodevelopmental therapy. The study group of 200 infants born prematurely (<37 weeks. Gestation) and time. Were analyzed therapeutic advances children from birth to the end of the 3rd year. F. Indicated age group should justify the greatest intensity of the development of the central nervous system and the possibility of diagnosis of cerebral palsy after 2 years of age. Verification have been subjected to medical history and conduct therapeutic children born before 2018. Existing patients and specialized therapeutic centers. The study enrolled patients with damage to the central nervous system - cerebral palsy. We analyzed data from the medical history of children and their therapeutic cards. In order to determine the long-term assessment of the development of children covered by the support neurodevelopmental collected detailed information on pregnancy and the development of neurological patients.

#### Results:

Detailed analysis of the study allowed us to determine the possibility neurodevelopmental support children suffering from cerebral palsy. The collected data show that the beneficial effect of improving the development of patients have long-term and systematic therapy, taken in the early developmental age. Its greater frequency and regularity allows you to achieve better therapeutic effect. In addition, studies have shown a large discrepancy between the

subjective assessment of parental neurodevelopmental and the actual condition of the child.

#### Discussion:

The most common complications postnatal which are characterized prematurely born infants are: respiratory disorder, intraventricular hemorrhage, necrotizing enterocolitis, impaired vision, hearing, or permanent neurological deficits [12]. The main problem is neurological cerebral palsy. It is a set of symptoms that define a variety of movement disorders and attitude resulting from a durable, nonprogressive brain damage in the early stages of child development [13]. Initially, the clinical signs are discrete and occur gradually as maturing brain, which take progressively heavier task [14]. Brain damage occurs in the prenatal stage, during childbirth, during the first months of life, or sometimes in early childhood. 75% of cases of the disease may result from the problems of gestation [15]. Between 40 and 50% of children, among whom was diagnosed with cerebral palsy are premature. [16] Most of these cases (75% -90%) is the result of problems related to perinatal or immediately after birth [17]. The risk of the disease in infants between 34 and 37 weeks of pregnancy is 0.4% [18].

Neonatal period determines the time in which the child's full adaptation to the new conditions after birth. Of full-term infants period is 28 days, while in premature product may be extended [19]. For infants born prematurely are characteristic disorders of psychomotor development. The development of disharmonious (some skills the child has reached in accordance with the standards, others too late) or develop later (important stages of development of the child achieves much more than provide the standard. The consequences of brain damage can also be disorders emotional (overactivity, ADHD, attention deficit disorder and concentration) and deficits resulting in learning disabilities (dyslexia, dysgraphia). [20] Thus, an important role is played by observation of the newborn also conducted by parents in the home after discharge from hospital. Unfortunately, parents often are not aware of due care, which currently provides health care system. Therefore, in this project emphasized the role of preventive measures in order to detect any further complications. The fast leveling development differences is also suitable physiotherapy care. A particularly important element of communication and cooperation physiotherapist with the families of newborns is covered by the support neurodevelopmental educational activities, which consists of improving knowledge, skills and competences parenting. The fast leveling development differences is also suitable physiotherapy care. A particularly important element of communication and cooperation physiotherapist with the families of newborns is covered by the support neurodevelopmental educational activities, which consists of improving knowledge, skills and competences parenting. The fast leveling development differences is also suitable physiotherapy care. A particularly important element of communication and cooperation physiotherapist with the families of newborns is covered by the support neurodevelopmental educational activities, which consists of improving knowledge, skills and competences parenting.

Long-term analysis of the data, carried out in a large group of patients revealed the factors that increase the efficiency and efficacy neurodevelopment. The findings may be useful to reduce the incidence of complications and their effects in the first 3 years of life. Particularly important it is to identify the correlation between the parameters natal child in relation to his health and to estimate the risk of neurodevelopmental problems in the context of the data collected from parents and medical staff. On this basis, it is possible to identify new courses of action for doctors and specialists in pediatric physiotherapy. The results are a valuable resource for parents of children with problems neurodevelopmental, mainly in terms of their actions care.

## LITERATURE

1. <http://www.healthnet.org.np/resource/thesis/paediatric/shambhu/intro.PDF>
2. Sarah McIntyre, A systematic review of risk factors for cerebral palsy in children born at term in developed countries, „Developmental Medicine and Child Neurology”, 6, 2013, s. 499–508
3. Bax Martin, Developmental Medicine & Child Neurology, Cambridge Journal, 2005, s. 571-576
4. Tyson JE, Parikh NA, Langer J, Green C, Higgins RD. National Institute of Child Health and Human Development Neonatal Research Network. Intensive care for extreme prematurity—moving beyond gestational age. *N. Engl J. Med.* 2008;358(16):1672-1681
5. J. Gadzinowski, M. Szymankiewicz, E. Gulczyńska, Podstawy neonatologii. Podręcznik dla studentów, Oddział Wielkopolski Polskiego Towarzystwa Medycyny Perinatalnej Poznań 2014
6. Steer P. The epidemiology of preterm labour.. „BJOG : an international journal of obstetrics and gynaecology”, s. 1–3, marzec 2005.
7. Położnictwo i ginekologia t. 1. Grzegorz H. Bręborowicz (red.). Wydawnictwo Lekarskie PZWL, ss. 77-85
8. Raju T.N., Higgins R.D., Stark A.R. et al. (2006) Optimizing care and outcome for late preterm (near-term) gestations and for late-preterm infants. A summary of the workshop sponsored by the National Institutes of Health and Human Development. *Pediatrics* 118: 1207-1214
9. Goldenberg RL., Culhane JF., Iams JD., Romero R. Epidemiology and causes of preterm birth.. „Lancet”. 9606 (371), s. 75–84, styczeń 2008
10. Jerzy Szczapa: Podstawy Neonatologii,. Warszawa: Wydawnictwo Lekarskie, 2008
11. One-Year Survival of Extremely Preterm Infants After Active Perinatal Care in Sweden, June 3, 2009
12. Marlow N., Wolke D., Bracewell M., Samara M. for the EPICURE Study Group (2005) Neurologic and Developmental Disability at Six of Age after Extremely Preterm Birth. *N. Engl. J. Med.* 352; 9-19
13. Premature birth has long-term effects *Science The Guardian* [www.theguardian.com](http://www.theguardian.com)
14. Draper ES, Zeitlin J, Fenton AC, et al; MOSAIC Birth Cohort. Investigating the variations in survival rates for very preterm infants in 10 European regions: the MOSAIC birth cohort [published online ahead of print September 19, 2008]. *Arch Dis Child Fetal Neonatal Ed.* 2009;94(3):F158-F163
15. John Yarnell, Dermot O'Reilly, *Epidemiology and Disease Prevention: A Global Approach*, OUP Oxford, 23 maja 2013
16. William B. Carey, *Developmental-behavioral Pediatrics*, Elsevier Health Sciences, 2009
17. Chan K, Ohlsson A, Synnes A, Lee DS, Chien LY, Lee SK. Canadian Neonatal Network. Survival, morbidity, and resource use of infants of 25 weeks' gestational age or less. *Am J Obstet Gynecol.* 2001
18. Christian F. Poets, Diethelm Wallwiener, Klaus Vetter, Risks associated with delivering infants 2 to 6 weeks before term--a review of recent data, „Deutsches Ärzteblatt International”, 43, 2012, s. 721–726
19. K. Kubicka, W. Kawalec, *Pediatrics*, Warszawa PZWL 2010
20. W. B. Carey, *Developmental-behavioral Pediatrics*, Elsevier Health Sciences, 2009