

## THE ISSUE OF DIAGNOSTICS OF CHILDREN CEREBRAL PALSY IN RELATION TO PROVISION OF HEALTHCARE IN THE DISTRICT OF TEPLICE

Dana Šlechtová

*Ústav zdravotnických studií UJEP, Ústí nad Labem, Czech Republic*

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### Abstract

Children cerebral palsy (CCP) is a chronic non-progressive disease characterised by an disorder of locomotion and development of locomotion resulting from damage caused to the developing brain in prenatal, perinatal, and early postnatal period. The scope of motoric handicap and occurrence of associated deficits in the area of sensoric systems or in the area of cognitive functions represents those factors that influence the individual's life in all areas. From research in the area of provision of healthcare to a child with CCP from the point of holistic approach it has followed that the recommended procedure for general practitioners relating to CCP diagnostics and therapy is accepted in practice, but it completely fails to meet the present requirements from the point of early diagnostics. In practice, cooperation between the paediatrician and the specialist – children neurologist is close and functioning. The relation between identification of difficulties and the adequate reflex locomotion according to Vojta has followed from the research as well. The difference in time relations reported in the recommended CCP diagnostic and therapeutic standard of 1997 and the currently advocated requirements for early diagnostics of locomotion disorder is only stated in the given communication; the assessment and evaluation belongs only to expert paediatrists and neurologists dealing with the given issues. Further, a certain disagreement between the doctors and parents of the afflicted children has followed from the examination, especially in the area of providing the much needed information about condition and further development of the child.

**Key words:** *children cerebral palsy; diagnostic and therapeutic standard; early diagnostics; physiotherapy; reflex locomotion method*

### INTRODUCTION

CCP represents a complex of symptoms covering numerous non-progressive, but frequently varying variants of motoric handicap in consequence of damage to the immature brain in an early development stage (Vágnerová et al. 2009). From the point of etiology, manifestations and severity of handicap, it is a heterogenic handicap and the condition is often

complicated by sensoric disorders, epilepsy or mental retardation (Kraus 2005, Miller et al. 2006). CCP represents permanent handicap, while the degree of expression of individual symptoms may vary in time.

CCP classification has undergone a complex development, which relates closely to development of interest in cerebral function disorders, to formation of children neurology as an independent



medical discipline and, last but not least, to achievement of medicine in the area of reduction of neonatal and infant mortality.

Numerous classification schemes have come into existence during the development. Subdivision of CCP into 4 basic forms – spastic form, dystonic-dyskinetic form, cerebellar form and mixed form – is regarded one of the simplest schemes. As Kraus states: “Recent CCP classifications do not refer to cerebellar form again” (Kraus 2005, p. 84). Another classification scheme, the one with which the working group Surveillance of Cerebral Palsy in Europe (SCPE) works, distinguishes three main groups, the common sign of which is abnormal posture and movement: spastic, atactic, dyskinetic form. SCPE represents a network of cooperating CCP registers having the aim to unify definitions, CCP evaluation criteria and further handling of the data for monitoring and analysing the development of individual CCP types in time.

Incidence of individual CCP forms differs in various studies available (Pharoah et al. 1996, Cooley 2004, Panteliadis and Strassburg 2004, Miller 2007). As Kraus (2005) reports, spastic diparesis (0.41–0.90/1000), hemiparetic form (0.55–0.79/1000) is the most frequently occurring form of CCP in foreign studies. Occurrence of dyskinetic form (0.16–0.21/1000) ranks on the third position, followed by quadriplegic form (0.07–0.16/1000) and atactic form (0.11–0.15/1000). CCP profile varies in time. In relation to the progress achieved by neonatology care, there is increasingly less heavy form of CCP globally, but the number of medium-heavy handicaps has been growing (Beckung et al. 2008). The number of athetoid syndromes has decreased; on the other hand, there are more and more diparetic forms in relation to survival of heavily immature children. Generally, the number of children with CCP is held to be growing (Miller 2005).

Early capturing of the incident disorders of locomotion, posture and deviations from psychomotoric development is substantial and determining for the child’s development as such (Vojta 1993, Kolář 2000, 2001). The key question is how early after the birth it is possible to recognize possible symptoms of CCP danger? Objectively, diagnostics of CCP development Langer is known to be possible within 3 months of age (Kolářová and Hánová

2007, Marešová et al. 2011). It applies here quite clearly that the earlier is the CCP development danger diagnosed, the earlier the treatment may begin and better results can be achieved. The thing at stake is the plasticity of brain, which is the biggest immediately after the birth and decreases rapidly as the child grows older (Vojta 1993).

Suspicion of CCP development danger may be pronounced in first weeks of life already based on evaluation of postural activity, postural reactivity by means of position responses and evaluation of dynamics of primitive reflexes. Through evaluation of a newborn child or infant in the above-mentioned manifestations it is possible to capture deviations from psychomotoric development, identify the degree of central coordination disorder, and indicate the commencement of reflex locomotion therapy.

Early diagnostics of locomotion disorders is based on the knowledge in neurophysiology and kinesiology regarding the postural ontogenesis as a genetically determined program of an individual’s development towards erected walking. The program takes place automatically without teaching; it is activated in the neonatal period already.

Postural activity means spontaneous posture of the whole body and its movement without external stimuli coming from the examining person. By evaluating the postural activity, the examiner obtains basic general information about body posture and its movement. Manifestations are evaluated in the sense of manifestations adequate to the development age or abnormal manifestations with presence of a deviation from standard. As Marešová et al. (2011) emphasize, however, knowledge of kinesiological contents of the child’s postural motoric development according to Vojta is substantial for accurate diagnostic evaluation.

Postural reactivity presenting automatic control of body posture can be monitored and evaluated starting from the neonatal age by means of 7 positional reactions (Vojta 1993, Kolářová and Hánová 2007). The examined child is exposed to provocation moves, i.e. standard examination procedures defined as to their contents and performance, to which the child’s CNS responses by regular standard response in a form of normal or abnormal movement patterns (Marešová et al. 2011).



Abnormal responses are recallable in the neonatal period already and can be used as a screening. It is well-known that 70% of the population reports ideal models of postural reactivity at birth, 30% report deviations in the number of abnormal positional reactions (Kolářová and Hánová 2007). The clinical unit called central coordination disorder (CCD) comprises the newborns reporting abnormal positional reactions and, according to number of abnormal reactions, it is further subdivided into 4 groups from very light to very heavy form of CCD. Early therapy using the reflex locomotion method started as soon as in the neonatal period may result in normalisation of the condition or it may have significant effect on manifestations of cerebral palsy (Vojta 1993, Kolářová and Hánová 2007, Marešová et al. 2011).

Further, evaluation of primitive reflexes and automatisms, which enables to reveal a danger of motoric development disorder as soon as in neonatal period, is a part of early diagnostics as well. In relation to diagnosis of CCP, primitive reflexology can be used to detect the spastic and dyskinetic forms (Marešová et al. 2011).

Utilisation of early CCP diagnostics using the primitive reflexology in modification according to Vojta as well as the evaluation of postural reactivity requires not only strict standardisation of the examination procedure (stimulus), but also standardisation of the response to the given stimulus, which increases the demands not only on theoretical knowledge, but also practical experience of the diagnosing physician (Marešová et al. 2011).

The first occasion to capture the deviations or commencing locomotion disorders is offered upon utilisation of screening of the postural development according to Vojta before release of the newborn child into domestic environment. In subsequent period, diagnostics of the endangered child is in the hands of the general practitioner for children and the young, who evaluates both the health condition and psychomotoric development within regular intervals during the first year of its life (Kolář 2001). The CCP diagnostic and therapeutic standard states the following with regard to evaluation of psychomotoric development: "Early identification of the starting posture and movement disorders:

- screening of psychomotoric development of the child according to Vlach is performed by general practitioner for children and the young (GPCY);
- postural development screening according to Vojta in all at-risk children and children with suspected delay in psychomotoric development. This examination is recommended by GPCYs and repeatedly performed by children neurologists, paediatricists specialised in diagnostics of early locomotion disorders" (Komárek and Hadač 1997).

As Severa reports: "Although Vlach's screening is used by both paediatricists and children neurologists, it usually does not help capture CCP before the second half of the first years of the child's age and often even later, which is late already for the possibility of achieving a very good effect – or even curing" (Marešová et al. 2011, p. 100).

The said screening according to Vlach in CCP diagnostic and therapeutic standard represents only an unbinding recommendation. The question remains, however, whether it is realized in practice at all due to its extensiveness, and if it is not the case, according to which criteria the paediatricist proceeds. Evaluation of primitive reflexology, postural reactivity, as described above, requires considerable clinical experience falling into the competence of a children neurologist or neonatologist.

This thesis has not dealt with the question of diagnostics, but from the holistic point of view, early diagnostics are absolutely substantial for further development of the child and the diagnostics-related problems have only been outlined here.

Monitoring and evaluation of psychomotoric development falls into the competences of a general practitioner for children and the young, but parents play a significant role in this important period for the child's future development as well. Parents should be aware of the potential for development of their child, and with this knowledge they should stimulate it adequately and watch closely. Monitoring of all manifestations, reactions and behaviour of the child is a precious source of information for the doctor enabling him/her to evaluate the child's condition in general. In the event of changes, deviations in psychomotoric



development or any suspicion of CNS affection, the paediatricist recommends, in accordance with recommendations of CCP diagnostic and therapeutic standard, an examination by a children neurologist, in the competence of which is the screening of postural development according to Vojta and identifying the severity degree of the central coordination disorder. During the subsequent period, repeated neurological examinations, indicated auxiliary methods such as targeted metabolic screening, neurophysical examinations and imaging methods are performed, the task of which is to diagnose any other pathological conditions that induce a clinical picture similar to that which accompanies CCP.

Depending on identification of central threat, which should be established no later than the second month of life based on early diagnostics, it is necessary to start the rehabilitation treatment with Vojta's method of reflex locomotion (Kolář 2001, Zouňková 2005, Kolářová and Hánová 2007, Severa 2009). Vojta has proved that by commencing the rehabilitation before the fifth month of age it is possible to prevent from development of light and medium-heavy spastic forms of CCP as well as athetosis; in the rest of children with the most heavy brain damage the heaviness of their handicap can be alleviated at least (Vojta 1993).

Diagnostics are clearly the primary task of the doctors, whether it is the general practitioner – paediatricist or children neurologist; the same attention, however, should be devoted to the child's parents as well. The period from recognition of the first symptoms relating to disorders of posture and movement up to establishing the final diagnosis represents the period of considerable psychic burden and uncertainty. Parents require information, often they ask repeatedly, not being able to absorb the information being given at once, they look for psychic support in the contact with the doctor. Where CCP develops, the parent must face up to the child's handicap, they have to

learn to work with the child, understand its manifestations, make sure that all its needs are satisfied while these may be signalled in a different way as compared to a healthy child (Vágnerová 2003). Another pitfall is the understanding and managing the therapy by reflex locomotion. The paediatricist's attitude and "work with the parent of the afflicted child" is another substantial task in terms of provision of healthcare to a child patient with CCP diagnosis (Orth 2009).

## MATERIAL AND METHODS

Qualitative method of research was used at work. For the initial data relating to identification of the healthcare level from the point of view of healthcare staff in the given region, general practitioners for children and the young were addressed using a questionnaire investigating their opinion of the level of healthcare provided to children with CCP.

The questionnaire contained 21 closed questions. 5 closed questions offering variants of answers were devoted to the issue regarding the capturing of psychomotoric development disorders. Paediatricists in Teplice district were addressed in total number of 26 general practitioners for children and the young. In subsequent phase of the research, structured interviews were conducted with the respondents – mothers of the children suffering from CCP. Inquiries regarding the establishing of diagnosis in their child were a part of semi-structured interview as well. The set consisted of 15 respondents. Interviews with individual respondents were processed in case studies. The data obtained was categorised based on the general analysis.

Answers of paediatricists to the questions regarding early diagnostics were confronted in the discussion with recommendations of the diagnostic & therapeutic standard for CCP and with the results obtained from structured interviews with the respondents of the observed set.



## RESULTS

**Table 1. Capturing of locomotion disorders in time from the view of a general practitioner for children and the young**

Alternative of answer	3 <sup>rd</sup> month	6 <sup>th</sup> month
Numbers of answers	4	16

Table 1 presents an answer to the following question: *“At which age, from the paediatrist’s point of view, is the locomotion disorder of a child captured the most frequently?”*.

Out of the total number of 26 addressed general practitioners for children and the

young, 20 doctors responded. In this number 16 doctors reported – *around the 6<sup>th</sup> month of the child’s age*, 4 doctors reported – *around the 3<sup>rd</sup> month of the child’s age*.

**Table 2. Capturing of locomotion disorders from the view of a general practitioner for children and the young**

Alternative of answer	always a general practitioner for children and the young	in most cases	other specialist
Numbers of answers	4	16	0

Table 2 summarizes the paediatricians’ answers to the following question: *“Who does capture the locomotion disorder most frequently?”*.

Out of the total number of 20 obtained answers, 4 paediatricians chose the option that – *it is always captured by a primary care*

*doctor*, 16 doctors chose the alternative of the answer that – *in most cases it is captured by a general practitioner for children and the young*, none of the doctors chose the alternative of answer that – *the locomotion disorder is captured by other specialist*. The total number of obtained answers was 20.

**Table 3. Capturing of the first locomotion disorders by the afflicted child’s parents from the view of a general practitioner for children and the young**

Alternative of answer	often	occasionally	in rare cases
Numbers of answers	0	18	2

Table 3 shows the paediatricians’ answers to the following question: *“How often are the parents alone the ones who points out the first signs of psychomotoric development disorders (i.e. they feel something is wrong with the child’s manifestations)?”*.

Out of 20 answers obtained from general practitioners for children and the young, 18 chose the alternative – *occasionally*, 2 doctors chose the alternative – *in rare cases only*, none of the primary care paediatricians chose the alternative – *often*. The total number of obtained answers was 20.

**Table 4. Procedure of the paediatrist when delayed psychomotoric development is identified**

Alternative of answer	the child continues to be monitored at the paediatrist’s office	the child is referred to the children neurologist’s care	the child is referred to a specialized consulting office
Numbers of answers	7	15	2



Table 4 shows the answers to the following question: “How does the doctor proceed when he/she suspects a development locomotion disorder?”.

Out of 20 returned completed questionnaires, 15 doctors refer the child to a specialist – children neurologist, 7 doctors indicated the alternative – *the child continues to be monitored at the general practitioner’s office*. The alternative of answer – *the child is referred to a specialized consulting office* was used in 2 cases. Out of the total number of 20 doctors who answered the questionnaire, 7 doctors chose 2 alternatives of answer to the

given question – *the child is monitored at the paediatrist’s office* and the alternative – *the child is referred to the children neurologist’s care*, 1 doctor chose only the alternative – *the child is referred to the children neurologist’s care*. Total occurrence of the chosen answers was 24.

### Results obtained from structured interviews with the respondents

Categorised data obtained from case studies processed on the basis of structured interviews with respondents from the monitored set.

**Table 5. Detection of the first manifestations relating to the handicap**

R = respondent	Sum	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
puerperium	7		1				1	1		1		1		1	1	
3 <sup>rd</sup> to 4 <sup>th</sup> month	2				1				1							
4 <sup>th</sup> to 6 <sup>th</sup> month	3	1				1										1
12 <sup>th</sup> to 13 <sup>th</sup> month	2			1							1					
<b>Total occurrence</b>	<b>14</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>		<b>1</b>	<b>1</b>	<b>1</b>

Table 5 in categorised form presents the respondents’ answers to the following question: “When did the first manifestations of the future handicap show from your point of view?”.

The most frequent category of answer – *during puerperium* was represented 7 times in total. The category of answer – *3<sup>rd</sup> to 4<sup>th</sup> month* was represented twice in total. The

category of answer – *3<sup>rd</sup> to 4<sup>th</sup> month* was represented 3 times in total. The category of answer – *12<sup>th</sup> to 13<sup>th</sup> month* was represented twice in total.

All the respondents answered in a single category. Respondent No. 12 did not answer the question, she adopted the child at the age of 6. Total occurrence of categorised answers of the respondents is 14.

**Table 6. Progress of establishing the diagnosis in time**

R = respondent	Sum	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
in 3 <sup>rd</sup> month	2						1								1	
in 6 <sup>th</sup> month	5					1		1		1				1		1
in 9 <sup>th</sup> month	1								1							
in 12 <sup>th</sup> month	4	1		1	1							1				
more than 18 months	2		1								1					
<b>Total occurrence</b>	<b>14</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>		<b>1</b>	<b>1</b>	<b>1</b>

Table 6 in categorised form presents the respondents’ answers to the following question: “When was the diagnosis of children cerebral palsy established?”.

The most frequent category of answer – *in the period around the 6<sup>th</sup> month of age* was reported 5 times in total. The category of answer – *around the 12<sup>th</sup> month of age* was



represented 4 times in total. The category of answer – *around the 3<sup>rd</sup> month of age* was represented twice in total. The category of answer – *around the 9<sup>th</sup> month of age* was reported once. The category of answer – *at more than 18 months of age* was reported twice in total.

Respondent No. 12 did not answer the question, she adopted the child at the age of 6 and the information of the above-mentioned character was not known to her. All the respondents answered in a single category. Total occurrence of categorised answers of the respondents was 14.

**Table 7. Awareness of parents in relation to the diagnosis**

R = respondent	Sum	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
Paediatricist – insufficient info	8	1		1	1			1			1	1			1	1
Paediatricist – sufficient info	2		1						1							
Neurologist – sufficient info	5					1	1					1		1	1	
Sufficient info – Motol, Lázně Teplice	6	1		1	1		1	1								1
Information from other sources	5	1											1	1	1	1
Info given by doctor not understood	1									1						
<b>Total occurrence</b>	<b>27</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>3</b>

Table 7 in categorised form presents the respondents' answers to the following question: "What was the awareness of the parents regarding the diagnosis as provided by the healthcare staff?".

The most frequently reported category of answer – *information from general practitioner for children and the young was insufficient* occurred 8 times in total. Category of answer – *sufficient information provided at FN Motol, Lázně Teplice* occurred 6 times in total. Category of answer – *sufficient information from neurologist* was reported 5 times in total. Category of answer – *information from other sources – other parents, Internet* was reported 5 times in total. Category of answer – *sufficient information from general practitioner for children and the young* was recorded twice only. Category of answer – *information obtained from other sources* was reported 5 times in total. Category of answer – *info given by doctor not understood* was reported once.

Respondents No. 2, 5, 8, 9, 10 and 12 answered in a single category, i.e. once. Respondents No. 3, 4, 6, 7, 11 and 13 answered in two categories of answers, i.e. twice in total. Respondents No. 1, 14 and 15 answered in three categories of answers, i.e. three times in total. Total occurrence of the categorised answers was 27.

Table 8 in categorised form presents the respondents' answers to the following question: "How satisfied you are with the care and attitude of the children neurologist?".

The most frequently reported category of answer – *satisfied with the neurologist's attitude* was reported 7 times in total. Category of answer – *significantly satisfied with neurological care at FN Motol* was reported 5 times in total. Category of answer – *dissatisfied with the neurologist's attitude and the neurologist changed* was reported 4 times in total. Category of answer – *generally satisfied – but more info and active interest of the doctor* was reported once in total.



Respondents No. 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13 and 14 answered in a single category, i.e. once. Respondents No. 7 and

15 answered twice in total in the categories. Total occurrence of categorised answers of the respondents was 17.

**Table 8. Satisfaction with the children neurologist's attitude**

R = respondent	Sum	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
Satisfied with attitude, info, care	7					1	1		1	1		1	1		1	
Satisfied with care, more info and interest are missing	1		1													
Neurol. care at FN Motol – significant satisfaction	5	1		1	1			1								1
Dissatisfaction with attitude and care – change of neurologist	4							1			1			1		1
<b>Total occurrence</b>	<b>17</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>

**Table 9. Satisfaction with the attitude of the general practitioner for children and the young**

R = respondent	Sum	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
Satisfied with attitude, info, care	2		1			1										
Satisfied with attitude, care, info is missing	4	1			1		1			1						
The paediatrician is the family's support	1		1													
Dissatisfied with the information provided	3				1									1		1
Passive paediatrician – meets the parent's requests, but activity is missing	6	1		1			1		1				1			1
Dissatisfaction with attitude and care – change of doctor, disharmony	4							1			1	1			1	
<b>Total occurrence</b>	<b>20</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>

Table 9, in a categorised form, presents the respondents' answers to the following question: *“What is your satisfaction with the attitude of the general practitioner for children and the young?”*.

The most frequent category of answer – *a passive paediatrician – meets the parent's*

*requests, but activity is missing* was reported 6 times in total. The category of answer – *satisfied with attitude, care, but adequate info is missing* was reported 4 times in total. The category of answer – *dissatisfaction with attitude and care – change of the general paediatric practitioner* was reported 4 times



in total. The category of answer – *dissatisfied with the information provided* was captured 3 times in total. The category of answer – *satisfied with attitude and information provided* was reported twice in total. The category of answer – *the paediatrician is clearly the family's support* was reported once only.

Respondents No. 1, 2, 4, 6 and 15 answered twice in total in the categories. Respondents No. 3, 5, 7, 8, 9, 10, 11, 12, 13 and 14 answered in a single category, i.e. once. Total occurrence of categorised answers of the respondents was 20.

**Table 10. Starting the rehabilitation therapy**

R = respondent	Sum	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
Spa health resort Teplice	1								1							
Rehabilitation short stay hospital Teplice	6					1		1			1			1	1	1
Rehabilit. centre Demosthenes Ústí	3	1			1					1						
Private rehabilitation practice	5		1	1			1					1	1			
Rhb. therapy started before 3 <sup>rd</sup> month	4						1	1						1	1	
Rhb. therapy started from 3 <sup>rd</sup> to 6 <sup>th</sup> month	4		1						1	1		1				
Rhb. therapy started from 6 <sup>th</sup> to 9 <sup>th</sup> month	3					1					1					1
Rhb. therapy started from 9 <sup>th</sup> to 12 <sup>th</sup> month	1	1														
Rhb. therapy started after 12 <sup>th</sup> month	3			1	1								1			
<b>Total occurrence</b>	<b>30</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>

Table 10 in categorised form presents the respondents' answers to the following question: "When and where was the rehabilitation therapy started?".

The category of answer – *rhb. therapy started before the 3<sup>rd</sup> month* was reported 4 times in total. The category of answer – *rhb. therapy started from the 3<sup>rd</sup> to the 6<sup>th</sup> month* was reported 4 times in total. The category of answer – *rhb. therapy started from the 6<sup>th</sup> to the 9<sup>th</sup> month* of life was reported 3 times in total. The category of answer – *rhb. therapy started from the 9<sup>th</sup> to the 12<sup>th</sup> month* was reported once. The category of answer – *rhb. therapy started after the 12<sup>th</sup> month* was reported 3 times in total.

Categories of answers referring to the facility, where the rehabilitation therapy took place, were distributed as follows: The category of answer – *Rehabilitation short stay hospital Teplice* was reported 6 times in total. The category of answer – *private rehabilitation practice* was presented 5 times in total. The category of answer – *rehabilitation centre Demosthenes in Ústí nad Labem* was reported 3 times in total. The category of answer – *Nové Lázně Teplice* was reported once.

All respondents answered in two categories of answers. The total number of categorised answers was 30.



Table 11. Evaluation of categorised data provided by individual respondents in relation to diagnostic and therapeutic standard

Diagnostic and therapeutic standard	Categorised data	total	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
Early identification of at-risk children – pregnancy	Smooth course of pregnancy	12	1	1	-	1	1	-	1	1	1	1	1	-	1	1	1
	Problems in pregnancy already	2	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-
<b>TOTAL</b>		<b>14</b>															
– delivery	Delivery at term	8	1	-	-	1	1	-	1	1	1	-	-	-	1	-	1
	Premature birth	5	-	1	-	-	-	1	-	-	-	1	1	-	-	1	-
	Delivery after term	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
<b>TOTAL</b>		<b>14</b>															
	Natural delivery	6	1	-	-	-	-	1	-	1	1	-	1	-	-	-	1
	Delivery by section	8	-	1	1	1	1	-	1	-	-	1	-	-	1	1	-
<b>TOTAL</b>		<b>14</b>															
	Multiple delivery	2	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-
	Delivery of one foetus	12	1	1	1	1	1	1	1	1	1	-	1	-	1	-	1
<b>TOTAL</b>		<b>14</b>															
– post-delivery period- puerperium	Difficulties identified in maternity hospital already	6	-	-	-	-	-	1	1	-	1	-	1	-	1	1	-
	No difficulties, evaluated as at-risk newborn child	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
	No difficulties at the time	7	1	-	1	1	1	-	-	1	-	1	-	-	-	-	1
<b>TOTAL</b>		<b>14</b>															
Identification of locomotion and posture disorders psychomotoric development screening	Signs of locomotion disorders identified - before the 3 <sup>rd</sup> month	7	-	1	-	-	-	1	1	1	-	-	1	-	1	1	-
	before the 6 <sup>th</sup> month	3	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1



[illegible]



Diagnostic and therapeutic standard	Categorised data	total	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
	from 9 <sup>th</sup> to 12 <sup>th</sup> month	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	after the 12 <sup>th</sup> month	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
	after the 15 <sup>th</sup> month	2	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-
<b>TOTAL</b>		<b>29</b>															
method of physiotherapy	reflex locomotion method according to Vojta	15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Bobath concept	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	combination of both methods	7	-	-	1	1	-	-	-	1	1	-	-	-	1	1	1
<b>TOTAL</b>		<b>22</b>															

Table 11 summarizes the occurrence of categorised data in relation to diagnostic and therapeutic standard for CCP in 15 respondents. The table presents only data relating to early capture of psychomotoric development disorders with relevant area of the given standard.

## DISCUSSION

Early capturing of any disorders in posture, locomotion and deviations from psychomotoric development is absolutely essential and crucial not only for establishing of a therapeutic plan, but also for a comprehensive approach to the individual with CCP diagnosis. Recommended CCP – diagnostic and therapeutic standard requires an early identification of at-risk children already on the basis of history data related to the course of pregnancy, delivery, early post-delivery period and subsequent objective examination of functional condition of the child by a paediatrician, children neurologist before release into home environment. In this respect, the standard is valid and corresponds with current requirements for early capturing of posture and locomotion disorders according to the evaluation.

From the results obtained it followed that out of the monitored set of 14 respondents (the 15<sup>th</sup> respondent adopted the child at the age of 6), difficulties were identified as soon as in the maternity hospital in 6 children, one newborn child without difficulties was evaluated as an at-risk one. Among these 7 newborn children, there were 4 born prematurely, 2 newborns with history of smooth pregnancy, born by section at term, 1 newborn child with history of smooth pregnancy, born naturally at term.

Subject to further evaluation of the respondents' answers it was found that out of these 7 children, 6 were referred from the maternity hospital directly into the care of children neurologist (Table 11). As to the seventh child, it followed from the mother's statement that discrepancies occurred between the place of delivery and the referring into the care of a general paediatric practitioner and neurologist in a different district. While monitoring the occurrence of the first difficulties relating to subsequent CCP manifestations, it was interesting to



monitor the time relations for other children in the set (Table 11). In the 6<sup>th</sup> month, symptoms relating to locomotion and posture disorder manifested in another 3 children (CCP diagnosed at later stage – two cases of hemiparetic form and hypotonic form). Occurrence of symptoms after the 9<sup>th</sup> month was reported in the mothers' responses in 4 cases (Table 9), while in 2 cases it was the mother who notified the general practitioner of discrepancies in the child's development. Both respondents were reassured by the doctor that everything was OK and there was not reason to be worried.

*General practitioners for children and the young*, responding to the question regarding the time capture of locomotion disorder, mostly chose the answer at the age of 6 months. An answer at the age of three months was recorded as well, which was in 4 paediatrists out of 20 inquired ones (Table 1). All 20 paediatrists addressed agreed in the question of the first capture of locomotion and posture disorders; in most cases it is nobody else than the general practitioner for children and the young or other specialist (Table 2).

From the point of respecting the recommended diagnostic and therapeutic standard in identification of locomotion and posture disorders, 10 children out of 14 were captured before the 6<sup>th</sup> month of age, while 6 children were referred to a neurologist immediately after release from the maternity hospital; another 3 children were referred before the 3<sup>rd</sup> month of age and the remaining child was referred at the age of 5 months. Disorders in 4 children of our set were diagnosed after the 9<sup>th</sup> month of life. It should be noted that children suffering from CCP in the given set were aged from 3 years to 17 years (CCP diagnosed after the 9<sup>th</sup> month of age was reported in children, the current age of whom is 7, 5, 8 and 15 years).

The relation between the general practitioner for children and the young and the specialist – children neurologist is regarded very important for early diagnostics of development disorders (Kolář 2001). Out of the monitored set, 6 children were referred to the neurologist's care after completion of post-delivery hospitalisation, another 3 children in the 3<sup>rd</sup> month of life, the remaining 4 children were referred to the care from the 5<sup>th</sup> to the 12<sup>th</sup> month of age (Table 11). The

reasons of time shift in referring the child to the specialist cannot be judged, the research examination was based on the respondents' statements. In two cases the mothers reported that they had notified the paediatrist of the development difficulties, repeatedly asking for additional examinations that subsequently resulted in establishing the CCP diagnosis. In one case difficulties showed as late as around the 1<sup>st</sup> year of age in relation to walking; subsequently, diparetic form of CCP was confirmed at FM Motol, where the mother was referred to by the paediatrist.

In relation to diagnostics, the respondents evaluated the satisfaction with provided information about the child's conditions firstly from the primary care paediatrist, and secondly from the specialist – children neurologist.

There is a certain *discrepancy between the parents and general practitioners for children and the young* reflected in Table 9. In 4 cases, parents expressed their direct dissatisfaction with the attitude and provided care, and in 6 cases the paediatrist is evaluated as a passive person fulfilling the parents' requirements. A positive evaluation by parents was performed in 3 respondents only, which can be considered a serious problem as in the healthcare system the paediatrist provides care to a child up to the age of 18. From the position of general practitioners for children and the young, the evaluation in respect of parents of the children with CCP was more tolerant; in most cases, the parents were evaluated as being able to cope with and provide care of their afflicted child.

Cooperation and attitude of the specialist-children neurologist with the afflicted children's parents was evaluated positively in most cases. Parents were provided adequate information; they were satisfied with the specialist's attitude as well. Only in 4 cases did the respondents express their dissatisfaction with the information and provided care; they resolved the situation by finding other specialist. In 2 cases (Table 7), the respondents directly indicated that the information provided by the neurologist was insufficient. On the other hand, the respondents in the interviews accentuated the attitude and information provided at FN Motol, where they had been referred based on the neurologist's recommendation, and



further the information and attitude provided by the staff at the children spa resort Nové Lázně in Teplice.

Early diagnostics of locomotion disorders is necessary for commencement of an adequate rehabilitation therapy (Table 10), which is represented particularly by the therapy of reflex locomotion according to Vojta. In this respect, the research has confirmed the respecting of the recommended standard; in practice, efforts are made to start the physiotherapy early. The therapy was started before the 6<sup>th</sup> month of the child's age in 8 children of the monitored set (in 6 children it was started immediately after release from the maternity hospital, in 2 children it was during the 2<sup>nd</sup> month). In another 3 children, it was started between the 6<sup>th</sup> and the 9<sup>th</sup> month of life, in the remaining children it was around the 12<sup>th</sup> month.

## CONCLUSION

The recommended CCP – diagnostic and therapeutic standard processed by Komárek and Hadač (2010) and approved by the Committee of the Czech Society for Children Neurology ČLS JEP on 5 March 1997 is still valid, but it contains provisions that already do not correspond fully with the requirements imposed on early diagnostics of locomotion disorders.

Diagnostics based on evaluation of postural activity, postural reactivity and evaluation of primitive reflexology enables to reveal the danger of locomotion disorder as soon as in the first 2 months of the child's life. Early commencement of reflex locomotion therapy according to Vojta enables to achieve an adjustment of locomotion development in at-risk newborns or infants reporting deviations from psychomotoric development. In children with cerebral palsy, early commenced therapy using the reflex locomotion influences the scope and heaviness of the handicap, contributing to reduction of occurrence of secondary changes of skeleton, reducing the need of institutional care, and also influencing the quality of life of both the child and the whole family.

On the basis of the obtained results, firstly from the questionnaire examination among the general practitioners for children and the

young and secondly from the data obtained from the interviews conducted with the mothers of children with CCP, the following statement can be made:

1. The relation between the general practitioner for children and the young and the specialist – children neurologist is regarded very important for early identification of development disorders. Out of the monitored set, 6 children were referred to the neurologist's care after completion of post-delivery hospitalisation, another 3 children in the 3<sup>rd</sup> month of life, the remaining 4 children were referred to the care from the 5<sup>th</sup> to the 12<sup>th</sup> month of age.
2. Early commencement of physiotherapy can be evaluated as a positive aspect in relation to recommendations of the standard and particularly to requirements for early diagnostics. Out of 14 children of the monitored set, an intensive physiotherapy was started in 4 children immediately after release into home care after the birth and in another 4 children it was started between the 5<sup>th</sup> and the 6<sup>th</sup> month of age.
3. Diagnostics of a threat to the child's motoric development is fully in the doctor's competence; parents, however, play a certain role in the period of learning about and diagnosing the locomotion disorder. Monitoring of all manifestations, reactions and behaviour of the child, keeping the primary care doctor informed about any discrepancies or doubts on the parents' part is important not only for general evaluation of the child's condition, but it becomes also the basis for cooperation between the parents and doctors. From the questionnaire examination among the primary care paediatricists in the given district it followed that the parents address the paediatricist only "occasionally" with regard to any doubts regarding the appropriate and adequate locomotion development of the child (Table 9). On the respondents' part, only 2 of them reported that they themselves notified the general practitioner for children and the young of the discrepancies in psychomotoric development.
4. Although we live in times of an easy access to information, it is appropriate to



continue providing the knowledge about psychomotoric development in the first year of life to the parents and guide them to consistent awareness and understanding of their own child's manifestations.

5. The investigation also confirmed the generally valid importance of communication and professional attitude of the healthcare staff to the children

of the afflicted child. For parents, communication and information are from the very beginning one of the substantial factors influencing not only the emotional harmonisation, but also the subsequent cooperation during the therapy and its results, which is directly reflected in further life of the individual with CCP and finding their position in the society.

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**Contact:**

Dana Šlechtová, Ústav zdravotnických studií UJEP, Velká Hradební 13, Ústí nad Labem,  
Czech Republic  
E-mail: Dana.Slechtova@ujep.cz; dana.sle@seznam.cz