

Bachelor Thesis

# Physiotherapeutic treatment of children with Cerebral palsy

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*A qualitative research in Ndola, Zambia*

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## Foreword

From August to December 2012 one of the researchers, A. Rademacher, did an internship in Zambia. There she worked at the Community Based Rehabilitation Center (CBR) in Chifubu, one of the Ndola compounds. The purpose of the CBR program is to offer care for physically and mentally disabled children within the community and change the perception of having a handicapped child. The services they offer are a special unit class, teaching of pro-vocational skills, home training and physiotherapy.

Since 2002, the Zuyd University of applied science works together with the Dutch organization “GCMF- Give the children of Mpongwe a future” and offers the chance to do an internship in Zambia. There is also the possibility to do an internship at the “CBR-Community Based Rehabilitation Program” of the catholic diocese of Ndola.

In the CBR center there is the possibility to get physiotherapy given by a so-called Physiotherapy Assistant. In the center of Chifubu this assistant is a woman who was chosen in 1999 to attend a workshop for a month in which she learned basics to treat children with CP. Since then she is responsible for the treatment of all physiotherapy clients at the center in Chifubu in addition to being responsible for running the whole center.

The CBR Chifubu is located in one of the Ndola compounds and most people there are not able to speak English. Especially older people and people who did not attend school are able to speak Bemba only, the common language in the Copperbelt area. For that reason, we could not ask the caregivers about their perception of the treatment and how they would describe the effect of the given therapy.

As a result of the language barrier, it became clear very quickly that conducting interviews would not be possible.

Our next idea was to investigate the amount of information about CP given to the parents by the therapist. However, this was not a reachable goal either, because the children were not always accompanied by the same person when they came for therapy and sometimes the people who brought the children to the therapy were not the people they lived with.

Because of the limitations we made the decision to change the main aim of the thesis. The situation in Zambia made it clear that there is no guideline or fixed schema to treat children with CP. Furthermore it was not possible to find evidence about the treatment of children with CP in Zambia or other southern African countries.

We decided that our research should focus on the physiotherapy in general. The description of our analysis, our research and our results can be found in the following bachelor thesis.

## **Acknowledgements**

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## **Abstract**

The main aim of our thesis is to give an impression about the physiotherapeutic treatment of children with cerebral palsy in Zambia. Our research focused on one center in Ndola.

Our two research questions were:

1. *“What kind of physiotherapeutic treatment do children with cerebral palsy receive in Zambia?”*
2. *“What kind of interaction can we identify between therapist and child?”*

### Method:

To answer our research questions, we conducted a qualitative research. We collected our data through a participant observation. We observed the treatment of two children with CP, who came for therapy regularly and were under the age of five years. We transcribed three videos per child from three different treatment sessions.

### Results and Conclusion:

The physiotherapeutic treatment in Zambia consists of two parts, a functional and a constructed approach. In the treatment the child often played no active role and the treatment target was not clear. In the observations only aspects of the treatment methods were visible. The interaction between therapist and child was not as expected, but may have been colored by our own cultural background. We were not able to define “Why” certain aspects of the therapy were done. Therefore we are not able to make a judgment about the therapy.

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## 1. Introduction

Cerebral palsy is the most frequently seen disability in new-born children [1]. In 2005, Bax et al. defined Cerebral palsy as:

*“Cerebral palsy (CP) describes a group of disorders of the development of movement and posture, causing activity limitation, that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain. The motor disorders of cerebral palsy are often accompanied by disturbances of sensation, cognition, communication, perception, and/or behavior, and/or by a seizure disorder.”[1]*

Cerebral palsy is a group of neurological disorders that appear in infancy or early childhood. It permanently affects body movement and muscle coordination but does not get worse over time. The non-progressive disturbances occur in the developing fetal or infant brain [1]. This definition highlights the fact that it is not a single disorder but a group of disorders with different causes.

Cerebral palsy is one of the main causes for motor disorder in childhood. The prevalence of CP in western countries ranges from 1.5 to 2.5 per 1000 births. Often the cause for having cerebral palsy is unknown. There are risk factors but those have to be distinguished from causes. In 10-20% of the cases, Cerebral palsy arises in the early postnatal period, in which premature birth, low birth weight, growth problems, bleeding in the brain or trauma can be risk factors.

The main symptoms for CP are impaired posture and movement. Furthermore, this disorder may have other neurological dysfunctions and disorders in the body, such as epilepsy. There can be visual, hearing, cognition, communication, behavior or sensory deficits, as well as a disturbed perception.

CP can be classified into several different motor disorders. This classification depends on the type of movement disorder [2-3]. On the basis of the association 'Surveillance of Cerebral palsy in Europe (SCPE) there is a distinction made between the different types of central motor movement. These are spastic, ataxic and dyskinetic disorders in movement. With 80 to 90 %, the spastic paresis is by far the most frequent movement disorder. Dyskinetic paresis can be found in 9% of the cases and the ataxic paresis in 2% [2-3]. To classify the severity of

the motor disorders regarding to the gross motor skills the Gross Motor Function Classification System (GMFCS), can be used. The GMFCS is divided into five different 'levels'. Children, classified into "level I" have the least difficulties standing, walking and running. In contrast, children diagnosed as “level V” have the most serious difficulties. This means that these children are not able to move independently, even when they make use of assistive technologies. [4]

In Table 1 the classification of the GMFCS is displayed.

*Table 1: Gross motor function classification system [5]*

<b>Level</b>	<b>Description of function exhibited by children at this GMFCS level</b>
Level I	Walks without restrictions; limitations in more advanced gross motor skills
Level II	Walks without assistive devices; limitations in walking outdoors & in the community
Level III	Walks with assistive devices; limitations in walking outdoors & in the community
Level IV	Self-mobility with limitations; children are transported or use power mobility
Level V	Self-mobility is severely limited even with the use of assistive technology

The target of the treatment of a child with a central motor disorder should preferably be formulated by an interdisciplinary management team. The physical therapist has the choice of a number of interventions on patient-centered treatment goals in treating children with cerebral palsy. The physical treatment in children with CP is initially focused on the functional level of the ICF-classification. Later in the treatment there should be an advertency on the activity level. [3]

Goals of these treatments may include: prevention of motor disorders, stimulation of the motor and the total development, reduction of pain and deformation, and improvement of the total functionality of motor-movements of the child. [2-3]. Furthermore, there has been a setup of guidelines for the diagnosis and the treatment of children with cerebral palsy which was written by the “Nederlandse Vereniging van Revalidatieartsen” [7].

In the CBR the physiotherapy is only given by one therapist, a so-called Physiotherapy Assistant, who completed her education in just a month. This means, that there is no possibility to formulate treatment goals with an interdisciplinary team. It was not obvious for

which goal the children were treated and if these goals were formulated before the therapy. Therefore we choose to observe the physiotherapy treatment.

This is a relevant topic, because we hope that this research will show us which aspects can be improved in the treatment and how this can be done.

To investigate the situation in Zambia we decided to conduct an observational participatory research [6].

We made this choice because we did not know in advance what to expect in Zambia. One of the main advantages of this method is that it is not crucial to overcome the language barrier. It also enables the researcher to take part in the treatment and get to know every participant and the environment. This will help to observe and understand the treatment not only based on the literature. The researcher will also be able to give explanations for certain behavior and therapy choices, based on personal knowledge and experiences.

## 2. Literature review

Physical therapy plays a major role in the treatment of children with Cerebral palsy. In the literature a high intensity and frequency of the therapy is reported and varying approaches and techniques are used [11]. Four main aspects of the treatment can be found, which are based on a number of functional areas. These four aspects are described below.

### Influence of muscle tone

Out of various therapeutic methods, there are techniques known to influence muscle tone. Tone can be increased or decreased by manual or tactile stimulation (heat, cold, pain). Of these techniques it has now been shown that they have no added value compared to the use of orthotics or regular physiotherapy. Furthermore, the relationship between the degree of the deviation of tone and the degree of implementation of an activity is very low. This shows that the therapeutic value of influencing the muscle tone is questionable. It is clear that symptoms such as muscle stiffness and weakness play a greater role than the activation disorders [3].

### Training of strength

Recent studies indicate that strength training in children with spastic CP does not increase spasticity [12]. Methods to train strength are isometric, isokinetic and functional exercises, as well as the RM-method. The frequency of training to improve strength should be two to three times a week over a minimal period of three months [3].

### Improvement in fitness

In most of the intervention studies aspects of fitness are separately examined. There are no studies which combine endurance and strength training. But for daily activities it is important that both endurance and strength improve [3]. By implementing a functional fitness program the level of activity could improve [3].

### Improvement of mobility

According to Ferrari and Cioni, slowly progressive passive stretch is the best technique to mobilize myogenic structures [14]. Recommended stretching durations are 10-40 seconds for smaller muscles and up to several minutes for the larger muscle chains. The stretch, according to Ferrari and Cioni, should be strong enough to trigger an activity of the Golgi tendon organ. The stretch should be repeated ten times [14]. Research has shown that myogenic contractures can be favorably influenced by daily stretching [15].

Also more complex treatment approaches, such as neurodevelopmental treatment (NDT) or Vojta-therapy are generally based on different principles of motor learning and require specific, specialized training.

A structural basis for physiotherapeutic treatment is provided by the International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY). Treatment goals in this model are directed on functions and anatomical properties, activity limitations and participation problems. The ICF-CY especially offers a better description of the growth and development of children and youth. Physical therapists can use the ICF-CY model to manage the selection of measurement tools, both in goal-setting and decision-making processes, and to define meaningful outcomes [13].

In all fields of physical therapy different measuring instruments can be used to inventory, to chart or to evaluate problems in anatomical properties, activities and participation. For children with Cerebral palsy, there are 2 main instruments to measure motor development. These are the Gross Motor Function Measure (GMFM) and the Gross Motor Function Classification System (GMFCS). The GMFM measures the level of functioning and can be used for evaluation. The GMFCS (table 1) is a classification system for children with cerebral palsy and aims to describe the seriousness of the cerebral palsy on functional activities. In addition to these two, there are more measuring instruments which test motor development, but not specifically for the disability cerebral palsy [3].

The treatment methods described above are only a fraction of the various options that currently exist. To give a child the best possible treatment, a physical therapist has to choose the best fitting option. To help physical therapists with that decision, the Netherlands set up a guideline for treatment of children with cerebral palsy which contains physical therapy techniques and their scientific evidence [7].

In our literature research, we did not only look for general literature about the physiotherapeutic treatment of cerebral palsy. We also tried to find literature specific to Zambia or other southern African countries, which was not successful.

To give an impression about the situation in Zambia, we chose for a qualitative research and set up the two following research questions:

1. *“What kind of physiotherapeutic treatment do children with cerebral palsy receive in Zambia?”*
2. *“What kind of interaction can we identify between therapist and child?”*

### 3. Method

To answer the research question, we used a participant observation to collect data.

Participant observation is not simply showing up at a site and writing things down. On the contrary, participant observation is a complex method that has many components. One of the first things that a researcher or individual must do after deciding to conduct participant observations to gather data, is decide what kind of participant observer he or she will be [10].

For our research we chose an active participation. We decided to observe as broad as possible to chart the situation. As the situation in Zambia was not previously assessed we were not able to write the Method before the investigations. Therefore we had to constantly adjust the method during the studies. Also, the choice for an active participation was not clear before the arrival in Zambia.

#### 3.1 Setting and sample

The study was carried out at the Community Based Rehabilitation Center (CBR) Chifubu in Ndola. Chifubu is the best equipped of the four Ndola CBR centers. Through a donation of Rotary Club Ndola they were able to afford a certain amount of CP-chairs and standing frames as well as mats and toys.

The CBR contains, next to the physiotherapy-department, a special education class and two sheltered workshops, where older children learn simple activities for their future life. These are divided by gender. The physiotherapy department consists of one main room, which was made up by joining two smaller rooms together. In the first part of the room lies a big mattress on the floor on which the children are treated and on the walls around the mattress hang big mirrors. The CP-chairs and standing frames are standing there as well. In this part of the room you can also find a lot of toys.

The second room contains a desk and two chairs and also some training tools. These tools, such as a treadmill, are mostly used by stroke-patients and the children of the special unit, who like to play in the physiotherapy department.

For our study we included two children with Cerebral palsy, Albert and Eddy. (Synonyms were used for the names to keep privacy.) Albert was three years old during the time of the study and Eddy four years. The main reasons for including them in our study were that their caregivers brought them for therapy usually on a daily basis. We supposed that their

caregivers would also bring them in the future. In addition, Albert and Eddy's caregivers were very interested in the therapy and the further development of the child. Next to that they needed to meet the criteria of a child with cerebral palsy younger than five years and with an impairment that meets the GMFCS classification of level IV or V.

Another important inclusion criterion was that the children were not afraid of people with white skin-color. Otherwise the observations and video material could be troubled through the reaction of the children on the presence of the observer.

Furthermore it was important that the children and their caregivers are in a good general health condition and that there were no accidents or fractures in the recent past that might have an influence on the treatment and the development of the child.

### 3.2 Approaching the participants

Before we could start on our investigation we first needed the consent of the Coordinator and the Assistant Coordinator of CBR, Sr. D. Kamuchele and Mrs. T. Nyendwa. After their consent was given, Mrs. L.C. Mayonde, the center in-charge of CBR Chifubu, needed to be informed and give her written consent.

With the help of Mrs. Mayonde we were able to inform the caregivers of the two children about our study. Because of the language barrier, she translated the given explanation and also the written consent-form, which the caregivers of both children signed.

### 3.3 Ethical considerations

During our observations we tried to maintain the privacy of the patients and other people present as good as possible. Videos and written observation will only be used for research-purposes and will remain with the researchers. First names were made anonymous and last names were not written down.

### 3.4 Data collection

We collected our data in the time from 27.09.12 to 20.11.12. In this time we made twelve written observations for Eddy and eleven for Albert. Our Video Observations were made in the time from 30.10.12 to 20.11.12. Both children were filmed on five days. Mostly one film was made during the therapy, but sometimes we filmed more than once and naturally these films are shorter.

### 3.5 Data analysis

For our data analysis we used the written participant observation and the video recordings. We transcribed 3 videos per child from 3 different treatment sessions. In total we transcribed 57:28 minutes of video material which resulted in 26 pages written data. The treatment sessions of Eddy were 20:55 minutes and the session of Albert 36:33 minutes in total.

We choose to analyze the data of these three dates, because they showed treatments which were relevant for us to answer our research questions.

The participant observation data, the transcribed videos and the field notes were coded. Codes were grouped, compared, and categorized into concepts. We used these concepts to answer our two research questions:

1. *“What kind of physiotherapeutic treatment do children with cerebral palsy receive in Zambia?”*
2. *“What kind of interaction can we identify between therapist and child?”*

### 3.6 Trustworthiness

To prove trustworthiness, four main criteria must be met: credibility, transferability, dependability, and conformability (*Guba and Lincoln, 1985*). For our research we used two of the four criteria's, namely credibility and transferability. Below we will explain what the criteria's mean and how we will maintain these in our research.

Credibility is confidence in the ‘truth’ of the findings (*Guba and Lincoln, 1985*). To create credibility, the strategies prolonged engagement, triangulation, and persistent observation are applied. Prolonged engagement means to spend sufficient time in the field to learn or understand the culture, the social setting or the phenomenon of interest. The observers stay in the CBR Chifubu of four months gave her the opportunity to spend adequate time observing various aspects of the setting, to speak to different persons and develop relationships with members of the culture.

Triangulation involves using multiple data sources in an investigation to produce understanding (*Sim and Sharp, 1998*). For our research we used video observations, which were recorded with a video camera and the written reports with field notes of A. Rademacher's active participation in the field.

Persistent observation is defined as identifying characteristics and elements that are most relevant to the problem or issue by studying and focusing on them in detail (*Guba and Lincoln, 1985*).

Transferability means that the findings can be applied in other contexts (*Guba and Lincoln, 1985*). To establish Transferability the technique of thick description is used. The observations in our research were described in sufficient detail to make them transparent to other readers and to make the patterns of cultural and social relationships explicit.

## 4. Results

Analyses and coding of the observations resulted in two core categories which relate to our main core questions about treatment and interaction. The core category treatment includes the following four aspects: Functional treatment, Constructed treatment, Facilitation and Disturbances (Fig. 1). The first three aspects are treatment techniques. Disturbances were present during the observations and had an influence on the therapy. The core category interaction was split up into verbal interaction and non-verbal interaction (Fig. 2). The codes and the fragments can be found in Appendix two.

### 4.1 Characteristics of respondents

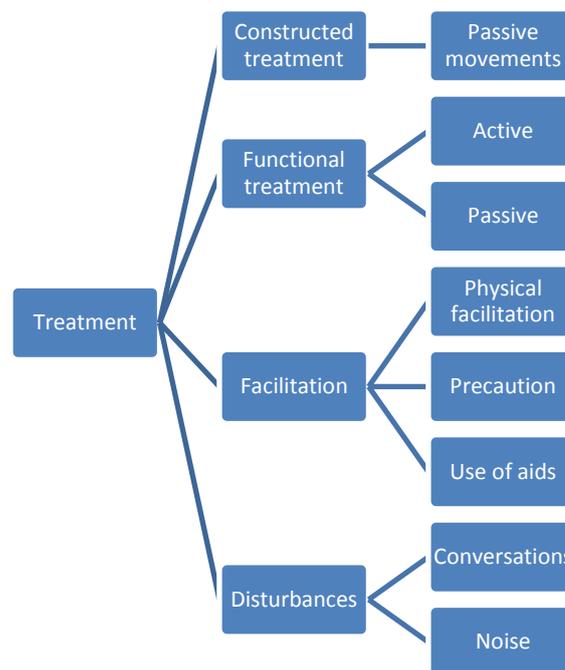
In our results we found that the children were treated differently, based on the severity of their handicap. Eddy is the older one of the two children and the one with the more severe handicap. His head control is very poorly and he is not able to move without support. He stays as he is placed and will not start to move by himself. His hand movements are also very poorly developed. Sometimes he will move with his hands, but he is not able to aim in a specific direction or grasp an object. Sometimes he would follow moving objects with his eyes and sometimes he would not. There was no way to tell, if he had problems with his eyesight during the stay in Zambia. There was also no way to tell, if he suffered from mental retardation, but there were some signs that pointed to it. For one he never took initiative and he was very quiet. He never used baby-talk and just made some sounds in different situations. He used to smile at people around him, but only when stimulated and most of the time, he did not seek eye-contact. [3]

The muscle tone in Eddy's legs is always higher than in a not-disabled child and in his arms his tone changes. By passive movements you can feel resistance in all his extremities. His arms are mostly flexed in the elbows, even when he is in a relaxed position. On his back his legs are extended and he suffers from shortened m. gastrocnemii. His biceps and his m. gastrocnemii are the only obvious contractions.

Albert is one year younger, but he is much more active. He wants to move around and wants to play and interact with people. He gets annoyed when he has to lay still for treatment and will start to "fight" against the treatment after a few minutes. His head control is good and he is able to sit with surveillance. He is also able to sit and play with his hands at the same time. His hand movements are impaired by his muscle tone. He sometimes needs more tries to open

his hands to grasp something, but he is always trying and exploring his environment. The tone in his arms is low, but when he moves it gets higher and his arms start to move in a spastic pattern. His body reacts with an increased spasticity to all activities and to excitement. He also suffers from shortened m. gastrocnemii, which are a problem during standing and walking. There were no obvious points in his behavior that pointed to a mental retardation.

#### 4.2 Treatment



*Fig. 1: Grouped codes to answer research question one*

##### 4.2.1 Functional treatment

Functional treatment can be divided into active and passive aspects. During the active part in the functional treatment activities such as walking, sitting, standing and rolling were trained. The frequency and intensity of the active training differs from child to child and from day to day. For example, in the treatment of Albert all of the functional activities, which are mentioned above, were trained. *“Albert is standing...”, “Therapist and Albert walk together”, “Albert is sitting on tricycle”, “Albert turns on his back with a little help and tactile stimulation of therapist”.*

In the treatment of Eddy only two functional activities were trained, namely sitting and rolling. The following fragments support our findings: *“She pulls Eddy up on both arms in a*

*sitting position*”, “*Turns Eddy slowly on belly...*”. Eddy’s head control is not good. In a sitting position his head often drops forward. He needs to be stimulated to pull his head up and often is not able to keep it that way for more than a few seconds. When he is shifted in his position, his head often falls back in hyperextension. This can also be seen in the passive part of the treatment.

For the passive part in the functional treatment we identified changes in the position of the child made by the therapist. For example: “*Therapist turns him and places him on his belly on the mattress*”. The child takes no active role in these changes.

#### 4.2.2 Constructed treatment

For constructed treatment passive movements can be identified. Passive movements of the upper and lower limbs, the spine and the pelvis were made. For the different joints of the body the therapist used angular movements and circulations. Also changes in the intensity were observed. The therapist used passive movements in the treatment of both children, but more frequently in the treatment of Eddy. During the passive movements especially Eddy lies passively in supine or abdominal position. Albert often tries to move away and shows his boredom.

#### 4.2.3 Facilitation

In the category facilitation three different subcategories were found, namely physical facilitation, precaution and use of aids. Physical facilitation was used to support or correct the body posture of the child during the functional movements. It was also used as stimulation for movement. For example: “*The Therapist takes his heel between her big toe and her second toe and is so able to direct his feet for a bit. His legs don’t cross anymore but he still places them very close to each other*”, “*She stimulates him shortly to hit on the ball with his hands*”, “*She places him on one side, with his upper leg before the one underneath, and motivates him with tactile stimulation to turn by himself*”.

To maintain the security of the child different methods of precaution were observed. This contains that the therapist was within reach of the child and that different types of aids were used during the therapy. For example: “*She stands behind Albert and his him secured by the*

*chitenge*”, “*She secures Albert with both hands*”. The aid “chitenge” (African fabric) was also used for padding the mattress so that the children won’t hurt themselves. During the observation it was noticed that different types of auxiliary were used during the therapy. For example: “*She moves the ball in front of him. First up and down, then left and right, “She uses one hand to arrange the bricks and the other to hold him*”. Mostly these were used to stimulate movement. For Eddy it was important to be stimulated to keep his head up. Sometimes, he would look at a moving object for a few seconds and keep his head up for it, and sometimes he wouldn’t even react to it at all. This behavior also aroused the question if he had problems with his eye-sight or a very short attention period. When an object was moved in front of Albert, he often tried to reach it and explore it with his hands and mouth. When a ball was placed in front of his feet, he would try to kick it away.

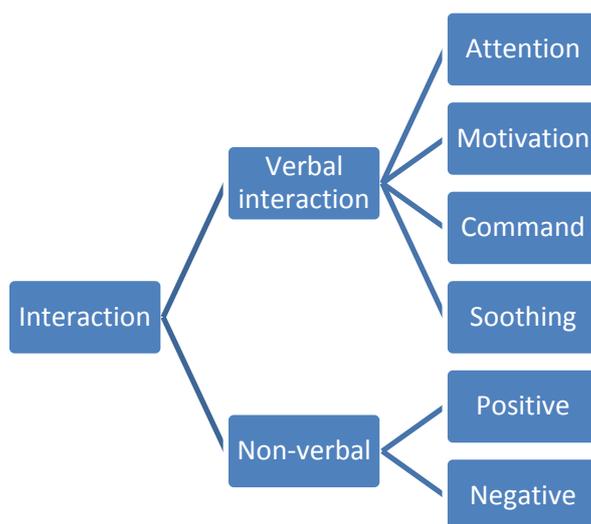
#### 4.2.4 Disturbances

During the analysis we could find two types of disturbances, namely conversations and noise. In the physiotherapy department waiting and treatment happens in the same room. This means, that during one treatment sessions, it is possible that there are more than ten people present. There were a lot of conversations between people in the background, but also conversation between the therapist and people who were not involved in the therapy. For example: “*Therapist and grandmother talk*”, “*talks with other women.*” It also happened a lot, that the employees of the center came to talk to the therapist. She is the center in-charge and therefore was needed, when decisions had to be made. An example for this is: “*Therapist and Jo talk*”. Jo is the male employee of the center and he works with the older boys in the boys’ workshop.

The noise mostly came from children in the background who were crying or running around. While the children waited for therapy, they were often placed in the CP-chairs or standing frames. The children often did not like that and started to cry. For example: “*You can hear another child crying in the background*”. Some of the caregivers brought also younger children with them. Eddy’s grandmother, for example, brought always a younger boy with her, for whom she also took care. He always played in the background and naturally made some noise. Eddy’s attention was often fixed on him.

The students of the special education class and the workshop could also be found in and around the physiotherapy department. On the one hand, you could hear them screaming and talking when they were in their classrooms or in the hall. On the other hand, some of them also liked to come into the physiotherapy department to play. An example: “*You can hear noises/children voices in the hall*”. Often there was also a lot of fighting between the children and some of the children also suffered from behavioral problems, which resulted in screaming and shouting. One of these children is Chuchu. “*You can hear Chuchu crying in the hall/somewhere in the building*”, “*Chuchu screams louder*”. Chuchu is one of the students in the special education class. He displays severe behavior problems with hyperactivity and it is also possible that he suffers from a mental handicap. His means of communications consist of repetitive words and body contact, when he feels good and of different pitches of screaming/crying when he does not feel good. In the videos we analyzed, there was one day when his screaming was very persistent. He came also running into the department and tried to hide there. This was a very frightening situation for Albert, who was treated at this moment. The therapist had to pause the treatment, until Chuchu was outside the room again.

#### 4.3 Interaction



*Fig. 2: Grouped codes to answer research question two*

#### 4.3.1 Verbal interaction

Wherever verbal interaction was used during the treatment, we tried to find out to which goal it was used. We identified the following four aspects: Attention, Command, Motivation and Soothing.

We described a verbal interaction as “Attention”, whenever it was used to get the attention of the child, keep his attention or to focus the attention of the child on something new. The therapist often called the name of the child, with the result that the child faced her and focused his attention on her.

A command is a short verbal instruction used to lock out wished behavior or stop unwished behavior. Wished behavior, for example, can be moving to a certain point or goal. *“Then she points to a ball lying in front of them and gives the command “tiye” (Let’s go)”* Unwished behavior is, when the child cries or screams, or when the child wants to do something else than the therapist. *“He keeps on crying. She commands him more vigorously.”*

Motivation was used when the therapist wanted the child to go on with his behavior or when she praised his good behavior after or during a therapy setting. *“She clasps her hands in front of his face and says: “Yeah, Albert is walking! Clap for Albert!”*, *“With every step she says something like ‘Hey’”*

When one of the children cries, she used verbal interaction to sooth them. For example: *“She rubs his back and says: sorry, sorry, sorry”* The tone of her voice also changes, when she talks to a crying child. *“She does it very gently and talks to him as if to test if he would start cry again”*. With this she also tries to calm the child down.

#### 4.3.2 Non-verbal interaction

In the non-verbal interaction we could find two aspects, namely positive non-verbal interaction and negative non-verbal interaction. Positive non-verbal interaction means, that we found interaction we expected to be there such as eye-contact and smiling. For example: *“They both look at each other and laugh.”*, *“She makes sounds while she moves his hands up and down”*. Negative non-verbal interaction means that we missed those aspects. For example: *“She works concentrated on her task in silence. Looks only at his hands”*, *“Therapist hasn’t talked to Eddy yet”*. We also found, that sometimes the physiotherapist

would not face towards the children during the therapy, but seemed to be concentrated on something else.

## 5. Discussion

This pilot study investigated what kind of treatment children with cerebral palsy receive in Zambia and the kind of interaction between therapist and child.

### 5.1 Comparison of results with the literature

#### 5.1.1 Treatment

##### 5.1.1.1 Functional Treatment

Out of the observations we found activities such as sitting, walking, standing etc. which can be placed under the treatment goal functional treatment. Functional physical therapy emphasizes the learning of motor abilities that are meaningful in the child's environment and perceived as problematic by either the child or the parents. Children practice these motor abilities in functional situations, with the child having an active role in finding solutions for motor problems rather than having the therapist's handling result in a solution [16]. The literature shows that Children with CP benefited from a functional goal-directed training approach in their development of gross motor function and everyday activities [17]. During the analyze we identified changes of the position of the child, which were made by the therapist. These were coded as the passive part of functional treatment. The literature shows that in functional treatment a main feature for functional approach is an active role of the child. He or she must find solutions for motor problems. When the therapist handles the child in a new position, the child isn't able to search for a solution of his problem [18].

This means that in the treatment session, the therapist sat with the child, but the child wasn't stimulated to find a way to change from a lying position into the sitting position by himself. We think, that this means, that the therapist missed an important point during the treatment. During our analysis it also became apparent that we found a lot of codes about functional treatment of the lower extremities, but none about the functional treatment of the upper limbs. Training of the functional activity of the hand is an important goal in the treatment of children with cerebral palsy [2].

##### 5.1.1.2 Constructed Treatment

In our data analysis we combined passive movements under the main code constructed treatment. During the analysis passive movements of the upper and lower limbs and of the spine and the pelvis were made by the therapist. As described in the literature above passive

movements are used for different treatment goals, for example: Influence of tone, Improvement of mobility etc. According to Ferrari en Cioni is slowly progressive passive stretch the best technique to mobilize myogenic structures [14]. On the contrary the review “The effectiveness of passive stretching in children with cerebral palsy” from Pin T. et. Al. shows that the current level of evidence to support the effectiveness of passive stretching in children with spastic CP remains weak [19]. In the review there are a few conclusions that can be drawn from the existing evidence: (1) there appears to be some evidence favoring passive stretching in increasing range of movements in children with CP, although the effect size remained small; (2) there is some favorable evidence indicating that passive stretching may reduce spasticity in children with CP although the effect size and clinical merit remain limited [19].

Our analysis showed a lot of moments when passive stretch was used, but it wasn't obvious for which goal. The passive movements were a lot more often used in Eddy than in Albert. We asked ourselves if the reasons therefore were lower functional abilities of Eddy or that Albert showed actively that he wanted to move and play during the treatment. In the literature we could not find an explanation why a child as Eddy should receive more passive treatment than a child as Albert, especially when there is not much proof for the effects of passive movements.

#### 5.1.1.3 Facilitation

In the category facilitation three different subcategories were found, namely physical facilitation, precaution and use of aids. Physical facilitation was used to support or correct the body posture of the child during the functional movements. In the literature the most common current therapy approach is NeuroDevelopmental Treatment (NDT), developed by Bobath and Bobath (1980, 1984). In this approach, intervention focuses on improving motor-based activities by changing the child's underlying impairments in motor control through inhibition and integration of primitive postural patterns and by facilitation of more normal movements [18]. The implicit assumption is that improvement of posture and movement experienced during treatment automatically will lead to improvement of functional daily activities [18].

Care institutions and health care providers are responsible for safe care. Patient safety means preventing unintended harm to the patient [20]. To maintain the security of the child different methods of precaution were observed. This contains that the therapist was within reach of the child and that she observed the child carefully. When there was a change in behavior or

reaction on the treatment, she was always able to help and to support the child, so that there were no unsafe situations. The equipment of the physiotherapy-department also helps to maintain the safety of the children. Most of the passive treatment is done on a big padded mattress in the middle of the room. The children cannot hurt themselves by falling down this mattress and also the toys are safe for the children. When they walk, they walk over the carpet, which lays in the rest of the room.

The therapist also uses aids to maintain the security, but also to support the children during the treatment. The things used, are mostly not made for this reasons, but function just as well. One of the examples is a “chitenge”, an African fabric, which is used for different goals. First a “chitenge” is always used, when the children lay down on the mattress. On the one hand it still gives more padding and on the other hand it prevents that the children come in contact with the plastic-material of the mattress, which gets sticky and uncomfortable, when it is hot. It also helps to keep the hygiene. When the children drool, they drool on the “chitenge” and not the mattress. This means that they keep germs from spreading from one child to another. The “chitenge” is also used to support Albert during walking. The therapist fastens the fabric around his waist and is able to control his upper body from falling forward. This is also a mean to maintain his safety. For the therapist, this means, that she does not need to lean as much forward as when she would want to support him with her hands. It helps her to maintain a good posture and prevents back pains.

#### 5.1.1.4 Disturbances

In our codes we found a lot of situations which were a disturbance in the therapy. We divided these disturbances in “conversations” and “noise”.

We defined conversations as a disturbance when there was a communication between the therapist and a person, who was not involved in the therapy. This person could be an employee, another patient or caregiver of a patient or some other person, who happened to be in the physiotherapy department. Conversations with the caregivers of the children were not seen as disturbances, because we were not able to distinguish between conversations about the child and the therapy, and conversations about different topics. There were also conversations between people in the background. It was a disturbance in the continuing of the treatment, when the therapist focused her attention on the speaker or joined in the conversation. Often these situations resulted in a pause of the treatment.

We described something as noise, when we could hear sounds in the backgrounds and we could see that this sounds distracted the patient and/or the therapist. These sounds were, for

example, playing children in and outside the department, but also crying and screaming children. Naturally this means that the attention of the little patients was mostly focused on the other children and not on the therapy.

### 5.1.2 Interaction

The relationship between therapist and patient can be characterized as a functional working relationship. The term "functional" indicates that the relationship is established to achieve a particular goal intentionally. In a functional cooperative relationship the patient is seen as an employee in performing a task. The division stems from the purpose of the provided care. The patient is actively involved in the care process. Therapist and patient will be working together to achieve the greatest possible degree of independence and personal responsibility of the patient to solve his health problem [22].

In the relationship between therapist and patient there is interaction. There is a constant mutual influence, a constantly interact on each other. Therapist and patient are playing both a role in the interaction [22].

To enter into a functional working relationship and to develop, maintain and terminate this relationship, the physical therapist has to have necessary competences such as the ability for verbal and nonverbal communication. He or she needs to be able to estimate the social and intellectual level of the patient, too. Also, the physical therapist has to empathize with the experiences of the patient, but he also has to keep an adequate distance [22].

We based the interpretation of our results on our own experiences with patients and especially with children. We also based them on our own cultural background. In this part we were also influenced by our emotions while we watched the videos.

When we look at a physiotherapeutic treatment of a child in the Netherlands, we expect a lot of verbal and non-verbal interaction, such as singing and playing. We would also expect a stimulation of wished behavior.

### 5.1.2.1 Verbal interaction

In the verbal interaction we have also seen a difference between Eddy and Albert. Albert sometimes started to “talk” to the therapist and she gave him answers. She also praised him more than she praised Eddy. We think, that this happens, because Albert asks for interaction while Eddy is quiet. He also asks for functional activities, for which he can be praised. During the passive movements, Eddy just lies on his back and therefore can’t be praised for something he does.

### 5.1.2.2 Non-verbal interaction

In the section non-verbal interaction we found both positive and negative items. Positive means that there was non-verbal interaction visible and negative means that there was none. We missed the interaction especially when Eddy was treated passively and the therapist was sitting in front of him. There were a lot of possibilities for more eye-contact and stimulation.

## 5.2 Reflection on the used method

To prove trustworthiness, four main criteria must be met: credibility, transferability, dependability, and conformability (Guba and Lincoln, 1985). For our research we used two of the four criteria, namely credibility and transferability (Chapter 2: Method). These have been applied successfully. However this qualitative research has also some limitations that we want to discuss.

A qualitative research is implemented as wide and open as possible. The researcher usually starts with preliminary ideas which are gradually increasing during the research process and are focused on the research question and the research object. This means that the data collection often is initially open and flexible. Even the research question can be adjusted during the research [21]. In our study, we also went through a process in which the method was constantly adjusted. We decided to collect our data with an active participant observation. As described in appendix 1 in an active participation the researcher becomes a member of the group by fully embracing skills and customs for the sake of complete comprehension [10]. During the investigation we had the chance to talk to Dr. Albine Moser (Senior lecturer, senior researcher at Zuyd University and Senior researcher at Maastricht University). She is

specialized in qualitative research and could give us valuable tips that have helped us in our Investigation. Next to key questions (Who, What, Where, When, Why, How) which we used during the observation, she gave us feedback on current observations that we made. With that feedback we were able to refine the observations and to make them more palpable so that the readers could empathize with the situation.

She also suggested that that we only focus on two children and try to get as many and as detailed observations about them as possible. During the time of our research A.Rademacher was in contact with the people in The Netherlands all the time. There was not only feedback from H. Wolff, but also from our supervisor Dr.Yolande Nelissen and Dr. Albine Moser. Through Skype and Mail A. Rademacher was able to get answers to her questions, which mostly concerned the matter of making the observations, especially how to observe as deeply as possible on the one hand and to stay as objective as possible on the other hand. Dr. Moser's suggestion was that we use fieldnotes and a reflexive diary. In the fieldnotes A. Rademacher wrote everything down, what she saw and in the diary her own thoughts and emotions she had during the therapy. Together it will help us to get a thick description of the therapy.

Her feedback also helped A. Rademacher to go from a passive form of observation to a more moderate form. In the beginning we wished for an active form, in which A. Rademacher knew the setting and the people, but getting to know them was not as easy as expected beforehand. The language barrier and cultural differences kept her from being accepted. Also her skin color was an obstacle for an active participation, because on the first view you could see that she was an "outsider". The children we chose for our observation luckily were not afraid of her and allowed her to touch them and liked when she watched/observed their treatments. But she could never take part in the conversations of the adults, because these were in Bemba and sometimes had the feeling that they didn't want her to. The feedback from Dr. Moser to this point was that it was okay to ask questions during the treatment to get an explanation for a certain kind of therapy and to interact and play with the children.

During the observation, the limitation turned out that the local official language Bemba was not understandable for us. Therefore, the question arises, whether we can speak of a fully active participation. This restriction also came up during our data analysis, because we were not able to interpret all verbal conversations. Through this it is possible that the reliability is not fully guaranteed.

For our data analysis we choose 3 video observations per child and the corresponding written observations which were made on that day. We made this decision because the video recordings did not record the treatments from the beginning till the end and we wanted to have a complete overview of the treatment. Due to the fact that not all video recordings were analyzed it could be possible that relevant information were missed. But we choose to analyze the data of these 3 dates, because they showed treatments which were relevant for us to answer our research questions.

Besides the language barrier we also met cultural differences during our investigation. These will be described below.

During the transcript of the videos occurred the problem that it was very difficult to write down the displayed emotions. We tried to describe as good and open as possible, but it is also clear, that some of our findings are interpreted by us. Especially, the facial expressions of the children were sometimes hard to interpret. To get a feeling for the situation, we watched the videos and made notes, in which we described our feelings about the emotions and atmosphere in the video.

### 5.3 Cultural differences

As mentioned in the section “Interaction”, some of our findings were interpreted by us based on our own cultural background. This colored our findings and also influenced our emotions about our findings. Based on the five dimensions of national culture by Hofstede, we will explain some of our findings based on the cultural differences.

Professor Geert Hofstede conducted one of the most comprehensive studies of how values in the workplace are influenced by culture. He set up the Hofstede dimensions of national culture, which are:

- Power Distance (PDI)
- Individualism vs. Collectivism (IDV)
- Masculinity vs. Femininity (MAS)
- Uncertainty Avoidance (UAI)

Power Distance “expresses the degree to which the less powerful members of a society accept and expect that power is distributed unequally”. (*Geert Hofstede*) A high score means that

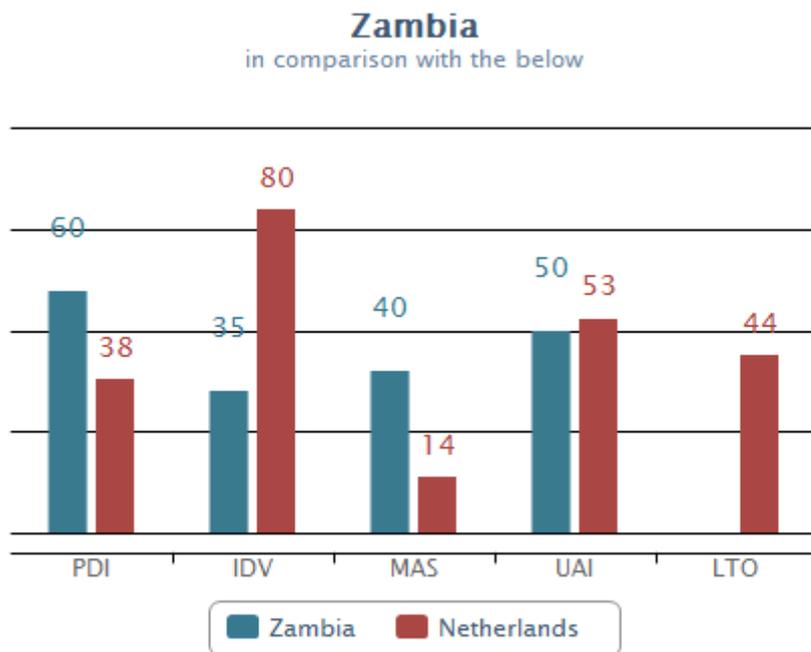
people in a society expect inequalities and a hierarchal order. The graphic (Fig. 3) shows that Zambia has a higher degree of power distance with 60 than the Netherlands with 38.

Individualism “can be defined as a preference for a loosely-knit social framework in which individuals are expected to take care of themselves and their immediate families only”.

Collectivism “represents a preference for a tightly-knit framework in society in which individuals can expect their relatives or members of a particular in-group to look after them in exchange for unquestioning loyalty” (*Geert Hofstede*). A high score means that there is individualism in the society and this means that people reflect to themselves as “I” not as “we”. As you can see in the graphic the Netherlands have a higher individualism score than Zambia.

Masculinity “represents a preference in society for achievement, heroism, assertiveness and material reward for success. Society at large is more competitive” and Femininity “stands for a preference for cooperation, modesty, caring for the weak and quality of life. Society at large is more consensus-oriented” (*Geert Hofstede*).

The fourth dimension Uncertainty avoidance “expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. The fundamental issue here is how a society deals with the fact that the future can never be known.”



*Fig 3: Dimensions of Hofstede Zambia compared to the Netherlands*

Based on our experiences in Zambia we would be able to show examples for all dimensions, but this wouldn't give answers to our research question. So we want to focus on the ones that do.

The high power distance index shows that people in Zambia accept hierarchy more easily than the people in the Netherlands. This means that there is a natural hierarchy between therapist and patient. When the patient is a child, the therapist stands even higher. This might be a possible explanation, why the interaction differs so much from our imaginations. In our culture it is normal to speak and play with a child on his or her level. We do not have the feeling that the child will not respect us in the future when we do. But these aspects have well an influence on the therapy in Zambia.

Zambia is a collective country, which can be seen on a score of 35 on the IDV. This means that families tend together and support each other. What one person does, falls back on the whole family. This low score might be one of the explanations why a lot of disabled children are still held at home. The family accepts that there is a disabled child and takes care of it. They do not want other people to be involved and they do not want to lose their face as a family. There is also the belief, that a disabled child is a punishment for some wrongs they

have done. Accepting the child as punishment, does also mean, that they cannot get treatment for the child, because then they would be interfering with the higher powers that want them to be punished. People without experience with disabled children and the possible treatment are also not sure what to expect from the treatment and might be too ashamed to walk with their child through town to a doctor or therapist.

We also saw a high collectivism during the treatment situation. The physiotherapy department was waiting and treatment room at once. There were always people present and there was no privacy for the patients during the treatment. But none of the patients was bothered by that. Naturally a lot of people also make more noise, which also distracted child and therapist from the treatment.

Zambia also shows a higher masculinity index. When we focus on children, this means that they have to behave all the time. Strict education and discipline are signs of good parenting. Good behavior is when children know when to talk and when to be quiet, and when they won't cry much. This might also be a reason, why we found a lack of interaction in our research. Eddy is a very quiet child and this is a wished behavior in Zambian society. When the therapist would talk to him more often, she might lock out unwished behavior.

#### 5.4 Influence of observer on treatment

We tried our best to maintain the influence of the observer on the treatment as low as possible. We first had an introduction period in which the observer had the chance to get used to the setting. This means that the therapist and the children had the possibility to get used to the observer as well. The observer watched a few treatments of Eddy and Albert before she started filming, so we could be sure, that the treatments were not influenced by the camera. She also treated the children herself, so they were not afraid of her as a new person and as a white person especially.

Even with these precautions we cannot be sure that the observer had no influence. On the first hand, it was very difficult to describe the way of our bachelor thesis to the therapist, because she had no experience with this kind of projects before. She also was not used to being filmed and could not understand the idea, that our research required a lot of computer-work. On the second hand, she gave the feeling that she felt inferior to her intern in the beginning. This might be, because of the different levels of education she had for being a physiotherapist and

what A. Rademacher had. This might have given her the impression that we wanted to judge her, because of her low education.

### 5.5 Recommendations

We strongly recommend that there will be further research done about the physiotherapeutic treatment in the CBR Chifubu and also the other CBR centers in Ndola. We now made a start and laid some basis for further research. We now have the experience about how to set up a research in this Center and we can share it with future students. Through our work we also made obvious were to start and future projects can be built on this start.

In our discussion we already mentioned that we missed the treatment of functional hand movements. We think that the children would benefit from a good introduction into functional hand treatment. This might a good workshop possibility for all the CBR-staff. Our idea was, that that could be realized by either a good-prepared physiotherapy student or an occupational therapy student.

For a further research over the physiotherapeutic care in the CBR center we recommend that a physiotherapist who is specialized in children with cerebral palsy takes part in the research. He could bring in his knowledge and his experiences.

## 6. Conclusion

After our literature review about Children with Cerebral palsy in Zambia we set up the following two research questions:

1. *“What kind of treatment do the children with cerebral palsy receive in Zambia?”*
2. *“What kind of interaction can we identify between therapist and child?”*

Through observations the researchers sought to find an answer on the above named research questions.

In the observations only aspects of the treatment methods were visible. We were not able to define “Why” certain aspects of the therapy were done. On the one hand it is not obvious in the observation to which goal the treatment is made. On the other hand we did not ask the therapist “why” she uses certain techniques during our stay in Zambia. Therefore we are not able to make a judgment about the therapy. But we are able, however, to identify some points from which we assume that these have an influence on the quality of the therapy.

For the first research question different treatment methods were found, namely: Functional Treatment, Constructed Treatment and Facilitation. It is questionable whether the treatment was carried out completely as the literature it purports [2,3,7,18]. The effect of the therapy is also questionable because there were no measurement moments.

In the Netherlands, the physiotherapists are obliged to make a specialized training to be qualified to treat children with cerebral palsy. The CBR therapists just had a short education period of one month. This education was given by a former coordinator of CBR who was a physiotherapist. She educated them on the topic of CP but without any theoretical background knowledge. Accordingly, the quality of the therapy is questionable.

With the guideline “Conceptrichtlijn Diagnostiek en behandeling van kinderen met spastische Cerebrale Parese” which was set up by the “Nederlandse Vereniging van Revalidatieartsen”, the Netherlands have a quality standard to treat children with cerebral palsy. In Zambia there exists no guideline which would provide a standard. In the CBR center the learned techniques form the standard of the treatment.

For the second research question verbal and non-verbal interaction was found. We can't say exactly in how much the interaction is defined by our cultural standards. From our cultural

point of view, we conclude, that there happens less interaction between therapist and child than we would expect.

The disturbances distracted therapist and child during the treatment which had a negative influence on the treatment. The time for the therapy session of the child had to be shared with other things. Therefore we assume that the therapy has a reduced effect.

In our opinion the CBR center would profit from a good educated physiotherapist who is specialized in the treatment of children with cerebral palsy. This therapist should take part in the daily routine of the center and help to improve the care for the children.

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## 8. Appendix

8.1 Table: Participant Observation Type Chart [10]

<b>Type of Participant Observation</b>	<b>Level of Involvement</b>	<b>Limitations</b>
Non-Participatory	No contact with population or field of study	Unable to build rapport or ask questions as new information comes up.
Passive Participation	Researcher is only in the bystander role	Limits ability to establish rapport and immersing oneself in the field.
Moderate Participation	Researcher maintains a balance between "insider" and "outsider" roles	this allows a good combination of involvement and necessary detachment to remain objective
Active Participation	Researcher becomes a member of the group by fully embracing skills and customs for the sake of complete comprehension	This method permits the researcher to become more involved in the population. There is a risk of "going native" as the researcher strives for an in-depth understanding of the population studied
Complete Participation	Researcher is completely integrated in population of study beforehand (i.e. he or she is already a member of particular population studied)	There is the risk of losing all levels of objectivity, thus risking what is analyzed and presented to the public

## 8.2 Data analysis

Main Code	Sub-code	Sub-sub code	Content Sub-subcode	Fragment	Summary
Treatment	Functional treatment	Active	<p>Standing</p> <p>Standing with support of chair</p> <p>Standing on both feet with support of the chair</p> <p>Standing steadily with support of the chair</p> <p>Standing with support</p> <p>Stand securely</p> <p>Standing without support</p> <p>Able to stand with little support</p>	<p>Albert is standing with a chitenge around his body</p> <p>Walks with him a few steps</p> <p>Albert won't stand straight. His feet are secured by Therapist feet but he shifts with his upper body</p> <p>Meanwhile he is standing with his right foot flat on the ground and the left on the lateral side and the front part of his foot. He cries again while standing.</p> <p>He was able to stand on both feet with the support of the chair for a few moments. Now he takes his left leg up and only stands on his right.</p> <p>Albert holds himself steadily on the armrest of the chair. Good and controlled use of arms. Licks at the armrest.</p>	<p>Albert won't stand straight. His feet are secured by Therapist feet but he shifts with his upper body</p> <p>Albert is standing</p>
			<p>Walking</p> <p>Walking with support</p> <p>Walking without chitenge</p> <p>Walking without support of therapists hands Support while walking</p> <p>Walking slower than before</p>	<p>Therapist and Albert start walking. His upper body is leaned forward.</p> <p>Therapist holds his arms to support him for a few steps.</p> <p>Therapist puts a hand on his back, because he still needs more support.</p> <p>Together they walk towards the ball.</p> <p>They start walking towards the ball again.</p> <p>They walk around the ball and Therapist</p>	<p>Together they walk towards the ball.</p>

				<p>kicks it away. Albert sees it and seems to be more interested now that it is moving again.</p> <p>Walking. Therapist supports his feet with her feet.</p> <p>Sets him back on the ground and they start to walk back together.</p> <p>Seems to take no pleasure in walking today. His head is bent down and you can hear him whimpering or sniffing.</p> <p>Walking. Therapist has her hands on his knees and helps him bend his knees and place his feet on the ground.</p> <p>After forced to walk a few steps, Albert manages to bend his knees and wants to sit down. But Therapist pulls him up again and they walk further.</p> <p>Therapist and Albert walk together.</p> <p>They resume walking.</p> <p>Now they go on walking.</p> <p>While walking his arms move in a spastic pattern.</p> <p>Therapist and Albert walk without chitenge.</p> <p>Now they walk back to the big mattress in the first room.</p> <p>Walking is the same. He leans against her legs, she has his heels between her toes and her hands are free.</p>	
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			<p>Sitting on tricycle</p> <p>Sitting</p> <p>Active sitting position</p> <p>Sitting without support</p> <p>Sitting in package position</p> <p>Tries to improve his sitting position</p> <p>Puppy-position</p>	<p>She pulls Eddy up on both arms in a sitting position. His head is not supported.</p> <p>He sits without support of Therapist hands. His arms are resting/leaning on her leg.</p> <p>With both hands/arms on the ball he can sit without the support of her arms.</p> <p>Sitting on tricycle. Therapist rearranges Alberts hands on the handlebar a few times.</p> <p>She has him sitting in a package position (sitting low on knees, head down). Wants him to come up with his head and arms (tactile stimulation). But he isn't able to do that.</p> <p>Therapist and Eddy sit facing each other. Lays one hand against his head and tries to push it slowly in the middle. Pushes her left leg against his right side and pushes him with her hand. First he sat more to his right side and she now tries to improve his position.</p> <p>While they keep on talking, Therapist shifts Eddy again in the right sitting position.</p> <p>She puts him in the puppy-position. First she has to rearrange his legs. During that he stays on his elbows with his head up. She now has his legs fixated under her legs. Pulls him up from his elbows on his hands with extended elbows, extended spine and hips.</p>	<p>He sits without support of Therapist hands. His arms are resting/leaning on her leg.</p> <p>She pulls Eddy up on both arms in a sitting position. His head is not supported.</p>
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			<p>Rolling/turning  Rolling  Bridging  Wants him to lean on his hands  Holds his body actively  Playing a game  Therapy gets more difficult because of less support</p>	<p>Turns Eddy slowly on belly. Turns him back on back, then turns him via his other side on his belly. Tactile stimulation via his legs. Arms and head stay as they are, when he is turned. When he is on his belly she turns him to the same side again, but she remains seated. She can still touch him, but isn't in that close contact as before. Then she turns him back to her as he was lying in the first place. Does it again. This time with a command "Tiye" and "pidivoca" (Lets go, turn). She places him (Eddy) on one side, with his upper leg before the one underneath and motivates him with tactile stimulation to turn by himself. He is coming from side to belly, but she also wants him to run further. But he isn't able to do that. Therapist tries to put his hands flat on the mattress with open hands and extended elbows. Because of his spasm she isn't able to extend his elbows with just one hand and to keep his hands open. She let go of the left hand and uses both hands to work on his right arm. His grandmother comes closer to help her with his left arm. Albert turns on his back with a little help and tactile stimulation from Therapist. Making bridge: Therapist holds his feet and gives compression on his knees. This</p>	<p>Albert turns on his back with a little help and tactile stimulation from Therapist  Turns Eddy slowly on belly.  Turns him back on back, then turns him via his other side on his belly. Tactile stimulation via his legs. Arms and head stay as they are, when he is turned. She places him (Eddy) on one side, with his upper leg before the one underneath and motivates him with tactile stimulation to turn by himself. He is coming from side to belly, but she also wants him to run further. But he isn't able to do that.</p>
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				<p>results in a lift of the pelvis. When she gives the command “Tiye, ima!” (Let’s go! Get up!) he pushes his pelvis actively in the air.</p> <p>Therapist tells Albert to look at me. Wants him to lift his head. Right now he is looking at his feet.</p> <p>When he doesn’t look up, she says “ayy” and shakes his hands above his head. He gives a spastic little jerk.</p> <p>Before Therapist hands supported him to stay leaned against her body. Now she moves her hands slowly away from him. Her feet stay on his feet, but her arms are a bit away from his body.</p>	
		Passive	<p>Pulls head in hyperextension</p> <p>Lifts him up passively</p> <p>Correction in sitting position on tricycle</p> <p>Tries to adjust his body to the right sitting position</p> <p>Correction of head position</p> <p>Lays child down</p> <p>Passive position</p> <p>Passive change in position</p> <p>Change in position without explanation</p> <p>Passive</p> <p>Lying on back</p> <p>Body posture child</p> <p>Adjustment body position child</p> <p>Change in position therapist</p>	<p>Pulls his head too far back. He could see the toys before with his head bent, but now he can’t see them and his head is hyperextended.</p> <p>She pulls Eddy up.</p> <p>She puts Eddy back on his back without explanation/without talking to him.</p> <p>Therapist turns him and places him on his belly on the mattress.</p> <p>She pulls his head up.</p> <p>She places him back in front of the ball.</p> <p>Therapist controls his posture by taking a step back. She has him still secured by the chitenge, but he is able to stand by himself without her being nearby or her hands on his body.</p> <p>Therapist lifts him up and turns with him.</p> <p>Sets him back on the ground and they</p>	<p>Pulls his head too far back. He could see the toys before with his head bent, but now he can’t see them and his head is hyperextended</p> <p>Therapist turns him and places him on his belly on the mattress.</p>

				<p>start to walk back together. She tries to place his feet on the pedals as well, but he is not keeping them there. His head is still hanging low and Therapist pushes it back. Therapist takes him up in her arms, gets the chitenge she left on a chair and comes with him to the mattress. Eddy lies on his back with his legs secured underneath her legs. She pulls him up until he 'stands' on his knees, but just for a short moment. From this position she places him on his belly and secures his legs underneath her legs. Therapist tries to open his hands by sliding them over her legs.... His hands are open now, his head is low. She tries to bring his arms closer to his body. But then his arms seem to flex again. Therapist crosses her arms and secures Eddy's arms on her legs. Therapist first tries to push his head back with one hand, then she takes both hands off his arms to slowly and gently turn his head. She takes his arm in her hands again, but first she secures his head with her underarm against his cheek, so he can't turn his head toward her and it can't drop. She places Albert on his belly on the chitenge. She puts him in the puppy-position. First</p>	
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				<p>she has to rearrange his legs. During that he stays on his elbows with his head up. She now has his legs fixated under her legs. Pulls him up from his elbows on his hands with extended elbows, extended spine and hips.</p> <p>She manages to extend his fingers without letting go of his elbows. She places him back on belly. She tries to place him straight on his belly again with the arms stretched in front of him.</p>	
	Passive movements	Therapeutic target isn't obvious	<p>Passive movements</p> <p>Passive movements legs in sitting position</p> <p>Passive movements lower limbs</p> <p>Circles</p> <p>Passive movements legs</p> <p>Passive movements hips</p>	<p>Starts with passive movements of his lower limbs. First flexion hips. Works in circles.</p> <p>Alternating flexion and extension hips. She fixates his left leg underneath her right leg. Starts with extension right knee and dorsal flexion ankle. Holds his leg in this position.</p> <p>Flexion and extension of knee responsively.</p> <p>Circulations in hip with flexed knee and dorsal flexion ankle. Circulations are done in both directions.</p> <p>Legs are changed. Now the left is moved passively.</p> <p>She starts with circulations in the hip with flexed knee. Seems to have problems to make a whole circle in the beginning. Tries to go as far as possible, then back and tries again until she is able</p>	Starts with passive movements of his lower limbs. First flexion hips. Works in circles

				<p>to make the whole circle.</p> <p>Dorsiflexion ankle with flexed knee and flexed hip.</p> <p>Flexion &amp; extension knee.</p> <p>Extension knee &amp; dorsiflexion ankle</p> <p>Sits with him between her legs. His legs are extended and she makes dorsiflexion with his feet alternately.</p> <p>Puts both feet in dorsiflexion and lifts his extended legs up, while he remains seated (flexion hip). Moves his legs also from left to right. I get more the impression that it is supposed to be a soothing rocking movement, but is has no effect on Albert.</p> <p>Alternating flexion hips.</p> <p>Places him a bit further away from her and starts with extension &amp; flexion of one knee. Secons leg is flexed &amp; extended. Foot in dorsiflexion with extended knee. Second leg in dorsiflexion with extended knee.</p> <p>Therapist is making a passive extension in his hips and spine with flexed knees. Meanwhile Therapist is rotating from left to right and vice versa with his legs.</p> <p>Therapist makes passive hip extension for one leg alternately.</p> <p>Therapist starts with dorsiflexion foot by extended knee and flexed hip.</p> <p>Fast movements in flexion extension hip/knee. Circulations in hips.</p>	
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			<p>Passive movement upper limbs  Passive circulation arm  Passive movements arm  Passive movements of hand &amp; fingers  Compression shoulder</p>	<p>Passive movements hand &amp; finger  She goes on with passive movements of hand and fingers  Flexion and extension elbow with arm in 90° anteflexion. Flexion and extension elbow in front of his face. Maybe she uses some sort of PNF-pattern?  Therapist starts to circulate with Ed's left arm (in shoulder)  Adduction and abduction left arm with flexed elbow.  Circulation and abd/add alternately  His legs are fixated underneath her legs. She stretches his arms out in front of her and tries to put his palms together, then stretches his arms.  She does passive movements with his right hand. She tretches and closes his fingers slowly. She tries to extend (open) his fingers as far as possible. She holds his hand open with her left hand and extends his thumb with her right hand. She makes a passive abduction with his thumb as well.  Circulations thumb. Passive palmar and dorsal flexion hand.  Passive movements of Eddys left arm.  Circulation in shoulder with flexed elbow.  Flexion &amp; extension elbow with abduction &amp; adduction shoulder.  Pattern? Therapist keeps his hands open.  Circulations again. Open hands.</p>	<p>Passive movements hand &amp; finger  Flexion and extension elbow with arm in 90° anteflexion.  Flexion and extension elbow in front of his face. Maybe she uses some sort of PNF-pattern?  Therapist starts to circulate with Ed's left arm (in shoulder)</p>
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				<p>Circulations in shoulder with extended elbow in 90° anteflexion.</p> <p>He lies on belly and Therapist tries to stretch his arms next to his body. When she tries to extend his elbows, his mouth opens and he gives unhappy facial expression. His body stiffens and his pelvis comes up. His head is still resting on the mattress with his face to the right. She tries it a few times very slowly and gentle, but his body remains very stiff. She is able to almost stretch his arms when his face is in the middle. When she then stretches his arms, his body stiffens, his pelvis comes up and his face is in the mattress. She releases his arms and he is able to move his head again.</p> <p>(belly)He goes on struggling with her, when she takes his arms in retroversion, dorsiflexion hands and gives compression in his shoulders. Tries to flex his arms and moves frantically with his head.</p>	
			<p>Passive movements pelvis</p> <p>Passive movements spine while sitting</p> <p>Passive movements in sitting position</p> <p>Rotations</p> <p>Frequency in passive movements increases</p> <p>Pattern?</p>	<p>Rotation spine. Just fixation on knees, not on upper body. Eddy is rolling with the movement of his legs. I would say, just minimal rotation spine.</p> <p>Places his feet on underground and gives compression on his flexed knees. She gives no command that he needs to help her put his pelvis up. Pulls his pelvis up, by putting one hand underneath it. His spine extends when he is pulled and also</p>	<p>She pulls his spine in extension with her hands in his armpits. She does it a few times. In between she puts his body back in a straight position. Head is still leaning backwards. She keeps her hands in his armpits, but now she makes a lateroflexion with his spine. During this his head falls</p>

				<p>his scapulae lose contact with the underground. His body is resting on the back of his head, which seems to be hyperextended. Movements with hip/back again. Circulations in hips and rotations spine.</p> <p>She starts to give pressure on his pelvis and a light shake on both sides. She puts her hands underneath his shoulders and his sternum and pulls him up, while her legs are secured underneath her. She pulls until his spine is extended. She takes his hands in her hands and pulls them up. His head falls in hyperextension. She holds his hands up in 90° anteflexion and flexed elbows. His head is not really falling anymore, but still bent backwards. She pulls him toward her on his arms. But his legs are still underneath her. His hips flex and his back extends. His head is still too much backward.</p> <p>She pulls him up another time. Now she gives little shakes at his hands. His head still isn't controlled.</p> <p>She makes sounds while she moves his hands up and down and in adduction/abduction</p> <p>She pulls his spine in extension with her hands in his armpits. She does it a few times. In between she puts his body back in a straight position. Head is still leaning backwards.</p>	<p>forward. Extension spine again. Now his head is leaned forward and seems to be able to control it.</p>
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				<p>She keeps her hands in his armpits, but now she makes a lateroflexion with his spine. During this his head falls forward. Extension spine again. Now his head is leaned forward and seems to be able to control it.</p> <p>Rotations spine.</p> <p>She starts to rotate with his pelvis while he is lying down</p>	
	Facilitation	Physical facilitation	Assistance by a task the child can't do himself (pulling up pants, cleaning face etc.)	<p>His pants are too long and big. Therapist has to pull them up and secure them.</p> <p>Saliva drops from his mouth. Therapist releases his arms to get the chitenge to clean his face.</p> <p>Chases the flies away that threaten to sit on his face.</p> <p>Therapist rolls up his pants.</p> <p>Therapist cleans his mouth and nose with the chitenge.</p>	
			<p>Correction</p> <p>Correction of feet</p> <p>Passive correction</p> <p>Correction of feet</p> <p>Correction has no effect</p>	<p>Therapist places his feet on the floor and secures them with her own feet.</p> <p>She stops, places his feet right on the ground and secures them with her feet.</p> <p>Therapist places his feet one for one towards the ball.</p> <p>Therapist corrects him when his legs cross. Says "awe" which means "no" and points to the ball, so he sees where he is meant to be going.</p> <p>When he places his feet, he only places them on the lateral side and in</p>	<p>She stops, places his feet right on the ground and secures them with her feet.</p>

				<p>dorsiflexion. Therapist helps him to uncross his feet another time. He mostly seems to walk on his toes, even when Therapist tries to correct his feet with her feet. Places his feet right on the floor. Therapist needs to place his feet a few times. He is only standing on his left leg. He is flexing his right leg. Therapist tries to place his foot again, but again it flexes. Helps him back to the chair and places his feet again. He was able to stand on both feet with the support of the chair for a few moments. Now he takes his left leg up and only stands on his right. Therapist places Albert's foot back on the floor while talking to mother. Albert isn't standing "above" his legs. He is pulling up his left leg and moving his hands on the armrest. That isn't helpful for his balance. Therapist supports him more and places his feet again underneath his body (2 times)</p>	
			<p>Support Support while walking Supports his steps Supports movement Therapist supports child more Therapist loses supporting</p>	<p>She pulls Eddy up on both hands in a sitting position. Head is not supported. ...she isn't holding Eddy that strongly. ... and Eddy's hands aren't resting on her legs any longer. Therefore his back goes from a flexed position in a straight</p>	<p>While Therapist shifts Eddy's sitting position she supports his head with her left arm. For a short moment she lets go of his head, but he can support it himself. In this time she</p>

			<p>contact  Change in way of support  Head is not supported  Lack of support  More support in sitting position  Supports head  Head not controlled</p>	<p>position and his head falls back.  Then moves with him in another sitting position, so that he can lean with his back against her flexed knee.  While Therapist shifts Eddys sitting position she supports his head with her left arm. For a short moment she lets go of his head, but he can support it himself. In this time she supports him by his arms and puts him in the sitting position. She supports his head and keeps it from moving. Supports also his upper body with her other arm.  Therapist supports his arm to reach for the ball while saying "oku", but he isn't able to grab the ball neither seems he interested to do so.  Therapist tries to support him by putting her hands in his armpits. The effect isn't good.  She uses one hand to arrange the bricks and the other to hold him. She holds his hand, not his entire body. His arm is stretched. He seems to 'hang' on his arm. Therapist tucks his heels in between her toes and helps him to lift his feet and make a step. Otherwise his legs would cross and he wouldn't be able to lift his feet.  Walking. Therapist supports his feet with her feet.  His head is still hanging low and Therapist pushes it back.</p>	<p>supports him by his arms and puts him in the sitting position. She uses one hand to arrange the bricks and the other to hold him. She holds his hand, not his entire body. His arm is stretched. He seems to 'hang' on his arm.  Therapist takes his heel between her big toe and her second toe and is so able to direct his feet for a bit. His legs don't cross anymore, but he still places them very close to each other</p>
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				<p>She helps him place his arms in front/ 90° abduction and flexion elbow. Like that he is able to lean on his arms and keep his head up.</p> <p>Therapist supports him with a chitenge around his waist. She helps him moving his feet. He is able to get up his leg, but not his foot.... Walks only on the lateral side of his feet. Therapist supports him and sets his legs straight.</p> <p>Therapist supports him and places her legs behind his body and sets his feet right again.</p> <p>Therapist takes his heel between her big toe and her second toe and is so able to direct his feet for a bit. His legs don't cross anymore, but he still places them very close to each other.</p> <p>Therapist helps him and places his foot right.</p> <p>She supports his legs now with every step. This is more support than in the beginning.</p> <p>A chair is standing on his left side and he grabs for it and uses the chair to support himself while he turns towards the chair. Therapist follows his movements. Places his feet right on the floor.</p> <p>When he gets excited his legs cross heavily and Therapist needs to uncross them first.</p> <p>Albert leans his body against Therapist legs. She has his heel between her toes</p>	
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				<p>and his hands in her hands.  She helps him not to cross his feet.  Therapist puts one hand lightly on his shoulder. Si he can't fall forward.  With one foot Therapist loses contact to Albert's foot. He feels that and grabs the armrest of a chair for support.  Therapist puts his heel back between her toes.  The first few steps they walk without his heels between her toes. During that he needs to be hold and his feet need to be supported when he places them on the floor.  While Therapist put his heels back between her toes, Albert was able to stand without support. Therapist hands were within reach, but there was no need to touch him.</p>	
			<p>Fixation  Fixation of feet  Fixation of limbs in sitting position</p>	<p>His legs are fixated underneath her legs.</p>	
			<p>Stimulation to touch things  Tactile stimulation  Physical and visual stimulation to use hands</p>	<p>Stimulates Albert to touch the toys on the car.  She stimulates him shortly to hit on the ball with his hands/do something with his hands.  She let go of one hand and stimulates him to touch the bricks.  She places him on one side, with his upper leg before the one underneath</p>	<p>She places him on one side, with his upper leg before the one underneath and motivates him with tactile stimulation to turn by himself. He is coming from side to belly, but she also wants him to run further. But he isn't able to do that.</p>

				<p>and motivates him with tactile stimulation to turn by himself. He is coming from side to belly, but she also wants him to run further. But he isn't able to do that.</p> <p>She has him sitting in a package position (sitting low on knees, head down). Wants him to come up with his head and arms (tactile stimulation). But he isn't able to do that.</p> <p>She uses tactile stimulation again to get his head up.</p>	
			<p>Playing Pointing Demonstration Guiding Demonstration of kicking ball Directs his feet Help Direction Facilitation in sitting position</p>	<p>Then she points to a ball laying in front of them on the ground and gives the command "tiye" (Let's go!)</p> <p>Therapist stands up and walks behind Albert. Points on the ball again.</p> <p>Therapist kicks the ball away with her right foot.</p> <p>They walk around the ball and Therapist kicks it away. Albert sees it and seems to be more interested now that it is moving again.</p> <p>They are playing a sort of peek-a-boo. Albert turns his head from left to right and Therapist looks at him on either side and says his name. Both laugh and have fun. He giggles especially when Therapist says his name in a rough whisper.</p>	<p>They are playing a sort of peek-a-boo. Albert turns his head from left to right and Therapist looks at him on either side and says his name. Both laugh and have fun. He giggles especially when Therapist says his name in a rough whisper.</p>

		Precaution	Precaution Security	<p>Stands behind Albert and has him secured by the chitenge.</p> <p>Tries to clap on the armrest. Looses his balance, but Therapist catches him while he is still standing. Fastens the chitenge again after that.</p> <p>Therapist arms don't touch him, but she holds them nearby.</p> <p>Therapist secures Albert with one hand against her legs.</p> <p>Therapist secures Albert with both hands.</p>	Therapist secures Albert with one hand against her legs.
		Use of aids	<p>Chitenge used as aid to stand</p> <p>Chitenge used as aid to support him while walking</p> <p>Chitenge used for padding</p> <p>Shaking with the chitenge to comfort him</p> <p>Cleans his face with the chitenge</p>	<p>Then she points to a ball laying in front of them on the ground and gives the command "tiye" (Let's go!)</p> <p>She needs to arrange the chitenge on which they are sitting.</p> <p>Stands behind Albert and has him secured by the chitenge.</p> <p>She rearranges the chitenge around Albert.</p> <p>Therapist gives little shakes/jumps with the chitenge to comfort him. But he won't stop crying.</p> <p>Therapist cleans his mouth and nose with the chitenge.</p>	
			<p>Ball used as aid to get his attention</p> <p>Toy car used as aid to focus his attention on sth else</p> <p>Lego bricks used as an aid to get his attention</p>	<p>Hits two lego pieces together so that they make noise in front of Eddy. First he keeps looking at Therapist, but then he realizes that something is happening. He looks at the bricks, but they don't seem high enough. He doesn't need to lift his head to see them. In between he looks</p>	

				<p>back at Therapist, but she doesn't respond to his view.</p> <p>Therapist loses her hand on his sternum and reaches to get a green ball with faces on it.</p> <p>She moves the ball in front of him. First up and down, then left and right.</p> <p>There are two balls lying nearby and she places them in front of Albert's face. First Albert is just looking at the ball. Albert realizes that there are balls lying in front of him. Tries to touch the first, but pushes it down from the mattress. He seems to tell the ball to come back.</p> <p>Playing with the second. Lays his hand carefully on rolls around with it.</p>	
			<p>Ball used as aid to lock out movement</p> <p>Lego bricks used as aid</p> <p>Sitting on tricycle</p> <p>Hand puppet</p> <p>Child uses chair to support himself</p> <p>Support from chair</p> <p>Aid</p> <p>Inventory</p>	<p>She uses one hand to arrange the bricks and the other to hold him. She holds his hand, not his entire body. His arm is stretched. He seems to 'hang' on his arm.</p>	
	Disturbances	Conversations	<p>Conversation with other person</p> <p>Question towards other people</p> <p>Therapist listens to conversation between other people</p> <p>Conversation with observer</p>	<p>Therapist is talking to other person.</p> <p>Bana Chuchu: "Iwe", makes Therapist focus on Junior, who plays with his grandmother.</p> <p>Therapist asks the grandmother a</p>	<p>Therapist and Bana Chuchu talk (I think, Therapist forbids her to use the stick on Chuchu)</p>

			<p>Greets other patient  Conversation with mother  Noise/Talking in background  Shouting towards other people  Tries to calm screaming child down  Therapist stops other woman from hitting her child  Conversation between therapist and mother of screaming child  Discussion therapist and employee  Conversation between Therapist &amp; John</p>	<p>question. Answer is three. So I think they talks about the age of Junior.  Therapist, Bana Chuchu and Grandmother talk. I think still about the age of Junior.  Bana Chuchu says something. Probably something sad, because of the reaction of Therapist.  Other woman also takes part in the conversation (still something sad assumed from the way they speak)  She asks a question about Cesco.  Talks with the other women (still serious topic from the way they talk)  While she stretches his arm, her attention is back on the grandmother who says something.  Therapist smiles at something Bana Chuchu says and gives an answer.  Starts to talk to John and looks at him.  He is standing in the door, which is a few meters to her right side.  Therapist listens to a conversation between John and one of the students.  I asked Therapist in the video if he was sick before and she tells me yes. She doesn't know the sickness that he had. (Gerstenkorn? "Small painful ball on the eye"). Therapist greeted another patient during our conversation. She says that he is still in pain and this might be an explanation for his bad mood/the crying.  John comes in and asks something. She</p>	
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				<p>gives him a short answer without pausing the treatment.</p> <p>Grandmother says something to Therapist I can't understand and Therapist answers her.</p> <p>Therapist says something to the grandmother I can't understand.</p> <p>John comes into the room and says something to Therapist. She listens to him and gives signs of understanding (nods, "hmh")</p> <p>The grandmother says something and Therapist looks at her. Bana Chuchu also joins the conversation.</p> <p>Therapist and John talk. Therapist turns her body halfway to face John.</p> <p>She talks to John again.</p> <p>Therapist places Albert's foot back on the floor while talking to mother.</p> <p>Therapist and I both greet the incoming husband of one of the stroke patients.</p> <p>The man says something else and she stops in her motions shortly to look at him and answer.</p> <p>Therapist talks to me and I answer.</p> <p>Therapist talks to the mother of Albert. I think that she tells her, that she walks with him without her arms on his body.</p> <p>She goes on talking to the mother. I assume that she praises Albert. You can hear that someone answers, but I can't identify the voice and I can't understand what they are saying. Their voices are</p>	
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				<p>drowned out by the screaming of Chuchu.</p> <p>Bana Albert says something from behind on the mattress. Therapist makes an approving sound (mhm)</p> <p>Therapist starts to talk to me.</p> <p>Therapist "shouts" something back. She says something about Chuchu.</p> <p>Therapist and Bana Chuchu talk (I think, Therapist forbids her to use the stick on Chuchu)</p> <p>John and Therapist seem to start a discussion.</p>	
		Noise	<p>Crying of other child</p> <p>Crying of other child stops</p> <p>Crying of other child gets harder</p> <p>Crying in background</p> <p>Screaming of other child</p> <p>Noise screaming towards other people</p> <p>Other child runs into room</p> <p>Screaming child tries to run and hide</p> <p>Junior squeals</p>	<p>Raphael goes back with his baby-car and starts crying.</p> <p>Raphael still cries.</p> <p>When Raphael sees me (observer) he stops to cry astonished, but then starts to cry even harder. (Afraid of skin color)</p> <p>Junior squeals. Not sure if it is from delight or if he is bored.</p> <p>Junior is crying in the background.</p> <p>You can hear another child crying in the background.</p> <p>In the background you can hear Junior talk and see him climbing on a chair.</p> <p>You can hear noise/childrens voices in the hall.</p> <p>You can hear Chuchu crying loudly in the hall/somewhere in the building.</p> <p>You can hear Bana Chuchu talking in the</p>	<p>You can hear Chuchu crying loudly in the hall/somewhere in the building.</p>

				<p>background.          Their voices are drowned out by the screaming of Chuchu.          You can still hear Chuchu scream.          In the background you can still hear people talking.          Chuchu screams louder.          Chuchu runs into the room.          Chuchu stands before Therapist and Albert facing the door. She pats his back and tries to calm him. The whole time she has one hand on Albert.          Bana Chuchu walks into the room.          Chuchu runs past them to the back of the room. Therapist stops Bana Chuchu, who is holding a stick, from running after her child. Chuchu runs in the back, where some training tools stand and climbs them.          John follows Chuchu and takes him in his arm. He still screams but not as before.          John takes him outside the physio-department and he starts to scream more.</p>	
		<p>Pause in treatment</p>	<p>Pause/stop in treatment because therapist needs to arrange her clothes          Pause/stop in treatment          Pause in treatment because of conversation with other person          Pauses the treatment for him to</p>	<p>While they talk, Therapist keeps Eddys hands in her hand, but stops the movement.          When she says sorry she pauses the treatment to look at Bana Chuchu.          Therapist looks straight ahead in the mirror to communicate with the other</p>	

			calm down	woman, who stands behind her in the door. During the conversation Therapist and Albert stand, not walk. Therapist pauses the movement for a bit, waiting for him to calm down. He takes two steps, then pauses to smile at the people watching him and to look around.	
		Stress	Stressed situation Therapist seems to be stressed or tired	Whole situation seems to be stressed. (Therapist seems to be stressed, a lot of people around, Raphael crying, Albert starting to cry now and then...) She rubs her eyes and her face. Seems to be stressed or tired.	Whole situation seems to be stressed. (Therapist seems to be stressed, a lot of people around, Raphael crying, Albert starting to cry now and then...)
	activities Child		Active movements by Eddy himself Eddy supports head himself Active hand movements by Eddy himself Active support head Needs to support himself Head brought back from hyperextension actively Seeks support for himself Reaching Exploring Child is able to move his arms and keep his balance Leaning on arms Stop in treatment results in	Eddy is lying on his back... He is moving slowly with his left arm. Touches his head. Eddy on back looking around, some small movements with his hands. While his arms are stretched and fixated by Therapist he is able to hold his head up and focus her. Eddys back can't lean on her leg now. He needs to support himself. His hands move around freely, but without a goal. It seems that he tries to support himself on Therapist leg. Eddy moves his left arm through the air and rests it on his forehead. Places it in	

			<p>active head movements Spasticity effects therapy</p>	<p>his mouth. Eddy is staring at the ceiling and slowly moving his hands, which are flexed on the elbows and the underarm is in the air. His other leg is moving and kind of kicking against her hand. Voluntary or involuntary movement? His way to say, that it is painful? His left hand fingers move (open and close) It seems that he tries to touch Therapist arm first and then her t-shirt. But he isn't able to reach it. He looks at his fingers which open and close slowly. He brings his hands closer to his face. Seems to be very concentrated on his task. Licks at the armrest. Tries to clap on the armrest. Loses his balance, but Therapist catches him while he is still standing. Fastens the chitenge again after that. He tries to look behind Therapist where his mother and Eddy &amp; grandmother are sitting. Now everything is fine again, because now he is attracted to the side of the mattress and he touches it from his position. He is reaching for things inside his range. Albert lifts his head up and looks at her. Albert babbles and looks around. Reaches his hands in the air and touches</p>	
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				<p>them.</p> <p>Albert babbles and reaches again. He is able to move his arms and to remain standing.</p> <p>With one foot Therapist loses contact to Alberts foot. He feels that and grabs the armrest of a chair for support.</p>	
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Main Code	Sub code	Sub-sub code	Inhalt Sub code	Fragment
Interaction therapist-child	Verbal	Attention	<p>Talking to child</p> <p>Calls name of other child</p> <p>Tries to get his attention</p> <p>Attentiveness</p> <p>Tries to focus his attention on sth else</p> <p>Tries to get his attention by calling his mother</p> <p>Tries to lay focus on sth else with no</p>	<p>Says the name of the child "Raphael" a few times.</p> <p>Therapist says Raphael's name again and points to him for Albert to see.</p> <p>Therapist talks to Eddy.</p> <p>Therapist says: "Baby! Baby Junior!" First to Eddy, then to Junior.</p> <p>Speaks softly to Eddy.</p> <p>Therapist turns her attention back to</p>

			<p>effect</p> <p>Tries to get his attention by saying his name</p> <p>Tries to get his attention with the use of her voice</p> <p>Tries to keep his attention</p> <p>Tries to get his attention by shaking him</p> <p>Use of language to get attention</p> <p>Greets him.</p> <p>Seeks his attention</p> <p>Says his name</p>	<p>Eddy and tells him "Hi".</p> <p>She talks to him. Says "Eddy" and he looks right up to her. Says his name a few times and smiles at him. He tries to keep the eye-contact, but his head goes slowly down.</p> <p>Says his name again.</p> <p>Tries to get his attention. It is still fixed on the playing Junior. She says "eyyy" and pulls him up on his arms. Says "ahh" when he is sitting up.</p> <p>Therapist starts to talk to him in baby language. He seems to focus his attention more on her and stops crying.</p> <p>Therapist turns his attention to a tricycle. He stops crying.</p> <p>Does not want to look up. When Therapist calls for his mother, she stimulates him thereby to lift his head. He looks up straight and he looks up at her. After she is done he turns his head back low. Therapist restarts calling for his mum again, but he doesn't react to it this time. He screams and fights against Therapist. She first tries to lay his focus on something else, but now she seems to wait for him to calm down.</p> <p>Therapist tries again to get his focus on something else but it is no good. He looked up once but he keeps on crying/screaming.</p> <p>Therapist gets her face closer to Eddy and says "eyyy" .</p>
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				<p>She talks to him quietly in Bemba. He responds by pulling his head up and looking at her. She goes on talking to him. His head stays up.</p> <p>She starts to talk to him again. Asks him how he feels. (Mulishani ,baby? How are you?)</p> <p>She asks him again how he feels and asks him to tell her something (in english, maybe just for camera?)</p> <p>Therapist says “eyyy” to get his attention, but he is still focused on his hands.</p> <p>When she gives his body a little shake his head comes up a bit more and he looks at her. Then she shakes ah second to long and he can’t keep his head up and it falls back. She says “ahh” when his head falls back.</p> <p>Therapist says: “Mama, Mamie!” The mother of Albert and Eddys grandmother sway to him and he let go of the armrest and tries to turn.</p> <p>She keeps talking to him while she is sitting above him.</p> <p>Therapist says his name with a loud voice. He seems a bit startled by that because his focus was still on me. When she says it a second time he answers with baby-talk and smiles all over his face.</p> <p>Therapist gives him answers (to Baby-talk)</p> <p>Therapist says “eyy” and shakes him a bit. Now they are “talking” again</p>
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				Therapist says his name again in her rough whisper voice and gives his body a little shake. He gives his happy little jerk.
		Therapy purpose Command	Command Commending Talking Commending vigorously Asks him to do sth. No command	<p>She gives him commands. Saying “oku” in a loud voice.</p> <p>Therapist gives commands to Albert (“Tiye”)</p> <p>Then she points to a ball lying in front of them on the ground and gives the command “tiye” (Let’s go!)</p> <p>Gives the command: “Tiye, Albert!”</p> <p>She keeps on talking to him. Says “Oku”, which means something like “go on!”</p> <p>“Come on”</p> <p>She talks to him, says “oku”.</p> <p>Therapist supports his arm to reach for the ball while saying “oku”, but he isn’t able to grab the ball neither seems he interested to do so.</p> <p>Therapist commands Albert to kick the ball: “Tiye! Tiye! Tiye!”</p> <p>Therapist corrects him when his legs cross. Says “awe” which means “no” and points to the ball, so he sees where he is meant to be going.</p> <p>Therapist wants him to go on. Says “Tiye” again.</p> <p>He keeps on crying. She commands him more vigerously.</p> <p>She gives no command that he needs to help her put his pelvis up.</p> <p>Does it again. This time with a command</p>

				<p>“Tiye” and “pidivoca” (Lets go, turn).  By every step she says “Tiye”.  Therapist asks him to step away from the chair and walk with her again.  Therapist tells him to stand back straight (imminina)  Therapist has to say “tiye” more often and Albert starts to make sounds of frustration.  Meanwhile she tells him, that he has to lay this way (“so”)  Making bridge: Therapist holds his feet and gives compression on his knees. This results in a lift of the pelvis. When she gives the command “Tiye, ima!” (Let’s go! Get up!) he pushes his pelvis actively in the air.</p>
		Motivation	<p>Motivation  Approval  Counts every step aloud  Encouraging  Praise  Approving sounds with every step  Cheering during movement</p>	<p>Therapist says something to him (sth. With imminina (sit) and mwuena (good). Could be approval.  She talks to him and it sounds like motivation. Then saying his name again loud and cheerful.  She motivates him through talking and smiling. Also rolls the ball through his feet and he follows it with his eyes.  Therapist makes a sound of approval. Thereby she counts every step.  Therapist tells him that he is a good boy (today)  Praises his work today and takes him up.  With every step she says something (like</p>

				<p>“hey”)  She claps her hands in front of his face and says: “yeah, Albert is walking! Clap for Albert!” Albert smiles when he hears that.</p>
		Soothing	<p>Soothing use of language  Soothes him  Tries to calm him down with the help of his mother  Uses toy-car, hand-puppet and language to calm him down with no effect  Tries to calm him down by talking but with no effect  Cheering-up</p>	<p>When he won't stop, Therapist stops the shaking and rubs his back and says “sorry, sorry, sorry”.  She does it very gently and talks with him as if to test if he would start crying again. He calms down on her arm. She talks to him, saying: “Baby, baby”. Uses a loud cheerful voice.  Therapist asks his mother to come sit next to them, so Albert can see her and maybe calms down.  His mother tries to get his attention and to stop him from crying with the red car. Therapist sets him back between her legs. Tries again with the red car, talks to him and uses a hand puppet to keep him from crying. But he still goes on with screaming and fighting.  She hands him over to his mother, who has now the hand puppet.  She makes fun of it in a positive way.</p>

	Non-verbal		<p>No reaction towards child  No smiling  Smiling  No eye-contact  Silence  Works in silence  No talking  No interaction  No close contact</p>	<p>Therapist pays him no mind and goes on talking  In this moment he looks at Therapist, but she isn't looking back.  Therapist focus is back on Eddy. Not talking or smiling to him.  No interaction. Therapist works in silence. She works concentrated on her task in silence. Looks only at his hand.  Therapist hasn't talked to Eddy yet. Isn't really looking at him.  No verbal or nonverbal interaction between Therapist and Eddy.  Eddy's head still seems to be hyperextended. He isn't able to put it right by himself. Therapist just pays attention to what she is doing right now. His other leg is moving and kind of kicking against her hand. Voluntary or involuntary movement? His way to say, that it is painful? He is not making a sound. Therapist doesn't react to his kicking.  She can still touch him, but isn't in that close contact as before. Then she turns him back to her as he was lying in the first place.  Therapist is working in silence. Concentrated on her task.</p>
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			<p>Demonstration  Waits for him to calm down  Rocking movements  No calming effect  Shaking/shakes his body  Eye-contact  Concentration  Shakes his body  Clapping  Secures child  Stimulation for active movements  Both laugh  Holds eye-contact during movement  Nodding  Makes sounds during movement  Close contact  Communication via facial expression</p>	<p>She goes back and forth with her head while she says his name.  They both look at each other and laugh while he is in an upright position.  Also rolls the ball through his feet and he follows it with his eyes.  Therapist corrects him when his legs cross. Says “awe” which means “no” and points to the ball, so he sees where he is meant to be going.  Therapist gives little shakes/jumps with the chitenge to comfort him. But he won’t stop crying  When he won’t stop, Therapist stops the shaking and rubs his back and says “sorry, sorry, sorry”.  He screams and fights against Therapist. She first tries to lay his focus on something else, but now she seems to wait for him to calm down.  Therapist tries if he would stop crying when she lays him on the ground, but he keeps on screaming and kicks out.  Puts both feet in dorsiflexion and lifts his extended legs up, while he remains seated (flexion hip). Moves his legs also from left to right. I get more the impression that it is supposed to be a soothing rocking movement, but is has no effect on Albert.  She moves her head slightly to her left and he follows her with his eyes. Leans a bit down so that he can look in her eyes</p>
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				<p>easily.  She nods at him.  By pulling him up she uses sounds.  She makes sounds while she moves his hands up and down and in adduction/abduction.  They lock eyes.  They keep on looking into each other's eyes.  But he keeps on looking on Therapist, even when fully rotated (head is still turned towards Therapist) He makes sounds when he is turned and smiles at me when he sees me and his grandmother. During the turn, when he can easily look at Therapist, he looks at her.  He keeps his head up for a few moments and looks at her. She also looks at him and comes closer with her head.  Therapist brings her face closer to his face and makes wide eyes.</p>
	Reaction towards child		<p>Reacts with use of language to his movements  Rubs his back to comfort him  Soothes him  Tries to focus his attention on sth else  Gentle movements  Soothing use of language  Therapist answers to baby-talk child  Patience  No acknowledgement when he does</p>	<p>His head is still up, without anybody acknowledging it.  Therapist tells him "awe", as if to tell him that he needs to wait.  When he won't stop, Therapist stops the shaking and rubs his back and says "sorry, sorry, sorry".  She does it very gently and talks with him as if to test if he would start crying again.  When she gives his body a little shake his head comes up a bit more and he looks at</p>

			<p>something good</p> <p>Voice used to show disappointment</p>	<p>her. Then she shakes a second to long and he can't keep his head up and it falls back. She says "ahh" when his head falls back. Albert babbles, says "oga". Therapist answers him and says: "Tiye! Oga"</p> <p>The whole time during his exploration Therapist waits patiently without saying anything.</p> <p>Albert tries to turn and look at her. Therapist looks at him as well, making wide eyes.</p>
	Focus therapist		<p>Attention changes between Eddy and other person</p> <p>Shift in eye-contact from child to other person</p> <p>Shift in attention from child to other person</p> <p>No attention towards child</p>	<p>Therapist changes her attention between Eddy and his grandmother. When she asks something she looks at her, otherwise at Eddy.</p> <p>Focus of her hands is on Eddy and she goes on with his treatment. Most of the time she also looks at him. But she listens to the conversation around her and her eyes are often on the speaker.</p>
Interaction child-therapist	Action		<p>Crying</p> <p>Fighting</p> <p>Screaming</p> <p>Baby-talk</p> <p>Smiles at other people</p> <p>Attention child towards other people</p> <p>Child squeals</p> <p>Sounds of discomfort/annoyance</p> <p>Sounds of excitement</p> <p>Exploration</p> <p>Curiosity</p> <p>Looks around</p>	<p>Starts screaming and fighting against the chitenge.</p> <p>He looks up at her.</p> <p>Albert babbles, says "oga". Therapist answers him and says: "Tiye! Oga"</p> <p>He squeals.</p> <p>Albert starts to make sounds of discomfort/annoyance. Might start to cry.</p> <p>Sounds of discomfort from Albert.</p> <p>Albert babbles.</p> <p>After he pushed himself up he starts crying again after a few moments and reaches forward with his hands. His hands</p>

			<p>Gaze Smiles at people watching him Seeks eye-contact Unhappy facial expression Eddy</p>	<p>move as if they would do when he would crawl. Is looking on something in front of him. Albert tries to turn and look at her. Therapist looks at him as well, making wide eyes. Albert makes sounds while he looks at her. Albert looks now straight ahead and smiles. Seems to be proud.</p>
	Reaction on stimulus	Positive	<p>Curiosity Response to motivation Response Response towards people around Response to command Response of his body to his task (spastic jerk) Grabbing He kicks the ball Stops crying Calms down on her arm Responds to be being asked to do sth. Responds to command Realization Answers towards verbal stimulus Smiles Proud Positive reaction of Eddy Eddy smiles/laughs Both laugh Child reacts to environments (person) Reaction to voice</p>	<p>Eddys focus immediately goes back to Therapist. When Eddy sees the ball moving in front of his face and gets a second to realize what it is, he gives a little jerk as a sign of his excitement. His eyes focus on the ball, he is able to support his head for a moment by himself and his hands make a motion towards the ball. He also smiles/makes his happy face. When he is in an upright position he smiles/laughs. They both look at each other and laugh while he is in an upright position. Albert is still standing with his weight on his right leg and tries to flex and lift his left leg to kick the ball. This isn't working. He kicks the ball for a second time. Again his weight is on his right leg and the left is moving. This time he kicks with a more extended than before and more flexion in hip. It is more a kicking movement than before. Therapist starts to talk to him in baby</p>

				<p>language. He seems to focus his attention more on her and stops crying.</p> <p>He calms down on her arm.</p> <p>He looks up at her. Follows her with his eyes, when she takes her head back and sits back straight.</p> <p>She talks to him quietly in Bemba. He responds by pulling his head up and looking at her. She goes on talking to him. His head stays up.</p> <p>Eddy smiles.</p> <p>But he keeps on looking on Therapist, even when fully rotated (head is still turned towards Therapist) He makes sounds when he is turned and smiles at me when he sees me and his grandmother. During the turn, when he can easily look at Therapist, he looks at her.</p> <p>Looks up at Therapist and gives a little squeal.</p> <p>Therapist says: "Mama, Mamie!"The mother of Albert and Eddys grandmother sway to him and he let go of the armrest and tries to turn.</p> <p>He makes sounds of excitement. Wants to go to his mother.</p> <p>Albert and Therapist "talk" the whole time.</p> <p>First he doesn't like that, but when he realizes what she wants him to do, it is okay.</p> <p>There are two balls lying nearby and she</p>
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			<p>places them in front of Albert's face. First Albert is just looking at the ball. Albert realizes that there are balls lying in front of him. Tries to touch the first, but pushes it down from the mattress. He seems to tell the ball to come back. Playing with the second. Lays his hand carefully on rolls around with it.</p> <p>Making bridge: Therapist holds his feet and gives compression on his knees. This results in a lift of the pelvis. When she gives the command "Tiye, ima!" (Let's go! Get up!) he pushes his pelvis actively in the air.</p> <p>Therapist says his name again in her rough whisper voice and gives his body a little shake. He gives his happy little jerk. She claps her hands in front of his face and says: "yeah, Albert is walking! Clap for Albert!" Albert smiles when he hears that.</p> <p>When she shouts Albert fist looks startled, but then he looks in her face and smiles.</p>	
		negative	<p>Whimpering Pushes himself up Crying sniffing no reaction pushing fighting kicking dis-like</p>	<p>From this Albert starts whimpering again. Albert whimpers again.</p> <p>Eddys doesn't react to her short stimulation. She seems to lose the interest and puts the ball away.</p> <p>As before he doesn't reach for the bricks. Albert whimpers and tries to fall backwards against Therapist legs. Tired? He keeps on crying. She commands him</p>

			<p>reacts with whimpering discomfort no response</p>	<p>more vigorously. He cries again while standing. He keeps crying. Pushes himself up. Whimpers quietly with each step. Seems to take no pleasure in walking today. His head is bent down and you can hear him whimpering or sniffing and his arms move spastically. He crosses his feet while walking and can't go any further. He tries to get his legs free by pushing himself forward. He gives little spastic jerks with his body. Starts to cry heavily. After she is done he turns his head back low. Therapist restarts calling for his mum again, but he doesn't react to it this time. He starts to cry again while walking. His upper body and head go down again. He screams and fights against Therapist. She first tries to lay his focus on something else, but now she seems to wait for him to calm down. He looked up once but he keeps on crying/screaming. When she sits down with him on the mattress he starts crying again. He starts fighting against Therapist even more and pushes himself up again. The change of position makes no difference to Albert and he keeps on screaming. Therapist tries if he would stop crying</p>
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				<p>when she lays him on the ground, but he keeps on screaming and kicks out. She hands him over to his mother, who has now the hand puppet. He first screamed on her lap, then calms down for a few seconds, then cries again. When he realizes that Therapist wants to treat him further on his mothers lap, he starts to scream again. He still screams. She talks to him, but that doesn't calm him. Therapist has to say "tiye" more often and Albert starts to make sounds of frustration. belly)He goes on struggling with her, when she takes his arms in retroversion, dorsiflexion hands and gives compression in his shoulders. Tries to flex his arms and moves frantically with his head. Makes a whimpering sound as if he will start to cry. Tries to wiggle free by moving his pelvis and his back. He is making sounds of discomfort.</p>
		Physical	<p>Body-response Fights against the passive movements Fights against getting cleaned with the chitenge Wants to move Touch Game Body reacts with spasticity Is able to keep his balance</p>	<p>She releases his left arm totally. It goes into flexion immediately, because of his spasticity. His head falls back and his right arm gets a higher tone. When she first puts the ball up, his head follows the ball in hyperextension. Also when she goes left and right, his head follows in hyperextension. Once in hyperextension he follows the ball with his eyes up and down.</p>

			<p>Response of body to shaking</p> <p>Spastic jerk</p> <p>Smile</p> <p>Child reacts with grabbing for support</p> <p>Child is startled</p> <p>Head hyperextended</p> <p>Physical reaction on treatment</p> <p>Reacts on change in treatment with a change in muscle tone</p> <p>Spasticity</p> <p>Body stiffens</p>	<p>Therapist moves the ball really low, almost on her leg and Eddys head follows her in this movement in a normal head position. In this position he can also move his head from left to right.</p> <p>She starts with circulations in the hip with flexed knee. Seems to have problems to make a whole circle in the beginning.</p> <p>Tries to go as far as possible, then back and tries again until she is able to make the whole circle.</p> <p>While she pulls him (to sit), his head falls in hyperextension. He isn't able to hold it. He tries to shift his weight on his right leg and flexes his left leg as if he wants to kick against the ball.</p> <p>Albert gives spastiv little jerks when he tries to kick against the ball.</p> <p>He shifts his weight to his right leg and flexes his left leg. Through the flexing he can kick the ball, which is lying directly in front of his foot.</p> <p>They almost reached the ball, but he now stands on his own feet and can't move further on. He leans forward in the chitenge to grab for the ball.</p> <p>Alberts legs are stiff with spasticity.</p> <p>Albert is still standing with his weight on his right leg and tries to flex and lift his left leg to kick the ball. This isn't working.</p> <p>He kicks the ball for a second time. Again jis weight is on his right leg and the left is moving. This time he kicks with a more</p>
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				<p>extended than before and more flexion in hip. It is more a kicking movement than before.</p> <p>Seems to take no pleasure in walking today. His head is bent down and you can hear him whimpering or sniffing and his arms move spastically.</p> <p>He crosses his feet while walking and can't go any further. He tries to get his legs free by pushing himself forward. He gives little spastic jerks with his body. He fights a bit against her.</p> <p>He sits cross-legged between her legs and she places a red car in front of him. He pushes himself in an extension spasm to relieve himself from the sitting position, but that won't work with his legs crossed. The car isn't helping either.</p> <p>Pulls his pelvis up, by putting one hand underneath it. His spine extends when he is pulled and also his scapulae lose contact with the underground. His body is resting on the back of his head, which seems to be hyperextended.</p> <p>Eddys head still seems to be hyperextended. He isn't able to put it right by himself.</p> <p>His other leg is moving and kind of kicking against her hand. Voluntary or involuntary movement? His way to say, that it is painful?</p> <p>She pulls him up until he 'stands' on his knees, but just for a short moment. In this</p>
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				<p>moment he tries to get straight (he gives a little spastic jerk). His head is hyperextended.</p> <p>He lies on belly and Therapist tries to stretch his arms next to his body. When she tries to extend his elbows, his mouth opens and he gives unhappy facial expression. His body stiffens and his pelvis comes up. His head is still resting on the mattress with his face to the right. She tries it a few times very slowly and gentle, but his body remains very stiff. She is able to almost stretch his arms when his face is in the middle. When she then stretches his arms, his body stiffens, his pelvis comes up and his face is in the mattress. She releases his arms and he is able to move his head again.</p> <p>He tries and let go of the chair.</p> <p>When he doesn't look up, she says "ayy" and shakes his hands above his head. He gives a spastic little jerk.</p>
	Focus child		<p>Focus on ball</p> <p>Child is focused on his feet</p> <p>Attention child towards other person.</p>	<p>Eddy is focused on Junior and his grandmother.</p> <p>In the beginning of the movement his gaze is still focused on Junior on his right side, but then he focusses on Therapist. Albert sees the ball and focuses on it. Albert also looks at John.</p> <p>His eyes seem to be focused on his feet.</p> <p>When Junior walks past him to his grandmother, Eddys head turns to his right side. He tries to look at them.</p>

				Smiles at John who came in that moment. Albert also turns his upper body (towards John) Isn't able to turn whole. He would fall if he tried to get his feet from the ground.
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