Music therapy in the rehabilitation of children with cochlea implant (CI)

Karen Radbruch

When I speak about music therapy in rehabilitation for children with cochlea implant it is necessary to characterise the context first of all. After the operation with a cochlea implant deaf or rather high grade hearing impaired children gain at least some physiological hearing abilities and the condition of learning to hear is created. Some children have for the first time a hearing experience. Rehabilitation in this context means to company and to support the slow growing into the world of sounds and voices. They have to make up the same steps of development as children do without a hearing loss - just a few years later. Our job is to bear in mind this natural development and to create conditions to help these children to make the essential experiences on their way. An interdisciplinary team works together, and what is interesting is that a music therapist is seldom part of this rehabilitation team in Germany. But nevertheless we find several fields of work within this process, in which music plays a major role: musical speech therapy, listening training with music instruments, musical rhythmic education and last but not least music therapy. In practical work it is not always possible to draw a clear dividing line between all these working fields and it is even not possible to define a general, standardised concept for music therapy.

When working with children my intention is to get in contact and to communicate with them via the medium of music. This kind of communication happens in a very playful way. At the beginning there are no specials rules or exercises. The children might try whatever they like to and what comes to their mind. Thus, children have the opportunity to discover their personal
creative skills. During this period, I try to take up their musical offers, to reply them or to continue them and to built up a first contact. It is important to emphasise the concept of musical activity as a joint activity. I am just another player with equal rights, I am not the leader, who in knows in advance what will happen next.

I would like to characterise the situation as a sort of “musical playground”. Hearing impaired children are involved in trainee programs quite often, doing a lot of exercises to improve their hearing and speaking abilities. I think that the playing character of music therapy can be a nice contrast. Learning and discovering by playing is a natural way of learning in the development of children and we must pay attention, that these children don’t forget to play.

When I started working with cochlea implanted children I often began with a welcome song with piano accompaniment or I added wonderful harmony chords to the first musical activities of the children. But these children were not really enthusiastic! Some looked somehow afraid, others looked just bored. These activities already make great demands on the children’s ability to hear. For children who stand at the beginning of a hearing process and who get in contact with music probably the first time this might ask too much of them and a welcome song with piano accompaniment might be characterised as “language with disturbing factors and interference”. Therefore, I prefer a more basic first contact with music: music that is simply and clearly built and does not frighten the children. From this starting point the musical activity can become more complex and be developed together with the children.

To find out their individual hearing needs we have to watch the children and their reactions attentively. They often show their needs quite clearly!

For me it is important in music therapy that children have the opportunity to discover instruments and sounds themselves (– even if it is not always easy for a music therapist to keep out of the process in the beginning!). However,
to start music dialogue and communication, children need to perceive themselves as creators of sounds and must get used to hearing all these different sounds of the instruments.

**Goals of music therapy when working with children with cochlear implant**

- For cochlea implanted children the first goal of music therapy on their way to the world of sounds and voices might be to awaken an interest in musical instruments and to explore the instruments as sound-instruments.

  I have met several children, often short time after the CI-implantation, who were quite interested at the instruments – but they were fascinated by all the screws of the drums, they discovered the letters written on the xylophone and arranged the same letters together or they reflected their faces in the metal of the trumpets. But they were not really interested in playing these instruments in the way we used to do it....

- If we succeed to develop an interest at the sounds of the instruments the children can discover a great variety of sounds and timbres. The high intensity and the huge frequency of music makes the perception of music somehow easier than the perception of language; hearing impaired people are more easily reached by musical sounds.

- Following this idea, a further aim of music therapy is that the process of learning to hear is supported and encouraged not only by discovering, but also by distinguishing, identifying and understanding. Focused listening as a first step, focused listening to another person as a second step are preconditions of effective mutual communication and we should not forget that the children have to make these basic experiences after an cochlea implantation.
The ability to hear can’t be conveyed in an isolated surrounding – it is only in a stimulating environment where a child is actively listening.

- An important fact is, that the auditory perception in this case is closely linked to their actions - children can search actively and are not just passive consumers.

- Another goal for the children with CI is to discover their individual voice in a new way. They can play and experiment with their voice, without the demands of speech and articulation. “A baby with hearing impairment does not hear his own voice. It doesn’t play with its voice like it plays with its feet and its hands” (HILDMANN, 1999, S.30). After the implantation the children have to catch up on this experience: playing with their voice, screaming, squeaking, howling. And we can work with all these sounds in a musical way: every voice has its pitch, its dynamic, probably its rhythm. So we accept it as a musical offer and work and play with it in a musical way.

- What is also worth mentioning is the fact that children find a new way to bring emotions into a form of expression – children who are in majority of cases limited in their development of speech and sometimes hardly find a way to express emotions. Music can have the function of a emotional “outlet”.

- Moreover, children might experience music as something positive and stimulating that enriches their way of perception. The promotion of personal musical abilities can be supported. A new self-confidence in musical abilities can be established and fears might be overcome.

- I personally think, that the most important aim is the communicative aspect of music therapy with cochlea implanted children, which is communication that is not linked to normal speech communication and
can be orientated at the age and the developmental abilities of each children.

Since the last point mentioned is the central aspect of my research I am working on, I would like to focus on the topic of communication.

**Communicative development**

The communicative development in children, with regard to children who can hear as well as those who suffer hearing deficits, starts very early in their lives. Already in the preverbal phase, a small child gains important communicative skills while interacting with the person to whom the small child relates most closely. Not only is the child’s day often structured by the parents but also interaction and communication, which, later on, leads to the acquisition of language.

If a child is hearing impaired, interaction between the child and parent is made more difficult. It is not the hearing impaired person who is hindered to communicate with the outer world, but rather his way of interacting with the *hearing world*. Verbal and non-verbal communication between the hearing impaired child and its hearing environment can not succeed completely and often much more effort is needed.

A large amount of psychological research has been done on the topic of the communicative development and behaviour of hearing impaired children (for example NICHOLAS, GEERS an KOZAK, 1994: “Development of Communication Function in Young Hearing-Impaired and Normally Hearing Children”. LEDERBERG EVERHARDT, 1998: “Communication between Deaf Children and their Hearing Mothers: the Role of Language, Gesture and Vocalisation”).

Those investigations mostly come to the conclusion that the communicative development of hearing impaired children progresses slowly concerning the
quality and quantity aspect of development (with the exception of deaf children of deaf parents). In my assessment it seems to be important in this context that verbal communication is always based on non-verbal communication. The research mentioned above also support this fact.

When working with children after the CI-Implantation, the learning of speech is central – but it should again be mentioned that non-verbal communication is the basic issue. The dependence of verbal communication upon non-verbal communication is always present.

“Several contemporary theories of language acquisition hold that the functional aspect of communication is the driving force in the acquisition of a formal language.”(NICHOLAS, GEERS, KOZAK 1994, S. 39)

The development of communicative skills is also fundamental for the social development of the child and is a key role for social integration. I am still not talking about the acquisition of speech but rather the acquisition of communicative skills.

To support and stimulate communicative development, it is necessary, as already mentioned, to focus on playful communication and dialogue, both meeting the needs of hearing impaired children. While doing so, the child’s personal stage of development, its hearing abilities and age of hearing should always be taken into consideration.

Through experiencing a positive and relaxed communicative situation, children gain personal strength and develop a sense of curiosity and joy for interaction and last but not least a motivation.

Improvised music offers possibilities for extremely varied communication, not merely linked to language components (s.a. ALDRIDGE, 1996, S.51ff).

Since 1999 I have been doing research on exactly this topic, namely to examine the components of communication development within the work of
music therapy with hearing impaired children. I would like to thank Andreas-Tobias-foundation, placed in Hamburg, which financially supports this research.

Music therapy with hearing impaired children with a particular emphasis on communicative development

The intention of my study is to find out whether communicative behaviour of children significantly changes within 10 sessions of music therapy. The following questions are always present:

- Does the length of the interactive phase between child and therapist change?
- What is the relationship between the communicative modes “alternation” and “co-activity” in the interactive phases?

This differentiation and division of those two communication modes is based on the theories of DANIEL STERN. In 1975 he found in the non-verbal communication between mother and child two parallel modes of communication:

- the co-activity, where mother and child vocalise at the same time. It is indicative of emotional tone and promotes mutual experience.
- the alternation, which has a dialogical structure and which is important for the exchange of symbolic information.

We can find both modes of communication in improvised music.

- At least the focus on the “initiatives for communication”, which means the varying offerings made by both players in the interactive phases that brings the other partner into communication. Does the number of the initiatives changes and does the relationship between the initiatives of the child and the therapist change?

It would be taking things to far in this research to evaluate all sessions according to those questions; therefore I will only focus on 2 episodes in the
first, fifth and tenth session. Each episode is about two minutes and contains two examples of the longest phases of interaction between child and therapist in each session.

In co-operation with a special education development program for hearing impaired children up to the age of 6 years in Bochum and the kindergarten for hearing-impaired children in Bochum as well I have been working with 24 children between the age of 3 and 6. 11 of them have a cochlea implant, the others normal hearing aids. These children are part of a special program but previously have never had experience with music therapy before. Children with additional impairments were excluded from my research.

I would like to present to you two little boys and take concrete examples from their therapies to explain the results:

Marvin is four-year-old boy, very friendly and calm, a little dreamer, who likes to be by himself. He is untiring in his actions if left alone. When Marvin was one year old, a severe hearing impairment bordering deafness was diagnosed in both ears. When he was three and a half years old, he got a CI. Three months later I got to know him in music therapy. The following sentences are taken from his file: “Marvin shows a passive communicative behaviour within the verbal level... Changes in play were only noticed sporadically.”

In the first music therapy sessions he was interested at the music instruments in his own way: he touches and examines them, especially the screws and fiddled around with the drumsticks. There is only some play activity and little interest for me. Moreover, there seems to be no interest in the instruments concerning sound. The first instrument he uses a little bit longer in the first session was the triangle.

Lets have a look at the beginning if this improvisation: Marvin has chosen the triangle. He plays the triangle and observes how the instrument moves – he is fully concentrated and thrilled.
I play the piano – like him with high pitch. I try to follow his playing, I try to imitate it.

A focused listening to his own instrumental activity starts – a focused listening to me is one step too far and so there is nearly no place for musical interaction for the moment.

In the 10th session we start sitting there with the congas; an interplay develops and there are long moments in which I have his full attention. Marvin realises my musical offers and he is able to response appropriately. In addition to that he brings his own ideas into the common play. Such a phase of directed concentration is something special for Marvin at this time.

Marvin is one of the children in the research whose phases of interaction have become much longer. In a chart this change of behaviour looks like this:

*Transparency 1*

This result explicitly proves that during these musical activities Marvin has discovered and enlarged his way of interacting and has made basically experiences concerning his communicative development: as we find the
ability to listen and respond appropriately to sound, which is a vital aspect of communication.

Until now I have done this evaluation with the videos of 9 children with cochlear implants and regarding this group we find 6 other children with the same tendency concerning the phases of interaction. All these 6 children I met in their first 18 months after the operation of the CI.

A second result of this evaluation is the structure in which Marvin plays within the interactive sessions:

*Transparency 2*

This interaction bases on the structure of alternation which seems to be plausible considering Marvin’s hearing age.

All the 6 children, where we find an increase of phases of interaction, started musical interaction in a dialogical structure, although this mode of
communication is not always as dominant as we find is in the development of Marvin.
“...the establishment of dialogical structure, that in itself enables meaning to be negotiated, is the first important step in communication”. (ALDRIDGE 1996, S. 36)

Completely different are the results of the second child I will show to you now:

Niklas is a 6-year-old boy. He is tall, full of energy and has broken three drumsticks during those 10 sessions while playing the drums ...
Niklas’ high grade severe hearing impairment was diagnosed when he was four months old. At the age of three he got a CI, which he didn’t accept at the beginning, but finally did half a year later. When I got to know Niklas he had already had the CI for two and a half years. From his file I get the following information: “Niklas knows about the communicative character of language and tries more and more to use this language.”

Let’s have a look at the graph showing Niklas’ length of interactive phases:

Transparency 3
A lengthening of the interactive phases can’t be observed – the tendency is even contrary. 3 children of the study show no clear change concerning the length of the phases of interaction. All of them had the CI for one and a half year or more. There is only one child where the interactive phases are definitely shorter in the end.

However, there is a change in Niklas’ communicative behaviour. I would like to illustrate this by referring two examples from the first and tenth session:

Niklas starts playing the drum very loudly and powerfully, I sit at the piano. He makes short breaks and waits for my entries. He gives the initiatives, I imitate his instructions. Twice I make him an offer, but he doesn’t seem to notice it. He seems to be quite astonished when I go on playing the piano without making a break. He waits till I finally make a break to go on with his drumming.

The next example belongs to the 10th session:
I play 2 congas in a regular, slow metre. Niklas sits down at the piano and starts to play in my tempo – we play together for a while. Then I start playing very soft and he does the same. He imitates my way of playing and finds out alternative ways of playing the piano. At the end the communicative mode changes again and we play together strongly – interrupted by joint breaks by a show of hands.

I think it is very plain, that the quality of interaction has changed in between the first and the second example and in addition Niklas has found a individual way of creation and expression in musical activity. In the first session it was Niklas who determinates the interaction and the mode of communication was exclusive the alternation.

In the 10th session we find both modes of interaction, co-activity and alternation. This leads me to the assumption, that the quality of partnership has changed.
Interaction is not only the imitation of a special number, of a special dynamic or tempo. Interaction has become more and more flexible and free. It is not so static as it was in the beginning.

Furthermore the mode of co-activity makes higher demands on the ability of hearing. Niklas has to follow the sounds of two different instruments simultaneously. In a chart this change looks like this:

7 of the 9 Cochlea implanted children in this study showed a changing concerning the modes of interaction.

In the 10th session we secondly see that both players give initiatives and react on the initiatives of the partner as well. An equal partnership has developed. This development I want to show you with the help of an other graph: . Here we can see the number of initiatives, offered by Niklas and by the therapist, that brings the other player into communication.
In the work with hearing impaired children I often observe an imbalance between the two communication partners: some of them dominate the interaction completely in the beginning, others only react or imitate for a long time what I play.

8 of 9 cochlea implanted children in this study showed a changing concerning the relationship between the initiatives of child and therapist.

A “healthy” interaction requires that there is a sense of action and reaction from all participants involved. For children who have just received the CI, interaction on a verbal level is almost impossible – but via the medium of music it is easier to connect and find an appropriate level of communication. Children experience active parts of interaction; they feel how to react and to lead. They make the experience of autonomy in an interaction.

Communication is never static. Strict exercises with fixed rules would never come close to what is typical of an interaction, namely that something develops in an unexpected way and permanently changes. This is the reason why I mostly avoid hearing exercises. It must be observed, however, that a completely spontaneous unstructured activity might be too much for some of the children, without at least some guidance and rules.
Thinking of the results of the research study and thinking of all the my experiences in the work with the children I know for sure that music therapy can be a useful and increasing supplementation in the rehabilitation of cochlea implanted children.

We will never replace neither the speech therapy nor any other profession in the program, but we can give the children useful and essential experiences on their way to the world of sound and voices and to the world of verbal interaction and communication.
