

Case studies of children with cochlear implant rehabilitation therapy, in Belgium



Title of the case study: Steven, age 18

1. General data on the case:

- Biographical and case identification data

Steven was the first child of a young hearing family. At the age of 8 months Steven became bilateral deaf by bacterial meningitis. This was a big chock for the family, especially for the father, who could not accept it. Two years later the parents divorced. Mother married again and has 2 more hearing children from her second husband.

The first 2 years after the divorce, Steven only went to his father every 2 weekends. But gradually, when the spoken language of Steven developed, the communication with his father increased and since Steven went to a regular school (at age 7), there is co-parent ship between the parents. The parents also decided to stay and live close to each other (same village), which made it easier for Steven going to regular school. During weekends and during school holidays, Steven is now helping his father distributing fuel to families. Steven already has his driving license, and is now following lessons to become a truck driver too.

- Case history (Anamnesis):

- **Significant medical data** – At the age of 8 months Steven had a severe bacterial meningitis and doctors only give him 50% chance to survive, but he did. Before leaving the hospital, the hearing was screened and they found a bilateral severe deafness. MRI was made and they could already see some ossification of the right cochlea. The ENT-doctor of the CI-team and the parents decided to give him a cochlear implant on the right side at age 10 months and to try a hearing aid on the left side.

Auditory performance with hearing aid was satisfied at the beginning but already 9 months later they found little or no thresholds anymore on the left ear and MRI showed also an ossification coming up in the left ear.

Because at that time (2004) there was no reimbursement for bilateral implants in children in Belgium (also not in case of meningitis), the father decided to pay by himself. So Steven received his second implant in August 2004 at age 2 year.

- **Significant psychological data** – Although Steven had a severe bacterial meningitis leading to bilateral deafness, there were no additional needs. He developed good speech and spoken language, but was not developing spontaneously. He really needed good support and intensive rehabilitation, focussing on audition and spoken language development. Signs were used to support spoken



language and to increase the comprehension of spoken language. As soon as he developed spoken language, he and also the parents stopped using signs.

On the intelligence scale WPPSI-Revised (at age 7) Steven scored a non-verbal IQ of 112 and a Verbal IQ of 85, which means he has above average non-verbal skills.

Already as a young child, he was a very social child, with a lot of friends and also a very sporty boy.

- **Educational setting:** At age 11 months, after receiving his CI, Steven started in a multidisciplinary day care centre for babies and toddlers with a hearing loss, where he received daily speech and language therapy. At age 3 he started in an oral special school for the deaf, where he stayed till age 7, when he moved to regular school in a group of children who were one year younger. First 2 years were not so easy for Steven and he needed a lot of support, but school performance became better year by year. At secondary school, he followed a more technical direction, which he is going to finish in June 2021. Next year he will start at University in the department of technical engineering.

Significant social data : The father was working as truck driver distributing fuel to families. The mother has a bachelor degree in education, but never worked in education. She had a part-time job as a consultant for a governmental organisation finding jobs for unemployed people.

- **Age of fitting the first hearing aids and cochlear implants:** At age 10 months Steven received his first CI which was fitted at age 11 months. Although 4 electrodes could not be inserted into the cochlear because of the ossification, the fitting went smoothly and Steven started reacting to speech quickly. He started wearing a hearing aid at the opposite ear, but because of a progressive hearing loss and the beginning of ossification in the left ear too, he received his second implant at age 2 years.
- **How often and what kind of support/rehabilitation does the child/family receive?**
After the deafness was detected, the parents received support from an early intervention team at home, especially focussing on answering all the questions these parents had. Immediately after receiving his cochlear implant (age 11 months), Steven started in a multidisciplinary day-care centre for babies and toddlers with a hearing loss, where he received 3x/week speech and language therapy. The parents received (in a group of parents) more information on how to nurture and educate deaf children and on how to communicate and to stimulate spoken language.

2. The implantation

- **age of undergoing first cochlear implantation (left or right side):** 10 months right side, 4 electrodes not inserted because of ossification
- **type of implant:** Cochlear Nucleus 24 contour electrode = Sprint body worn processor
- **number of implants (CI and hearing aids):** CI1 at 11 months; CI2 at 25 months
- **current average duration of the CI use (information from the audiologists):** 14 hours/day
- **other relevant information:** difficult periods during early stage development. If yes, why?
No difficult periods in using devices



3. What is the procedure to start the speech therapy after CI? (actors involved, what is needed)

Already before cochlear implantation, the CI-team discusses with the parents the rehabilitation after implantation. They suggested a multidisciplinary day-care centre at 30 km distance from the family, which they also decided to do.

Children can only go to this kind of day-care centre after receiving a certification from the government of health care, based on the audiogram and a short report signed by an ENT-doctor.

4. The Speech Therapy used in the rehabilitation

- **describe the kind of therapy done (communication options, approach, environments, average timing)** . The speech therapy was integrated in the work of the multidisciplinary day care centre. Children can receive daily therapy : speech therapy + also physical therapy if needed + audiological support
- **Steven came 3 days/week to this multidisciplinary day-care centre** and every day he received individual speech therapy. Also an audiologist is working in the day-care centre and works close together with the audiologist of the fitting team.
- **listening development** : already a few weeks after the first fitting, it was clear that Steven started reacting to speech sounds
- **speech production development**: his babbling never stopped and he started speaking his first words around the age of 2 years. He has a very nice natural voice.
- **spoken language development**: in early communication, parents and therapists decided to use some signs to support the spoken language, because it was not clear yet if he was able to discriminate all speech sounds or not. The signs were also supporting spoken language comprehension. The early spoken language development took some time and Steven needed extra support (by the speech and language therapist) to come to spoken language. Also the parents were coached on how to support the child's spoken language development at home.
- **monitoring of the progress in auditory, speech and spoken language development. How?** In the day-care centre audition, speech, spoken language development, cognitive development and social emotional development is monitored very well. Every 6 months there is a multidisciplinary meeting with the parents on the development of their child. Audition is monitored by: tonal audiogram, Auditory Speech Sound Evaluation (ASSE)-test, Littlears parent questionnaire. Also the NAMES (Nottingham, Auditory Milestones) is used to monitor the early auditory development.
Speech is monitored by a Dutch Speech test
Spoken language (expressive and receptive) is monitored by the Bayley Scale and later by the CELF-test.
The NEAP (Nottingham Early Assessment Package) is also a very interesting monitor to be used the first 3 years after implantation. This assessment package is also available in the Dutch language.



5. Results



SWOT analysis by Steven

Strengths: Steven has little or no memories from the content of the rehab he received as a young child. But he loved his friends from the day care centre and from the preschool for the deaf. Although he moved to the regular school at age 7, he still has regular **contact (using social media) with some deaf and hard of hearing friends.**

The fact that I am very good in sports, helped me to integrate in the regular school. Other children invited me to play football at the playground. Ones in regular school, I received extra support from a speech and language therapist (SLT) from the mainstream support service. This was very useful for me, especially my first year in regular school..

Weaknesses: I suggest to **stimulate deaf children more to function independently**, not to be afraid to take initiative.

For example:” the first years in regular school I was afraid to say to the teacher I did not understand him or was afraid to ask to look at me or to use the distance microphone. When I wanted to play football at age 7, my parents suggested to wait a few more years, so I could better communicate and finally they had chosen to start with athletics (because less communication was needed). But I preferred football at that age. Later I moved to gymnastics, which I still do”.

Transition stages (moving from special to regular school or from primary to secondary school) are very difficult stages in which I really needed some extra support (which I was missing). The start in a new school is so important, and created a lot of stress, because **I missed a lot of information.** Some extra support during these stages is really welcome.

Last schoolyear, I was also sitting in a very noisy classroom. Several students were very noisy and some teachers had problems in controlling the class. This was a very negative experience. I am happy that this is discussed between the school staff and it is not a problem anymore this school year.

Opportunities: Because my parents were divorced, especially my mother supported me during my early years. But the better my spoken language developed, the easier it was for my father to communicate with me, and the more contact I had with my father. I am also very thankful my father decided to pay for my second cochlear implant himself. The **support of both parents were very important for me.**

So I think it is really important that **parents also stimulate their child to become more active in communication** with their environment. They have to stimulate their child **to take initiative.**

Threats: I was lucky I always received **good support.** First **intensive training in speech and spoken**



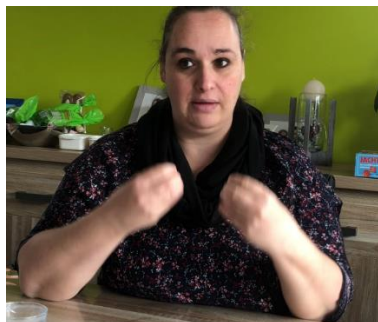
language and ones integrated in a regular school, every 2 weeks, one hour of **support by a SLT who visits me in the regular school.**

I do not like to go to the CI-team **for fitting**. This is always a stressful situation and the audiologist often wants to change something in the settings of the CI. I don't like these adaptations in the programming ones I am satisfied with my speech perception.

I never had big problems to understand the teacher in the classroom. I don't use my FM-system anymore because I don't like to be special in class and because of poor quality. When I go to University in 6 months' time, I will try out the blue tooth microphone.

It was also a **disappointment for Steven** to hear he was **not allowed to go to the Belgium army**. A very good sportsmen he was interested to become a soldier, but he was refused because of his deafness.

Now during **Covid and with teachers wearing masks and with distance (online) learning**, I often have more problems to understand the teachers.



SWOT analysis by Stevens' mother

Strengths: The detection of a bilateral deafness after a bacterial meningitis at the age of 10 months, was a **big chock for both parents, especially for the father who felt guilty**. It took several years for him to accept the deafness of his child. It was also one of the reasons of our divorce. But although we were divorced and I was taken care of Steven most of the time, Steven's father decided to pay for the second implant by himself. Ones Steven started learning to speak, it was possible for Steven's father to communicate with his son. This was also the beginning of the co-parent ship.

After Steven received his first CI, he started in a **multidisciplinary crèche for children with a hearing loss, called 'KIDSJE'**, which was a wonderful place, where they make always time to listen to your questions. The multidisciplinary team of the day care centre consists of: a speech and language therapist, teacher of the deaf, audiologist, physiotherapist, psychologist and social worker and they work in close cooperation with the CI-team. In group as well as individually the children receive intensive stimulation of their listening and spoken language.

Also the **parents receive (in group) information** on how to nurture a child with a hearing loss and on how to communicate with your child who has a hearing loss. Now, 17 years later, I still have contact with a mother of another deaf child, who I met during these parent sessions.

Weaknesses: We received excellent support **with little or no weaknesses**. When Steven moved to a regular school in our neighbourhood at age 7, **we suddenly missed all the support we received at KIDSJE**.



There was no audiologist or therapist any more to take care of his device in case it was not working properly. I have to solve all these problems myself.

Transition periods like these (but also moving from primary school to secondary school) were difficult periods, during which we miss some extra support. Every transition phase is always a big challenge for us as parents and for Steven.

Opportunities: The support we and our child received from **the multidisciplinary team in KIDSJE was excellent** and it is hard to improve it. The only thing we can suggest is to **involve the parents even more in therapy.**

Threats: we **had little or no negative experiences** on the support we and our child received. We were supported by excellent professionals with a lot of experience and knowledge in educating deaf children and in stimulating listening and spoken language in children with a hearing loss. It is our experience it is not a good idea to go for extra therapy in the evening, after school. We did it for 2 years, but Steven was tired after school and needed some free time to play too. So this was not a big success.



SWOT analysis by Stevens' therapist (Ria) in the oral school for the deaf

Strengths: Supporting young deaf children with cochlear implants needs a multidisciplinary team. Also parents are part of the team. As therapist you have to invite the parents as much as possible in therapy. On average one session/week together with the parents is ideal. Modelling is essential in the beginning as well as parents need a lot of information. Learn the parents to come to interaction with their child (serve and return). Creating a diary together with your child, can be a very interesting task to stimulate their language development.

Parent groups can also be very successful, but depend on the group and on the professionals who guide these sessions. It's good to build up their knowledge gradually. Don't give them too much information at once.

Monitoring the children during their development is also very important, because the population of CI-children is very diverse.

Although we focus a lot on audition (by using the Listening Cube program) in therapy we may not forget to stimulate also eye contact and lip-reading.

Weaknesses: it's hard to support children from families who want **to use sign language** with their child. **Parents and professionals should be motivated to stimulate the child to develop spoken language.**



It also means that you need motivated and enthusiastic staff members, with knowledge and experience in stimulating spoken language development.

Opportunities: It is important that all professionals and parents stimulating and educating this child have **the same goals** and aims. The Listening Cube is an excellent auditory training program, which helps professionals to stimulate the auditory development of this CI-child at the right level.

Threats: All professionals supporting the child, should have the same goal. They have to support the same approach. When the team can work together on the same goals, professionals of the team (and also the parents) will become more motivated and enthusiastic.

