



Little Listeners

A Resource for Supporting Young Children with
Cochlear Implants





Acknowledgments

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Welcome



If you are reading this booklet, you probably have a very young child who has received a cochlear implant. Congratulations on your quick response to provide your child with a technology that will help him or her to hear. Take a minute to realize that you have embarked on a very exciting journey. It will be difficult at times, but the rewards are great. The information in Little Listeners is a combination of knowledge gleaned from scientific findings, clinicians' experiences, and the results of the research project mentioned above. This booklet is aimed especially at parents and caregivers, but it is also appropriate for teachers of children under age three who are using a cochlear implant.

Remember: the most important thing you can do for your child after cochlear implantation is communicate with him or her in a pleasant, relaxed, and natural way (without too much thinking and preplanning). In fact, the best way to read Little Listeners is to think of it as the handbook of extra things to keep in mind while you are talking to your child as if he is a child with normal hearing. Little Listeners describes these "extras" and how to make them a natural part of everyday communication between you and your child. After getting familiar with these tools and tips, try them. You will find that they will quickly become a "healthy habit" which supports your child's language development after cochlear implantation.



This booklet assumes that most children with significant hearing loss benefit from cochlear implants and have the potential to go on to become competent communicators using spoken language. It is well-understood that there are many factors that contribute to communicative competence, such as age of identification and treatment of hearing loss, family and educational environment, and the presence or absence of other learning challenges, to name a few. The focus of this guidebook is to help you set the stage for later communicative success, and in the beginning, it is important to expect a positive outcome. If we don't expect the best, we might be tempted to settle for less than the best. Work closely with your local habilitation professionals to ensure that your expectations are realistic given your child's individual situation.

We hope you find the information in Little Listeners helpful. For further ideas, materials and assistance, please contact your nearest MED-EL office or the BRIDGE to Better Communication section of the MED-EL website at www.medel.com.



Chapter 1: State of the Art for Cochlear Implantation¹

A cochlear implant (CI) is an electronic device that is implanted into the inner ear (cochlea) and is used to improve hearing in patients with severe to profound hearing loss. It has been only about 30 years since the first CI surgeries were conducted. Cochlear implantation now is an accepted treatment method for both children and adults with significant hearing loss.

A CI does not restore or create normal hearing. Instead, under the appropriate conditions, it can give a person who is deaf the ability to hear sounds in the environment, understand speech, talk on the telephone and even enjoy music. Children are a group that greatly benefits from CIs, especially if they receive a CI early in life.

Children who are deaf and use CIs often require additional support and educational options. This brochure aims to provide parents with useful tips and in-depth information, specifically applicable to working with very young children who have received a CI.



The Importance of Early Implantation

The introduction of universal newborn hearing screening in many countries has led to early diagnosis of children's hearing abilities. Intervention is now being provided within a couple of months of diagnosis with profound hearing loss. An evidence base for very early implantation and for the existence of a "critical" or at least "sensitive" period for optimal auditory and verbal development is growing (Osberger, 1997; Sharma et al. 2005).

Significant differences have been documented in the auditory and verbal growth of children implanted under the age of four versus under the age of two, as shown by De Raeve (2010), May-Mederake et al. (2010), Svirsky et al. (2004), Anderson et al. (2003), Kirk et al. (2002), Osberger et al. (2002), Sharma et al. (2002), and Nikopoulos et al. (1999). Also, there is a growing body of research indicating that children implanted under two years of age can catch up to normal hearing peers in some areas of language development (Geers et al., 2009; Hayes et al., 2009; Nicholas et al., 2007; Svirsky et al., 2004) and that many enter mainstream schooling in early primary grades (Francis et al., 1999; Geers et al., 2003).

It is therefore crucial to support children with CIs as much as possible in the time after implantation.

¹ This chapter is an adaptation of chapter 1 of De Raeve et al. (2008).



Are Two Implants Better than One?

Having both ears is important for hearing. Not only do we hear better with two ears than with one, but we can also hear softer sounds easier, understand better in noisy environments, locate the direction of a sound source, and understand speech from a distance. This could take the form of early bilateral implantation. While bilateral implantation is not covered by every health insurance provider in the world, coverage is increasing and there is growing evidence that it should be. **If you are not able or ready to consider bilateral implantation, then it is important for your child to continue to wear a hearing aid on the non-implanted ear.** This is an important discussion to have with your implant audiologist.

Implanted children are a unique group. Unlike adults who may have had hearing and then lost it, children usually learn to listen using only the sound from the cochlear implant. It is common knowledge that it is more difficult to learn certain things later in life – such as a second language – and it has long been understood that there is a “critical window” of time early in a child’s life when he or she has the best chance of making use of sound for the development of language. For example, studies have illustrated that children who received their bilateral implants prior to age 3½ were able to take better advantage of the brain’s ability to learn (Sharma et al. 2005).

Communication Mode

There are many factors that contribute to the type of communication a parent chooses to use with their child. Some families choose a strictly spoken language approach, others choose a combination of both spoken and sign language. Some families even use multiple spoken languages in the home. Most parents who choose early implantation do so because they want to give their child the best possible opportunity to become a functional spoken language communicator and still take advantage of the early critical language learning period of childhood. Using spoken language alone can be a very successful approach for young implanted children. However, there are children who face other learning challenges beyond hearing loss where the use of Total Communication (also called a “bilingual” approach in some countries) may be preferable. These decisions are best made by the family and professionals working closely with the child; they understand the unique needs of an individual child and his or her family. The brochure *Communication Options and Educational Placements* available from MED-EL discusses the range of communication methods and how they relate to educational environments the child may later encounter in school. For the purposes of this booklet, instructions such as “tell your child” or “say ___ to your child,” usually refer to an activity that is intended to develop language regardless of the communication mode being used. If you are using a combination of sign and spoken language with your child, try using spoken language first, to stimulate the skill through listening with the implant, but then use your best judgment about adding the sign equivalent as necessary to support language learning.



Chapter 2: Preverbal Communication²



You may wonder what preverbal communication is, and why it is relevant for a child with a CI. Preverbal communication is the stage that all children with normal hearing go through before they start to communicate with words. You may have provided excellent stimulation for your child prior to implantation. Your child may have already developed some of the skills that we will discuss using residual hearing and hearing aids. Now that your child has a CI it is important to look at these early communication skills that precede verbal communication. Your child now has full access to sound and he may begin to make sounds and babble prior to using a first true word. The skills that we will discuss are important for assisting the child with a CI to become a competent verbal communicator later on.

Preverbal development mainly takes place in the first year of life. During the first few weeks and months after birth, babies express their basic needs through body language, crying, or making sounds. Parents usually react very quickly to these signals by changing them, comforting them, feeding them, or cuddling them. The parent's facial expressions, body language, and voice attract and hold the baby's attention. The parent's quick response teaches the baby that his attempts at communication were effective. Babies quickly learn that they can easily get their parents' or caregiver's attention. Over time, this process of reinforcement encourages the child to develop more sophisticated methods of communication. These early interactions build trust and bonding.

During the first few months of life, babies are especially interested in people. They like it if you pick them up, hold them, and talk to them. They react happily when they see the face of a parent and they may even begin imitating the parent. Other types of preverbal communication are: briefly looking at people; tracking people's attention with their eyes; smiling as a reaction to someone else's smile; showing that they are aware of strangers and strange situations; crying differently when they are tired, hungry, or in pain. Later in the first year, preverbal communication includes more complex activities such as enjoying a game, stretching out their arms when they want to be picked up, waving their hands, shaking their heads, pushing away, reaching out to an adult and squealing to draw attention, stretching out a hand to get an object back, pointing to get an object, or requesting help.

There is already a lot of communication happening between the infant and caregiver without any formal "speech" from the child. During the preverbal stage, parents need to talk as much as possible about everything occurring in the child's environment in an age-appropriate and child-friendly way. Parents of children who have normal hearing do this instinctively, often without even recognizing it. **Even though your child is deaf, using the same communication strategies that you would use instinctively with a child who is not deaf are the very behaviors that take best advantage of early implantation.** Although your child is not yet "talking," the preverbal stage is the time when you will lay the foundation of language development.

² This chapter is an adaptation of chapter 2 of De Raeve et al. (2008).

Tips for Establishing a Positive Learning Environment

All children, whether hearing or not, need to feel safe, secure, and a part of the family environment. Some ways to promote this:

- Meeting your child's basic needs (feeding, changing, dressing, comforting) in a timely and loving manner creates a feeling of trust and security.
- Playing together and cuddling are almost as important as meeting other basic needs.
- Use a regular daily schedule (eating, bathing and sleeping at a fixed time). This offers a feeling of security and promotes ease and peace.
- Immediately after implantation, talk to your child as if they can understand.
- Give your child your attention if he is making sounds or trying to say something. Say, "I can hear you," nod your head, and encourage him to go on. Try to respond, even if you don't understand. It is okay to guess at what he is saying.
- Clarify situations beforehand. The fact that you are going outside is made clear to the baby very quickly when you put on his jacket and get the stroller out. Somewhat older children may want to know where you are going. A picture (of granddad, grandma, or the store) can come in handy to show where you want to go.

Before babies learn to talk, they communicate in a variety of non-verbal ways. The most important are: eye contact, shared attention, imitation, and taking turns. The parent then needs to adapt his or her language level to meet the child's level.



Eye Contact

Although at birth a baby can only see vague figures, infants begin tracking objects with their eyes after only a couple of months. During the first four months, your actions as a parent are normally directed toward the child. For example, you place yourself above the stroller or bed and start communicating in a particularly expressive and melodic way. Around the age of four months, we see a change in eye contact. The baby slowly starts to track you or even an object with her eyes and starts pointing at it. In fact, this is the first way the child takes turns.

From the age of six months, we see that the child is able to look at an object that the parent is looking at. This milestone is often referred to as "shared" or "joint" attention. It forms the basis for spoken language development since she can then make the connection between the object and the words she is hearing from you.

As a parent, you probably spend a lot of time watching your child's face. This encourages the development of eye contact and at the same time, it creates a bond between a parent and child. Babies are also extremely interested in expressive faces. You may find that it is very natural to keep the attention and interest of your child by continuously changing your facial expression. This is the first lesson in communication: communicating with each other implies that you look at each other.

Tait (2001) found that having a CI positively influenced the development of eye contact as a communication skill. At first, the children were quicker to look at the parent or the object in question. As their auditory skills improved, the children needed less eye contact and participated more in conversations.

Eye Contact is an Important Factor in Preverbal Development

Whenever possible, position yourself at eye level with your child. Gently touch your child or the object that she is holding. This way, you can easily get her attention. Be sure to comment on or label the object she is holding. For babies, the ideal distance for making eye contact is about 25 to 30 cm / 10 to 12 in. The perfect opportunity for this is when holding her in your arms or your lap, as well as during changing or feeding. With older babies, this distance can be increased to 1.5 m / 5 ft. This way they see the whole body expression and also part of the surroundings. Try reading a book or looking at pictures with the child on your lap or sitting on the floor where she can see you as well as the book. Young children really enjoy peek-a-boo games or blowing bubbles. These games are also good for practicing eye contact.

Let Your Baby Take the Lead (Shared Attention)

When parents communicate with their child, they look where the child is looking or at the object of the child's interest. Afterwards, they usually start talking about whatever it is they are looking at together. Talking about things the child is looking at teaches the child to understand the words being said. We also call this "shared" or "joint" attention because in these moments, the parent and the child are both focused on the same thing. Later, the child may even point at the object, either to confirm that the adult is also looking at it or to request that the adult look at it.

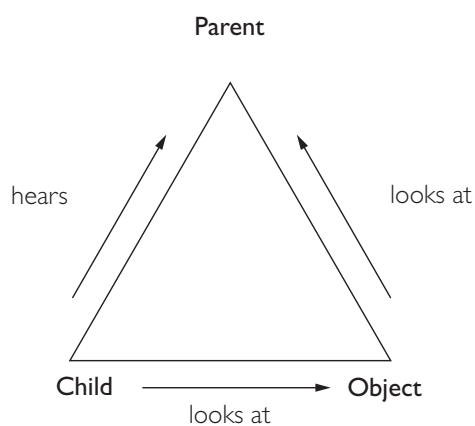


Figure 1: Communication Triangle

Important here is that the child hears your voice clearly. She can look at the object you are talking about while listening to you. If she does not respond to you talking, you can bring the object in the visual field between you or use gestures to point out the object.

The child not only reacts to what the parent says but can also take initiative herself to communicate. The child's ability to point to an object in a communicative way is a crucial aspect in the development of communication. The parent responds by labeling the object ("ball") or action ("bouncing") that the child is pointing out.



Communication and Shared Attention

Make sure that during feeding, dressing, or playing your child can see what you are talking about. If you say “now you can have a drink,” give him the bottle or cup.

Say his name to get his attention. If he does not respond, try using a toy or touch him to direct him toward you. Once he looks at you, then say something. You can say, “I said your name,” or “You heard your name!” This reinforces responding to his name and attending to what you are saying.

When your child points to or is playing with an object, reinforce his interest by describing the object or event in age-appropriate language. Playing together or looking at a book together while talking about what you are doing supports his language development.

Imitation

After only a few months babies are capable of imitating an expressive face. It is normal at this stage for parents to frequently imitate the facial expressions of their child. Babies understand this game easily. When they start making noises like cooing, consonant or vowel sounds, or gestures and the parents start to imitate this, this inspires even more reaction from the baby. As mentioned before, babies like to see that their efforts at communication are working.

Like babies with normal hearing, babies who are deaf vocalize with pre-speech sounds until the age of about five to six months. They sometimes play with their tongue and lips while making sounds such as /p/ or /f/. Around the time that babies with normal hearing start to babble (six to seven months), babies who are deaf often quit babbling or babble with less variation of syllables.

Older babies spontaneously start to make babbling noises like “dada, mama, gaga,” usually including consonant and vowel sounds together. This forms the basis of their first words. It is necessary for the child to hear before babbling will occur – one of the main advantages of early CI use is the ability to take advantage of a child’s normal stages of babbling at approximately the correct time. It is important for you to start imitating the early sounds your child makes. By imitating these babble sounds, you show your child that the sounds he is making are very important and that you want to listen. Also, this encourages your child to practice babbling even more.

Imitation Shows that You Like Something

Now that your child can hear with the cochlear implant, encouraging and playing imitation games are important first steps toward developing “first words” or language. Imitate the sounds your child is making. This may prompt even more sounds from him. Provide extra stimulation for babbling by:

- Repeating and expanding the sounds your child makes. Initially, he will only repeat the same sounds but eventually, there will be more variation in his babbling.
- Imitate the sounds he produces in front of a mirror and make a funny face while doing it. Your child will probably imitate this.
- Imitate your child’s facial expressions back and wait a bit to see if he repeats this. Older babies or toddlers also imitate mouth movements (sticking out the tongue, opening the mouth, etc.). This is the ideal opportunity to play games by making funny faces. The mirror can be helpful here. Be sure to vocalize so that he will start to associate the movements of your mouth with certain sounds.

Try introducing new sounds and encourage your child to imitate new sounds. Use objects with associated sounds, i.e., “the cow says, mo-o-o.” Make the sound while manipulating the toy, and then wait a minute to see if your child will imitate this sound. His favorite animals and transportation toys are great for this fun activity. Once you attach a sound to the object try to be consistent with the same sound. Young children need lots of repetition to imitate or say sounds, so be sure to do this activity often or repeat it several times. Sounds rather than words are easier for your child to imitate. He will most likely do this before saying his first word.

Taking Turns

Good communication assumes that it’s not always the same person who is talking, but that both parties (parent and child) take turns saying something. Even very young children that do not speak yet can take their turn by pointing at something, smiling, or crying. You should react to this as if your child spoke. When it is his “turn,” you may need to wait a bit so he has enough time to react.

Taking turns like this teaches your child how a conversation works: one person communicates while the other waits and then the next time, the roles reverse. **Children are able to start taking turns by the age of three months;** turn-taking at this age may not involve vocalizations. Verbal turn taking will initially happen by making vowel like sounds (ie, oe, eeh, ooh, aah, ae, uuh) and later, with consonants (such as d, b, m).

Turn by Turn

Around the age of nine months babies really enjoy playing games that involve taking turns.

Examples:

- You make a tower (your turn) and your child knocks it down (his turn).
- He throws an object on the ground and you pick it back up.
- You cover his face and then pull away the cover (peek-a-boo).
- He not only imitates what you are doing but also your facial expression and the sounds accompanying the game.

Toys can also stimulate turn taking.

Examples:

- Tossing a ball back and forth
- Taking turns driving a toy car
- Taking turns using the play phone
- Stacking blocks or rings
- Putting blocks in a box
- Putting shapes into a shape sorting toy

Put words to these turn taking games. Talk about pushing the toy car, stacking the blocks, count the blocks. Use words such as “in” and “on.” In other words, describe what you and your child are doing. Don’t be afraid to use a variety of words or vocabulary. This is how your child will learn language. Remember that a lot of repetition is necessary!

Introducing the Concept of Turn Taking

At the time of their first birthday, children already play simple role plays. They actively take turns and pretend, for instance, feeding a doll. They also enjoy looking at other children or imitating them. From this moment on, you can more formally introduce the concept of turns and make turn-taking a big part of the game: “Now it’s mommy’s turn.” This is an especially important step because it will set the stage for more structured activities later. By demonstrating a skill you want to work on (your turn) you can then prompt the child to practice that skill during his turn. Turn-taking games give you some control over the situation and allow you to focus your child on a specific task while still making the activity fun.

Adjusting the Language Model

Adults talk differently to babies and young children. They use a higher pitched voice, with a slower pace and with more intonation (even a singsong voice). We call this the use of baby talk (sometimes we use the terms “Motherese” or “Parentese”). All parents do this naturally with their children. These adjustments in language and tone make your child more interested in what you are saying. Another typical characteristic of early communication is frequent repetition. Parents continuously talk to their children about the same events or routines (e.g. changing the diaper, dressing, meal time, etc.). These are all things that involve the child personally. The words and sentences that are used are frequently repeated. All of this repetition creates an ideal situation for learning language, enabling the child to more easily catch the meaning of the language that is directed towards them. This early repetition should be in the form of simple short sentences or phrases. A child's memory typically cannot handle more than that yet. It is best to limit your language to one or two levels higher than what the child has already mastered. This means that when the child talks in one-word sentences, you should talk in two- or three-word sentences.

In this phase of development, the child really loves simple nursery rhymes and lullabies. Children love rhythm, intonation, simple sentences, and plenty of repetitions. They love songs with accompanying finger-play or actions. These activities also prompt imitation as the young child tries to twist his little hands and sing along.

Adapting the Language Model to Meet Your Child's Needs

This is an especially fun stage of development because you will begin to see real progress in your child's communication skills. Here are some things to keep in mind:

- Communicate with your child about everything that he experiences: what he sees, hears, smells and feels.
- Speak clearly at a sufficient volume but a bit slower than you would to an adult. This gives your child more time to process the spoken language.
- With a young child, you may speak with a slightly singsong voice (Parentese). Studies have shown that babies and toddlers pay special attention to speech with extra intonation and melody. While lifting up your child, pair the action with a sound like "wheeeee, up, up, up high." Repeat these games regularly, to increase the chance that your child will associate your words with the movement. Wait a minute, and if your child does not initiate another turn, say, "Do you want up?" and repeat the game. Encourage your child to imitate these sounds, actions, and simple words to request the game.
- Make sure there is adequate turn taking. Wait briefly after your child finishes babbling and take your turn. Brief pauses give your child the chance to take his turn.
- Use a lot of onomatopoeic sounds (these are words that imitate the sound of the object, such as "choo choo," "tick tock," "woof woof,"). This attracts the attention of your child and stimulates him to associate the sound with the object. Sometimes use the name of the object with the sound ("Oh listen, the dog says 'woof woof!'")
- Try to attract the attention of your child by calling his name. If he looks up, make sure you have a message or some other reward. Calling games are good for a short while, but often the child loses interest if there isn't an interesting reason to look.
- Nursery rhymes and songs with a lot of expression are ideal for learning language. By frequently repeating the song or the rhyme, the baby will learn to respond with words and gestures that go with these rhymes, and will even make his first attempts at singing and making music.
- Looking at books or photos together provides an opportunity to repeat the same words and phrases. Children seem to never tire of hearing their favorite books over and over. It is never too early to introduce a child to storybooks. Be sure to choose books that are engaging for your child's age level. Simple board or cloth books are best in the beginning, and over time you can move up to more elaborate stories. However, even a simple book's story and characters can be made more complex (with a little imagination) as the child matures.

Transitioning On From the Preverbal Stage

We mentioned earlier that a child's preverbal utterances usually have a goal and that, as a parent, you have to react positively to them as much as possible. But how do you do that? An answer to this question is described in a course developed by The Hanen Centre (Toronto), in which parents learn how they can adjust and fine tune their language to best meet their child's needs. We mention these strategies at the preverbal level, but they can also be applied at later stages of speech and language development. To empower parents as facilitators of their child's communication, Hanen recommends using the "3A Approach." The three "A's" stand for: Allow Your Child to Lead, Adapt to Share the Moment, and Add New Experiences and Words (Manolson et al., 1996). The following is a summary of these Hanen Program principles:

Allow Your Child to Lead

This means that you let your child take the lead on the topic for communication and you follow him by talking about what he is doing and the things in which he takes an interest. A child is more likely to learn language about activities that are of interest to him. By following his lead, you have the opportunity to even further enhance his language development because he has shown you he is interested in the topic. You might want to read a story about zoo animals, but if the child is more interested in playing house, then adapt your plan to the game of playing house and talk about that activity instead.

Adapt to Share the Moment

Your child goes his own way sometimes and it can be difficult to really connect with him or to focus on a specific goal. To have meaningful interactions with your child, you must adapt your interests to his. This means that you try to adapt to the play level and the subject of your child's game. You play along with him and talk about whatever he is busy with in a way that he likes. You will still achieve your goal, but this way you can connect with your child more easily and meaningfully while doing so.

Add New Experiences and Words

Once an interaction is happening, you have the opportunity to add something new or teach him something. If you repeat the same words over and over again in a well-known situation, you encourage your child to start using language. However, at some point, language has to expand and grow, so you add language and experiences to games he already knows. We call this "language expansion." For example, if your child is already saying something, you can add an extra word or two or an extra detail. By adding something extra to what your child is saying, you give him the tools to broaden his message. (see the table below)

Since expanding language is so important to the development of a broad vocabulary and a more well-rounded language repertoire, we want to spend some time talking about it in more detail.

Expanding Language

Depending on your child's language skills and developmental level, you can expand on what he is saying in a variety of ways. Make sure your language level is just slightly above the level of your child. You do not want to speak in long sentences if your child is communicating in one-word utterances. This can be discouraging for the child. If your child talks in one-word utterances, then answer with two- or three-word sentences. See the box below for examples of how you might do this.

If your child is playing with a car and produces sounds like "brrr" or even a whole sentence like the second example below, there are several ways you can respond appropriately and add information to what your child is saying:

| Child says: | Adult can... |
|----------------|---|
| "Brrr: Uh, oh" | Accept: "Uh, Oh, brrr:" |
| | Adapt: "Oh, no. What happened? Your car is broken?" |
| | Add: "Yes, one of the wheels has broken off." "Let's fix it." |

| An older child may say: | Adult can... |
|-------------------------|--|
| "Boom! Car broken." | Accept: "I'm sorry, your car broke." |
| | Adapt: "The lights and the tires are broken." |
| | Add: "Let me try to fix the car:" "Let's go find a different car:" "Should we put on a new wheel?" |

By adapting your language to match or approach your child's language level, then adding more language, you are giving your child the opportunity to understand what you have said and learn more language. When your language example (model) is simple but slightly beyond the child's level, it is more accessible to your child and easier for the child to transition to more complex language. And, because you are following his lead, it is also a topic that your child wants to talk and learn about. Don't worry about making a grammatically perfect sentence. You will refine your language as you go and as your child progresses. This is especially true with younger children or with children who have learning challenges.



Chapter 3: Hearing Development³

Although we often talk about “hearing development,” “speech development,” and “language development” as separate topics, they are all closely interrelated. Each depends upon the other. All children develop listening skills in a recognized sequence. For the purpose of this booklet, we want to keep in mind that we are working on the development of listening skills in order to facilitate the development of speech and language skills. Therefore, when reading the following tips for developing better listening skills, keep in mind that **auditory development in isolation is not really the goal – the goal is the development of language.**

After a few months, babies with normal hearing will develop the following skills: 1) they start to perceive certain sounds (detection); 2) they start to perceive differences between sounds (discrimination); 3) they start to recognize sounds (identification); and finally, they attach meaning to the sounds (interpretation or comprehension). A hearing child needs a minimum of 12 to 24 months of listening practice to acquire these skills (Erber et al., 1976).

Depending on the age that your child has received his CI, he may still be going through the normal preverbal chronological age and stage. In this case, it is often very easy to take advantage of where he already is and continue with hearing and speech development very naturally. You'll find that our tips for stimulation in the preverbal stage fit nicely with the early auditory and speech development tips described below. If your child has received his implant during or after the preverbal stage (based on chronological age), you may find that you have to deliberately re-create those situations in order to take your child through those early developmental milestones that are important for laying down the foundations of later language development. The process should go quickly if your goal is for your child to catch up to his normal-hearing peers. The tips below should help you think of fun activities to do that, while still maintaining your child's interest. They follow the Auditory Skills Checklist, a communication assessment available from MED-EL.

Although we talk about the various steps in auditory development as occurring in a particular order, children don't necessarily spend a lot of time on one level before moving to the next. Often it seems as though they are developing detection, discrimination, and identification all at once. Feel free to try a variety of different activities and games and follow their lead.

³ This chapter is an adaptation of chapter 3 of De Raeve et al. (2008).

Games to Stimulate Auditory Development

Limiting background noise is important, especially during focused listening activities. You may find that your child is more focused on sound when competing noise, such as the radio or TV, is turned off and the environment is relatively quiet. When your goal is for your child to increase or develop listening or auditory skills the use of visual cues should be minimized. Many parents find that sitting beside their child during these learning activities minimizes the visual cues and maximizes the child's dependence on "listening alone" for these focused listening activities.

Awareness to Sound

Encourage your child to notice sounds. You can do this by reacting enthusiastically to every reaction your child has to sound. Cue your child to listen, then show him the sound your both hear. Remember to label or tell the child what the sound is. For example, "Listen, I hear the telephone." Notice if your child indicates that he hears your voice. Do his eyes widen or does he look at you? Get his attention or cue him that he hears your voice. Example, "You heard Mommy, yes, Mommy is here." Be sure to do the same thing with other family members. Cue him when he hears Dad or his siblings.

Provide ample opportunities for your child to make sounds by himself (using his own voice or other noise-makers and toys that make a sound). Most young children love playing with the pots, pans, lids and wooden spoons found in your kitchen. Set aside a low cabinet that the child is allowed to pull open for playing with these items when you are in the kitchen. Talk about the sound they make. Is it loud, soft? This way the child can learn about the sources of sound.

Experiment with sounds in and around the house, so that your child has contact with as many different sounds as possible. Make sure your child can see and/or feel that there is something happening at the moment he hears a sound. Look for a few toys that light up, vibrate, or move while they make a sound.



When there are certain sounds in the environment (someone rings the door bell or the phone rings), first draw the child's attention to this sound and then take him with you to the source of the sound (the front door, the phone). By frequently repeating this, your child will start to see the connection between the sound, the source of the sound and the meaning of that sound.

Paying Attention to Sound

Now that your child is aware of more sounds, does he attend to what he hears for a longer period of time? Playing listening games is a fun way to increase the attention to sound.

- Act as if you are sleeping and wake up with a start when your child calls out. Take turns and be sure to talk: "Wake up!" "Shhh!"
- Go and stand behind a door together and wait until someone knocks on the door; you may only open the door when you have heard the knocking.
- Introduce finger plays and simple songs such as "Itsy Bitsy Spider." Young children love these games and it will hold your child's attention to music longer.
- Join your child in games when he is making sounds with different items around the house. Playing together will increase his attention to sound.
- Walk in place or march to a rhythm; sway or move to the beat while your child bangs a drum; Have your child do the same while you bang on the drum.

Searching for the Source of Sound

Once your child is aware of sounds, he may search for sound but not be able to locate the source. Children with bilateral implants may locate the sound more easily than children with unilateral hearing.

- Point out the sound, label the sound, or take the child to the source of the sound.
- Play games to encourage the child to find the sound source. Play hide and seek. Have a sibling or other adult hide and make a sound or call the child's name. At first, you may need to help your child find the source of the sound. This can become a fun turn-taking game as well.
- Arrange to have someone "knock on the door" or "ring the doorbell." Cue the child to listen. Say, "What do I hear?" or "Listen, someone is at the door. Who is it?" Go to the door.

Noticing when Sound Stops and Starts

- Rock or sway to the rhythm of the music you play for your child. Stop moving when the music stops. This will stimulate the child to also take note of the music's beginning and end.
- Jog in place or dance as long as the music is playing, and stand still or go and sit on the floor when the music stops. Add language to the activity: "Uh oh, the music stopped!" "What happened?" "It's all gone."
- Get two identical empty containers such as small film canisters or small Tupperware. Leave one empty and put a few coins in the other. Shake each one separately. See if your child notices that one makes a noise and the other does not. Then open the canisters and show them to your child so that he can make the link between sound/no sound and the content. Add language to this activity as well.
- Make animal and vehicle sounds with your voice. Have the child move the toy along with your voice. Have the child stop moving the toy when your voice stops. Be sure to use real words, too. For example, "Good job, the car stopped."

Identifying a Sound Source

Your child may now be able to turn to the source of the sound or find the sound that he hears.

- Reinforce this skill by commenting on the source of the sound your child identifies. For example your child may turn to your voice, and you can say, “Good job, you heard Mommy.”
- Encourage your child to tell you what he heard, by pointing or saying “I heard the _____.” Or, “I heard that.”
- Play a calling game where siblings take turns responding appropriately when their name is called. Have your child find the sibling that is calling his name.

Imitating Sounds or Speech

You have been working on sound imitation and turn taking with your child. Now you want your child to be able to imitate babbling or other speech-like sounds either as a long or short string of syllables.

- Sitting in front of a mirror and making long versus short strings of syllables can be a fun way to encourage the child to imitate your syllables. Pick sounds that the child is already capable of producing, such as “babababa” vs. “ba” or “mamama” vs. “ma.” Mixing in a few funny faces always helps to keep the child interested.
- Put a piece of paper and marker, crayon or finger paints on the table. Pair the action of drawing along with long vs. short strings of syllables. You make the sounds then encourage your child to imitate.
- Take turns. Have the child produce long vs. short syllables and you imitate the sound. This encourages understanding of this task.
- Use toys to make sounds for your child to imitate. For example, push a car along with imitation of “beep-beep-beep” vs. “beep.”

Imitating the Pitch of a Sound or Speech

You will want your child to be able to imitate or use vocal inflection for common utterances, such as falling pitch in “uh oh,” or to imitate rising inflection for a question such as “more?”

- Use a strategy called “acoustic highlighting” by over-emphasizing your modeling of these pitch changes. You can also use a little “sing song” in your voice.
- Sometimes, swaying slightly or using gestures helps your child get the feel for this. Many young children using a CI are able to use appropriate voice inflection fairly easily. Children enjoy playing around with different pitch changes of common phrases like “uh-oh, oh no, more please” in a fun and silly manner.

Imitating the Volume of Sound or Speech

Children that develop this skill are better able to modify the intensity of their own voices for appropriate situations. Most children, whether they have normal hearing or are deaf and use a CI tend to be “too loud” in some situations. Many parents want to teach them to use a quiet or “inside voice” when the situation calls for moderation.

- Play a wake-up game. Use a loud voice to wake up a doll or stuffed animal vs. a quiet voice when the doll is sleeping. This is a great game when your child is playing with stuffed animals, dolls or when playing house. Remember to use language to describe what you will do and what is happening.
- Repeat some of your child's favorite games from the previous activities using imitation of a quiet vs. loud voice.
- Take turns playing a drum or banging on a pot, with loud vs. quiet sounds. This can be helpful to teach the loud vs. quiet concept.

- Use finger puppets. Assign the “lion” to be the loud puppet and a “snake” to be the quiet puppet. The lion has a loud roar; while the snake sound is quiet, perhaps just “sssss.” Then model what each puppet will do. Take turns being different puppets and making loud vs. quiet sounds.

Modifying his Utterance to More Closely Match an Adult Model with Hearing Alone

Once your child begins to use words, phrases and sentences, you will want him to be able to improve his accuracy of speech production to match the adult model. Parents of children who have normal hearing frequently correct speech production or grammar by “reflecting” back to the child the correct pronunciation or structure.

- Your child may say, “Look at the tat!” You then say, “Yes I see the cat.” Try to emphasize the word “cat.” Over time your child will begin to correct himself.
- Try using a technique called a “forced alternative” during snack time, meal time, and play time. Instead of giving him a global choice, such as “What do you want?” you give the child a choice of two. Ask the child, “Do you want apples or cheese for snack?” This strategy allows the child not only to focus on the adult model but also to produce the word right after hearing a model. If your child repeats back “teese” for cheese, you then say, “Good, here is your cheese.” Use “acoustic highlighting” (extra emphasis on the word cheese). Then enjoy your snack.

Working with Simple Phrases or Directions

Now you want to offer the opportunity for your child to respond to simple phrases or predictable directions. There are many games, play time and daily living activities that can facilitate your child’s ability to follow directions. Remember to follow your child’s lead when you pick your activities.

- For younger children who enjoy dumping and pouring, you can put blocks in a box, toys in the dump truck, or toys in the sand box. You give the directions during play. Be sure to take turns and have your child “tell” you what to do sometimes.
- Put farm animals in a barn or wagon.
- Put zoo animals in a cage, box, or fence enclosure.
- Have your child find different trucks, cars, or airplanes to push, or put under in a box or table.
- Find the pictures in the book when reading a story.
- Include actions as well as objects. For example, “show me the one that is walking” (running, jumping, etc.)
- Have the child help fold clothes, put clothes away, or take clothes out of the dryer. It can be fun to do these tasks together.
- Have the child find apples, crackers or other familiar items when you are at the grocery store.
- Have the child follow directions when he helps set the table for dinner.
- Play games such as “Simon Says” where the child will need to follow the directions. Take turns and let the child be Simon.
- Hide some objects under containers and then uncover the objects as you name each of the hidden toys. Then cover the toys again and ask the child to find certain objects.



Remembering and Repeating More Elaborate Utterances

As your child becomes a more sophisticated listener, he will be able to handle comprehension of longer utterances. The ability to follow these types of utterances helps children to be more successful as they enter into the preschool setting. Any of the activities above can be used with changes made to the complexity of your directions. For example: if your child wants to help sort the laundry, you can use this situation to introduce a lot of everyday language. For example, you can say, "We are going to sort the clothes. Let's put all the socks together. Please hand me Daddy's big white socks." You can also have the child find the "big blue airplane" vs. the "little red airplane."

Nursery Rhymes or Songs

It is important to continue to use songs, rhymes and finger plays with your child. Your child will most likely follow a sequence of skills during these activities. At first, your child may make sounds that follow the intonation of the song or rhyme but words may not be identifiable. Later, your child may imitate actions and then some of the key words. Finally, your child will be able to sing along with the song or rhyme. Repetition is good. But add new songs, rhymes and finger plays as your child's skills improve and he begins singing or saying the words. These activities help increase auditory memory for increasingly longer strings of information.

Working Deliberately in Background Noise

Although background noise creates a difficult listening situation, it is important to practice listening sometimes in a noisy environment. The world is a noisy place and in order for your child to do the best he can in a bad acoustic environment, you need to practice in those situations occasionally. Take your listening activity to a noisy area occasionally or turn on the radio. It's important to use a quiet environment most of the time, however.





Chapter 4:

Speech and Language Acquisition⁴

To stimulate speech and language development, use developmentally appropriate games, books, toys and activities and talk about everything you do. Talk some more, and yet even more.

In his language comprehension and production a child shows that he has discovered rules for: the order of words, making sentences negative, the construction of questions, and the construction of complex sentences (using words like “and,” “but,” “because,” etc.). So sentences not only get longer but also more complex in their structure. Children learn to actively use the grammatical rules of their language and increase their working vocabulary. To stimulate this, it is important to continually increase the complexity of your language as your child progresses. Don't limit your choice of vocabulary words – use a variety of words that describe the same thing, but don't sacrifice his attention or interest.

A child's speech production skills (also called articulation) develop as he matures. Some articulation errors are typical for a certain age but are expected to disappear when the child gets older. Initially he will imitate a word but it might not be understandable. As his speech progresses, he will be more intelligible to parents and other family members but not necessarily to strangers. The intelligibility of the child's speech becomes better and better over time until eventually most children with normal hearing are intelligible to everyone by around age three. Children with CIs develop the most natural-sounding speech if they learn to compare their own speech to yours well enough to be able to correct and revise their articulation or pronunciation of the word to match yours.

Tips for Stimulating Speech and Language Development

Describe what your child is doing or feeling. This way she learns to make a connection between the language and the event. This supports language comprehension. Adjust the level of the language you model to the language level of your child. Remember Hanen's 3A principles, as described in a previous section.

Involve your child in selecting books that she is interested in. When you are talking or reading to her, emphasize important words and concepts. Pausing after saying something important gives your child the chance to really think about what you have just said. Sometimes children learn things just by hearing them repeatedly, over and over again. Sometimes they learn “incidentally” – just by being exposed to language in the environment.

- During a game like Simon Says, it is a good idea to emphasize words like “on, under, next to,” or “in.” For example, you might say, “Simon says put the ball IN the box;” “ON the cupboard;” “UNDER the table,” etc.
- Use common household items to stimulate language. For instance, one person can describe an object in the room and the others have to find this object by asking extra questions. You can tell her “You are getting warmer!” when she is close to the object, or “You are getting colder!” if she moves away from it.
- Provide a variety of enriching childhood experiences. Trips to the zoo, the grocery store, and the playground all provide opportunities to increase vocabulary and stimulate a variety of language forms that might not be readily accessible at home. Talk about everything you do.

⁴ This chapter is an adaptation of chapter 4 of De Raeve et al. (2008).

- Once she uses her first word, provide the opportunity for her to continue to use more words and word combinations. Quickly these become sentences. This is where the turn-taking skills built during the pre-verbal stage come into play. After commenting on an action, pause to give her time to verbally respond. As you continue talking about the topic, ask questions to encourage her to further expand on her own language.
- Don't be afraid to use "wh- questions" (who, what, where, when, why, which one). If at first she doesn't respond correctly or at all, then model the correct answer for her. Try to avoid questions that promote only a yes/no answer when you can.

As you can see many of the activities suggested under the section on Games to Stimulate Auditory Development are really games or activities that also stimulate language development. This integrated approach is how children with CIs learn language and become competent communicators.

Social-Pragmatic Skills

Language is used as a tool in the interaction between partners in a conversation. But what skills are needed for successful interaction? Language skill is more than knowing some words and being able to put them together to form correct sentences. It is also more than forming the correct sounds in your mouth. Children must also learn how to use language appropriately. A good communicator has a repertoire of things to say that fit particular situations, depending on what job (communicative function) the words must serve: greeting, protesting, giving information, asking for attention, asking for information, etc. A good communicator learns to use the words and the communicative functions which are appropriate in his own culture or community. For example, in many cultures it is not appropriate to address your teacher with "Hey, Jim" but instead, with "Hello, Mr. Jones."





Chapter 5:

Off to Preschool! Now What?⁵

In this section we want to offer parents some ideas to help them to make choices about the school setting. Prior to school age, some parents may have already found a specialized kindergarten, pre-school, infant play group, or a regular day care center. However, the choice as to which academic, social, or support setting will be best for an individual child is often a difficult one.

Choosing a Preschool

Because we have already discussed the communicative options available in the chapters on preverbal speech and language development, this chapter will focus on making the decision of which preschool is right for your child.

Depending on where you live, parents may be given the choice between regular and special education for their child who is deaf. Special groups or services offered within the regular schools, which is quite common in the UK and the US, may not be offered in some other areas of the world. Another option is placement in a special school for children who are deaf or hearing impaired.

The Picture Perfect Preschool program, available from MED-EL, can assist parents in choosing an enriching school placement for their child, particularly if they are looking for a regular (mainstream) preschool setting. It includes a list of key questions to ask the teachers and administrators at a preschool you might be considering. In addition it provides guidance for parents on observing in the classroom, and offers advice on specific situations that might better support their child. Finally, it provides some tips for mainstream preschool teachers who might not have had previous experience integrating a child who is deaf into their classroom.

To make a good choice of preschool placement, it is important that parents look at the big picture and consider all possibilities for their individual child and family.

It is very important to know that choosing a school is not something you only do once, but a choice that should be reevaluated as necessary over the years.

Regular preschools may not be available or beneficial for every child. This is especially true for children who are deaf and have additional challenges. For them, depending on what special services and programs are available, it may be an over-stimulating or overly challenging placement. The goal is for them to feel comfortable, learn the information they need (the same information that children with normal hearing need to learn), and be happy socially. Therefore it is of extreme importance that any additional learning difficulties are identified as quickly as possible, especially when children who are deaf plan to start in a regular school. These are decisions that are best made in cooperation with the professionals working with your child.

⁵ This chapter is an adaptation of chapter 5 of De Raeve et al. (2008).

Background Noise in the Classroom

Even people with normal hearing find speech much harder to understand in background noise (for example, at a party), when the speaker is far away (when you are standing in the back of a group, trying to understand the tour guide), or in a bad acoustic environment (in a cathedral). If you are hearing impaired, this will interfere even more and hearing aids and CIs do not completely solve this problem. These devices usually have a microphone that captures all sound, including background noise and any reverberation in the room. This sound is then processed by the hearing aid or the CI, but the disturbing elements are also entirely or partly processed and passed on.

In the school setting, these environmental or situational difficulties can be partly solved by classroom modifications to help absorb sound, such as carpeting, curtains or shades over the reflective surface of the windows. Wall hangings on large sound-reflective walls also reduce noise interference. Another support is the use of extra amplification systems which can be fitted for the whole classroom (via loudspeakers) or individually (via FM-equipment, infrared system or a telecoil). To use these systems, teachers have to wear a microphone and transmitter. If you have concerns about the auditory environment of your child's classroom, speak to your child's audiologist for suggestions.

We hope you have found Little Listeners to be a helpful resource on the support and education options available for young children with CIs. There are many resources available to you as a parent of a child with CI or a professional working with young children with CIs. This booklet was meant to provide you with an overview of some basic information and suggestions to stimulate your child's development. Please visit MED-EL's Bridge to Better Communication program online at www.medel.com, or contact your nearest MED-EL office for further assistance or to access other Bridge materials.



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