Cochlear Implant and Your Child

You have made the decision for your child to receive a cochlear implant. You have spent a considerable amount of time at a cochlear implant centre through the initial selection evaluation procedure, surgery, and initial stimulation process. You have been involved with physicians, audiologists, speech pathologists, psychologists and educators who have helped you learn about the implant and who have helped your child get started using the implant. Do you know that surgery and being fitted with the external equipment does not bring about instant hearing for your child? In fact, the hearing loss has not been cured nor has hearing been restored. However, the experience and trained professionals will help your child benefit fully from the cochlear implant.

Although it is important to remain realistic, it is exciting that you can now approach your child’s learning with new expectations. You, as parents, best facilitate the learning process which must now occur, and you have the most significant role in helping your child make the best possible use of the implant. This is a new beginning for you and your child.

Developing a Positive Attitude

Depending on your child’s age and educational opportunities, he may be the only child in his school with a cochlear implant. He may be the only hearing-impaired child in your neighbourhood. Therefore, it is especially important for your child to feel good about his implant and develop a positive attitude toward it. This is most likely to occur if your child experiences benefits from having the implant, and if he begins to learn to rely on it for communicating and learning.

You shape much of this positive attitude. As parents, you need to be confident that the implant benefits your child. This means that you must expect your child to wear the device during all waking hours and that the implant is in good working order at all times. Only then can your child learn to depend on his implant to provide the listening experiences he needs.

You also need to feel comfortable with how the implant looks. It is inevitable that curious people will ask questions when they see the implant. You may be the one who must educate others, such as the classroom teacher, speech therapist, babysitter, grandparents and other significant people in your child’s life. Your attitude towards the implant will shape the attitude of so many others.

You and your child’s educational team together can help the other children understand what the implant does and how the parts work. You might even be asked to present information to the other students on the subject of hearing loss and on types of amplification. Some audiologists are willing to provide hearing aids for the class to listen to, and the cochlear implant centre might
Developing Your Expectations

As you develop your expectations for your child, it is important that you keep in mind that there are individual differences among all children who have implants. How well and how quickly your child uses the implant depends on many factors, such as: the age when your child was deafened and the hearing loss diagnosed; the length of time between diagnosis and when your child received the implant; and the cause of the hearing loss. Before your child received the implant, responses to sound, especially to voice, may have been minimal. Your child may have been using visual methods to facilitate the development of language.

Now your child should have an awareness of human voice. The use of audition becomes most important. Your goals depend to a large extent on the degree of your support and involvement both at home and in his educational programme. Understanding individual differences and your involvement are the keys to setting and reaching achievable goals.

Educational Placement

While individual experiences differ, most deaf children with cochlear implants can detect all speech sounds, if their implant is mapped correctly. However, their listening skills still need to be developed. It will be much easier for them to develop spoken language with the help of trained professionals.

These individuals can provide one-to-one listening training to help your child learn to listen through his implant. Many teachers, therapists and clinicians are receiving the necessary training to learn how to help deaf children who use cochlear implants. Ask your professional team about their training and backgrounds.

A deaf child with a cochlear implant needs to be placed in an appropriate educational environment. In the UK, the process of placing a child in the correct class begins with an IEP (Individualized Educational Plan). Regardless of your child’s educational placement, appropriate auditory goals need to be included in the educational plan so that your child can receive maximum benefit from his cochlear implant.

Many auditory skills curricula are available to teachers of deaf children, including children with a cochlear implant. These curricula stress the use of audition (listening) to provide the child with learning experiences. Teachers may obtain information about these curricula from the Alexander Graham Bell Association for the Deaf and also BATOD, which is listed at the end of this paper. Ask your educational and implant team about the auditory skills programme which they will be using with your child.

Many parents choose a cochlear implant so their child will develop spoken language, and therefore it is very important that the emphasis of the educational environment is directed towards the development of spoken language skills. If your child is in a visually based programme, it
is important that auditory goals be incorporated into this environment. A programme which stresses audition for the development of spoken language is essential for a child who has a cochlear implant.

Many children who use cochlear implants take time to transition from a more visually based environment to a more auditory environment. This is especially true for older children who have been depending upon vision for language and communication. You will want to work with your educational team on planning the best language learning experiences for your child’s individual needs.

Auditory Development with the Implant - Making Your Home a Listening Environment

When your child had his initial stimulation of the implant, he was introduced to a new perception of sound. Now is the time for YOU to assume the role of helping your child learn to listen. Your child’s language development and speech production will improve as a result of the use of audition. The steps towards auditory development are the same as for a child with hearing aids or any normally hearing child. Auditory development includes sound awareness, discrimination, recognition and comprehension. If you are enrolled in the Elizabeth Foundation Home Learning Programme, the following suggestions among others, are included in the lessons.

Detection

The first level in the development of listening skills is sound awareness or detection. With the implant, your child is experiencing sound which is much different from sound received through hearing aids. This is why sound awareness is such an important beginning step. Your child may now detect sounds which are unfamiliar to him, and he may not yet respond to many new sounds right away. Therefore, you must draw your child’s attention to voice and to sounds which are occurring around you, and you must help your child notice these sounds with his implant. This will take time and practice.

Think about all of the sounds that exist in your own home. There is the ring of the telephone, a door knock, the radio playing and the clanging of pots and pans, just to name a few. Outside your home there are car horns, aeroplanes, dogs barking and thunder. Your child may point to his ear, stop movement or search for the source of sound on his own. This is spontaneous awareness of sound. However, it could be that your child heard “something” or detected the sound, but he has no idea where it came from or what made the sound. You need to make these sounds meaningful to your child by showing him their source and by talking to him about them. It is important to point out sounds even if your child does not immediately respond to them. With continuous exposure, your child may eventually begin to detect and identify sounds on his own.

With the cochlear implant, your child should be aware of voice, including his own, which is the most important sound in his world.
To determine if he is responding to the low and high pitched speech sounds, it is important that you use the “Ling Six Sound Test” every time he puts on his implant. To do this test, stand behind your child and pronounce each sound, one at a time, varying the timing of each so that your child does not respond to a “pattern.”

The six sounds to use are:
- ah as in father
- oo as in moon
- ee as in key
- sh as in shoe
- s as in sock
- m as in mummy

Teach your child to respond to each of the six sounds. A response may be raising a hand to indicate that he detects the sound or even attempting to imitate the sound back to you. He should respond to all of these sounds. If he is not responding after some practice, there should be further checking of the equipment. Talk to your implant centre about any concerns you have about your child’s detection of these six sounds.

Preschool Lesson Three from our Home Learning Programme provides some excellent activities to assist in the development of an auditory awareness of voice within your home. One of these activities is “Auditory Hide & Seek” in which your child will practice locating the sound of your voice.

Discrimination

The next level of auditory development is discrimination. After a child is able to detect sounds, the next step is to be able to tell the difference between sounds without visual clues. To begin this, it is helpful to provide him with just two or three very different sounds to discriminate at a time. Presenting your child with a few specific sounds from which to choose will allow a successful listening experience. For example, a beginning discrimination activity could be to have your child discriminate between someone knocking on the door and someone calling him.

Your child can learn to discriminate voices on the basis of pitch by listening as mummy (mid pitch), daddy (low pitch), and brother or sister (high pitch) call his name. Who is calling? Is that Daddy? This can be lots of fun!

He should also be aware of the pitch of his own voice and how to vary that pitch, making it low or high. This can be practiced by using a toy such as an aeroplane, and making the high-pitched sound, “Wheeeeee” while pretending to fly it through the air. Then a truck can be pushed while using the low-pitched sound, “Vrooom”.

There are many other opportunities which can be used for giving your child practice with discrimination. You can offer your child a choice of things to eat or drink. Ask your child, “Juice?” (a short word) or “Do you want some chocolate milk in your cup?” (longer sentence)

When your child is able to discriminate between sounds, he should respond to the Ling Six Sounds by repeating them. When he repeats these sounds, you know that not only does he hear across the broad spectrum of speech, but also that he knows the difference between speech sounds at different pitches. Remember, all of this will take time and practice.

Recognition

The next stage of auditory development is recognition. Once your child is able to detect sounds and knows the difference between a few
select sounds, he should then learn to identify a sound without visual clues. An example of recognition is when a child looks at the telephone after he has heard it ringing. Another example of recognition would be running to the window to look when a dog barks. At this stage, your child is able to identify sounds without relying on choosing from a given set of choices — that is, your child recognises a sound in the general environment.

One of the most important words for your child to recognise is his own name. It is therefore very important that family and friends use his name often. For example, when playing with a toy aeroplane, you might say, “What a big aeroplane you have, Jimmy. Grandpa, look at Jimmy’s aeroplane. Jimmy has a big aeroplane.” Be sure that all members of the family use the same name for the child and not different “pet” names or nicknames. Therefore, everyone in this example would refer to the child as “Jimmy” and not “James” or “Jamie.”

There are many games which can be played to help a child learn discrimination. One of the games is described in our Preschool Lesson 5, and consists of using two different objects. When you know that the child understands the name of each object (such as an aeroplane and a ball), by use of voice only, say to the child, “Where is the aeroplane?” The child will point to that object.

Comprehension
The last stage of auditory development is comprehension — understanding what is heard. At this level, your child is able to detect a sound, associate it with its source and give it meaning. For example, when playing, your child responds to someone knocking at the door. He attaches meaning to the sound of the door knock when he runs to the door to open it.

Perhaps your child recognises the sound of your car as you drive into the garage. At the deeper level of comprehension, he responds by stopping what he is doing in order to greet you.

Another example of the difference between recognition and comprehension might be a variation on the discrimination game in Lesson Five. When cooking, you might ask your child to get a spoon and he does. This is recognition. When you ask for a spoon and he not only gets it, but begins to stir, he demonstrates comprehension.

Reaching this level takes time and patience. To begin developing comprehension, your child can participate in activities involving answering questions without any visual information. For example, you might show him a picture book and tell him that there is a red bus going through the town. Then ask your child, “Where is the bus going?” If he comprehends, he will be able to respond to simple questions you ask.

It is important that as this skill is attained, your child learns to integrate and generalise the information he learns from lessons into daily living experiences. When this occurs, true auditory comprehension is achieved. Think of all the daily activities and meaningful conversations in which you can now expect your child to participate.

It cannot be emphasised enough that implant users will vary as to what they are able to do with their implants and how quickly they will achieve these steps. Remember that listening with the implant is a process which begins with the awareness of a new sound, and continues until the sound has meaning in the child’s life. It is important to be aware that listening should occur all day long. Auditory learning not only includes activities which you plan ahead of time, but also includes those valuable incidental opportunities where listening is expected “on the spot.” The key is to make listening fun, successful and a part of your child’s daily experiences.

Care And Maintenance Of The Implant
As mentioned earlier, it is crucial that your child wear his implant during all waking hours and that the equipment is in good working order.
at all times. This is a very important role for you as parents and for the classroom teachers and therapists, as well. Auditory learning and successful listening cannot be achieved when the device is in less than optimal working condition. In order for your child to understand what he hears, a consistent signal needs to come from his implant. Therefore, it is important for you to be knowledgeable about the implant equipment and be aware of some basic troubleshooting steps. Each cochlear implant company provides a guide containing this information. You child’s benefit from the implant depends on your ability to check and troubleshoot the equipment, so reading this guide is essential.

Tips For Maintaining You Child’s Implant

1. Before changing the battery or cord, make sure the speech processor is turned OFF, and that the external transmitter is removed from your child’s head.

2. At night, be sure the processor is turned OFF and stored in the container provided by the cochlear implant manufacturer.

3. If you live in a humid environment, it is a good idea to store the processor and headset in a Dry and Store packet obtained from your cochlear implant manufacturer.

4. Use your best judgment as to when to remove your child’s external equipment during sports or energetic play. Some things to consider are proximity to water, perspiration, and possible impact to the cochlear implant.

5. When in the rain or engaging in water activities, make sure your child wears a waterproof raincoat, and uses a hood or umbrella to protect the equipment. Be careful, however, of plastic because of possible electrostatic discharge.

6. If water or liquid should get into the speech processor, immediately turn it off. Remove the battery and allow the processor to dry completely before turning it on again. Do not use a hair dryer or any electrical appliance to dry the unit.

7. Protect the equipment from being dropped or banged. This can cause the equipment to malfunction due to breakage, loosening of wires, etc. Problems due to loose internal components can only be repaired by the manufacturer.

8. For young children who wear their processors in a pouch or harness, make sure the top of the pocket is closeable so that the processor cannot fall out when the child bends or moves. It is recommended that children wear their processors under their clothing with wires touching their skin for added moisture to further protect the equipment from possible damage.

9. Keep equipment away from excessive heat.

10. When necessary, clean the processor case with a soft, dry or slightly dampened cloth. You may need to use an old toothbrush to clean within the grooves and hard-to-reach areas, especially the microphone grid. Be sure not to get any liquid inside the speech processor.

11. Clean the battery contacts of the speech processor with isopropyl alcohol, which is typically used for cleaning tape heads, and a foam swab.

12. Clean the external input socket using a dust remover spray. This spray is available at most stores that sell electronic equipment.

General Precautions

Electrostatic Discharge

Static electricity discharge results in the small shock we feel when there is low humidity in the air and we touch another object. This small shock of static electricity has the potential to erase the programme of the speech processor or damage the internal components of the implant. To control electrostatic discharge: use fabric
softener or antistatic spray on clothing, carpets and car seats; remove the processor before taking off or putting on a sweater or pullover; do not allow your child to touch computer or TV screens; place antistatic mats under the computer chair and under the keyboard and mouse, remove all external cochlear implant parts before playing on plastic slides, plastic balls, trampolines or parachutes.

**Metal Detectors**
The implant may set off a response from metal detectors at airports, so it is recommended that you carry your child’s cochlear implant patient ID card to explain this response. Metal detectors as well as anti-theft devices may create an unpleasant sound perceived by implant users. This sound should disappear when your child moves away from the source.

**Aeroplane travel**
Airlines request that electronic equipment be turned off during takeoff and landing, and this might include turning off the processor of the implant. Medical equipment may be exempt on American carriers. Check with airline personnel before you travel.

**Magnetic Resonance Imaging (MRI)**
Check with the cochlear implant manufacturer to determine if your child’s implant is one which can undergo MRI testing.

**Head Trauma**
A blow to the head near the cochlear implant may cause damage to the internal device, and it is suggested that parents think carefully before allowing their child to engage in hard-contact sports. This subject should be discussed with your cochlear implant team, especially if your family is focused on athletics.

**Mobile Telephones**
Some digital mobile telephones may create a distorted sound when your child is within three to twelve feet of the telephone. Removal of the telephone will eliminate this problem.

**A Final Note**
It is most important to realise that no matter how old your child is and what educational opportunities exist, auditory processing tasks can be taught to assist in the development of sound awareness and in speech discrimination and production. You can facilitate that development by your knowledge of the implant and how it works, and by your teamwork with therapists, teachers and the cochlear implant centre. Ultimately, however, your most important role as a parent is to guide your child in growth and development and to enjoy your time together.