The National Paediatric Cochlear Implant Programme

Helping Deaf Children To Hear And Talk
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The National Paediatric Cochlear Implant Programme
Helping Deaf Children To Hear And Talk

The Paediatric Cochlear Implant Programme

The National Paediatric Cochlear Implant Programme was established in 1995 as an extension of the Adult Programme. It is based at Beaumont Hospital and the Children’s University Hospital, Temple Street in Dublin, and is supported by the resources of these major teaching hospitals. All assessment and rehabilitation takes place in Beaumont Hospital, and the surgery for children under 6 years old takes place in Temple Street Hospital.

There is a multidisciplinary clinical team consisting of:
Consultant ENT Surgeons
Teachers of the Deaf
Speech and Language Therapists
Audiological Scientists
Clinical Psychologist
Administrators

There is also access to:
Interpreters
Radiology Department
Consultant Geneticist
Consultant Ophthalmologist
Consultant Paediatrician

The Paediatric Programme is committed to achieving a comprehensive family friendly service for the assessment and management of children with a severe / profound hearing loss. The National Cochlear Implant Programme has developed programmes recognised both nationally and internationally for children and adults with nearly 550 people having successfully received cochlear implants by the end of 2011.

The Service

Our service assesses children, including those with complex needs, for suitability for a cochlear implant. If deemed appropriate we then offer the necessary medical, surgical and post-operative management and rehabilitation. Cochlear implantation in young children requires a unique combination of technology, skills and long-term child and family support, while the child learns to use the new auditory sensation provided by the implant system. Our facilities and staff provide this comprehensive range of services.

The Technology

Cochlear implantation is now established as a routine clinical procedure to provide useful hearing sensation to those with a severe / profound hearing loss. For young, profoundly deaf children, a cochlear implant provides the opportunity to learn to communicate effectively through spoken language. The National Paediatric Cochlear Implant Programme regularly reviews the technology used, ensuring the latest developments are available. In the coming years we hope to be able to offer bilateral cochlear implants to those children who may benefit from a second implant.

What is a Cochlear Implant?

A cochlear implant is a highly sophisticated electronic device that provides a hearing sensation for people with a severe / profound hearing loss. It replaces the function of the damaged inner ear (cochlea) by electrically stimulating the hearing nerve (also known as the auditory or VIIIth nerve) to produce a sensation of sound. It can improve communication abilities and give awareness of everyday sounds. Worldwide over 200 000 severe-to-profoundly deaf people of all ages, had become cochlear implant recipients by 2010. Throughout this period improvements to cochlear implantation technology have provided benefit to every age group of recipients.

How Does a Cochlear Implant Work?

A cochlear implant sends an electrical message through a wire called an electrode directly to the hearing nerve, bypassing the damaged or absent hair cells in the cochlea. This means that, provided the hearing nerve is still working, profoundly deaf people can hear sound. With developments in technology and with expanding cochlear implant candidacy criteria, many people can now be helped significantly, and their quality of life improved with a cochlear implant.

The cochlear implant consists of both internally implanted and externally worn components.

The Internal Device

The internal device consists of a receiver and electrode array. Figure 1 shows the Nucleus system. The electrode array consists of 22 active platinum electrode bands. It is inserted into the cochlea by the surgeon, and the 22 electrodes can stimulate multiple sites within the cochlea to give a hearing sensation of all speech sounds. The electrodes of the cochlear implant are connected to a small control circuit called the receiver-stimulator. There is a magnet to enable the external transmitter coil to be held in place (see below). All of this is placed under the scalp during surgery.

Figure 1: The Nucleus cochlear implant and electrode array (not to scale)
The External Components

The external part of the equipment consists of a battery (or rechargeable cell) driven speech processor. The processor is connected to a transmitting coil by a cable. There is a magnet in the middle of the coil that holds the external device onto the implant that is underneath the skin at the back of the ear. Over the years there have been several different models of speech processor, both body worn and ear level. Pictured below (figure 2) are the Nucleus Series 5 speech processors – the BTE (behind the ear) and the body worn, and the Nucleus 5 processor being worn (figure 3). Young children, and occasionally some adults, are provided with the body worn configuration initially. The external parts of the implant are fitted about 4 weeks after surgery.

How Do You Hear With a Cochlear Implant?

The ear level microphone (1) picks up sound, which is then sent to the speech processor. The speech processor converts the sound signals into an electrical format. This information is then sent to the transmitting coil, and crosses the skin to the internal receiver stimulator via radio signal (2). This signal is then decoded to determine which electrodes should be stimulated and at what level. The appropriate electrodes in the cochlea (3) are stimulated and they send electrical impulses to the auditory nerve (4). The auditory nerve sends the signals to the brain where they are interpreted as sound. This whole process happens at the same speed as normal hearing.

Who Is Suitable?

We consider children for implantation if the following criteria are met:

- Bilateral severe / profound sensori-neural hearing loss.
- Aged under five years if spoken language has not developed.
- Limited auditory speech discrimination ability.
- Have parents who understand the long-term commitment involved in cochlear implantation.

Ideally, children born profoundly deaf who have not acquired spoken language should receive their cochlear implant before the age of five. Otherwise it becomes increasingly difficult for the child to make sense of the new auditory sensation, and to learn to listen and talk. If the child has already acquired spoken language, age is not a factor.

The external parts of the implant can be removed at any time, for example, when sleeping or swimming and bathing. When they are removed, no hearing sensation occurs.
and will ensure attendance at the Cochlear Implant Centre for ongoing management.

• Have local professionals who support the process of cochlear implantation and will provide consistent oral/aural input whatever the educational or communication setting.

• Appropriate inner ear and hearing nerve anatomy as shown on MRI scan.

Children with additional disabilities or complex needs are also considered for cochlear implantation.

**What Factors Influence Progress with a Cochlear Implant?**

The multi-channel cochlear implant provides the severely or profoundly deaf child with access to speech. Following implantation the child has to (re) learn to “listen” and use the information provided by the implant. Some children learn to make better use of this auditory information than others. Good listening skills are the essential building blocks for developing spoken language.

There are several factors that can affect how a child develops listening and talking, including:

• Age at implantation
• Age at onset of hearing loss
• Length of profound deafness prior to implantation
• Degree of residual hearing and hearing aid use prior to cochlear implant
• Presence of additional needs
• Presence of central auditory processing disorder
• Number of active electrodes
• Cause of deafness
• Experience using an implant
• Communication mode
• Educational setting
• Consistency of (re) habilitation and support from family, peers and professionals
• Auditory memory
• Attention skills
• Learning ability
• Consistency of processor use post implant
• Child’s own motivation and personality

As each child is an individual, we aim to ensure that the expectations of the child’s family and friends are realistic and achievable.

**The Cochlear Implant Process**

The decision to implant the deaf child begins a life-time’s support, through childhood, adolescence and into adulthood. Children transfer to the Adult Programme at 16 years of age. If the decision is made to go ahead with a cochlear implant, the time from initial consultation to implant surgery varies depending on assessment needs and waiting lists, but is usually about 9 months.

**Paediatric Cochlear Implant Programme Assessment Schedule**

<table>
<thead>
<tr>
<th>Referral</th>
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<tbody>
<tr>
<td>Initial Medical Consultation</td>
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<tr>
<td>Initial contact with: Audiological Scientist ENT Consultant</td>
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<tr>
<td>Assessment Phase</td>
</tr>
<tr>
<td>Evaluation of hearing Initial Communication / Educational Assessment Information counselling MRI scan Further individual assessments or visits to home or school may take place as needed. Reports to Parents &amp; Local Professionals</td>
</tr>
<tr>
<td>Medical Review Consultation</td>
</tr>
<tr>
<td>Results of MRI scan Discussion and shared decision Information/consent form</td>
</tr>
<tr>
<td>Final Medical Review Consultation</td>
</tr>
<tr>
<td>Sign consent form Date for surgery</td>
</tr>
<tr>
<td>Surgery</td>
</tr>
<tr>
<td>Admitted day before or day of surgery Discharged approx 2 days after surgery</td>
</tr>
<tr>
<td>Switch On</td>
</tr>
<tr>
<td>(approx. one month after surgery) Learning to use the speech processor Habilitation and regular assessments to monitor progress Life-long support &amp; maintenance</td>
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The Assessment Phase

The assessment phase is very important and will be carried out in conjunction with the family and local professionals. After referral, the parents and child attend a medical appointment during which they meet the ENT consultant surgeon who leads the team, and are told about the various assessments that are part of the process.

Audiological Evaluation

The next phase will involve an audiological evaluation of your child’s hearing to confirm the type and degree of hearing loss and to establish the auditory benefit the child is gaining from their hearing aids.

Auditory Brainstem Response (ABR) testing will be arranged for children who are too young or unable to participate in co-operative behavioural hearing tests. ABR testing is an objective hearing test performed either under sleep (with very young babies) or under a general anaesthetic. For more information please read the ABR leaflet. Several appointments for hearing assessments will be required to ensure that the hearing test results are consistent and accurate.

It is ideal for children to attend the CI Programme with hearing aids as a hearing aid trial is critical before a final decision can be made about cochlear implantation. Hearing aids are fitted and maintained through local audiology services. It is important that the best hearing aids and earmould combinations are provided to determine the benefit obtained from high powered digital hearing aids.

Assessment of what sounds the child hears with hearing aids may indicate that despite being a good hearing aid user, the child is not hearing enough speech information for good spoken language development. In this case a cochlear implant will be considered. On the other hand, assessment may indicate that the child has good access to speech and is making good progress with acquiring spoken language, therefore, a cochlear implant may not be suitable for them currently. However such children will continue to be carefully monitored for any changes or deterioration in hearing levels.

If a child has a hearing loss due to meningitis, the assessment procedure will be expedited as in some cases the inner ear can become blocked by the formation of bone (ossification), which could make it very difficult or impossible for the surgeon to place the implant electrode accurately in the cochlea. Therefore, the decision to proceed with an implant may be made more quickly, this will be discussed with you in detail by the implant team.

Speech & Language Assessments

During the assessment phase your child will also attend for appointments with a speech and language therapist on the team to assess their communication, listening skills and pre-verbal development. If the decision is made to go ahead with the cochlear implant, this will include an assessment, the results of which will be used as a baseline from which to monitor progress over the coming years.

Teacher of the Deaf

A teacher of the deaf from the team will liaise with the child’s local visiting teacher of the deaf, may visit your child at home and, if appropriate, at school to assess their functioning in their local setting.

Scans

A Magnetic Resonance Imaging (MRI) scan is carried out under general anaesthetic unless the child is older, as it is essential to lie completely still. An MRI is a sophisticated scan, which is used to assess the structure of the inner ears, the auditory nerves and the brain. An appointment will be made a few weeks later with the surgeon, who will explain the results of the scan. If your child is suitable for a cochlear implant, the surgeon will also explain the risks of the operation and any further assessments that may be necessary.

Psychological Assessment

The clinical psychologist with the Cochlear Implant Programme may also meet with you and your child. Often it is important to find out about children’s understanding or cognitive abilities, their behaviour and their social development and play skills. This information is sometimes important in deciding whether to proceed with a cochlear implant and can help you in making a decision about your child’s schooling. The psychologist can assess these areas using formal tests but can also meet with you if you or your child are worried or upset about any other issues. The psychological assessment process can often take up to two or three appointments to complete but this will be discussed with you at the time. Please ask if you would like to meet with the psychologist on the team.

Onward Referrals

As a significant proportion of hearing loss has a genetic basis, or is associated with other medical issues, children are referred to a paediatrician for further assessment as required. Often parents would like to find out why their child is deaf. In a number of cases, the paediatrician or the geneticist is able to pin point the cause of the hearing loss and may be able to advise parents of any risk that future children, or their
children’s children, may inherit the deafness. Not all genes or other factors causing a hearing loss are known. Some parents decide that they do not wish to know if a gene has caused the hearing loss. Any referral for genetic testing is based upon parental request. Hearing loss can occasionally be associated with syndromes and other medical issues, consequently, your child may be referred to other medical specialists e.g. to assess their vision etc.

**Group Information Sessions**

Parents will be given the opportunity to attend information and support meetings within the department. This will include information on cochlear implants, development of spoken language, realistic expectations etc. There will also be an opportunity to meet parents of children with a cochlear implant and the children themselves. This helps to develop a better understanding of the whole process and the level of commitment required to maximise the benefits from the cochlear implant.

**Making the Decision**

There will be ongoing discussions about making the decision regarding implantation e.g. whether everyone concerned feels that it is the right route forward for the child.

If your child is old enough, he/she will be encouraged to participate fully in the decision. You should make sure that you know what your child feels about having a cochlear implant, as his/her feelings are very important.

**The Final Decision**

Following completion of all the assessments the team will meet with you and discuss the suitability of a cochlear implant for your child.

**Remember, any final decision to proceed with the cochlear implant is yours!**

A final visit to the implant centre is arranged in order to confirm the decision, and to discuss any final issues such as which ear to operate on, before final consent is given, and a date for surgery is arranged.

**Surgery**

**What Does The Operation Involve?**

Patients are admitted to the hospital either a day before or on the morning of their implant operation. During the operation, the surgeon implants the internal parts of the cochlear implant underneath the skin. A small area of hair is shaved, but this hair will grow back quickly after the operation. There will be a small scar that is generally covered by hair. The body of the implant sits just behind the ear and the delicate electrode array is inserted into the chamber of the inner ear (cochlea). The audiological scientist will perform intra-operative checks of electrode function, called NRT (Neural Response Telemetry). This ensures that the electrodes are working properly, and also gives the scientist some important information to use at the initial tuning and fitting of the speech processor.

**How Long Does The Operation Take?**

The operation takes approximately 2-3 hours. After the surgery, children remain in hospital for a couple of days and, in most cases, are up and out of bed the following day! Your child will have a large bandage on their head for about 24 hours but after that no further dressing is required.
Are There Any Risks?

There are some risks involved with the cochlear implant operation but no more than the risks involved with any major ear surgery. The risks associated with cochlear implant surgery include:

- Risks associated with the use of general anaesthetic, as for any surgery
- Risk of inflammation or infection
- Disturbance or damage to the facial nerve leading to a facial paralysis
- Stiffness or numbness around the ear
- Disturbance of taste or balance
- Possibly changes in head noises (tinnitus).
- Possible inability to fully place the electrode within the cochlea.

You will be advised to obtain vaccinations for meningitis prior to surgery as there have been some reports that patients with cochlear implants, and/or inner ear malformations may have a slightly higher risk of meningitis. The vaccinations significantly reduce any such risk.

The cochlear implant surgeon will discuss the risks with you in more detail before the operation.

While it is important to be aware that these complications can occur, in practice, there have been very few significant negative side effects worldwide for people receiving a cochlear implant.

Fitting of the Speech Processor and Initial Tuning

Approximately one month after surgery you will attend the Cochlear Implant Programme to have the external speech processor fitted and “switched on”.

The external speech processor is placed on the child. Some children need to be coaxed to accept what is a new and unfamiliar device. If hearing aids have not been worn consistently it may take some time to persuade the child to wear the speech processor.

When the system is in place, the audiological scientist connects the speech processor to a computer and performs the electrode checks again (Telemetry) to ensure that the internal component is still working correctly.

An initial programme or MAP will then be made, primarily based upon the NRT measurements made following surgery. Programmes are made to use the NRT measurements cautiously as a “guide” for the initial programmes. Older children will participate in further co-operative testing that gives us feedback on their individual programme needs.

When the speech processor is switched on, usual reactions from children include:

1. No reaction
2. Stilling, looking bemused
3. Searching
4. Getting upset
5. Turning / running to parent(s) for reassurance

There are no typical reactions as each child is different. Although we do not wish to surprise or frighten your child with the new sensations, any adverse reaction should be looked at as a positive reflection – that your child responded to the strange sensation. Alternatively, some children just do not react behaviourally at all, despite neural telemetry having indicated that the nerve is responding to sound. Once the cochlear implant is switched on the child needs time to adapt to the new sound quality. If the brain has not heard sound at all the sounds will be very strange at first. The MAP in the speech processor will need to be fine-tuned over the coming months.

The biggest changes in sound quality generally will happen in the first few months, which will necessitate frequent tuning sessions initially.

What Happens After Initial Tuning?

Following the initial tuning your child will attend for further tuning sessions until the audiological scientists are satisfied that the MAP is giving your child good access to the full range of speech sounds. This is when the real work (and hopefully fun!) begins.

You will receive regular appointments with the speech and language therapist over the few months to work with your child to facilitate listening and spoken language development. More importantly the speech and language therapist will work with you to help you to learn how best to do this at home and in your everyday life – parents are the most important people on the rehabilitation team!

After the first year, depending on the level of support available locally and how your child is progressing, the frequency of appointments with the speech and language therapist at the Cochlear Implant Programme will reduce. The support of local professionals is required wherever the child lives to ensure that the child makes the most use of the sound provided by the implant.

The cochlear implant team works with the family and local professionals. Outreach support is provided to the child’s home and school to ensure that everyone involved locally has the necessary expertise and skills to support use of the implant. The most important members of the team are,
however, the child and family themselves. While other team members provide advice and guidance, it is the support and language rich environment provided by the family that plays the main part in determining the child’s effective use of their cochlear implant.

In addition to ongoing speech and language therapy sessions to facilitate listening and spoken language development the speech and language therapist also carries out regular formal assessments to monitor progress. These are carried out at set intervals:

- Pre-cochlear implant
- Year 1, 2, 3, 4, 5, 7 and 10 post implant

The results of these assessments help us to plan therapy programmes best suited to your child’s needs, and are always made available to parents and local staff to make sure we are all working together. Over time the implant centre speech and language therapist aims to hand over much of the regular therapy to the local speech and language therapist, but will always be available to liaise and advise as necessary.

The teacher of the deaf will liaise with your local visiting teacher of the deaf and/or school, and may visit you and your child at home or in school. Broadly speaking, the role of the Implant Centre teacher of the deaf is to ensure that local teachers and families have all the specialist information they need to ensure that good implant use forms the basis of effective learning.

Outcomes

Every child who has a cochlear implant is an individual, and as such outcomes and progress vary hugely from child to child. However, the National Cochlear Implant Programme in Ireland has now been running for some considerable length of time, and we are able to provide information about predicted outcomes and average performances. But it is important to remember that there are many factors that affect performance and you should discuss your own child’s situation with the team.

Functional Hearing

The Categories of Auditory Performance (CAP) scale was devised by Archbold et al (1995) and measures a child’s progress in ability to make sense of the sound provided by the implant, categorising auditory perception as outlined below:

- 7: uses the telephone with a known speaker
- 6: understands conversation without lipreading
- 5: understands common phrases without lipreading
- 4: discriminates some speech sounds without lipreading
- 3: identifies environmental sounds
- 2: responds to speech sounds
- 1: aware of environmental sounds
- 0: no awareness of sound

Outlined below are charts that should give you some idea of outcomes for speech understanding using listening only.

**Category of Auditory Performance 5 Yrs Post CI: All Children**

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Category 6</td>
<td>42%</td>
</tr>
<tr>
<td>Category 5</td>
<td>11%</td>
</tr>
<tr>
<td>Category 4</td>
<td>9%</td>
</tr>
<tr>
<td>Category 3</td>
<td>6%</td>
</tr>
<tr>
<td>Category 2</td>
<td>4%</td>
</tr>
<tr>
<td>Category 1</td>
<td>0.7%</td>
</tr>
<tr>
<td>Category 7</td>
<td>0%</td>
</tr>
</tbody>
</table>

As approximately 40% of deaf children have additional needs, including for example learning difficulties, autistic spectrum disorder, additional speech and language difficulties, we also looked separately at outcomes for this group of children.

**Category of Auditory Performance 5 Yrs Post CI: Children with Additional Needs**

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<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Category 6</td>
<td>22%</td>
</tr>
<tr>
<td>Category 5</td>
<td>19%</td>
</tr>
<tr>
<td>Category 4</td>
<td>13%</td>
</tr>
<tr>
<td>Category 3</td>
<td>9%</td>
</tr>
<tr>
<td>Category 2</td>
<td>3.2%</td>
</tr>
<tr>
<td>Category 1</td>
<td>3.2%</td>
</tr>
<tr>
<td>Category 7</td>
<td>1%</td>
</tr>
</tbody>
</table>

Children with no additional needs are likely to make progress more quickly, and to achieve better listening and spoken language skills in the long term.
Speech Intelligibility

The Speech Intelligibility Rating scale (SIR) measures the progress in speech intelligibility for children acquiring spoken language post implant, and the rating scale is outlined below:

6: speech intelligible to all listeners
5: speech intelligible to listeners with little experience of deaf speakers
4: speech intelligible to a listener who concentrates and lipreads
3: speech is unintelligible
2: primary mode of communication is manual, vocalisations may give some additional information
1: pre recognisable words in spoken language

The charts below show speech intelligibility for all children, children with additional needs and children with no additional needs 5 years post cochlear implant. As with listening skills, the children with additional needs are likely to struggle more to achieve intelligible speech.

Educational Placement

There are many options with regard to educational placement for your child. Some children with a cochlear implant attend their local mainstream school, some attend a school for the deaf and some attend a unit with facilities for deaf children which is attached to a mainstream school. Again every child has different needs, and your visiting teacher of the deaf, implant centre teacher of the deaf and other team members will help you decide what is right for your child.

The graphs below show mode of communication used and current numbers attending the different type of schools. Thanks to the visiting teachers of the deaf and to teachers of the deaf in schools and units for their help in gathering this information.
Frequently Asked Questions (FAQs)

Can my child participate in sports with a cochlear implant?
Yes. The implant should not prevent participation in leisure activities, with a few exceptions eg. boxing, rugby, and martial arts. It is advised that a helmet be worn for any contact sports to avoid damage to the internal or external components of the implant. When swimming the processor needs to be taken off, similar to a hearing aid.

Are there any costs I need to cover for the operation/implant/processor?
No. The National Cochlear Implant Programme provides a public service and can therefore offer all services and devices free of charge to patients who are implant candidates. However you are responsible for travel costs to and from appointments, although in some circumstances you may be able to obtain financial assistance through your local Community Welfare Officer. If you do not have a medical card you will also be charged for the stay in hospital, which you can reclaim if you have medical insurance. You may also choose to buy batteries rather than use rechargeable options.

Where do I get spare leads/accessories?
The Cochlear Implant Programme is able to supply a limited number of spare leads and accessories per patient. However, the family is able to purchase extra accessories directly from the implant manufacturer.

Can I have a spare processor?
No. We are only funded to issue each patient with one processor as they are very expensive.

Can I purchase a spare processor?
Yes. The team can provide you with information as to how you can purchase your own speech processor. Just keep in mind the cost is approximately €6000.

What happens if I go on holiday and need spare parts?
You are able to avail of the ‘Holiday Loaner Program’ from the implant company (Cochlear Europe Ltd), which includes all spare parts and a speech processor. There is a fee for this service and it is an agreement between you and the implant company.

What is the life expectancy of the external speech processor?
The speech processor is an electronic device and is therefore subject to faults or breakdowns. A well-minded processor should last for 3-5 years.

When the implant is in place, does it stay there for life?
The system is designed to accommodate growth, so that very young children can be implanted. Cochlear implants can and do break down like any electrical device, thankfully however the failure rate is extremely low. It is however possible to replace the implant due to a technical problem. If later in life technological advances would be of benefit it is also possible to replace the implant.

What happens when the implant is not working/broken?
You can do minor repairs (i.e. replacing leads) at home. However if the processor is still not functioning properly it can be checked over by someone on the team during standard working hours. If we are unable to fix the processor we will issue you with a replacement and send the other for repair.

Can patients hear when they wake up after surgery?
Not yet. The surgeon has only fitted the internal parts of the device. There is a wait of approximately one month after surgery, to allow any swelling or tenderness around the implant site to subside, before the external parts of the device can be fitted. Your child may wear their hearing aid on the opposite side to the implant in the weeks awaiting ‘switch on’. A hearing aid should not be worn on the side of the surgery.

It is important for you or other family members to ask any questions that you have; if you are unsure about anything please ask. It can be useful to make a note of any questions that you may have so that you do not forget when you are in the hospital.

Do not hesitate to ask. It’s your child and we will do our best to answer your questions.
Testimonials

Susan & Emmet, Parents of Thomas,
Implanted March 2009,
Aged 2½

Thomas was diagnosed profoundly deaf and was fitted with two hearing aids at 19 months. He had no speech and communicated using gestures for his needs. He was implanted at 29 months and at “switch on” had no real reaction. The first time Thomas displayed a real reaction to sound was around two weeks later walking on Howth Pier and Thomas started clapping to the sound of a musician playing the accordion. It was a very emotional moment for us as a family. (Thomas has two older hearing brothers).

In the early days, weeks, and months the implant team and Thomas’s visiting teacher gave us invaluable advice, encouragement and support as a family towards helping Thomas on his journey to hear and talk.

Thomas will be five next month and has just started school. What his implant has helped him achieve is unbelievable. He can talk on the phone, he can hear upstairs if we call him from downstairs, he can sing “Happy Birthday”, and he can tell you the names of most of the Barcelona FC team! His passion is football both Gaelic and soccer. His favourite book is “The Troll” by Julia Donaldson and he can recite chunks of the story by heart! He is constantly asking us questions and is generally a little chatterbox! The sound of his voice chatting away is the most beautiful sound and one we never dreamed as a family might happen when we were at the start of this journey.

Karen, Implantation August 2009,
Aged 9

My name is Karen, I’m 11 now. I got the Cochlear Implant when I was 9. I was born deaf and at first my parents didn’t know I was deaf because I could lip-read so I was nearly 3 when I got Hearing Aids. It’s been almost 2 years since I got the Implant and I’m so glad I decided to go for it. I thought I could hear with my Hearing Aids but since I got the Implant I realised I couldn’t hear very well at all. I rely entirely on my Cochlear Implant now!!! 😊

I can hear the TV a lot better, I can listen to music on my phone and I don’t have to ask everyone what’s happening? Before I was always asking over and over again to repeat what they’re saying and I mostly had to lip-read in school. Oh, and I can switch it off when I’m annoyed! 😎 I never used to hear the phone ringing, the clock ticking, water running. It was strange at first, so I didn’t even know what the sound was!!! 😎

I love playing sport and I find it a lot easier with the implant as I can hear the coaches, the referee and my team mates calling.
Overall it has made my life so much easier. 😊
Iman,  
Implanted February 2005,  
Aged 2

Hello everyone, my name is Iman Ahsan. I am 9 years old. I live in Dublin. I had a cochlear implant surgery at the age of 2 years. Doctor Laura Viani and her team of doctors and audiologists operated on me. The cochlear implant had a huge impact on my life. Now I am blessed to be able to hear everything, I can hear my friends talking to me, I can understand what my mom and dad are saying to me, I can hear the wind blowing and rain drops falling. I enjoy going to the cinema, one of my favourite movie is “The Muppets”. I love to swim and like going to Phoenix Park, I enjoy cycling and skating in the park I enjoy playing just dance 3 with my younger sister. I can understand my teacher explaining to me very well, my favourite subject is maths, I like doing divisions and multiplication. I wish to thank the cochlear implant team for all their help and support.

Christine and David, Parents of Jack,  
Implanted November 2009,  
Aged 3 ½

Our son Jack was born in March 2006 and in 2007 was diagnosed with a mitochondrial disorder. Simply put he is missing 3 of his energy cells. He was diagnosed as being profoundly deaf, suffers chronic renal failure which entails being on dialysis 6 nights a week, he has poor muscle tone and probable development delay. He had his cochlear implant operation in November 2009 and was “switched on” in January 2010. We made the decision to accept a place for him on the cochlear implant programme as we felt we wanted to give him every chance of communication. Life is hard enough for him with dialysis, not walking, special needs and so on, that having hearing would be a benefit to him. As far as we are concerned the implant is a miracle technology and the cochlear implant team are amazing. We did all the preparation information days prior to implant and knew what was ahead of us. Our son now hears and 2 years on he is actually listening and understanding. It has not given him speech yet, and I say yet as we never give up hope for him, but we have always understood speech is not guaranteed. However, from the time you put the implant on him in the morning, he is babbling all day. We understand what his happy, excited sounds are and which his “not-so-happy” sounds are. He now points at his CI harness as he wants it put on as soon as possible in the morning.

The first year and a half was difficult as he constantly used his magnet piece as a chewing toy. He would also knock the magnet off if he didn’t want to listen to you or if he wanted to get your attention. It was frustrating for us, but we would just pop it back on and pretend nothing happened. You have to do a lot of “hearing” work with him to help him understand and distinguish sounds, things hearing people take for granted and it is a huge learning curve for parents. We work closely with the CI team, our visiting teacher for the deaf and his special needs school and continue to use Lamh and ISL to enhance any communication. Eventually he has learned that without it, he has no sound. He loves music and we think he is trying to “sing” when we have the radio on in the car. He is more focused on things and hopefully it will enable him to live a full hearing life.

To anyone contemplating this little miracle, you have nothing to lose for your child and a whole new world to give them.
Useful Websites

In the UK, there are 3 main manufacturers of cochlear implants:

- Cochlear
  www.cochlear.com

- Advanced Bionics
  www.advancedbionics.com

- MED-EL
  www.medel.com

Other useful websites include:

- National Deaf Children’s Society
  www.ndcs.org.uk

- British Cochlear Implant Group
  www.bcig.org

- Ear Foundation, Nottingham, UK
  www.earfoundation.org.uk

- Deaf Education Through Listening and Talking
  www.deafeducation.org.uk

- DeafHear
  www.deafhear.ie

- Irish Deaf Kids
  www.irishdeafkids.ie

- Simply Signing
  www.simplysigning.ie

- The Elizabeth Foundation
  www.elizabeth-foundation.org

- Information for teenagers
  www.ci-4teenz.com

- Comprehensive website for current and future CI users
  www.cochlearimplantHELP.com

- Books, videos and CDs about deafness and deaf issues
  Forest Books
  The New Building
  Ellwood Road,
  Milkwall, Coleford,
  Gloucestershire, GL16 7LE
  Tel: 00 44 1594 833858
  www.forestbooks.com