

The National Paediatric Cochlear Implant Programme



Helping Deaf Children To Hear And Talk



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Helping Deaf Children To Hear And Talk

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with contributions from all the Cochlear Implant Team

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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, Dublin, and is supported by the resources of this major teaching 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

The Paediatric Programme is committed to providing a comprehensive family friendly service for the assessment and management of children with a severe /profound hearing loss.

The Service

Our service provides for the assessment of children, including those with complex needs, for suitability for a cochlear implant. If deemed appropriate we then provide 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 offer this combination of technology, skills, care and services.

The Technology

Cochlear implantation has been 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 Paediatric Cochlear Implant Programme regularly reviews the technology used, ensuring the latest developments are available.

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 (auditory or VIIIth) nerve to produce a sensation of sound. It can improve communication abilities and give awareness of everyday sounds. Over 75000 severe-to-profoundly deaf people, of all ages, have become cochlear implant recipients over the last 20 years. Throughout this period improvements to cochlear implantation technology have provided benefit to every age group of cochlear implant 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. This means that, provided that the hearing nerve is still working, profoundly deaf people can hear sound.

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

The Internal Device

The Nucleus multi-channel cochlear implant is used in Dublin. The internal device is placed completely under the skin, in a well made in the mastoid bone behind the ear during surgery. Figure 1 shows the Nucleus system. It comprises 22 active platinum electrode bands. This electrode array is placed 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).

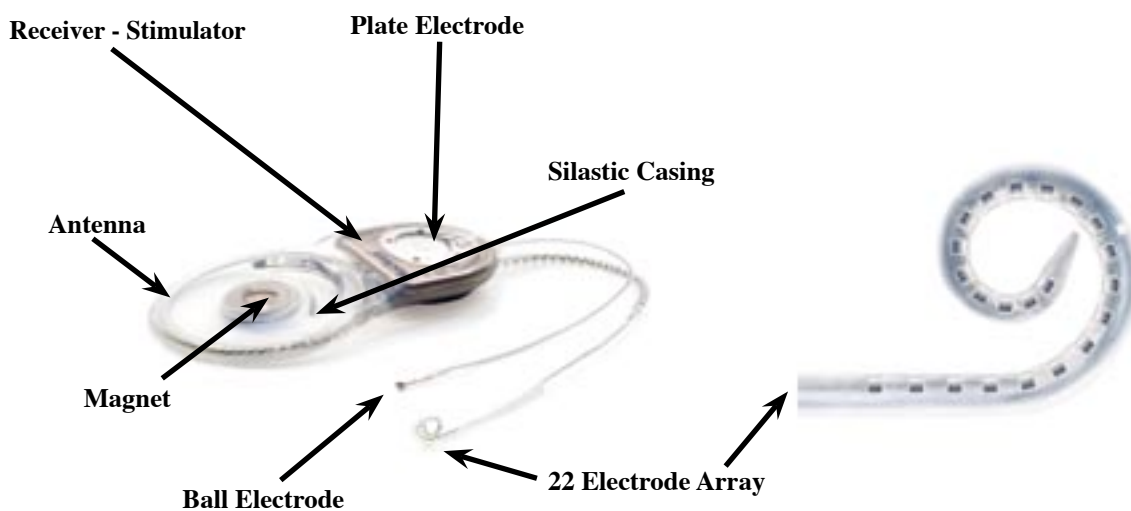


Figure 1: The internal Freedom Nucleus implant and electrode array (not to scale)

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 Freedom speech processors – the BTE (behind the ear) and the body worn. 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.



Figure 2: The Freedom BTE speech processor (left) and body worn speech processor (right) (not to scale)



Figure 3: The Freedom BTE speech processor being worn (not to scale)



Figure 4: The Freedom Bodyworn speech processor being worn.

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.

How Do You Hear With a Cochlear Implant?

The ear level microphone 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. This signal is then decoded to determine which electrodes should be stimulated and at what level. The appropriate electrodes in the cochlea are stimulated and they send electrical impulses to the auditory nerve. The auditory nerve sends the signals to the brain where they are interpreted as sound. This whole process happens at a similar speed to normal hearing.

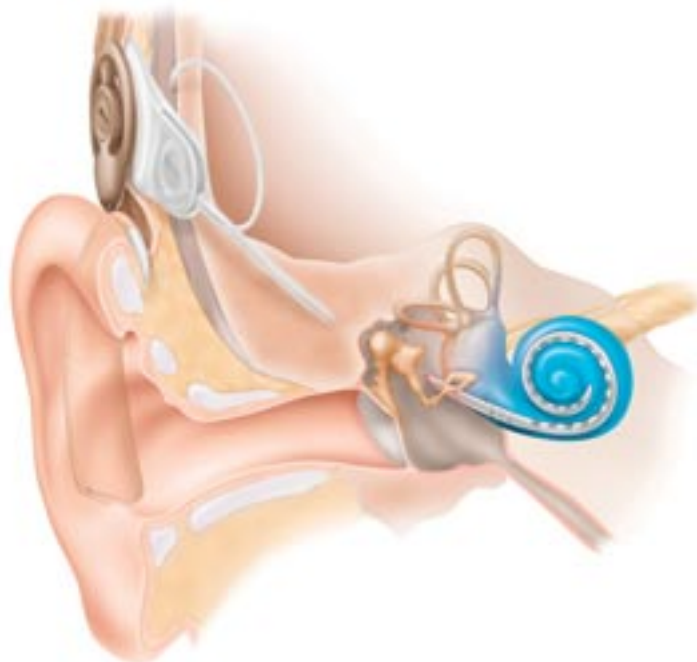


Figure 5. Transmission of sound using the cochlear implant

Who Is Suitable?

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

- Severe / profound, bilateral, sensori-neural hearing loss.
- Aged under five years, if spoken language has not been acquired
Ideally, children born profoundly deaf, who have not acquired spoken language should receive their cochlear implant before the age of five. Otherwise it is 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.**
- Limited auditory speech discrimination ability
- Have parents who understand the long-term commitment involved in cochlear implantation and will ensure attendance at clinic 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.

Children with additional disabilities or complex needs are 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 spoken language later.

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

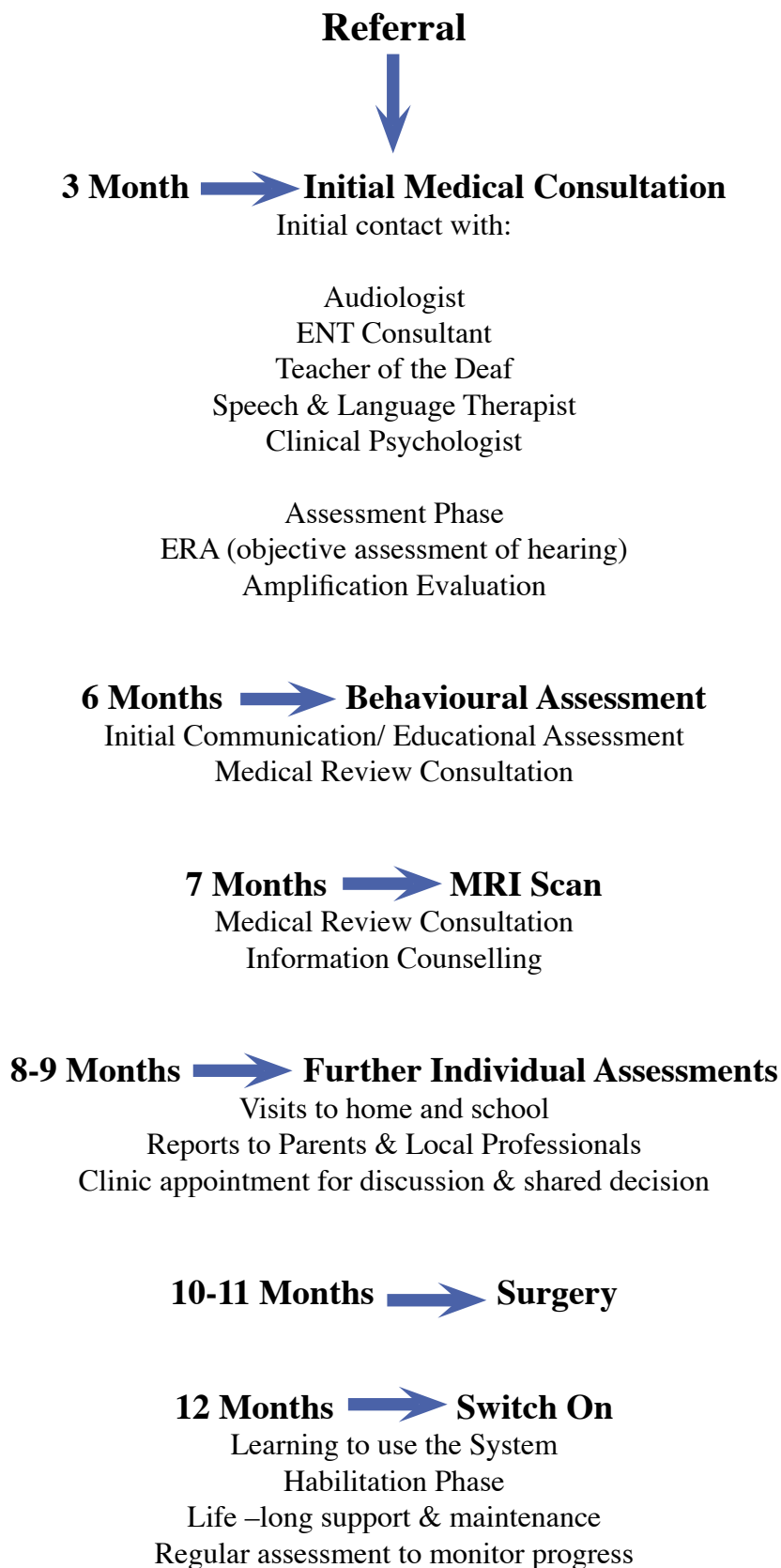
- Cause of deafness
- Age at onset of hearing loss
- Length of profound deafness prior to implantation
- Age at implantation
- Degree of residual hearing and hearing aid use prior to cochlear implant
- Presence of additional needs
- Presence of central auditory processing disorder
- Number of active electrodes
- Experience using an implant
- Communication mode
- Educational setting
- Consistency of (re) habilitation and support from family, peers and professionals
- Auditory memory
- Auditory and cognitive attention
- 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 lifetime's support, through childhood, adolescence and into adulthood. Children transfer to the adult programme at 18 years of age.

Paediatric Cochlear Implant Programme Assessment Schedule



Please note that the timescale is approximate and may be subject to change

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. As a decision to proceed with cochlear implant is a decision for life and involves assessment of hearing aid use over time, the assessment phase necessarily takes many months to complete.

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 discuss the child's use of behind the ear hearing aids. Evoked Response Audiometry (ERA) will be arranged for children who are too young or unable to participate in behavioural hearing tests. These are automated tests that are performed either under sedation or under general anaesthetic. For more information please read the ERA leaflet. Behavioural testing is carried out after ERA.

Several appointments for hearing assessments are required in order to ensure that the hearing test results are consistent and accurate, to ensure that the best hearing aids and ear mould combinations are provided and to determine the benefit obtained from high power amplification. A trial of consistent hearing aid use therefore lasts between three and six months before any final decision can be made regarding suitability for a cochlear implant. Assessing what a child hears with the most suitable individual hearing aid available is an important part of audiological assessment. Assessment of what sounds the child hears when aided, observation of what she responds to, and what sounds she produces, may indicate that despite being a good hearing aid user, a child is not hearing enough speech information. In this case a cochlear implant will be considered. On the other hand, assessment may indicate that a child has good access to speech and is acquiring spoken language, with hearing aids, and currently may not need a cochlear implant. However your child will continue to be carefully monitored for any changes.

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 electrode accurately in the cochlea. Therefore, the decision to proceed with an implant may be made quickly. This will be discussed with you in detail by the implant team, if relevant.

Speech & Language Assessments

During this time your child will also attend for appointments with a speech and language therapist on the team to assess their communication and listening skills and pre-verbal development.

Teacher of the Deaf

A teacher of the deaf from the team will liaise with the child's local visiting teacher of the deaf, will visit your child at home and, if appropriate, at school to assess her functioning in her local setting, and to assess follow-up support available.

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. If the child has been deafened by meningitis, this will be carried out first, as there may be bony growth occurring in the cochleas, which has implications for suitability for cochlear implantation. An MRI is a sophisticated scan, which is used to assess the structure of the inner ears, the auditory nerves and the brain. Approximately one month after the scan an appointment will be made with the surgeon, who will explain the results of the scan, and if the child is suitable for a cochlear implant, the risks of the operation and any further medical assessments that may be necessary.

Psychological Assessment

A clinical psychologist may also see you or your child for assessment of your child's functioning in terms of cognitive abilities, behaviour and/or play skills.

Onward Referrals

As a significant proportion of hearing loss has a genetic basis, we offer a referral to a clinical geneticist. Many parents would like to try and find out why their child is deaf. In an increasing number of cases the geneticist is able to pin point a gene that has caused the hearing loss and is able to advise parents of any risk that further children, or their children's children, may inherit the deafness. Some parents decide that they do not wish to know if a gene causes the hearing loss. This referral is based upon parental request. The waiting list for this appointment is quite lengthy.

Hearing loss can occasionally be associated with syndromes. 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 children themselves. This helps to develop a better understanding of the whole process and the level of commitment required to maximize the benefits from the cochlear implant.

Making the Decision

Ongoing discussions will continue about making the decision regarding implantation, and whether everyone concerned feels that it is the right route forward for the child. By the end of the assessment process you are going to have detailed information about your child's deafness, hearing levels with and without hearing aids, and communication and speech and language development. This will enable you to contribute to an informed decision on what is best for your child, and whether a cochlear implant is part of that.

If your child is old enough, s/he will be encouraged to participate fully in the decision. You should make sure you know what your child feels about having a cochlear implant, as their 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 a day or two days before their implant operation, to allow for assessments prior to surgery. This includes a baseline assessment, which is carried out by the speech and language therapist, and will be used to monitor progress over the coming years. During the operation, the surgeon implants the internal parts of the cochlear implant underneath the skin. A small area of hair is shaved, but 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 in a well made in the mastoid bone 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 3 – 5 hours. After the surgery, children remain in hospital for about a week 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 two days, 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
- Risks 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).

You will be advised to obtain vaccinations for meningitis prior to surgery as there have been some reports that patients with cochlear implants, or inner ear malformations may have a slightly higher risk of meningitis. The vaccinations reduce any risk significantly. 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 Department 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, and especially if hearing aids have not been worn consistently it may take some time to persuade the child to wear the speech processor. However, initial resistance has never been a long-term problem.

When the system is in place, the audiologist 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, using the NRT measurements made following surgery as a guide. 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 typical reactions from children include :-

1. No reaction
2. Stilling, looking bemused
3. Searching
4. Getting upset
5. Turning or 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 with a positive reflection – that your child responded to the sensation. Alternatively, some children just do not react behaviourally at all, despite having recorded measurements that indicate 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 may seem 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. Thereafter you do not need to attend the department for implant tuning as frequently.

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 first couple of 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 team.

After the first year the frequency of appointments with the speech and language therapist will reduce, depending on the level of support available locally and how your child is progressing. 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 people on the team are however the child and family.

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
- 6 months post implantation
- Year 1,2,3,4,5,7 and 10

The results of these assessments help us to plan therapy programmes best suited to your child's needs, and are always made available to local staff to make sure we are all working together. Over time the implant centre speech and language therapist aims to hand over as 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 visit you and your child at home, and will liaise with your local visiting teacher of the deaf and school. She will assess your child's use of and progress with the implant over time. Her role is to ensure that local teachers and families have any specialist information and equipment they need to ensure that good implant use forms the basis of optimal language and learning development over the long term.

Post-implant, the clinical psychologist sees children who are experiencing difficulties with learning at school or with socializing, and children who have emotional or behavioural difficulties.

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

Functional Hearing

The Categories of Auditory Performance scale, developed by Archbold et al. (1995) measures a child's progress in ability to make sense of the sound provided by the implant, categorizing auditory perception from awareness of environmental sound to the higher order skill of discriminating speech on the telephone. Figure 6 plots the achievements of children implanted within the preferred age range, before the age of three. 100% understand common phrases after five years, 90% understand conversation, and 60% can use the telephone. A significant majority of these children achieved these skills within three years post implant. Figure 7 shows that after five years over 70% of those implanted within and outside the ideal age range achieved understanding of common phrases.

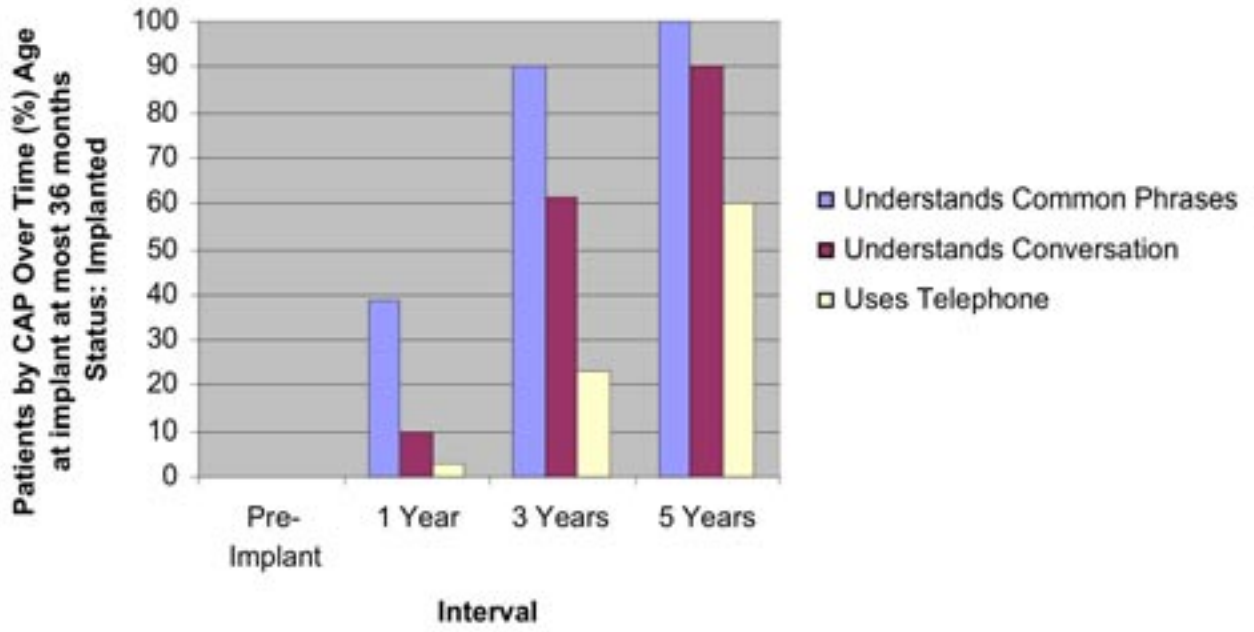


Figure 6

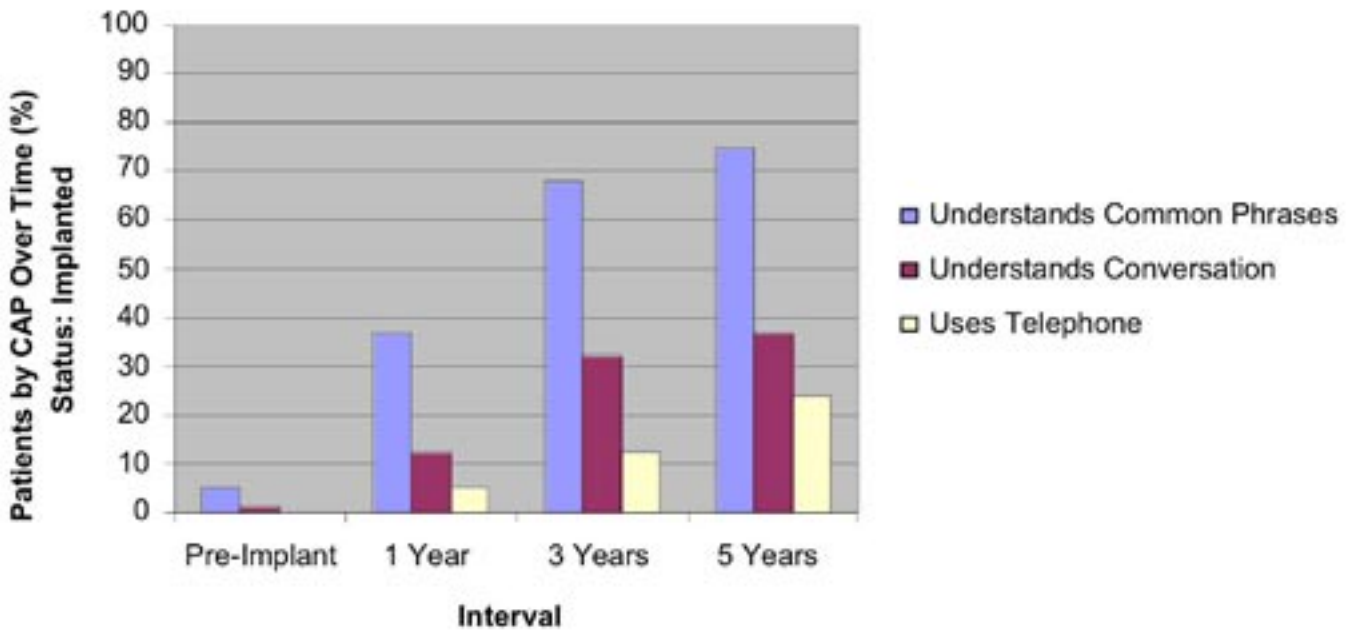


Figure 7

Speech Intelligibility

The Speech Intelligibility Rating scale (SIR) measures the progress in speech intelligibility of children acquiring spoken language post implant, from being intelligible if their conversational partner concentrates, through to being universally intelligible. If we look at those children implanted during the preferred age range of under three (fig 8), five years post implant 100% were intelligible to those who concentrated, 95% were intelligible to those familiar with deaf speakers, while 36% were intelligible to all. Again a significant number achieved intelligibility within the first three years post implant. Figure 9 shows that of children implanted within and outside the ideal age range, over 65% were intelligible to those who concentrate, five years post implant.

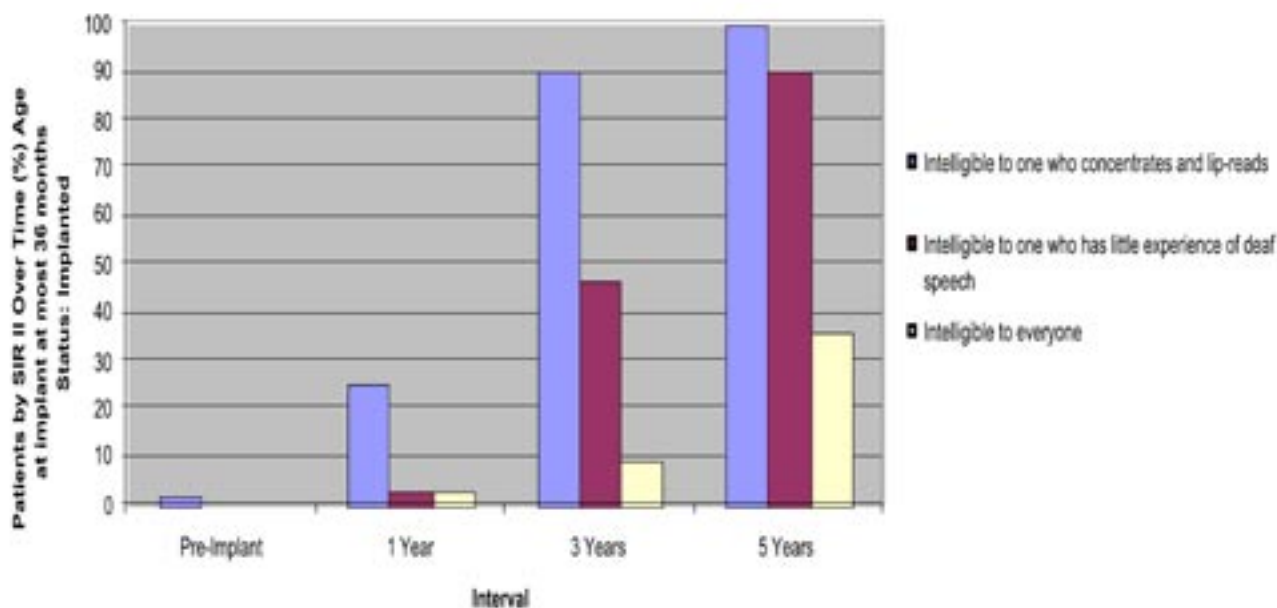


Figure 8

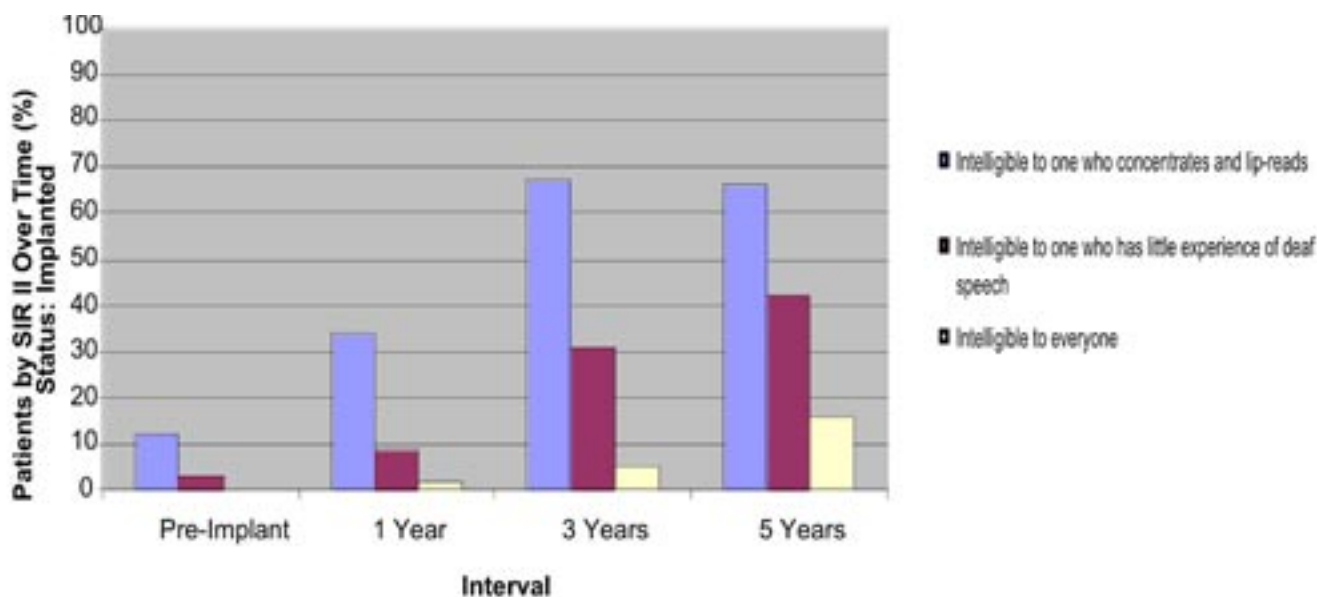


Figure 9

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 and implant centre teacher of the deaf will give you information so that you can decide what is right for your child.

The graphs below show the current educational placement of children implanted at the National Cochlear Implant Programme in Ireland.

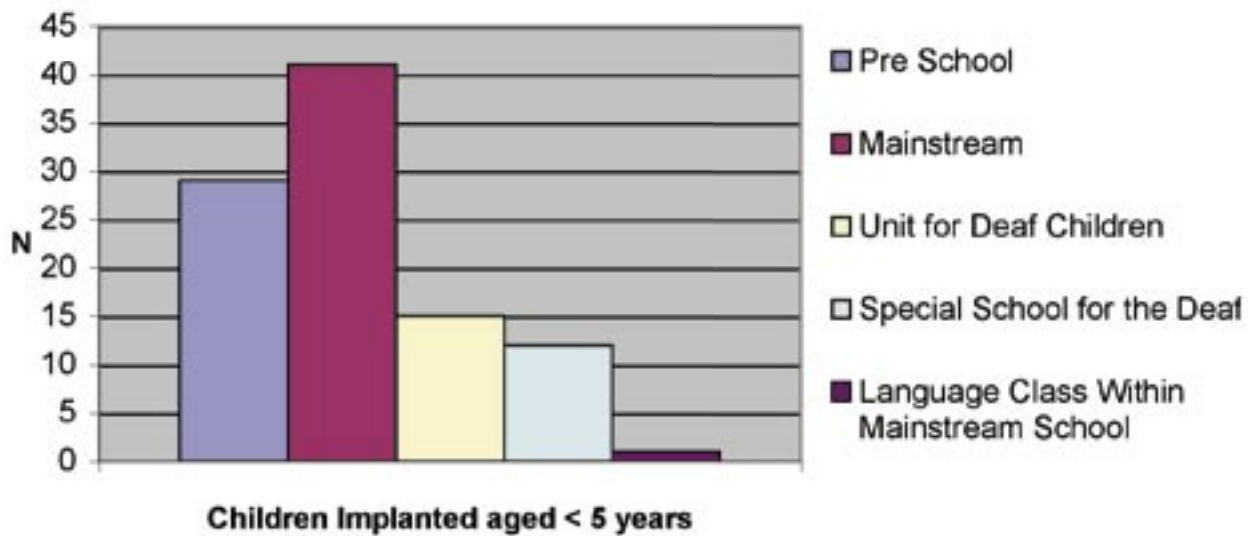


Figure 10

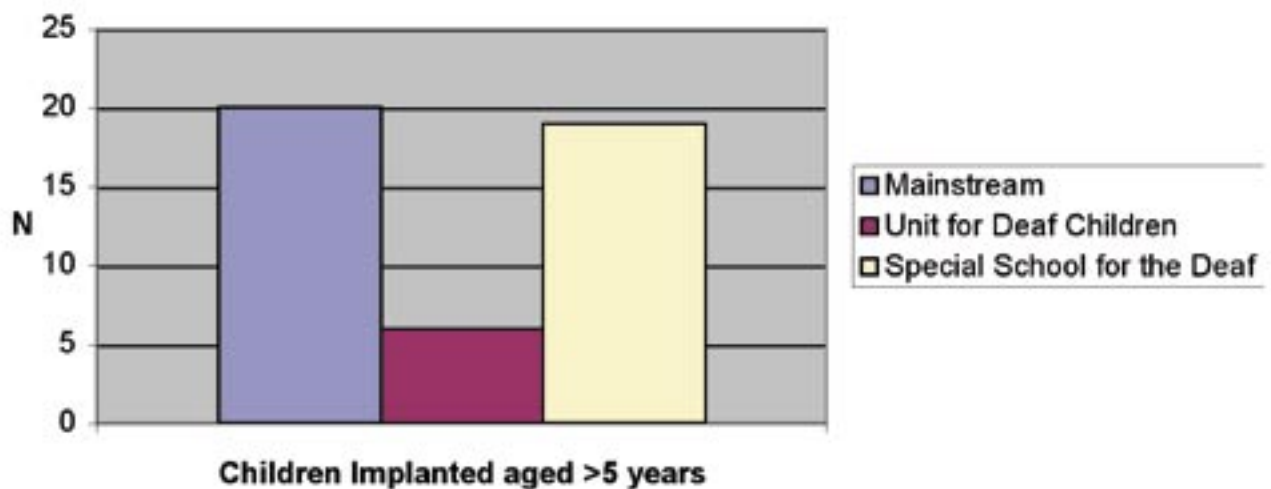


Figure 11

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, for example horse riding and cycling. 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.

❖ **Where do I get spare leads/accessories?**

The cochlear implant department will supply you with any spare leads, coils, microphones, pouches, etc you may need.

❖ **Can I have spare batteries as well?**

We supply spare **rechargeable** AA and AAA batteries to those patients who use a body worn processor. Patients needing 675 batteries for their ear-level processor need to purchase their own supply. The team can give you some advice as to where you can get these batteries.

❖ **Can I have a spare processor?**

No. We issue each patient with one processor only.

❖ **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?**

The cochlear implant program can provide you with any spares you may need or you can order a 'holiday loaner kit' from the implant company, 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 a couple of years.

❖ **Once 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. If we are unable to fix the processor we will issue you a new one 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 should wear their hearing aid on the opposite side to the implant in the weeks before '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.

Speaking for Ourselves

Patrick,

Implanted November 1995, Aged 6½

When I was born I could not hear anything. I remember wearing hearing aids. I could not hear with them. Mammy and daddy used to call me “Pat! Pat!” And I could not hear them. Then I got a cochlear implant. Now I can hear anything. The first sound I remember was the TV. I turned it up and thought great. Mammy was delighted I liked the implant from the start. It has helped me to learn to talk. I also like music now. I listen to Metallica, D12, Guns N Roses, AC/DC and Slipknot. I can talk on the telephone. I can talk to all my friends even though I still use some sign. I don’t need mam to talk for me to my friends! I have more privacy!! I play sports now. I can hear anything. Getting the implant is the best present I ever received. I wouldn’t be without it for the world. It’s the first thing I put on every day and the last thing I take off at night.



Kevin,

Implanted February 2003, Aged 12

I could hear a bit with my hearing aids but I had to depend on lip-reading at most times. Telephones were useless to me as it was like listening to a lot of fizzing noises. Music would drive me mad, and the TV. I couldn’t hear so I was always asking my family what was happening. I still do as I’m still not great at listening to the TV but I’m improving.

My hearing was dropping but I got the chance to have a cochlear implant. It took me a while to decide to have the operation since I was nervous due to the risks. After the implant was switched on (programmed for the first time) everything seemed so noisy. Opening a packet of crisps was terrible, but as time went on I got more used to the implant and soon liked it. The hearing is great (hearing things is great) and I now love music and can use the phone but not much.

I’m so glad I made the decision to have the cochlear implant. It changed my life for the better.

Mother of Sally,

Implanted March 2003, Aged 2 ½

Sally was diagnosed profoundly deaf at 20 months. She was assessed for a cochlear implant and was found suitable. We had some reservations initially about the operation, but with the help of other parents and the implant team we were confident that it was the only way Sally would have some useful hearing and be able to speak and participate in her local community. Sally was implanted at two years and eight months.

Her initial reaction to the cochlear implant was very good. She wore it all the time and just took it off to investigate and have a chew on occasions. It was three months before we noticed her turning to her name and when she started play school in the September after the implant we really noticed a big difference in her speech and understanding.

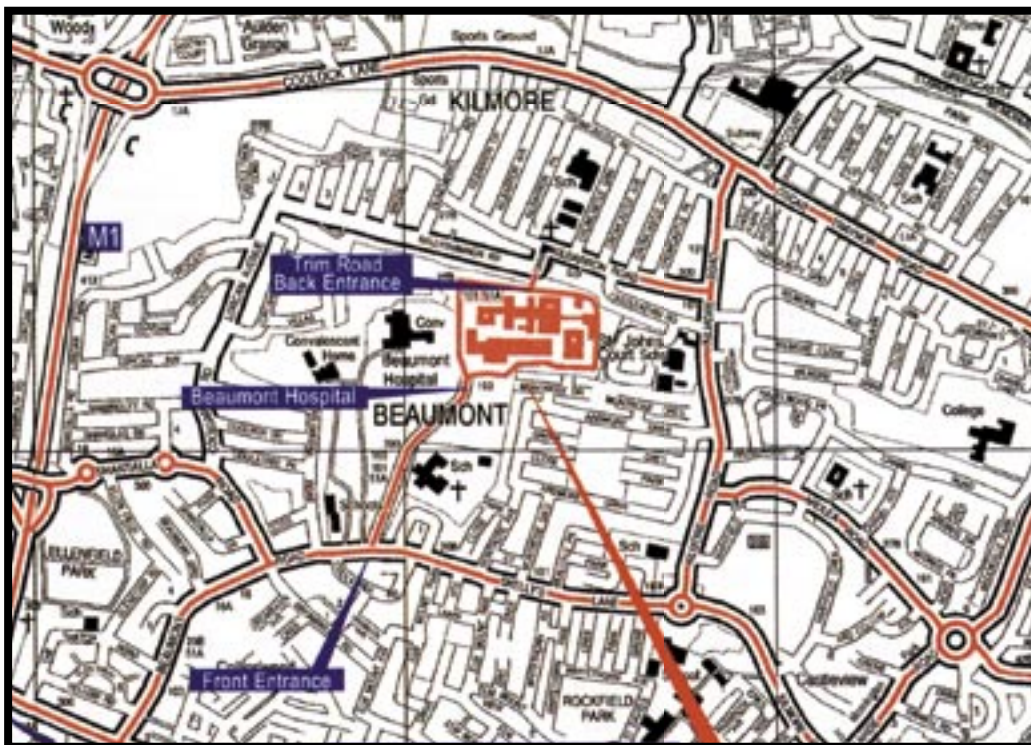
Sally can now have a conversation with family members on a hands free phone and enjoys playing musical chairs. We feel that seeing and speaking with other families and implanted persons helped us to decide it was right for Sally. She had no speech and little understanding before the operation, but now just one year and six months later she understands nearly everything and her speech is improving daily

Tracey

Implanted May 1996, Aged 8

My name is Tracey. I'm sixteen years old now. I got a cochlear implant in Beaumont Hospital in May 1996. I was born profoundly deaf. I got hearing aids at about one and half years old. I couldn't hear anything with them. Someone told my parents about the cochlear implant (when I was seven years old), but it was so new then. I was the first in Donegal to get the new implant. (I was implanted at eight years old.) I remember the day I got it switched on. I could hear someone knocking but I didn't know what it was. I had to learn everything. The things I loved most was the birds singing and the water running in the river. I remember the first song I heard was "Words" by Boyzone. I managed to get through mainstream school. It was difficult because I had to listen very closely to hear what the teachers were saying but as I got used to the sounds it became a bit easier. I'm now in the fourth year in the local community school and (even) passed my Junior Cert Examination. I have no doubt that without the cochlear implant I wouldn't be where I am today. I can honestly say it was the best thing that happened to me!!!

I am able to go out with my friends! I can understand everything they say to me. I am able to listen to CDs. I can understand my family on the phone and I am able to hear all the environment sounds. I really wish I could go to sleep with it on as I really miss it when I take it off as I feel so cut off from everything then. It has made a huge difference to my life!



Bus Routes to Hospital

51A, 27B, 103, 104. There are several other buses that serve stops within walking distance of the hospital.

Please check the internet for the latest information regarding bus timetables.

Useful Contacts

Please visit the British Cochlear Implant Group website:

www.bcig.org

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

www.cochlear.com

www.advancedbionics.com

www.medel.com

Working With Others:

National Association for Deaf People

North Frederick Street

Dublin 1

www.nadp.ie

Connevans

Equipment for deaf and hearing impaired people at home, school and work

54 Albert Road North

Reigate

Surrey

RH2 9YR

Tel: 00 44 1737 24751

www.connevans.com

Cochlear Implant Children's Support Group (CICS)

Tricia Kemp

4 Ranelagh Avenue

Barnes

London SW13 0BY

Tel. 00 44 20 8876 8605

The Speech Language and Hearing Centre

Christopher Place

Chalton Street

London

NW1 1JF

Tel. 00 44 20 7383 3834

www.speech-lang.org.uk

Deaf Education Through Listening and Talking

DELTA

PO Box 20

Haverhill

Suffolk

CB9 9BD

Tel: 00 44 1440 783 689

www.deafeducation.org.uk

The Ear Foundation

Marjorie Sherman House

83 Sherwin Road

Lenton

Nottingham

NG7 2FB

Tel: 00 44 115 942 1985

www.earfoundation.org.uk

The Elizabeth Foundation

Southwick Hill Road

Cosham

Portsmouth

Hampshire

PO6 3LL

Tel: 00 44 23 9237 2735

Email: info@elizabeth-foundation.org

[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

Royal National Institute for Deaf People

RNID

19-23 Featherstone Street

London

EC1 Y8SL

Tel: 00 44 20 729 6809

Email: membership@rnid.org.uk

Pockets

Custom-made pocket harnesses to accommodate processors/radio aids etc. for your child from just £24.50 inc. p&p

Sarah Davies

Kingslow House

Kingslow

Pattingham

Wolverhampton

WV6 7DY

Tel: 00 44 1902 700029

ADDITIONAL USEFUL WEBSITES:

National Deaf Children's Society

www.ndcs.org.uk

British Deaf Association.

www.britishdeafassociation.org.uk

Early support for families with hearing impaired children

www.earlysupport.org.uk

www.deafnessatbirth.org.uk

Information for teenagers

www.ci-4teenz.com

