

COMER
CHILDREN'S
HOSPITAL



THE UNIVERSITY OF
CHICAGO

COCHLEAR IMPLANTS:

*Bringing the gift of sound
to children with severe to profound
sensorineural hearing loss*



Dear Family,

In a magical world, all the problems of childhood are solved with a simple stroke of a wand. In our everyday world, we can't solve all children's problems that easily, but we are closing in on one major problem: the problem that isolates children with sensorineural hearing loss (nerve deafness) from the world of sound.

The pediatric cochlear implant program at the University of Chicago Comer Children's Hospital has the tools to bring clear spoken language and enjoyable musical sounds to the deaf child's silent world. A safe, proven medical treatment, the cochlear implant transmits sound beyond the non-functioning portion of the ear, enabling the child to hear in a most natural-like way.

The University of Chicago pediatric cochlear implant team is expert and dedicated. Highly trained in our fields, our team is made up of surgeons, audiologists, speech pathologists, Child Life specialists, a social worker, a geneticist, a developmental pediatrician and a psychologist. Working together, we make sure each step of the process is executed successfully. As the child's parent, you are also an essential member of our team, and partnering with you in the best interest of your child is an important part of our program.

I know you'll have many questions. I welcome talking with you, and I would be very pleased to have your child as part of this life-changing program. Please read our brochure, and then contact me to discuss our program more fully.

Sincerely,



Dana Suskind, MD

Director/Surgeon Pediatric Cochlear Implant Program

Telephone: (773) 702-9022

Email: dsuskind@surgery.bsd.uchicago.edu

The Cochlear Implant Program



Front cover:

At birth, two-year-old Ronin could not even hear drums. Today, thanks to bilateral cochlear implants, he both plays them and hears them — along with his entire family.



The cochlear implant team at the University of Chicago Comer Children's Hospital

Our cochlear implant team is dedicated to helping deaf children hear, particularly children with severe to profound sensorineural hearing loss. We combine advanced medical technology – the cochlear implant – with years of experience to bring these children into the world of laughter and ringing telephones, music playing and expressions of love, shouts of enthusiasm and words of encouragement. Once they have the gift of clear sound, these children can develop the ability to listen, to understand and to speak.

First things first: What is the cochlea?

The cochlea is the organ of hearing. This pea-sized structure, located deep inside the ear, sends sound information to the brain where it is heard as sound. Inside the cochlea are very

delicate hair cells, which enable the individual to hear different pitches and rhythms of sound. If the hair cells are non-functioning, the individual has severe to profound sensorineural hearing loss.

What is a cochlear implant?

A cochlear implant is a safe, FDA-approved medical device that transmits sound past the non-functioning hair cells of the ear, enabling deaf children to hear electronically. The internal portion – the implant – is positioned in the cochlea of the ear. The external portion – the processor – is positioned close to the child's outer ear. The processor picks up sounds with microphones and sends them to the implant, which stimulates the hearing nerve directly.

How natural hearing works

Ear canal: Sound moves through the ear canal and strikes the ear drum.

Eardrum and bones: Sound waves cause the eardrum to vibrate, sending the bones in the middle ear into motion.

Inner ear: The motion causes the fluid inside the inner ear (cochlea) to move the hair cells inside the inner ear.

Hearing nerve: Hair cells change the movement into electric impulses, which are sent to the hearing nerve in the brain, enabling the person to hear.



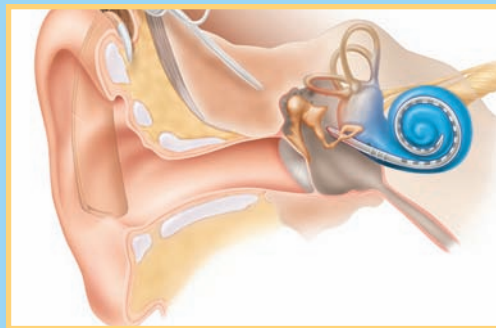
How cochlear implant hearing works

Sound processor: External sound processor captures sound and converts it into digital signals.

Digital signals: Processor sends digital signals to internal implant.

Electrode array: Internal implant converts signals into electrical energy, sending it to an electrode array inside the cochlea.

Hearing nerve: Electrodes stimulate the hearing nerve, bypassing non-functioning hair cells. The brain perceives the signals as sound, enabling the person to hear.



Why not a hearing aid?

For some children, a hearing aid is simply not enough. Hearing aids only amplify sound. For children with severe to profound hearing loss making sounds louder does not make them clearer. For these children, even the finest, most advanced hearing aids will not work effectively. While hearing aids may provide minimal benefit to some, what they hear will not be clear. They will find it difficult to understand speech and other sounds. With even the best hearing aid, children with severe to profound hearing loss are unable to interpret sounds well enough to learn to understand the spoken word and to develop the ability to speak.

In contrast to a hearing aid, a cochlear implant does not make sounds louder – instead it bypasses the non-functioning part of the ear, sending sounds directly to the auditory (hearing) nerve, mirroring the intricacies of natural hearing for the child.

How do I know a cochlear implant is right for my child?

Cochlear implants are not for everyone. To know whether a cochlear implant may be right for your child, you first need to know the extent of the hearing loss. Children with mild to moderate hearing loss are not candidates for cochlear implants. They can usually be helped by hearing aids and other forms of amplification. Cochlear implants are most likely to help children who have severe to profound sensorineural hearing loss (nerve deafness). Children with this type of hearing loss get little or no benefit from hearing aids.

The earlier a child receives an implant, the greater the potential to develop listening/speaking skills at the same level as peers who have no hearing loss. The multidisciplinary cochlear implant team at Comer Children's Hospital, as well as audiologists and specially trained teachers in the educational system in your community, have the ability and resources to help your child make as much progress as possible with listening/speaking skills.

Finally, for your child to be successful with a cochlear implant, your family must have a **strong commitment**. You are the most important part of the process!

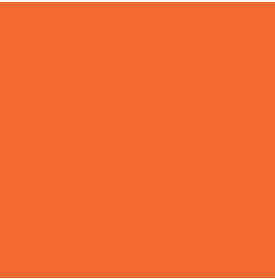
Will my child outgrow the implant?

The cochlea is fully formed at birth, so your child will not outgrow the implant. The skull is almost full-grown by the time a child is two years old, and the electrode array is designed to accommodate this skull growth in children under two.

What if technology changes?

The cochlear implant is designed to last a lifetime. Its design has changed relatively little since it was first created over 30 years ago. Conversely, the methods that deliver the signal to the receiver have changed significantly over time. However, the external speech processor, which stores this programming, is designed to accept new programming as it is developed. And the speech processor itself can be easily replaced if technology improves.

What is more important is that the cochlear implant be received as soon as possible. To learn to communicate verbally, your child must learn to interpret the sounds received. The longer your child goes without hearing these sounds or hearing them clearly, the more difficult it will be for him or her to interpret these sounds.



Why choose the University of Chicago Comer Children's Hospital

The University of Chicago Comer Children's Hospital is an ideal setting for a comprehensive cochlear implant program. Opened in 2005, it is a warm, inviting home away from home for children as well as a state-of-the-art medical facility. The staff is phenomenal – individuals selected for compassion and understanding as well as for professional excellence. In the few years since its opening, the Comer Children's Hospital has become a model for children's hospitals nationwide.

How the multidisciplinary cochlear implant team benefits your child

Much of what makes the cochlear implant program at Comer Children's Hospital special is the multidisciplinary team. The individuals within each discipline are deeply caring and highly qualified. Together they bring great depth and breadth to the program.

Surgeon The surgeon “orchestrates” the entire cochlear implant process, working closely with your child and family as well as with each member of the multidisciplinary team from diagnosis, to decision, to surgery and throughout follow up.

Audiologist The audiologist plays a key role in evaluating your child's hearing initially. If your child receives a cochlear implant, the audiologist programs the sound processor to your child's unique needs. She plays a key, long-term role in helping your child develop and progress with aural communication skills. She is your greatest resource!

Speech therapist The speech therapist evaluates your child's speech and language as appropriate for his/her age with major input from parents and specialized testing. She teaches you how to provide therapy to your child.

Child Life specialist The Child Life specialist focuses on each child's psychological and developmental needs in order to minimize anxiety. She prepares the child and family for what to expect throughout their medical experience.

Educational liaison The educational liaison explains hearing loss and cochlear implant to your child's class and teacher when your child returns to school with an activated cochlear implant.

Social worker The social worker determines where your family's greatest needs lie and helps your family move through the surgery and its aftermath as smoothly and effectively as possible.

Developmental pediatrician The developmental pediatrician evaluates how your child is progressing developmentally, if needed.

Psychologist The psychologist serves as a resource for other team members who can, if necessary, refer your child and help you manage your own concerns.

Geneticist The geneticist is able to identify any genetic factors in your child's hearing loss.

Parents You play the most important role in helping your child achieve success with the cochlear implant, providing appropriate therapy at home, getting your child to follow up appointments as needed, and working with the multidisciplinary team to see that your child receives the support needed in school.



Ian celebrates his “Hearing Birthday” with his mother and cochlear implant team members.





When you bring your child to us

Our goal first – and always – is the best interest of your child. We are experts in determining if a cochlear implant is the best choice or if another alternative would serve your child better. To make this determination, we thoroughly evaluate your child's health and hearing.

Initial evaluation is done on an outpatient basis. It is noninvasive and usually takes several hours.

The medical evaluation is accomplished with the use of advanced imaging technology, which enables our surgeons to view and evaluate the structure of your child's inner ears.

Conducted by our team of audiologists, the hearing evaluation is multifaceted. Your child undergoes a series of tests individually tailored to him/her: every child is different.

Speech and language evaluation and educational plan assessment are ongoing components of the process involved in helping your child attain appropriate developmental levels.

The surgical experience

If cochlear implant is deemed the best option for your child by the multidisciplinary team (which includes you), the next step is to schedule surgery. The surgery is a routine, outpatient procedure, which usually takes one to three hours. It involves a small incision, which allows the surgeon to properly place the implant within the inner ear.

At Comer Children's Hospital, you are allowed to wait in the operating room until the anesthesia takes effect and your child is soundly asleep – one of many extra steps the cochlear implant team takes to assure the best experience for your child and for you. For your comfort, we can also arrange an overnight stay for your child and family.

Activation – moving from a world of silence into a world of sound

Three to four weeks after surgery, your child returns to have the implanted device activated. This involves linking the implanted internal receiver to the external speech processor. The audiologist creates the initial MAP or program, which allows your child to hear sound for the first time with the cochlear implant.

This is a truly momentous occasion – the moment at which your child moves from a world of silence into a world of sound.

Surgeon and staff celebrate this major turning point in your child's life with you at a "Hearing Birthday" party – a party that marks a totally new beginning for your child and family.

Helping your child progress

Once the cochlear implant is activated, your child returns to the multidisciplinary team for check-ups and therapy on a regular basis. At each evaluation, your child's speech processor is remapped, and additional testing is provided as needed. Each child hears differently, and audiologists excel at matching programs to each child's unique style of hearing.

If you live far away and/or it is not convenient for you to come here on a regular basis, we work with you to find healthcare professionals in your area who can provide care that is both appropriate and convenient.

Amazing success

Thousands of children around the world are hearing thanks to cochlear implantation.

At Comer Children's Hospital, we sincerely hope that your child can join ranks with these children. And, if your child is suited for cochlear implantation, we have the right team and tools to make it happen. We have many families whose children have had cochlear implants at Comer Children's Hospital. They would be happy to share their experiences with you to help you while you are in the decision-making process.

We also have a support team you can join if your child has a cochlear implant here. It will put you in touch with other families whose children have also received cochlear implants at Comer Children's Hospital as well as with the professionals dedicated to helping you and your child.

Contact us

To learn more about the pediatric cochlear implant program and the full range of other hearing services at Comer Children's Hospital, please contact Dana Suskind, MD, Director, by phone at (773) 702-9022 or email at dsuskind@surgery.bsd.uchicago.edu.

Or visit us online at

www.uchicagokidshospital.org/cochlear.

Convenient Locations

For the convenience of our patients, services are available in several locations, including:

**University of Chicago
Comer Children's Hospital**
5721 S. Maryland Avenue
Chicago, IL 60637

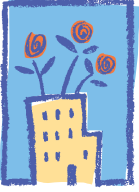
**Duchossois Center for
Advanced Medicine**
5758 S. Maryland Avenue
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Chicago, IL 60637

University of Chicago Physicians Group
4801 Southwick Drive
Fifth Floor
Matteson, IL 60443

For an appointment at any of these locations, please call us at **(773) 702-9022**.



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