

Cochlear Implants

Cochlear implants are benefiting thousands of severely or profoundly deaf adults and children who have viable neurons in the inner ear that can respond to direct electrical stimulation. These electronic devices deliver sound to the inner ear, bypassing the damaged hair cells to deliver rich auditory impulses directly to the auditory nerves. Cochlear implants help patients hear, improve their understanding of speech and improve their speaking ability.

Cochlear Implants — 3 Components

Headpiece – Worn externally behind the ear like a hearing aid, the headpiece has a microphone where sound enters and travels down a cable to a speech processor

Speech Processor – A small box worn in a pocket or on a belt changes the sound from the microphone into an electrical code and sends the code back up into the headpiece. Most patients now choose to wear a miniature speech processor behind the ear like a hearing aid.

Implantable Receiver – Surgically placed within the cochlea, the implantable receiver takes the electrical code and sends it through tiny wires to the inner ear to directly stimulate the hearing nerve fibers.

The brain adapts to give the person what sounds like almost normal speech. While the result does not fully reproduce normal sound, the device filters out background noise and is good for person-to-person conversation. In only the last six years, the electronic signals have improved to make speech clearer, so that many patients can use telephones.

University Hospitals Cochlear Implant Program
Department of Otolaryngology, Head and Neck Surgery
University Hospitals of Cleveland
11100 Euclid Avenue
Cleveland, OH 44106
216-844-5500 | TTY 216-844-1544

Cochlear Implant Faculty

Cliff A. Megerian, MD, F.A.C.S.
Director of Otology, Neurotology and Lateral Skull Base Surgery
Medical Director, University Hospitals Cochlear Implant Program
Adult and Pediatric Cochlear Implants
E-Mail: cliff.megerian@uhhs.com

James M. Coticchia, MD
Pediatric Otolaryngology
Pediatric Cochlear Implants

Gail Murray, Ph.D., CCC-A
Audiology
Clinical Director, University Hospitals Cochlear Implant Program
E-Mail: gail.murray@uhhs.com

Additional audiologists, speech therapists, deaf educators and social workers are integral to the cochlear implant team.

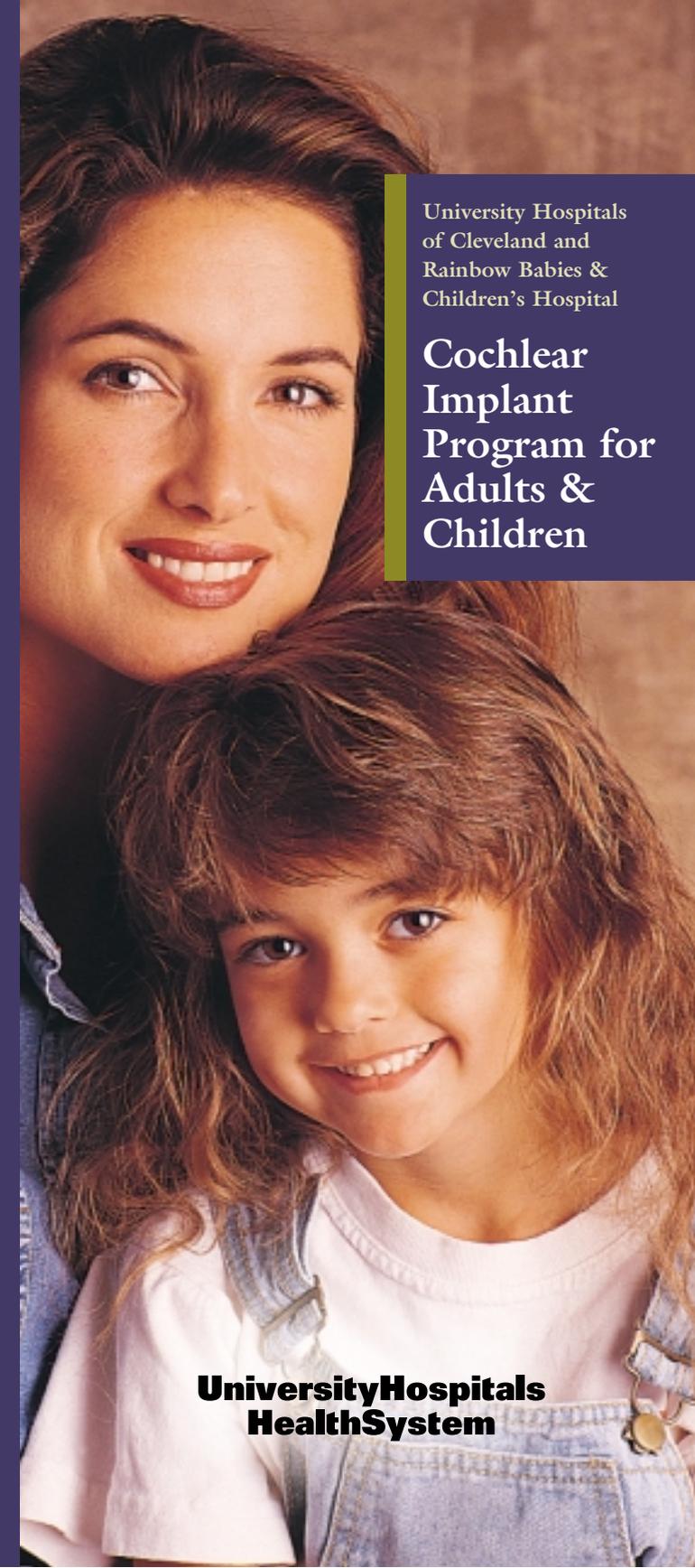
About University Hospitals Health System

University Hospitals Health System (UHHS) is the region's premier healthcare delivery system, serving patients at more than 150 locations throughout northern Ohio.

Committed to advanced care and advanced caring, University Hospitals Health System offers the region's largest network of primary care physicians, outpatient centers and hospitals. The System also includes a network of specialty care physicians, skilled nursing, elder health, rehabilitation and home care services, managed care and insurance programs, and the most comprehensive behavioral health services in the region.

Visit our Web site at www.uhhs.com

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HealthSystem**



University Hospitals
of Cleveland and
Rainbow Babies &
Children's Hospital

Cochlear Implant Program for Adults & Children

Help for the severely or profoundly deaf

More than two million people in the United States are severely or profoundly deaf, having 90 percent hearing loss in both ears. Some are pre-lingually deaf, having had no hearing from birth or losing their hearing before developing speech and language; others have had their hearing deteriorate over years until everything sounds garbled. The condition affects nearly every aspect of life and has an enormous impact on families. Conventional hearing aids that amplify and deliver sounds to the ear do not improve this type of deafness.

The majority of those with severe to profound deafness have a degeneration or malfunction of thousands of delicate hair cells in the cochlea (inner ear) due to illness, injury, or hereditary factors. Damaged or malfunctioning sensory cells prevent electrical impulses from reaching the hearing nerve and sending them along to the brain where they are interpreted as sound.



Photo courtesy
of Cochlear Ltd.

Adult Program

Candidates usually include the post-lingually deaf adult population, however more and more pre-lingual deaf teens and adults are choosing implants to improve lip reading and oral communication skills. The adult deaf community is an especially savvy group. Well educated about different types and causes of deafness, deaf persons are aware of services available for them throughout the country and of new developments that may enhance their ability to communicate.

University Hospitals Cochlear Implant Program invites adults with severe or profound hearing loss to explore whether a cochlear implant is appropriate for them. In addition to a wealth of information for patient and family, the adult program provides:

- **Comprehensive audio evaluation**
- **Consultation/choice of cochlear implant**
- **Aural rehabilitation to regain good articulation**
- **Evaluation of assistive device**
- **Ongoing support services for implant recipients and families**
- **Videotapes and educational literature**
- **Website**

Patients and family members, particularly spouses are part of the cochlear transplant team, and family support is invaluable. The clinical team members welcome their participation, questions and concerns at any time. Their goal, like the patient's and family's, is the best possible outcome for the implant recipient.

University Hospitals and Rainbow Babies & Children's Hospital Cochlear Implant Program

Highly skilled hearing specialists bring the newest hearing technology to adults and children.

The University Hospitals and Rainbow Babies & Children's cochlear implant team has extensive experience in routine as well as difficult cases in both pediatric and adult patients. The team strives to educate the patient and family and works closely with them before, during and after implantation to provide all support services needed to assure the best hearing outcome in every case.

- A neurotologist, a specialist in the treatment of ear disease and surgery as well as nerve and brain related problems of the ear, leads the cochlear implant team
- Surgeons are fellowship trained in otology and neurotologic surgery.
- Audiologists perform pre-operative hearing evaluations.
- Cochlear Implant Audiology Specialist programs the external speech processor to the patient's diagnosis and measures and reprograms it to physiological changes over time.
- Speech-language pathologists, social workers, education consultants and psychologists available as needed.

Everything for the most successful outcome possible:

- A thorough evaluation determines whether the patient is a candidate for implantation.
- The surgical procedure is about 2 hours, typically performed on an outpatient basis.
- The three major types of cochlear implants are available — the Nucleus, Clarion and Med-El devices
- Team helps each patient choose the most appropriate device.
- Following implantation patients learn how to properly decode the electronic signal and process speech.
- Habilitation training teaches prelingual patients to process speech for the first time.
- Patient and family participate in decision-making.

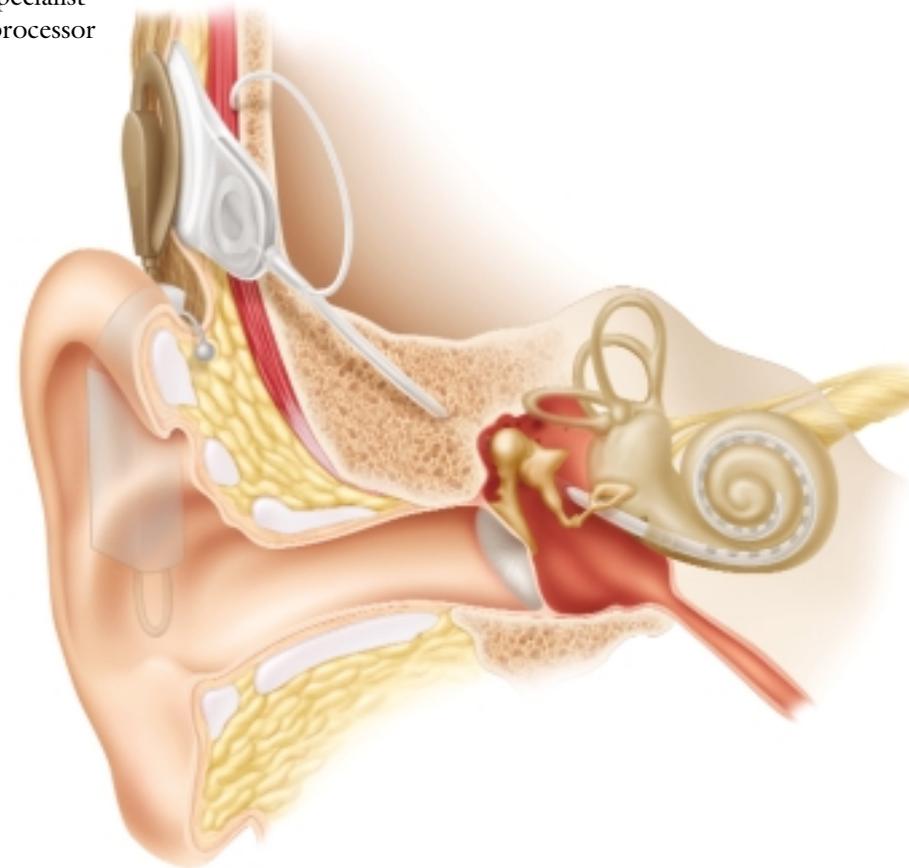


Diagram courtesy of Cochlear Ltd.

Pediatric Program

Rainbow Babies and Children's Hospital

About 1 in 1,000 babies are born severely or profoundly deaf. Cochlear implants can provide the ability to hear for many of these young ones and others who have lost their hearing through accident or illness. As mandatory universal hearing screening becomes law in Ohio, hearing impaired children will be identified earlier and earlier.

University Hospitals Rainbow Babies & Children's Hospital, consistently ranked in the top tier of children's hospitals in the country, has an extensive Pediatric Cochlear Implant Program where parents can be sure that their child is receiving the best possible care and the most advanced treatment.

- **Comprehensive evaluation**
- **Comprehensive training prior to implanting**
- **Consultation/choice of cochlear implant**
- **Individual aural habilitation**
- **Educational support services**
- **Family support services**
- **Surgical collaboration with both neurotologic and pediatric otolaryngologic support**

Today's smaller, more sophisticated cochlear implants make them appropriate for children age 12 months and older. Research shows that the younger a child is when implanted, the sooner speech and language development can begin. This has psychosocial and educational advantages, and as a result younger implantation improves chances of a deaf child moving into mainstream schools.

For the appropriate child, cochlear implants improve self-expression, understanding of language and academic performance.

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