

CENTRE FOR HEARING AND EAR IMPLANTS

Cochlear Implants



Singapore
General Hospital
SingHealth

What is a cochlear implant?

Unlike hearing aids, the cochlear implant is an electronic device that bypasses the damaged parts of the inner ear and stimulates the hearing nerve directly. This sends electrical signals to the brain and is heard as sound.

Who should get a cochlear implant?

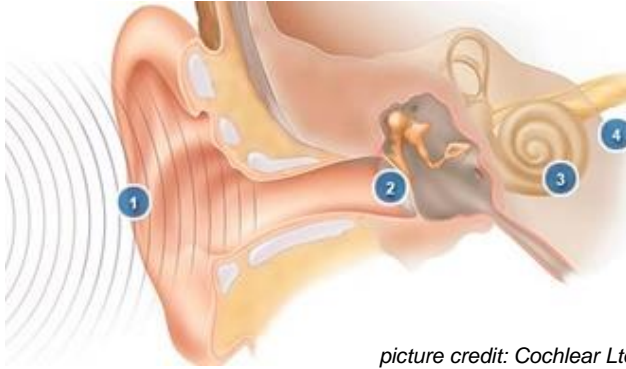
The cochlear implant is an alternative treatment option for people with severe to profound sensorineural hearing loss in both ears and receive little or no benefit from conventional hearing aids. With this device, useful hearing is possible for these people and communication can be improved.

Children as young as one year of age may receive a cochlear implant. Studies have shown that the earlier the age of implantation, the better the outcome will be.



How does natural hearing work?

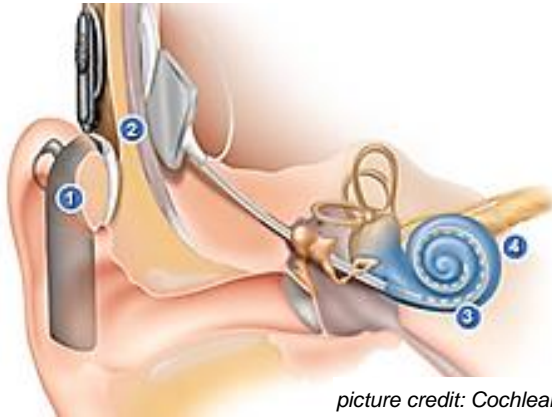
1. **Ear canal:** Sound travels through the ear canal and hits the eardrum.
2. **Eardrum & Middle ear bones:** The eardrum vibrates and causes the middle ear bones to move.
3. **Cochlea:** This sets the fluid in the cochlea into a wavelike motion, causing the cochlear hair cells to bend and generate electrical signals.
4. **Hearing nerve:** These electrical signals pass through the hearing nerve to the brain and is heard as sound.



picture credit: Cochlear Ltd

How does a cochlear implant work?

1. **Speech processor:** A processor worn on the outer ear collects sound with the help of a microphone and changes it into digital signals.
2. **Headpiece:** The signals are sent to the internal implant through a magnetic headpiece.
3. **Electrode array:** The internal implant converts signals into electrical pulses and sends them to the electrodes.
4. **Hearing nerve:** Electrical pulses stimulate the hearing nerve directly and the brain interprets this as sound.



picture credit: Cochlear Ltd

What is involved in the cochlear implant process?

- **Pre-operative evaluation**

Several assessments will be conducted to determine if one is suitable for a cochlear implant. This includes a pre-operative assessment by an Audiologist, an Auditory-Verbal Therapist and an ENT Surgeon. A referral will be made to a Medical Social Worker, should one require financial assistance.

- **Pre-operative conference**

A meeting with the patient and family members will be held to understand the (re)habilitation process and to establish realistic expectations. Issues regarding use of cochlear implant technology, risks and considerations unique to each individual will be discussed.

- **Surgery**

The procedure, which lasts about two hours, requires general anesthesia and usually 1-2 days of stay in the hospital. There will be subsequent medical follow-ups with the ENT surgeon to ensure a smooth recovery.

- **MAPping sessions**

The implant will be “switched-on” by the Audiologist about 3 weeks after the surgery.

The audiologist will go through orientation of the cochlear implant and its accessories.

Subsequent MAPping will be done to maximise speech sounds heard by the patient, to ensure the optimal function of the cochlear implant.

- **Auditory-Verbal Therapy (Children)/ Auditory Rehabilitation (Adults)**

Post-operative therapy is important for cochlear implant recipients to achieve the optimal results from listening through an implant. The Auditory-Verbal Therapist will guide the family in training the recipient's brain to process and understand the auditory information from the implant. The goal is to develop auditory abilities in the implanted ear alone and sounds to both ears.

What are the possible benefits from a cochlear implant?

- Improved potential for young children to develop spoken language through listening alone.
- Improved ability to engage in conversations.
- Increased awareness and recognition of environmental sounds.
- May be able to make telephone calls, especially with people they speak to on a regular basis.

Speech and other sounds from the cochlear implant will not sound exactly the same as they do for a person with normal hearing. The benefits from a cochlear implant may vary for different people.



Centre for Hearing and Ear Implants

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Clinic hours

Mondays to Fridays: 9am to 5pm

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