

# BIONIC EAR

## FACT SHEET

### What is a bionic ear?

A bionic ear (or cochlear implant) is a neural prosthesis, designed to produce hearing sensations by electrically stimulating nerves inside the inner ear of severe-profoundly deaf patients.

It consists of a receiver-stimulator, which is surgically placed under the patient's skin behind the ear and an external sound processor which sits behind the ear, similar to a hearing aid.

### How does the bionic ear work?

The sound processor captures sounds and converts them into digital code, which is then transmitted wirelessly across the skin to the receiver-stimulator.

The receiver-stimulator converts the digitally coded sound into electrical impulses and sends them along the electrode array, which is positioned in the cochlea (the spiral shaped inner ear).

The implant's electrodes stimulate the cochlea's hearing nerve which sends the impulses to the brain where they are interpreted as sound.



### Who benefits from a bionic ear?

The bionic ear benefits people who have severe, profound or total hearing loss in both ears. Under some circumstances it can also be used in combination with a hearing aid.

### How many people use a bionic ear?

The Australian bionic ear, manufactured by Cochlear Ltd, has provided the gift of hearing to more than 180,000 people world-wide.

### How is the BI working to improve the bionic ear?

Research at the Bionics Institute is aimed at improving the performance of cochlear implants and hearing aids, enabling their application to many more adults and children with hearing impairments.

Specific projects include sound processing research to enhance the perception of music and speech, the development of techniques to improve the function of the hearing nerve, and investigation of how the brain responds to long-term stimulation.

### Who is the Bionics Institute?

The Bionics Institute is an independent, not-for-profit medical research organisation working in the field of medical bionics. Its multi-disciplinary team of researchers are working in collaborative projects related to bionic hearing, bionic vision and neurobionics.

The institute is focused on clinical outcomes in response to the health needs of the community. Our work strengthens the Australian economy through innovation, commercialisation, and skills training for the next generation of researchers.

### How can I help?

You can make a donation to the Bionics Institute via our website ([www.bionicsinstitute.org](http://www.bionicsinstitute.org)) or phone (03) 9667 7500.

### Where can I get further information?

For more information visit the BI website ([www.bionicsinstitute.org](http://www.bionicsinstitute.org)). To determine if a cochlear implant is suitable for you, contact your doctor or the Cochlear Implant Clinic at the Royal Victorian Eye and Ear Hospital on (03) 9929 8624.