

# Answers to your questions

Cochlear Implants







## Welcome

This guide is designed to give you the information you need when considering a cochlear implant for yourself or someone important in your life.

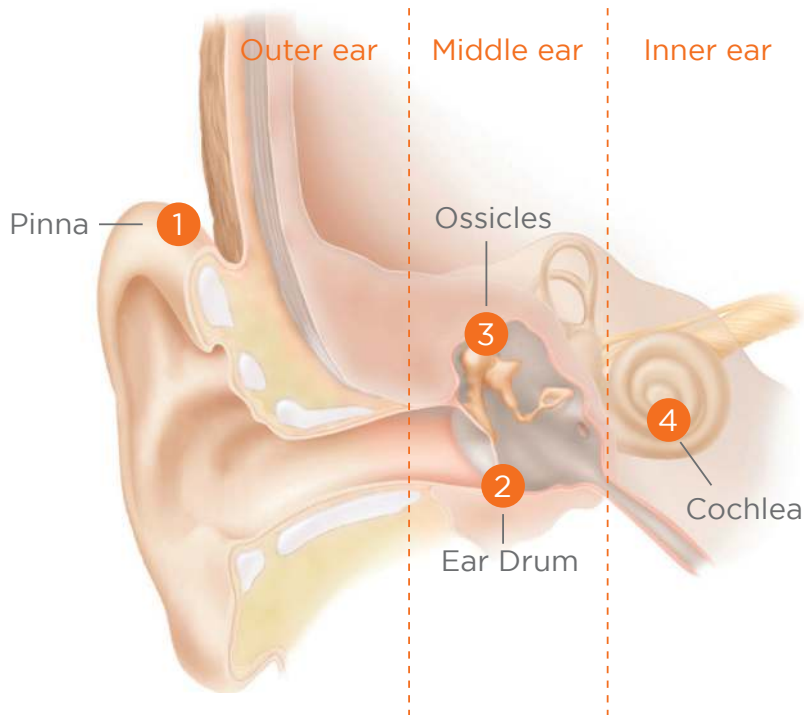
It will help you understand how hearing works, how hearing with a cochlear implant works and answer some common questions about receiving a cochlear implant.

## You're not alone

Hundreds of millions of people around the world experience some form of hearing loss. While many can be helped with hearing aids, more than 75 million people still find the most powerful hearing aids inadequate. However do not be concerned, more than 300 000 people around the world have received a cochlear implant and have achieved excellent hearing results.

# How do we hear?

Hearing is the sense by which sound is perceived. It consists of four distinct steps and the whole process only takes a fraction of a second.



**1** Sound waves are guided down your ear canal by the pinna.

**2** The sound waves hit your eardrum, making it vibrate.

**3** The small ossicles vibrate with the eardrum, transferring the sound across the middle ear to the cochlea.

**4** These vibrations cause the fluid inside the cochlea to move, carrying them to the thousands of tiny hair cells. These hair cells convert this movement into electrical impulses which are sent along the auditory nerve to the brain. The hearing centre of the brain interprets these impulses as sound.

# Types of Hearing Loss

## Sensorineural Hearing Loss



Sensorineural hearing loss is caused by damage to the cochlea, or the nerve pathways between the cochlea and the brain. Sensorineural hearing loss can be mild, moderate, severe, or profound. It can affect one or both ears, and is usually permanent. Mild-to-moderately severe sensorineural hearing loss can usually be helped with hearing aids or a middle ear implant. Moderately severe to profound hearing loss can be

helped with a cochlear implant.

Sensorineural hearing loss can be caused by:

- Inherited hearing loss
- Ageing (presbycusis)
- Viral infections such as rubella, measles, mumps and cytomegalovirus
- Drugs which damage the hearing system
- Birth trauma
- Complications from premature birth
- Trauma (e.g. long term exposure to extremely loud noise or head injury).

## Conductive Hearing Loss



Conductive hearing loss occurs when there is a problem with the outer or middle ear. This means that sound is unable to travel or 'conduct' from the outer ear to the eardrum and the tiny bones, or ossicles, of the middle ear. A conductive hearing loss may occur in both ears or just one and can often be helped by medical or surgical treatment.

Conductive hearing loss can be caused by:

- Congenital factors
- Excess wax or a foreign object in the ear canal
- Outer ear infection
- Chronic 'glue ear' or middle ear infection, called otitis media
- A hole in the eardrum (perforation).

## Mixed Hearing Loss



Mixed hearing loss combines problems with the conductive pathway (outer and middle ear) and the cochlea or auditory nerve (the inner ear). Mixed hearing loss can occur in both ears, or just one.

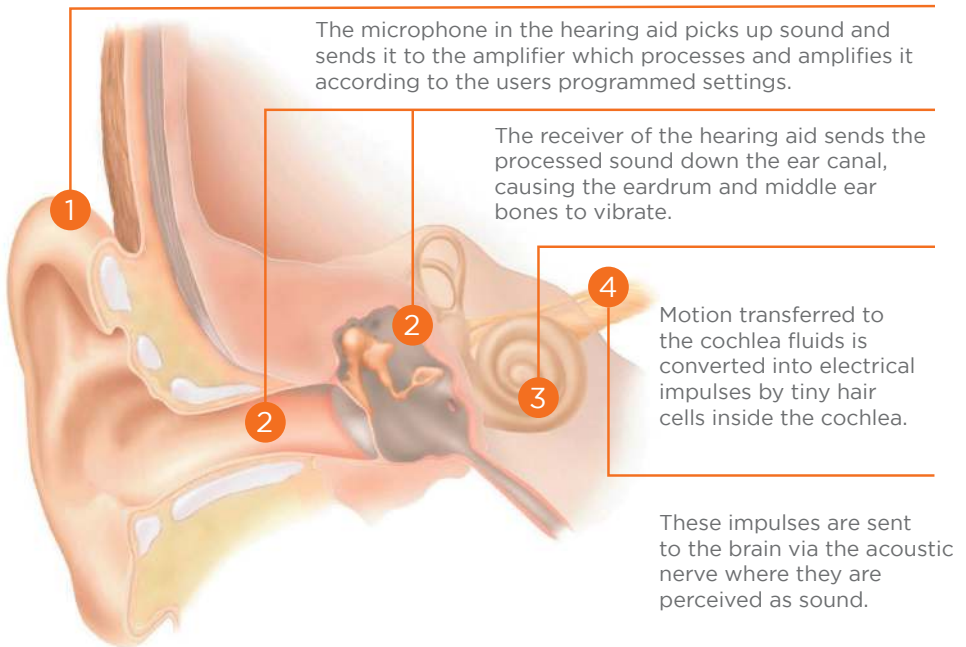
# When you need more than a conventional hearing aid

Hearing aids help many people with hearing loss. However they cannot help everyone. For some, even the most advanced hearing aids can be like listening to a badly tuned radio. While you can certainly hear the broadcast, it's broken up and hard to understand.

Whilst modern hearing aids can select and amplify specific sounds, for some people speech can still be

difficult to understand. When people with severe to profound hearing loss don't benefit from hearing aids, a cochlear implant may be a more effective long term solution.

## How a Hearing Aid works





## Ask yourself the following questions when wearing hearing aids:

1. Do you have to ask people to repeat themselves, even in one on one conversations in a quiet room?
2. Do you depend on lip reading to understand what is being said?
3. Do you find it difficult to follow a group conversation? Do you avoid social situations where this occurs?
4. Is it difficult for you to hear on the phone and does that make you avoid answering the phone?

If you answered yes to any of these questions it is likely that you could benefit from a cochlear implant.



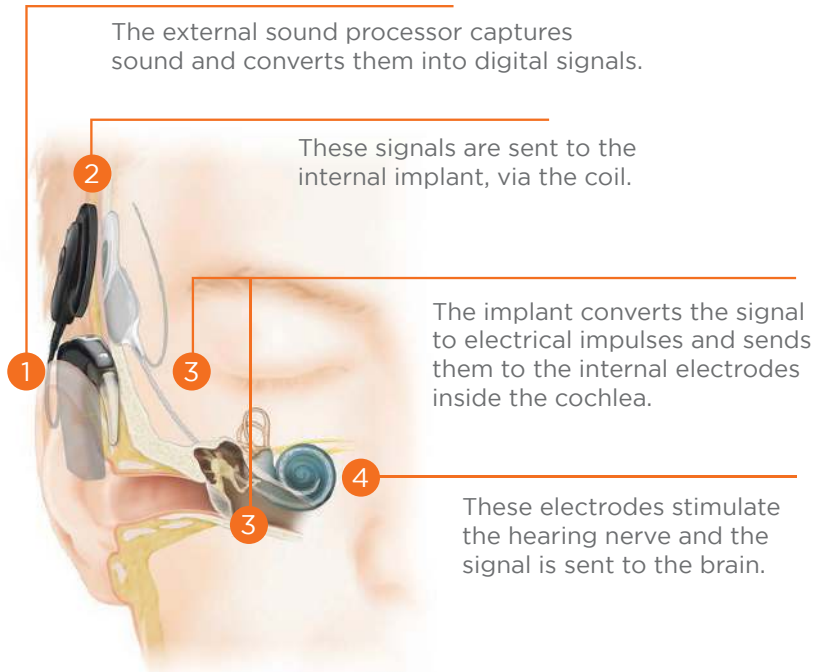
# How do Cochlear Implants differ?

Unlike hearing aids, cochlear implants don't amplify sounds but instead mimic and replace the hearing function of the inner ear through electronic stimulation.

The system has two parts – an external sound processor and the actual cochlear implant. Incoming sounds are processed into electrical signals and then transmitted directly to the hearing nerve, bypassing the damaged parts of the inner ear.



## How a Cochlear Implant works





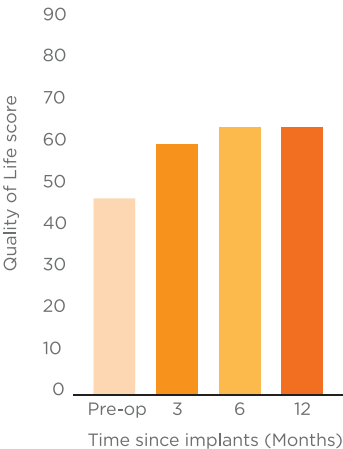
# Benefits of Cochlear Implants

The sooner you receive a cochlear implant, the sooner you can start hearing, interacting and enjoying your life to the full.

Instead of the isolation and loneliness that often accompanies significant hearing loss, you can look forward to rediscovering

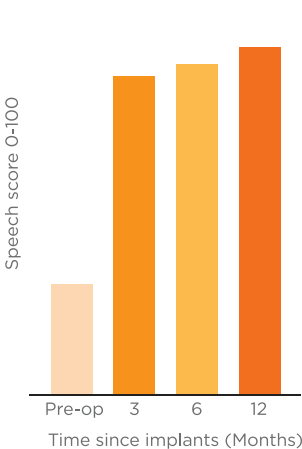
the activities that you may have abandoned because of your hearing. You won't just reconnect with the world of sound, but with a whole wide world of enjoyment and opportunity.

Quality of Life - before and after



Pre implants with hearing aids  
6 months with implant

Speech Perception - before and after



3 months with implant  
12 months with implant

For suitable candidates, cochlear implants can deliver rapid improvements over hearing aids, especially in the crucial area of speech perception. Our patient outcomes have shown that on average adults can achieve 77% sentence understanding after using a cochlear implant for just 3 months

and 79% after 6 months, compared to 26% previously, when using just their hearing aids. Likewise average quality of life scores for our patient group increased from 37% before a cochlear implant to 64% 6 months after surgery.

## Benefits of Cochlear Implants continued

It's important to realise that not all hearing losses are the same. Results can vary and people may experience different hearing outcomes with their cochlear implant. Ask your implant audiologist about your individual situation and raise any

questions or concerns you might have. For people with severe-to-profound hearing loss in both ears, having cochlear implants in both ears (bilateral) may give you a more natural hearing experience.



# Considerations

## How good is the implant for understanding speech?

Understanding speech is considered the most important goal in any form of treatment for hearing loss. How well you understand speech following implantation is mostly dependent on how long you have had a hearing loss and the type or degree of hearing loss. Your audiologist will discuss your specific situation with you.

## Will your daily activities be limited by a cochlear implant?

Contact sports such as rugby, football and boxing that result in blows to the head are not advised. Processors may need to be removed before participating in water sports however there are aqua accessories available. Check with your audiologist if you need to have an MRI scan or a brain scan as these procedures can damage the device.

## Will you be able to keep up with developments in cochlear implant technology?

Today's implant systems are designed to let you benefit from future technologies without the need for further surgery. The Ear Science Implant Clinic's staff will keep you in touch with new product releases.

## Are cochlear implants covered by health insurance?

The initial cost of the implant device is fully covered by a number of health insurers. Replacement or upgrades to processors needs to be accounted for via insurance or other independent financial means approximately every 8-10 years.

## What if the implant stops working?

With any technical device there is a risk of it failing. This occurs very rarely (less than 1% of the time) but if it did fail, a new device can be implanted.

## What if a cochlear implant is not suitable for my hearing loss?

The team at the Ear Science Implant Clinic are specialists in complex hearing solutions. If a cochlear implant is not a suitable option there are other devices we can consider including bone anchored hearing aids, middle ear implants or electro-acoustic systems.



# Your pathway to better hearing

## Assessment

As a potential cochlear implant candidate you will undergo a number of tests to make sure a cochlear implant is the right solution for you.

- Audiology tests that determine your hearing thresholds with and without hearing aids, your speech perception and auditory nerve function.
- Medical tests and MRI scans to evaluate your general health, possible causes of your hearing loss and assess the hearing anatomy of your ears.

## Surgery

The cochlear implant procedure is considered to be low risk minor surgery and usually takes between 1 and 3 hours. Thousands of cochlear implant surgeries are performed each year. The risks involved are small, and your surgeon will discuss them with you.

## Activation

Within a week or two of surgery, your audiologist will be able to activate the cochlear implant and the sound will be turned on. The audiologist will program the device to suit your unique hearing needs, fine tuning the settings over a number of follow-up sessions.



# Client Stories



Janet Horgan

At the age of 49, Janet Horgan was diagnosed with otosclerosis, a condition leaving her with severe to profound hearing loss in both ears. At first Janet turned to hearing aids to help with her everyday listening needs however noted that she “still really struggled to listen and social outings were very difficult to feel involved in.” She sought out the advice of the Ear Science Implant Clinic and after a thorough assessment it was deemed she was a suitable candidate for a cochlear implant. Janet received her cochlear implants in 2012 and describes the implant as opening up a whole new world of sound.

“I am happy to recommend a cochlear implant to anyone who is struggling to hear. I have no regrets and continue to look forward to discovering new sounds every day” Janet said.



The 3 Generations

From 2006 to 2015 three members of Leslie French's family received cochlear implants. Leslie French (72), his daughter Jody Maitland (39) and grandson Hayden Maitland (10) have all suffered varying degrees of hearing loss. After receiving cochlear implants at the Ear Science Implant Clinic, they are now able to hear with clarity and understand the words their loved ones speak.

“It was so great” Leslie said. “I could hear sounds I had never been able to hear before, like birds chirping off in the distance or car horns honking. The clarity was unbelievable. I wish I had it done sooner.”



Michele Alexander

In June 2007 Michele Alexander awoke one Tuesday morning profoundly deaf. “I remember the feeling of complete isolation. The night before I had gone to bed with a ringing in my ears... Now I had woken up to silence.”

After beginning testing in June 2007 Michele “couldn't cope with the sheer physical and mental exhaustion of using inadequate hearing aids and the challenge of not being able to use a telephone or join in conversation”. So to overcome this struggle Michele received a cochlear implant in her left ear in November 2007 and after experiencing excellent hearing results received a second cochlear implant in her right ear in 2010.

“My cochlear implant is wonderful. I wake up each morning to silence, thank the universe that I am alive to start another wonderful day, grab my cochlear processor and allow the world of noise to enter my world”.



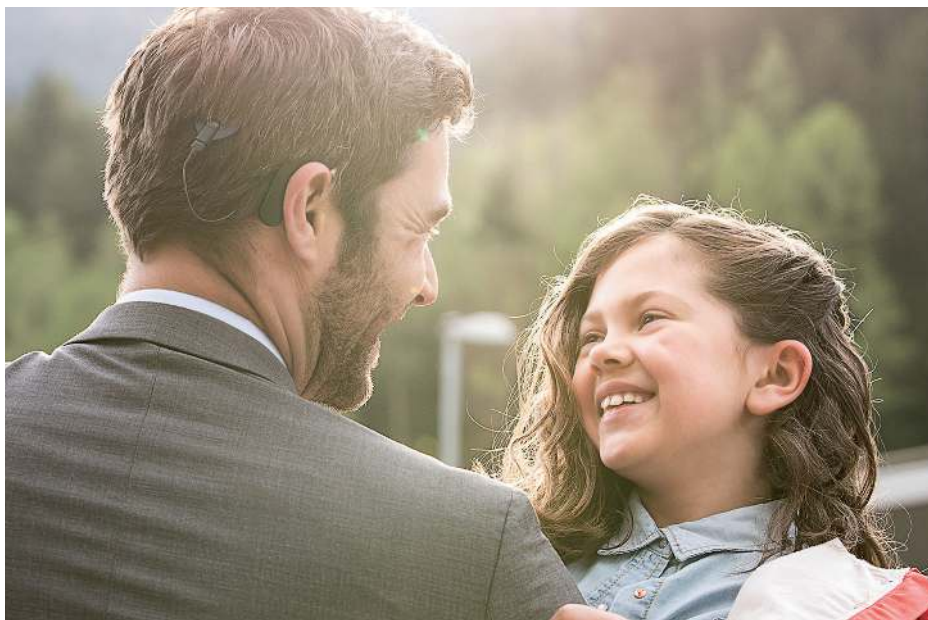
# The Ear Science Implant Clinic

The Ear Science Implant Clinic specialises in implantable hearing technology. Ear Science's team of ear, nose and throat (ENT) specialists, audiologists, speech pathologists and psychologists work closely together to provide the best hearing solution to each individual client.

## Our team:

- Fosters a friendly and caring culture that supports our clients through their hearing journey.
- Enjoys long term relationships with clients. We proactively maintain and encourage client contact to ensure their hearing management needs are met.
- Has over 100 years of combined experience in implantable hearing technology.
- Has close relationships with major teaching hospital Sir Charles Airdner Hospital, St John of God Health Care, Subiaco Private Hospital, Joondalup Hospital and Osborne Park Hospital.
- Has strong relationships with leading implant technology manufacturers.
- Is strongly committed to ongoing learning and professional development.
- We conduct our own research projects and participate in industry forums for the purpose of improving client's hearing outcomes.
- Facilitate support groups for cochlear implant users including young adults, working adults and general support groups.

For more information visit  
**[www.earscience.org.au](http://www.earscience.org.au)**









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