



Every moment matters

How a cochlear implant solution may help your child succeed

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You are not alone

An estimated 6 out of every 1,000 children may be born with severe to profound hearing loss.¹

Like any parent, you want the best for your child. You have hopes and dreams for a bright future because your child should have every opportunity to get ahead in life. To become independent. Self-confident. And most of all, to have every opportunity to achieve their personal best.

When your child is first diagnosed as deaf or having a hearing loss, you may experience different emotions from feeling devastated to feeling overwhelmed, angry or confused.

You think ahead to the little moments you and your son or daughter may miss out on—interacting with friends on the playground, her first singing recital, the simple joy of hearing your child speak his first words. You can't help but worry how will he fit in at school? Will she struggle just to get by? Will he make close friends? And the future? Will your child succeed in building a career, in enjoying social relationships, in realising the happy and fulfilling life you want for them?

More than 170,000 people around the world have already received a Cochlear Nucleus Implant.² In fact, cochlear implants have increasingly become the solution for people with severe to profound hearing loss who no longer benefit from hearing aids.

These thoughts and emotions are completely understandable. And we'd like to help your child achieve the hopes and dreams that you have for his future.

This guide was created by a dedicated team of professionals who are committed to assisting you in finding the right solution. You'll learn about cochlear implants and why they might be the best choice for your child.

‘I didn't want there to be any limitations for Jillian. I wanted her to be able to hear the birds chirping, the wind going by her ears, her sister saying, “Jillian, come with me and play” and the best words ever... “I love you”.’

Mum of Julian M.

Is a cochlear implant right for your child? Ask yourself the following questions:

If your child was born with a severe to profound sensorineural hearing loss (also called nerve deafness):

- Does your child fail to respond to your voice or loud sounds, even when wearing hearing aids?
- Does your child avoid socialising or playing with other children?
- Is your child falling behind with key speech and language developmental milestones?

If your child was born with normal hearing and has progressively lost hearing:

- Has your child experienced hearing loss after learning to speak?
- Is your child falling behind with speech and communication skills?
- Does your child depend heavily on lip-reading?
- Is your child exhausted at the end of the school day because he/she has to concentrate so hard all day just to understand speech?

If you answered yes to any of these questions your child may be a candidate for a cochlear implant.

Every moment matters

Studies indicate that the earlier a child with profound hearing loss receives a cochlear implant, the better his speech and language skills achievement.³⁻⁸

A cochlear implant early in your child's life can make a huge difference

A critical factor that determines success with a cochlear implant is how early your child receives an implant. With early use of a cochlear implant, children may have a greater chance of realising their personal best speech and language skills.³⁻¹¹ Studies have shown that children who receive a cochlear implant and appropriate rehabilitation at a young age (before the age of 18 months) have a greater potential to develop language skills equal to or close to those of their same-aged peers with normal hearing.^{4,7-9}

Developing speech and communication skills are among one of the most important benefits that a cochlear implant can help your child achieve.³⁻¹¹ Language is critical not just for communication and life skills, but for cognitive skill development – the neural pathways of a child are always developing and the development of speech and language helps to spur other development.

The sooner that your child can hear and use spoken language, the more likely they will be able to do the following:

- Learn how to read near the level of similar-aged children with normal hearing
- Be able to attend mainstream school
- Communicate with family, friends and teachers using hearing and spoken language
- Have the greatest opportunity to enjoy success in higher education
- Achieve successful employment
- Listen to and even play music
- Talk on the phone
- Participate fully with the hearing world

Research shows that children implanted at an early age have a greater potential to develop speech and language skills that are comparable to children with normal hearing.^{4,7-9}

‘The cochlear implant has been nothing short of a miracle for Sam. Currently he is above his peers academically, which is a pretty neat thing.’

Parents of Samuel B.

‘There have been many, many changes to Wenqing’s life since the cochlear implant. She is now able to hear, learn and communicate...’

Parent of Wenqing L.

‘Therapists report that families who began auditory therapy prior to when their child received a cochlear implant often progress more rapidly, likely because both parents and child have already learned their role in the process.’

Donna L. Sorkin, M.A.
Former Executive Director AG Bell Association
Vice President, Consumer Affairs Cochlear

Common considerations

To act now or delay?

Many parents make the decision to have their child implanted with a cochlear implant early on. Yet, some families wait until the child is much older, feeling that it's better to let their child decide for himself. Unfortunately, waiting to implant until your child is older has distinct disadvantages. Specifically, the child's early development stage for speech and spoken language skills is within the early years of life. Early intervention during this critical period is correlated with better outcomes. Older children miss out on this opportunity to acquire the same speech and language communication skills as those of children who are implanted at a younger age.^{4,7-9} Although it may be initially a difficult choice to make for your child, discuss with your hearing health care team if earlier intervention with a cochlear implant is better for your child than waiting, because a key goal is speech and spoken language skills development.

What can I do right now to help my child?

It is important to begin your child's path toward spoken language development as early as possible – even before your child receives her cochlear implant. Having her wear hearing aids (the earlier, the better) may provide her with access to some sounds. It is recommended that you begin a program of family-centred auditory therapy immediately following the hearing aid fitting.

Beginning therapy early will help your child begin the process of learning to listen. Parents are a child's first teacher. As the parent of a child with a significant hearing loss, your role in helping your child acquire spoken language and learn about the world around her is critical. An auditory therapist will mentor you in how best to do this so that when your child receives her cochlear implant, the family will already be moving along the spoken language development path. Cochlear can help you begin your journey with a variety of support materials. To view some of the available online rehabilitation programs, please visit www.cochlear.com/au

Can my child take advantage of future advancements?

Some parents are concerned that by choosing a cochlear implant now, their child may not be able to take advantage of future developments in technology. Rest assured, current implants and processors are designed so your child may benefit from new technological innovations, without the need for additional surgery. This is an important first consideration when researching solutions your child will need for the future. Because of the importance of time, getting a cochlear implant early in life is more important than waiting for future developments in technology. Starting early may make the difference of your child being able to attend a mainstream school and communicate using spoken language with his friends and teachers.





How to get the information you need

Educating yourself on cochlear implants is critical in order for you to feel more comfortable and confident in reaching the right decision for you and your child. Information is available from numerous resources so it is important to seek out information from those that are credible and trusted.

Talk to other parents

We suggest reaching out to other parents whose children have received cochlear implants to hear about their first-hand experiences. There are also several supportive communities that host meetings, events, workshops, and online message boards.

We encourage you to ask questions and to learn more about cochlear implants by accessing any or all of these free services. You'll find this information invaluable and it's made available for your benefit.

Find a hearing clinic and health care team that's right for you and your child

It is important that both you and your child are completely comfortable with the audiologist you select to manage your child's hearing health care. The audiologist you ultimately choose should always make you feel comfortable when asking questions. There are no bad questions and you should feel free to ask as many questions as you need. A strong referral from your paediatrician, a friend or colleague is an excellent place to start your search for an audiologist.

There may be times when you are speaking with a generalist hearing health care provider who does not specialise in cochlear implants. Consulting with a cochlear implant specialist can help to ensure you receive all of the necessary information you require to make an informed decision for your child. However, if you are at a loss for referrals, there are many reliable online and phone services to help you locate a clinic and an audiologist in your area. Once you find a clinic near you, have your child's hearing evaluated by an ear, nose and throat specialist (ENT) and audiologist.

To find a cochlear implant clinic, please visit www.cochlear.com/au

When hearing aids are not enough

It is estimated there are over 20 million people in the world who could benefit from cochlear implants²

Cochlear implants are a solution

Experts in the medical field consider a cochlear implant an effective long-term solution for individuals with severe to profound hearing loss who do not benefit from hearing aids. An audiologist will perform a series of tests to determine the extent of your child's hearing loss before discussing specific options.

Hearing aids vs. cochlear implants

Hearing aids can help the majority of children with mild to moderate hearing loss – but they can't help everyone. For many children with severe to profound sensorineural hearing loss in both ears, even the most advanced and powerful hearing aids may not help. That's

because hearing aids simply amplify sound – and with a severe to profound sensorineural hearing loss (sometimes referred to as “nerve deafness”), this amplified input can sound very distorted. Despite being referred to as “nerve deafness,” most sensorineural hearing loss is a result of damage to the inner ear (cochlea), not the hearing nerve.

With hearing aids, no matter how loud you make a sound, when a key part of the ear isn't working the way it should, it can still be unclear and distorted. A cochlear implant bypasses the damaged inner part of the ear and stimulates the hearing nerve directly.

A cochlear implant is an electronic device that is surgically implanted and works by directly stimulating functioning auditory nerve fibers in the inner ear. Unlike hearing aids, cochlear implants do not amplify sound,

but instead are designed to mimic natural hearing. Cochlear implants convert sound waves to electrical impulses and transmit them to the inner ear, providing people with severe to profound hearing loss the ability to hear sounds and potentially better understand speech without reading lips. The cochlear implant has become widely recognised as an established treatment for profound deafness.

‘We find something new and exciting every day with Ryunosuke’s hearing.’

Parents of Ryunosuke K.

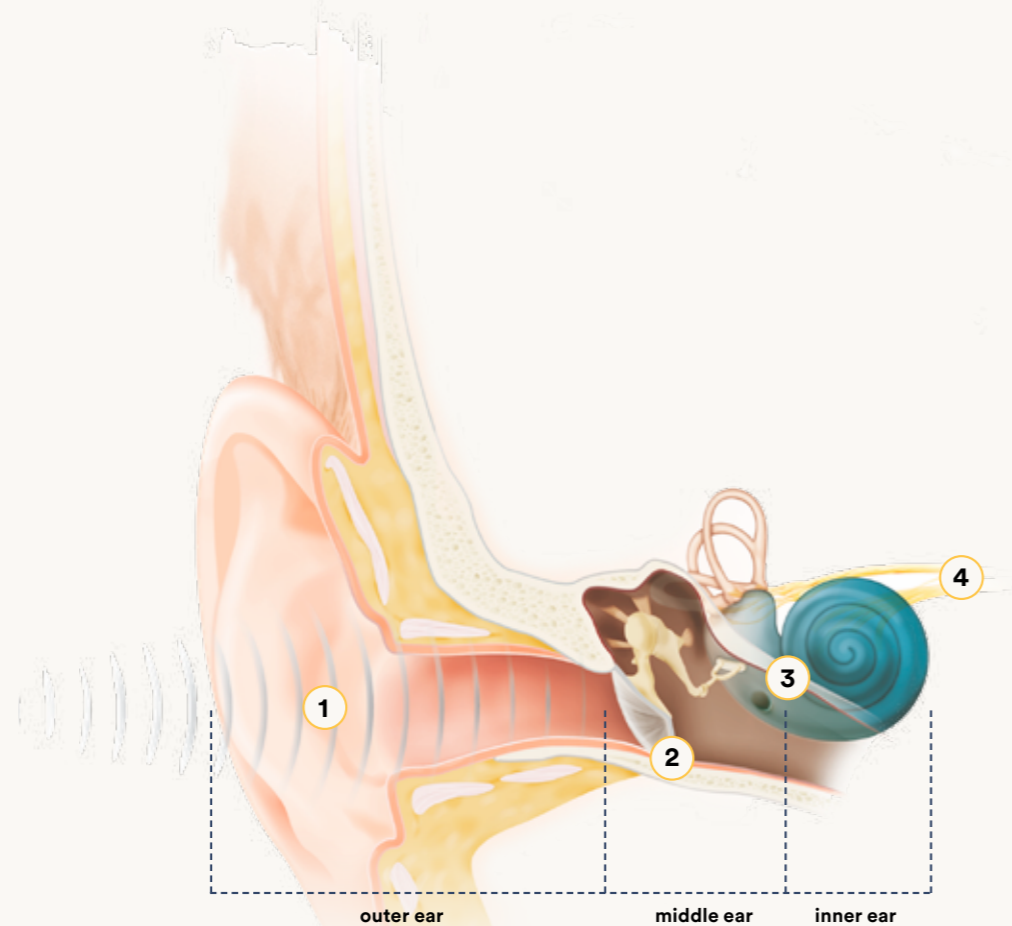


How natural hearing works

Designed to work the way your ears do – cochlear implants mimic natural hearing.

Deep in your ear is a pea-sized structure called the cochlea. The cochlea is fully developed at birth. Tiny, delicate hair cells in the cochlea communicate sound signals to your brain, allowing you to hear different pitches and sounds. If these delicate cells are damaged, you can lose some or all of your ability to hear.

Cochlear implants are designed to make up for the damaged cells, helping to restore your child's ability to perceive and understand sounds. A cochlear implant works by bypassing the damaged part of the ear and sending sound signals directly to the hearing nerve.



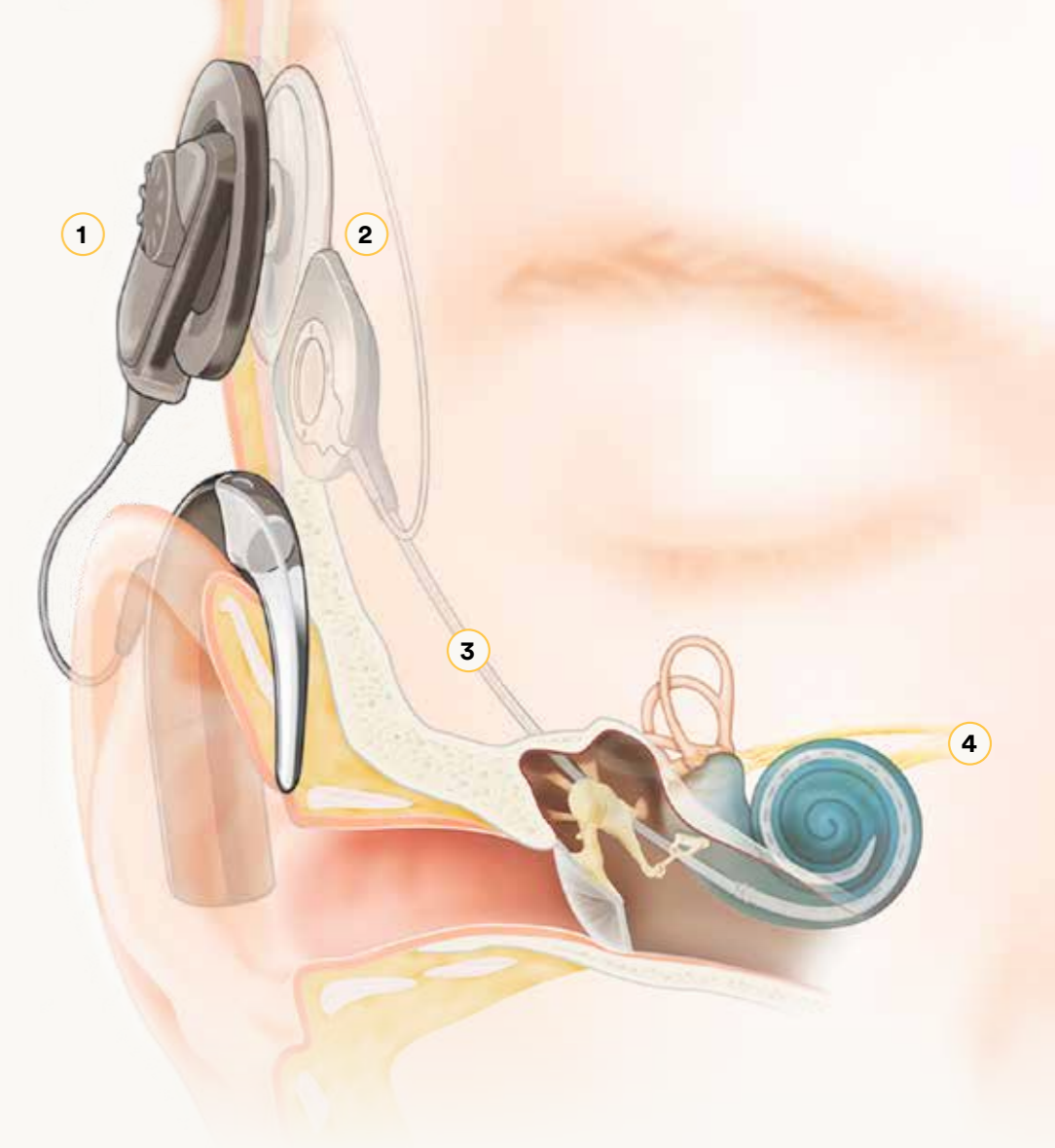
- 1 Sounds enter the ear canal and travel to the eardrum.
- 2 These sound waves cause the eardrum to vibrate, sending the bones in the middle ear into motion.
- 3 This motion is converted into electric impulses by tiny hair cells inside the inner ear (cochlea).
- 4 These impulses are sent to the brain, where they are perceived by the listener as sound.

How a cochlear implant works

Bilateral implants are increasingly becoming an option for young children

If there is profound hearing loss in both ears, a second cochlear implant (bilateral) may be appropriate. Bilateral implants are an option you can discuss with your audiologist, surgeon or ear, nose and throat specialist.

- 1 The external sound processor captures sounds, then filters and processes the sounds.
- 2 The sound processor translates the filtered sounds into digital information, which is then transmitted to the internal implant.
- 3 The internal implant converts the digital information into electrical signals, and sends them to a tiny, delicate curl of electrodes that sits gently inside the cochlea.
- 4 The electrical signals from the electrodes stimulate the hearing nerve, bypassing the damaged cells that cause hearing loss and allowing the brain to perceive sound.



What to consider when choosing a cochlear implant for your child

Designed to work the way your ears do – cochlear implants mimic natural hearing.

Not all cochlear implants are the same

The name cochlear was derived from the Latin word cochlea – referring to the tiny anatomical structure that sits inside the human ear. Although all cochlear implants are designed to restore sound in a similar fashion, the exact way in which each manufacturer designs their particular device is different. It's important to understand the distinctions between the different cochlear implant devices and ask the right questions before choosing the best device for your child. Take the time to compare. It's worth the extra effort.

What is CSR?

Implant reliability statistics are expressed in terms of the Cumulative Survival Rate (CSR), a standard established by the International Organisation for Standardisation (ISO). The CSR standard indicates the likelihood that a device will function properly during a given period of time. You will want to review the track record of each company's products at year one and beyond in order to make an informed decision.

How do you start to determine what's important? The following considerations may help narrow your search:

○ Implant reliability

Audiologists and cochlear implant surgeons believe that implant reliability is a crucial factor when selecting a cochlear implant, particularly since the implant itself must be designed to last your child's lifetime. Be sure to ask about the implant's performance record, whether there is a known history of technical complications or problems. Each product manufacturer reports their reliability data, measured in terms of Cumulative Survival Rate (CSR). While initially all of the data may appear to be the same, what's most important is reviewing a product's record after the first year of implantation. The Nucleus Cochlear Implant is the industry's most reliable as reported by independent research and when compared with other manufacturers' implant reliability reports.¹²⁻¹⁷

○ Speech understanding performance

Most audiologists agree that a primary factor in selecting a cochlear implant is the device's ability to improve hearing and speech understanding in everyday situations. Although other activities, such as music enjoyment, are also considered important options, experts agree that developing speech and spoken language skills should be considered the first priority.

○ Flexible for an active lifestyle

The durability and versatility of the implant should allow your child to participate in everyday activities – listen to music, talk on the phone, swim, play sports, or even run through the lawn sprinkler – with minimal disruption. Depending on your child's lifestyle, you may want to consider a device that is water-resistant. The external sound processor comes with different options for batteries. Manufacturers may offer devices with the option of rechargeable or disposable batteries; some offer the flexibility of both. With rechargeable batteries, the battery life varies by manufacturer so you'll want to ask how long you can expect batteries to last. Disposable batteries are a great option for instances when you do not have readily available access to a power source, such as power outages, travelling and camping.

○ Access to future technology upgrades

Current cochlear implant systems are designed so your child can benefit from new technological innovations, without the need for additional surgery. A future technology upgrade can refer to a software upgrade, a hardware or sound processor upgrade or an implant upgrade. For those wishing to avoid additional surgeries, an important consideration is whether or not they will be able to upgrade their child's processor as new technology becomes available. This is an important consideration when selecting a cochlear implant system because your child will need to live with it for years to come. It is also important to know that the company you select is committed to investing in new, improved technologies and will make them readily available to their customers. There are examples of cochlear implant users who received implants 30 years ago and now have access to the advanced processors available today. Read Holly's story on page 21.

○ Rehabilitation and educational services

Rehabilitation is vital to achieving the best possible hearing and speech outcomes, and as the saying goes, practice makes perfect. No matter how good the cochlear implant

is, it is a well documented fact that success depends on the individual user and his audiologist, speech and language therapist and healthcare team working together and investing time in ongoing rehabilitation. Consider the rehabilitation and educational support provided by each manufacturer and whether they serve you and your child's needs. Be sure to team up with a paediatric rehabilitation specialist early on.

○ Reputation

Be sure to choose a company that you trust to be there throughout your child's lifetime. In addition to asking a healthcare professional, talk with other parents who have experience. It is also beneficial to contact each manufacturer and ask questions. You can tell a lot just by spending a few minutes speaking directly with a company representative. There are, of course, additional "nice to have" options to consider when choosing a cochlear implant and you should discuss them with your audiologist and surgeon. Yet, most healthcare professionals readily agree that implant reliability, speech understanding, flexibility and reputation rank at the top of the "must have" list.



Connecting your child to a world of sound

Surgery

The entire cochlear implant procedure usually takes 1-3 hours. Typically, your child will go home later the same day or will be released early the following morning. Your surgeon will discuss with you the risks associated with the procedure. In terms of recovery time, you may find it surprising to learn that most children and adults are able to return to normal activities in less than a week.

The external processor, which is worn on the ear, is typically activated within 2-4 weeks after surgery. This delay in activation allows for healing time. Once activated, everyone's initial experience with a cochlear implant is unique. Most cochlear implant users say that the sound changes over time and gets better every day. Daily practice and listening patience are important to the process. Children who have had little or no hearing prior to their cochlear implant appear to get used to the sound very quickly.

Time to activate the cochlear device

Within a few weeks after the surgery, you will have an appointment with the audiologist to have your child's device activated. The audiologist will program the device to match your child's hearing needs. This will likely take more than one session with the audiologist to fine tune the settings.

Some devices offer customisable sound programming

Although not available with every cochlear implant system, some devices offer a range of programmable listening options that can be adjusted to optimise sounds for different listening environments. This way, you or your child will be able to change the settings on the external processor to adjust for noisy or quiet environments, even for music. While your child might not need more than one program setting at the start, as he grows up and his needs change you will want him to have a system that grows with him.

Ongoing care for your child's lifetime

One concern often heard from parents is what happens after their child's implant is activated. Important considerations when choosing a cochlear implant system are the technical support available from the manufacturer for their customers and the length and coverage of product warranties available. It is important for you to be confident in knowing that your child will be connected to the hearing world for the rest of his life.

Helping your child achieve her personal best

A successful outcome can best be achieved through a combination of factors. The right cochlear implant system, the right team of hearing professionals, consistent practice and rehabilitation, and a positive attitude and encouragement are key to your child's long-term success.

Of course, it is important to develop realistic expectations with your child's audiologist and schedule regular appointments to discuss a plan for your child's individual needs. The developmental progress you'll see can be extremely motivating.



One implant, five sound processor upgrades... unlimited possibilities!

Holly received her implant at four years old and continues to enjoy the benefits of the latest sound processor advancements.

Australian Hearing, an Australian government agency, also provides a comprehensive range of hearing services for children and young people up to the age of 26. This includes hearing assessments, fitting and maintenance of hearing aids, replacement cochlear sound processors as well as maintenance and repair of these devices.

‘With my Cochlear implant, I was able to happily attend mainstream schools and successfully achieve my own personal and career goals.’

Holly T – Cochlear Nucleus Implant user

Then	Holly lived in a world of silence after getting meningitis at the age of four years, four months
	Holly's mother wanted to give her a more normal childhood and a better future, so eight months later, just before turning five, Holly received a cochlear implant
1988	Holly started school – and attended mainstream schools for 13 years, from kindergarten to 12th grade
1989 – 1999	Holly takes advantage of the latest technology by upgrading to three new sound processors
2000	Holly graduated from high school in the top 2% of students in the state
2004	Holly upgrades to newest sound processor
2007	Holly graduated from a university with first class honors in Law. She upgraded to newest sound processor
	Happily works as a lawyer and lives life to the full
Now	
Future	Holly has the option to take advantage of new technology as it becomes available

Committed to your child's hearing health

Reaching the right decision for your child Below is a summary of key information you need to comfortably arrive at the right decision.

Research your options

Many children with severe to profound hearing loss may benefit from a cochlear implant. Answer the questions featured on page (5) to determine whether your child might be a candidate. Then discuss your options with your child's physician, surgeon and audiologist. Cochlear implants can provide a solution for children with severe to profound hearing loss.

Learn more about each cochlear implant system

To obtain a copy of Cochlear's product brochures and receive other information please visit www.cochlear.com

Make an informed decision

Evaluate information about reliability, performance and reputation of each cochlear implant manufacturer. You need to be able to trust that the decision you make will be the right one for your child. That's why it's important to ask trusted experts like your child's audiologist or surgeon about the track record of each device manufacturer in order to assess which will be the right one for your child. Not only do you want a device that will last a lifetime, you want a dependable and reputable manufacturer that will support you and your child well into the future.

Take immediate action to achieve your child's personal best hearing results

You need to be able to move quickly in order to get the best results for your child. Research shows that early intervention and early use of Cochlear implants can help your child achieve the best possible hearing result.³⁻⁹



Hear now. And always

Cochlear is dedicated to helping people with moderate to profound hearing loss experience a world full of hearing. As the global leader in implantable hearing solutions, we have provided more than 650,000 devices and helped people of all ages to hear and connect with life's opportunities.


We aim to give people the best lifelong hearing experience and access to next generation technologies. We collaborate with leading clinical, research and support networks to advance hearing science and improve care.

That's why more people choose Cochlear than any other hearing implant company.

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www.cochlear.com/CochlearANZ



Please seek advice from your health professional about treatments for hearing loss. Outcomes may vary, and your health professional will advise you about the factors which could affect your outcome. Always follow the directions for use.

Not all products are available in all countries. Please contact your local Cochlear representative for product information.

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