

Advanced Bionics

In performance and innovation, the combination of Advanced Bionics and Phonak technologies stands among the leaders of the cochlear implant industry.



The Naída CI Q70 sound processor delivers the combined R&D strengths of Advanced Bionics and Phonak.

Advanced Bionics is one of the three global leaders in cochlear implant systems, with a clear focus on innovations that improve quality of life. A cochlear implant is a surgically fitted electronic device that allows people with significant hearing loss to hear the world around them. It is the only medical technology that can functionally restore one of the five senses: many children and adults who receive a cochlear implant may be experiencing hearing for the very first time.

Unlike hearing aids, which amplify sound, cochlear implants bypass the damaged part of an ear and send electrical signals directly to the brain via the hearing nerve. In the two decades that Advanced Bionics has been in existence, the market for cochlear implants has grown strongly, with now approximately 50,000 devices being implanted every year across the world.

Advanced Bionics began sharing R&D efforts with Phonak since it was acquired by Sonova in 2009, thereby combining the innovative designs for cochlear implants with leading-edge hearing instrument technologies. This unique collaboration has led to such industry breakthroughs as Binaural VoiceStream Technology for cochlear implant recipients, allowing for the first time the streaming of speech, phone calls, and media to both ears, irrespective of whether the second ear is aided by another cochlear implant or a compatible Phonak hearing instrument. Now recipients of Advanced Bionics cochlear implants have access to the full range of wireless accessories that allow wearers of Phonak hearing aids to understand speech, communicate, and enjoy music – even in the most challenging listening situations.

This binaural capability can make a great difference for people who have a large variation in their hearing loss between one ear and the other. In the past, cochlear implants were not generally indicated for use unless the potential recipient had significant sensorineural hearing loss in both ears. This year, however, the European Union has approved Advanced Bionics cochlear implants for the treatment of Single-Sided Deafness (SSD) in patients with normal or near-normal hearing in the other ear. The power and flexibility of our solution will therefore be available to change the lives of an entirely new group of recipients.

A versatile implant platform

The surgically fitted internal part of a cochlear implant system must be highly accurate in the location and timing of the electrical signals that it sends to the hearing nerve; it must also have the inbuilt versatility to make optimum use of every advance in external sound processor technology. The Advanced Bionics HiRes 90K implant family features state-of-the-art sound processing circuitry, providing optimal programming flexibility, a wide spectrum of ways to deliver sound, and upgradeability to ensure that recipients get the full benefit from future innovations.

HiRes 90K implants can be combined with the HiFocus family of electrodes. With three custom options to choose from, surgeons can select the most appropriate shape and type of electrode to suit each individual recipient's needs. The Advanced Bionics HiFocus Mid-Scala electrode is the industry's latest innovation in electrode design: built using highly sophisticated manufacturing processes, the electrode has been designed for optimal placement in the cochlea to protect its delicate structures, preserve any residual hearing, and give recipients the ability to hear the greatest number of individual frequencies for improved speech understanding and the enjoyment of music.

Our aim is to make life with a cochlear implant as normal and convenient as possible. We are therefore delighted that Advanced Bionics HiRes 90K implants received CE Mark approval this year that allows recipients to have MRI scans (at 1.5T field strength) without having to remove the implant magnet, which is used to hold the external headpiece in place. Having this approval means that diagnostic imaging will be simpler and quicker – and recipients will not need to undergo procedures to remove and then replace the magnet.

Shared innovation leadership

The introduction of the Naída CI Q70 sound processor (Naída CI) has received a strong market response. The first product to benefit from the combination of Advanced Bionics and Phonak innovations, it brings to cochlear implant recipients the benefits of the industry's most advanced technologies for natural sound delivered to both ears. Just one touch activates Phonak Binaural VoiceStream Technology, sending optimized voice, telephone or media player sound simultaneously, in real time, to both ears, whether to a compatible Phonak acoustic hearing aid or a Naída CI electronic sound processor.

Advanced Bionics can now offer cochlear implant recipients the complete range of wireless connectivity accessories enjoyed by Phonak hearing aid wearers, including Roger wireless communications, ComPilot streamers, AB myPilot remote controls, and the Phonak TVLink and RemoteMic accessories.

Their advanced features and functionality connect recipients to the full range of electronic devices used in daily life. For improved speech understanding in noisy environments, the Phonak Roger system discreetly links the Naída CI sound processor with the Roger Pen or RemoteMic wireless communication devices. Recent studies show that cochlear implant recipients using this technology have a significantly better speech understanding in noisy environments than even normal-hearing adults.

Collaboration in R&D has opened up yet more potential synergies between Advanced Bionics and Phonak. The company has launched a partnership program with selected hearing aid retail channels to serve clients with significant hearing loss, informing them about cochlear implants as an effective solution beyond hearing aids. The broad uptake of the Naída CI sound processor also creates opportunities for the hearing aid retail centers to work with cochlear implant recipients by providing and servicing Phonak accessories for the processor. The continuing integration of Advanced Bionics and Phonak technologies will further strengthen this partnership.

Living life to the fullest should not mean having to stay on dry land. Advanced Bionics has already established a leading position in giving cochlear implant recipients the chance to enjoy sound in water with Neptune, the world's first and only swimmable sound processor. This year, we added a unique accessory for our Naída CI processors: the AquaCase enclosure, which safeguards the sound processor in any environment and during the most rugged activities. The AquaCase features a security lock and special corrosion-resistant materials that stand up to water, dirt, mud, sand, and other grime. Recipients can wear it with a compatible clip, armband, and lanyard. The AquaCase is designed to be used with the swimmable AquaMic, the unique, IP 68-rated microphone from Advanced Bionics. The AquaMic headpiece is 100% waterproof and does not require a bag or enclosure that would significantly reduce sound quality.

The next step-change innovation from Advanced Bionics will be the approval and launch of the Naída CI sound processor, ready for EAS (electro acoustic stimulation). This offers the full integration of Advanced Bionics and Phonak technology for recipients with some residual hearing who are seeking the most natural-sounding hearing experience. The processor combines the electric sound signal from an Advanced Bionics cochlear implant with acoustic sound from a Phonak hearing aid. The combination of electrical and acoustical stimulation should allow recipients to hear high and low frequencies for a more natural hearing experience and improved music enjoyment.

1 Wolfe J. et al (2013)

Constant innovation is the fruit of our strong commitment to academic and industry research into significant hearing loss and its treatment. In 2014/15, we renewed and expanded that commitment, increasing the number of research partnerships with leading cochlear implant centers around the world.

Expanding markets for innovation

Advanced Bionics continues to strengthen its position in new markets as we secure further approvals for innovative products. In Australia, the HiFocus Mid-Scala electrode and the Naída CI sound processor have become commercially available for the first time.

Our unique Neptune swimmable sound processor is now available to cochlear implant recipients in China and Japan. Neptune is designed to help recipients hear both in and out of the water; it is warranted for use in oceans, lakes, and rivers as well as pools, showers, and baths. It has proved popular for all ages: 95% of adult recipients are satisfied with Neptune; 9 out of 10 parents choose Neptune to help their children hear in the water, while 90% of audiologists agree that its stylish design helps fulfill the needs of their patients.



CONTINUOUS INNOVATION

Linda Mier meticulously inspects the components of a cochlear implant. Some of the parts that comprise the implant have microscopic dimensions, smaller than the diameter of a human hair and require precision handling under a microscope. Together with other specialists, she works at the Advanced Bionics headquarters in Valencia, California in a special clean room facility that is carefully controlled for dust-particles, temperature and moisture. The staff here wears protective gear that covers clothing, hair, hands, and shoes.

Abhijit Kulkarni, Vice President, Research and Technology at Advanced Bionics, explains: "Creating technology that will be implanted in an individual is a huge responsibility. In our work, the standards of precision and accuracy can never be high enough." As well as skilled craftsmanship, implant production calls for cutting-edge technology,

and it must meet the highest international safety standards for sterile medical products. Inspectors regularly come from all over the world to examine every last detail of the production operation. Each step in the work of every single employee must be clearly traceable. Certification by leading Notified Bodies such as the US Food and Drug Administration (FDA) and Germany's Technical Inspection Association (TÜV) are required for distribution of the products.

"We make every effort to ensure that users enjoy the best possible hearing," says Hansjürg Emch, Group Vice President Medical of Sonova and President of Advanced Bionics. "Their trust in us is the greatest honor we could receive, and it motivates us to attain ever higher standards of performance, day after day." Recipients of cochlear implants are regularly invited to Valencia so that they can report to the staff on life with the products. "It's highly motivating to get direct feedback about the positive impact of our cochlear implants on people's lives," research leader Kulkarni notes. "At the same time, reports on

customers' experiences help us to continue developing our products."

Advanced Bionics is a global innovation leader in the cochlear implant segment. A foundational element of its product portfolio is the flexibility designed into the cochlear implant electronic platform. "We continue to push the boundaries of auditory science every day and our implant electronics have been designed with the flexibility to embody these advances for years to come. This means that recipients can expect to have access to the very latest developments without having to undergo another procedure," Kulkarni explains. "Innovation doesn't simply happen out of the blue. On the contrary, it is largely the result of a long-term vision and targeted investments in the future. We believe that technology has to anticipate the future so that our customers always have the best possible opportunity to hear."



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