BONEBRIDGE
Bone Conduction Implant System
“Was getting a BONEBRIDGE the right choice? Simply—YES!”

Alan, UK

* Wireless connectivity feature is available with the Siemens miniTEK™. Sivantos is not responsible for the operation with the SAMBA or its compliance with safety and regulatory standards in operation with the SAMBA.

Pictures: eye5.at // Daniel Zangerl
The First Active Bone Conduction Implant Worldwide—BONEBRIDGE

We are proud to introduce you to the world’s first active bone conduction implant—BONEBRIDGE.

With the BONEBRIDGE, MED-EL complements its family of hearing implants. The well proven intact skin technology which is already implemented and established in our cochlear implants and middle ear implants, is now being employed successfully in bone conduction stimulation. MED-EL can now offer even more people suffering from varying forms of hearing loss, solutions from the widest product range of hearing implants worldwide.

Breakthrough Technology

BONEBRIDGE is an innovative bone conduction implant, which lies completely under the intact skin. It allows sound to be directly transmitted to the inner ear by means of bone conduction. Bone conduction plays a significant role for people, in whom sound cannot be transferred to the inner ear via the natural path through the outer and the middle ear. Therefore the sound is transmitted via the cranial bones to the inner ear to stimulate the auditory nerve.

In order to determine whether BONEBRIDGE is the right solution for you, the reasons for your hearing loss must first be clarified.

BONEBRIDGE is available for adults and children aged 5 years or above and can be used for the following types of hearing loss:

- Conductive hearing loss
- Mixed hearing loss
- Single-sided deafness
How our Hearing Works

The ears are really exceptional organs. They collect sound waves and convert them into information that can be interpreted by the brain. Knowing how natural hearing functions can help you to understand the reasons for your hearing loss and help decide which treatment options could be best for you.

The human ear is divided into three areas: The **outer ear** comprises of the visible parts of the ear and the ear canal. The **middle ear** consists of mainly the eardrum and the three small bones that form the ossicular chain. The **inner ear** is the actual hearing organ and is called the cochlea.

How Natural Hearing Works:

1. Sound is picked up by the ear and transmitted through the auditory canal to the eardrum.
2. The eardrum converts the incoming sound into vibrations.
3. The three auditory ossicles are moved by these vibrations and transmit the acoustic stimulation to the cochlea.
4. The fluid in the cochlea is thus set into motion and stimulates the so-called hair cells.
5. The hair cells generate electrical signals which are transmitted from the auditory nerve to the brain.
6. The brain interprets the electrical signals as acoustic sound.
Different Types of Hearing Loss

Each type of hearing loss is as different as the person who is suffering from it. Hearing loss originates through damage of one or several parts of the ear. The four different types of hearing loss are explained below:

Conductive Hearing Loss

Conductive hearing loss is often caused by malformations of the ear or by severe middle ear infections.

Sensorineural Hearing Loss

Hearing loss associated with ageing (presbyacusis or age-related hearing loss) is usually a sensorineural hearing loss. Another common cause could be a noise trauma.

Mixed Hearing Loss

Mixed hearing loss means a combination of sensorineural and conductive hearing loss.

Single-Sided Deafness

This defines the significant or complete failure of the hearing function on one side. Although patients can hear with the second ear, they still have difficulties in hearing conversation on the impaired side, understanding speech in noisy surroundings and localizing where the sound is coming from.

BONEBRIDGE is an appropriate solution for conductive and mixed hearing loss and for single-sided deafness.

Sensorineural Hearing Loss

The cochlea does not function properly and is unable to change sounds into the electrical pulses that the auditory nerve needs.

Conductive Hearing Loss

A blockage or deformity in the middle ear can prevent the bones from vibrating properly and conducting the acoustic information to the inner ear.

Single-Sided Deafness

This defines the significant or complete failure of the hearing function on one side, while the hearing in the opposite ear is still normal.

Mixed Hearing Loss

A mixed hearing loss is a combination of sensorineural and conductive hearing loss.
The first user of the bone conduction principle, known to us, lived in the 18th century. It was the famous composer Ludwig van Beethoven. Even before he reached the age of 30, his hearing problems had begun and became worse year by year. At the end of his life he was practically deaf. In spite of his hearing loss he was still able to hear music. To achieve this, he attached a baton to his piano and bit on the baton with his teeth to be able to hear the music through his jaw bone.

How can Sound be Transmitted?

The pathway for sound transmission from the outer ear, via the middle ear to the inner ear is known as the air conduction. Besides the air conduction, there is a second mechanism of sound transmission—the so-called bone conduction. Bone conduction bypasses the outer and the middle ear. Through the bones of the skull sound is transmitted directly to the inner ear.

When is Bone Conduction Hearing Used?

When the natural transmission of sound to the inner ear is impeded, bone conduction hearing systems can be used. In bone conduction hearing systems, the cranial bones are stimulated by mechanical vibrations. These vibrations are transmitted directly to the inner ear, where they are processed like normal sound.
BONEBRIDGE is a bone conduction implant system, consisting of an external audio processor, worn behind the ear and an implant, positioned surgically under the skin.

The audio processor is kept in a position directly above the implant by means of magnetic attraction and can therefore be worn discreetly and comfortably under the hair.

Sound waves are picked up by the microphones of the audio processor. The audio processor converts the sound into electrical signals. These electrical signals are transferred through the intact skin to the implanted part of the BONEBRIDGE system.

The electrical signals are converted into mechanical vibrations by the implant and transmitted to the bone. The bone then conducts the vibrations directly to the inner ear, which is embedded in bone. This is the reason why such implants are called bone conduction implants.

In the inner ear, the mechanical vibrations are converted into nerve signals and transmitted to the brain via the auditory nerve and perceived as sound.

As the signals are transferred directly to the inner ear via bone, hearing impairments in the outer and middle ear can be compensated.
The innovative bone conduction hearing system offers you numerous benefits:

**Cosmetically Appealing**
- The implant is positioned completely invisibly under the intact skin.
- Experience with other hearing implants shows that these kinds of intact skin implants are associated with an extremely low rate of skin complications.
- No occlusion of the ear canal.
- The covers of the new SAMBA Audio Processor can be interchanged. This gives you the choice of wearing SAMBA conspicuously with a design or more discreetly under the hair.

**Gentle Surgery**
BONEBRIDGE surgery is a quick and simple procedure, usually lasting half to one hour. No further surgical intervention is required afterwards. All replaceable parts of BONEBRIDGE system are located in the external audio processor.

**Activation of the System**
BONEBRIDGE can be activated two to four weeks after surgery. Activation is accomplished by fitting the audio processor to your individual needs.

**Simple Handling**
With the SAMBA remote control, the audio processor is really simple for you to handle. It enables you to control the volume of SAMBA and change easily between the various programs.

**Always Benefit From the Latest Technology**
With BONEBRIDGE you always benefit from the latest technology: each generation of audio processor is compatible with the implant. This makes it easy for you to continue to upgrade to the latest model even years after having the implant. As a result you always benefit from the latest audio processor technology. All that is needed is a fitting by the audiologist or hearing specialist.
SAMBA Audio Processor

SAMBA is the newest generation of audio processor for the BONEBRIDGE and VIBRANT SOUNDBRIDGE systems. SAMBA does what its name suggests: it comes in a range of colourful covers and brings sound and colour into your life. Its cutting-edge technology is as impressive as its design.

The Design—as Individual as you are

The new and innovative SAMBA design gives you the freedom of choice! With a quick snap and a click, you can attach one of the many interchangeable covers to the audio processor to reflect your mood: Do you feel like turning a few heads today? Then make an expressive statement by wearing one of the bright contemporary design covers. Or would you rather blend in? Then choose a cover that matches your hair colour and hide the processor discreetly underneath your hair. For the innovative design and range of features that the audio processor offers its users, SAMBA was awarded the renowned Red Dot design award 2014.

But SAMBA does much more than simply reflect your own personal style. Read on to find out more about the technical features offered by the new audio processor.
Choose Your Individual SAMBA Style

Basic package
Your SAMBA comes with these 9 interchangeable covers:

- Silver Grey
- Light Blond
- Golden Sand
- Simply Black
- Glossy Black
- Terra Brown
- Mahogany
- Dark Chocolate
- Tweed

More information at www.medel.com/samba

Design covers
These 12 individual SAMBA design covers can be ordered separately:

- Playtime
- Coral
- Very Berry
- Intarsia
- Driftwood
- Space
- Glossy Anthracite
- Safari
- Kilt
- Night Sky
- Glossy Blue
- Melody
Intelligent Sound Adapter—SAMBA Adapts to Your Listening Usage

SAMBA distinguishes between different hearing situations (e.g. a loud environment, music, conversations in a quiet environment, etc.) and automatically adjusts to the most appropriate setting. The audio processor also has the ability to learn and recognise manual adjustments that users make regularly in the respective situations. For example, if the user always readjusts the volume in a quiet environment, SAMBA recognises and stores this information. The system then automatically adapts the basic settings as fitted by the audiologist to the user's individual manual readjustments. This saves the user from having to make frequent readjustments and fitting appointments with the audiologist and hearing aid specialist.

Adaptive Directional Microphones—Background Noise is a Thing of the Past

The adaptive directional microphones automatically identify and minimise noise interference. This feature is particularly helpful in situations where there is loud background noise, such as in a restaurant. With SAMBA, you can give your full attention to the person you are talking to—noise interference behind you and beside you is automatically cut out.

Speech Tracking—Razor Sharp Speech no Matter From Which Direction

This special feature enables SAMBA to automatically recognise the direction from which speech is coming and make the corresponding adjustment to the directionality of the microphone. This results in optimum focus on speech. For example, just think of when you are driving your car and your passengers are talking to you. You will no longer have any problem hearing them.

Individual Adaptable Programs—Customizing Your Hearing Experience

You can select one of five programs, each with its own individual settings, for particular situations (e.g. for noisy environment or for TV & music). This makes SAMBA quick and easy to use.

SAMBA Remote Control—In Control at the Push of a Button

The SAMBA remote control provided enables you to control the volume of SAMBA and change between the various programs. With the Home button, you can restore the basic settings with a single click.

Wireless Connectivity*—Connected to the World

SAMBA can be connected to external devices via Bluetooth or telecoil. This enables the signal from your mobile phone, MP3 player, FM system or assistive listening device to be transmitted wirelessly and with no loss of quality to the audio processor.

These wireless connectivity functions are available with the Siemens miniTEK™, sold separately. For further information, please contact your local MED-EL representative, your audiologist or hearing specialist.
MED-EL Sports Headband

Comfort and Support for an Active Lifestyle

The MED-EL Sports Headband provides comfort and security for sports and many other vigorous activities. With the MED-EL Sports Headband, there’s no need to worry about your audio processor shifting out of place or falling off. Now you can keep the audio processor securely in place over the implant thanks to the specially-designed pockets within the headband. The breathable microfiber material also protects the audio processor from sweat and moisture.

The MED-EL Sports Headband is available in black and comes in four different sizes (XS, S, M and L). Order your headband at www.medel.com/skinfit-en or contact your MED-EL representative.
What do BONEBRIDGE Users say?

I can now hear people on my left and by having BONEBRIDGE I am now comfortable in company again. I no longer need to ask people to repeat what they said and I no longer respond with inappropriate answers to questions or comments. For my family it has made life so much easier as they don’t have to repeat what they say to me all the time. Going out in a group is once again an enjoyable experience as I can sit in any chair and become fully involved in the conversation.

Was getting BONEBRIDGE the right choice? Simply—YES!

Alan, UK

I have had my BONEBRIDGE system for a year now and I can say that it really was the right choice. The expectations I had have been largely exceeded. The quality and richness of the sound is much better than I could have imagined. I can follow conversations again during meetings and join in when out with friends in a restaurant. Not only my hearing, but the quality of my life has improved since receiving my BONEBRIDGE.

Dirk, Belgium

Vera was not afraid at all before the surgery. Her older sister had received a VIBRANT SOUNDBRIDGE one year before and Vera had seen how much a hearing implant had improved her daily life. Therefore she really wanted to have BONEBRIDGE. Since receiving BONEBRIDGE, Vera understands her teachers much better and she happily shows off her audio processors to all her friends and schoolmates. Playing football with everyone in the break time has also proved to be no problem at all!

Vera’s parents, Italy

Since I received the hearing implant, music has played an increasingly important role in my life because for me the sound is now louder and more intensive. What pleases me the most: When I get into my car in the morning and turn on the music and hear everything much more intensively and clearly! This makes me feel so happy! I feel like a new person since the day my BONEBRIDGE was activated.

Daniela, Austria
FAQs

What are the benefits offered by BONEBRIDGE as opposed to conventional bone conduction hearing aids?

With conventional bone conduction hearing aids you have a dampening effect because of the transmission through the skin. On the contrary, BONEBRIDGE is implanted under the skin, therefore the dampening effect can be avoided. A great advantage of BONEBRIDGE is that the users don’t have any problems with pressure pain. Compared to BONEBRIDGE, so called bone conduction spectacles must be pressed to the scalp using specific strong pressure to allow vibration to be transmitted through the skin to the bone. That constant high pressure applied can cause skin problems and headaches.

What are the benefits offered by BONEBRIDGE as opposed to bone anchored hearing aids?

Besides the unfavourable cosmetic situation, bone anchored hearing aids have a pedestal that protrudes through the skin. This may cause skin irritations and skin infections. BONEBRIDGE is the first active bone conduction implant that leaves the skin intact. Experience shows that these types of intact skin hearing implants have an extremely low rate of skin complication.

Can I test hearing with a bone conduction implant before surgery?

If you would like to find out whether BONEBRIDGE is the right solution for you, you can experience bone conduction hearing prior to the implant surgery. This is accomplished with the help of a bone conduction headband or bone conduction headphones, positioned on the skin behind the ear. The sound is then carried by the bone to the inner ear.

Can I feel vibrations in the head?

No. The mechanical vibrations of the bone conduction implant are not perceptible as vibrations.

When can I start to use the device after surgery?

The implant is usually activated two to four weeks after the surgical procedure. The implant is activated by fitting the audio processor to the individual hearing loss.

How long can I wear the audio processor?

You can wear the audio processor as long as you wish. The majority of users wear it all day. However it should be removed before you go to sleep or bathe.

What do I have to do on a daily basis, so that my BONEBRIDGE system works?

When you get up, all you have to do is to place the audio processor over the implant. Only the battery of the audio processor needs to be replaced approximately every 5 days.

Who can tell me if BONEBRIDGE is the right solution for me?

If you are interested in a BONEBRIDGE system, please contact a hearing implant centre in your area. You can find the relevant information on our website (www.medel.com) under “Find a Clinic”. The type and severity of your hearing loss will be determined in the implant centre by means of audiological tests. In conjunction with a medical examination, it can be established whether BONEBRIDGE or another MED-EL hearing system is suitable for you.
MED-EL—A TRUSTED PARTNER
Meet MED-EL

At MED-EL, our goal is to overcome hearing loss as a barrier to communication and quality of life worldwide. Based in Innsbruck, Austria, MED-EL has over 1,500 employees and is present in more than 100 countries.

For nearly 40 years, MED-EL founders Ingeborg and Erwin Hochmair have been pioneering cochlear implant research. As a company, MED-EL has been driving innovation in the field of hearing implants for more than 20 years.

Let us know if you have any further questions. We’re always here to support you during every step of your hearing journey.