Growing up With a Hearing Implant
Children With SOUNDBRIDGE or BONEBRIDGE
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Audiological Terms

**Audiogram:** A graph showing a person's hearing capacity. The results of a hearing test are recorded in an audiogram to display the degree and type of hearing loss. It displays hearing loss in decibels at different frequencies.

**Audiologists:** Hearing specialists who treat people with hearing loss.

**Audiology:** Branch of science concerned with the treatment and rehabilitation of hearing and communication disorders.

**Audiometry:** A series of audiological tests designed to measure hearing performance.

**Auditory:** Relating to hearing.

**Atresia:** Occlusion or absence of the ear canal.

**Binaural hearing:** Hearing with both ears. Binaural hearing is extremely important for discriminating differences in direction.

**Binaural/bilateral hearing loss:** Loss of hearing in both ears.

**Decibel (dB):** The strength of an audio signal is given in decibels (dB).

**Acquired hearing loss:** Hearing loss that occurs after birth.

**Frequency:** The pitch of an audio signal. The unit of frequency is measured in hertz (Hz).

**Auditory Brainstem Response (ABR):** An objective hearing test that measures electrical processing of sound in the brain so as to test the proper functioning of the auditory nerve pathways. An auditory brainstem response test is often performed during newborn infant hearing screening and is non-invasive.

**Hearing threshold:** The minimum volume that a person with normal hearing can hear. Hearing tests are performed to determine hearing thresholds at different pitches and are recorded in an audiogram to enable diagnosis of a hearing impairment accurately.

**Inner ear hearing loss (sensorineural hearing loss):** Hearing loss caused by problems in the inner ear.

**Bone conduction:** The conduction of sound and vibrations to the inner ear through bone. This makes it possible to bypass the ear canal and middle ear if there are any problems in these areas.

**Bone conduction hearing aid/headband:** These devices generate acoustic vibrations, transmitting them via the skull to the inner ear, where they are perceived as sound.

**Mixed hearing loss:** Hearing loss caused by problems in the middle and inner ear.

**Congenital hearing loss:** A hearing loss that is already present at birth.

**Localisation:** The ability to identify the source of a sound.

**Air conduction:** The transmission of sound and vibrations through the air. The sound is transmitted through the outer, middle and inner ear.

**Otology:** The area of medicine that deals with disorders and conditions of the ear.

**Post-lingual hearing loss (post-lingual: after the acquisition of speech):** Hearing loss which develops after the acquisition of speech.

**Prelingual hearing loss (prelingual: before acquiring speech):** Hearing loss already present at birth or occurring before a person learns to speak.

**Habilitation:** Individual training for people with hearing loss to encourage language acquisition and comprehension. The term habilitation is also used for children who could never hear or speak.

**Residual hearing:** The ability to hear some sounds even if a hearing loss exists. Most people with severe hearing loss have some degree of residual hearing, although often this cannot provide information clear enough for a person to understand speech.

**Conductive hearing loss:** Hearing loss caused by blocks in the outer and/or middle ear.

**Speech frequency:** The frequency range from 250 to 8000 Hz that encompasses human speech and is most important for hearing and understanding speech.
Our Child Hears with an Implant – What can we Expect?

Implantation of a VIBRANT SOUNDBRIDGE (VSB) or BONEBRIDGE was an important step towards a new future for your child. It opens a lot of doors. Such a step is always accompanied by great expectations. How will our child hear now? How will their hearing develop? What will everyday life be like for our child? Although there are no one-size-fits-all answers to your questions, there are some stories which we would like to share with you – stories about families who were in the same situation as you. Here you can read about how the families of Lisa, Elodie, Vera, Rabea and Nathalie experienced their new situation:

**Parents of Lisa, 6 years old, BONEBRIDGE**
Before she got a BONEBRIDGE, Lisa was a rather quiet child at school. She now actively gets involved and contributes to the group. It has given her a new lease of life and she can really enjoy life.

**Parents of Elodie, 5 years old, VSB**
The SOUNDBRIDGE has made life so much easier for our daughter. She can do sports without getting annoyed about hearing aids slipping out of place. Doing sport makes her happy. She is not at all shy about showing people her scar because she is proud of how brave she has been.

**Parents of Vera, 6 years old, BONEBRIDGE**
School has become much easier and not such a strain for Vera since she received her BONEBRIDGE. She understands her teachers much better and being able to hear better is so important for learning foreign languages. Now she can take an active part in lessons.

**Parents of Rabea, 7 years old, VSB**
Rabea is incredibly active. She tries her hand at all sorts of sports and she’d also like to learn to play an instrument. Her SOUNDBRIDGE also makes life much easier for her at parties and other noisy gatherings. Incidentally, at home we always call her audio processor her “ear”.

**Nathalie, 17 years old, BONEBRIDGE**
My BONEBRIDGE lets me experience music again. I play guitar and the flute and I can now hear the notes much louder and clearer. The time I spend with the band and my friends is important to me and I always really enjoy it. Even if my new hearing was unfamiliar and loud to begin with, I quickly got used to my BONEBRIDGE. The audio processor has become a part of my life and lets me live it with a satisfied smile on my face.
A great advantage of SOUNDBRIDGE and BONEBRIDGE systems is that they emulate the natural path of hearing with the aid of existing structures. Although it’s normal to have a period of acclimatisation after implantation, it’s not absolutely necessary to have speech therapy or anything similar. However, if language development was impaired before implantation, it may make sense to check whether speech therapy is appropriate. Getting the audio processor settings regularly checked and having yearly residual hearing tests is advisable in any case.

Ideally, one ear will have always been functional or a hearing aid/headband was used for hearing assistance prior to implantation. Therefore, everything will not automatically be louder for your child after implantation and you will tend to notice the changes in their behaviour. For example, they will start to turn their less-used side towards you when you call them; your child will be more able to tell which direction sounds are coming from and point themselves directly towards the source of sounds (e.g. television).

Speech therapy is generally not necessary. However, if language development was impaired before implantation, you should check whether speech therapy is required.
Fitting

What is fitting?

Professional adjustment of the audio processor is referred to as fitting. The first fitting for a BONEBRIDGE is performed 2–4 weeks after implantation and for a SOUNDBRIDGE after 6–8 weeks. At the fitting appointment, the audio processor is adjusted to suit your child's hearing loss and individual needs.

What exactly does fitting involve?

Audio processor fitting consists of evaluating the necessary volume at different frequencies and optimising sounds. During fitting, your child’s audio processor is connected to special software. This allows the audiologist to play sounds into the audio processor at all frequencies to give your child an impression of these tones. At each frequency, the audiologist measures the volume at which your child can hear the tone through the implant. This test is also called Vibrogram. The results are stored in the audio processor and in the software. Then the audiologist tries to adjust the audio processor as individually as possible based on your child’s feedback. The more accurately your child can describe what the tones sound like, the more effectively the hearing system can be adjusted to their needs. There are no limits to the imagination here: images or examples of situations describing what the tones sound like, can help identify the right settings. As a parent, you can encourage your child to say everything that comes to their mind. SAMBA can store 5 programs in its memory that can be programmed with the appropriate settings for different hearing situations. Usually, a universal program is set during first fitting so that your child doesn't need to worry about different programs in the acclimatisation phase.

If your child is using a Siemens miniTek remote control (see pages 20–23), this device is programmed at the fitting appointment.

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1 Fitting appointments may vary slightly with different audiologists. The steps described here are the basic steps that take place at every fitting.
How many fittings does my child need?

Every hearing implant user should have a first fit and one or two follow-up fittings. However, don't be afraid to arrange more appointments if your child is having any difficulties in particular situations. After all, you want your child to get the greatest benefit from the hearing system.

After the first fit
Settings are already stored as accurately as possible at the first fitting appointment. After the first fit, try to experience a range of different situations with your child and observe their reactions. Together with them, try to find specific words, descriptions or images for their listening impressions. Make a note of the situations and reactions and take your notes along with you to the next appointment with your audiologist. That will help them optimise the settings for your child.
Step-by-step through the fitting appointment

**First fit**
1. Hearing test, if necessary
2. Clarify any general questions (How is the audio processor worn? What programs are there?, etc.)
3. Handling the audio processor (changing the batteries, changing the cover, remote control, securing, etc.)
4. Positioning the audio processor and connecting it to the software
5. Initial adjustment to your child’s needs

**Follow-up fitting**
1. Discussion of the test phase (What was good? What could be improved?, etc.)
2. The strength of the magnet is checked and if necessary the magnet is modified
3. Fine-tuning by the audiologist, if necessary
4. Memory programming
5. Hearing test, if necessary
SAMBA Audio Processor

The Design
The new, innovative design of SAMBA gives your child freedom of choice: With a simple snap-on and click, one of the many interchangeable covers can easily fit onto the audio processor for a completely new look. Does your child wish to stand out in the school crowd today? Then it’s time for one of the colourful, patterned design covers. Or would they prefer to blend in? Then your child can opt for a cover which matches their hair colour, concealing the audio processor discreetly under their own hair.

Intelligent Sound Adapter
The SAMBA Audio Processor can detect and distinguish different acoustic situations (e.g. loud surroundings, music, talking in quiet environments, etc.) and automatically adjusts its microphone to suit requirements. This does away with the need for constantly having to switch programs. In addition, the audio processor continues to learn and can detect any manual changes that your child regularly makes in certain situations. For example, if your child always adjusts the volume in quiet surroundings, SAMBA detects this and stores the setting. This means that the system is constantly adjusting basic settings to your child’s needs over time. This saves your child the trouble of making frequent adjustments and attending additional fitting appointments with the audiologist or acoustician.

* Wireless connectivity feature is available with the Siemens miniTek™. Sivantos is not responsible for operation in combination with SAMBA or its compliance with safety and regulatory standards when using SAMBA.
Adaptive Directional Microphones
The adaptive directional microphones automatically identify and minimise noise interference. This function is particularly helpful in situations with distracting background noise such as at school or in the playground. With SAMBA, your child can play with their friends or listen to the teacher without hindrance – distracting noise from behind or from the side is automatically reduced.

Individual Adaptable Programs
SAMBA has 5 programs that can store custom settings for specific acoustic situations (e.g. for loud surroundings or for TV and music). This makes SAMBA quick and easy to use. However, children often use the universal program, that detects the acoustic environment and automatically adjusts SAMBA's settings accordingly.

SAMBA Remote Control
With the aid of the SAMBA remote control included with the audio processor, your child can control the volume of SAMBA and switch between programs with ease.

Wireless Connectivity*
SAMBA also offers connectivity options to external devices. This allows wireless transmission of the signal from a mobile phone, MP3 player, FM system or other assistive listening devices, with no loss of quality to the SAMBA Audio Processor. These connectivity functions are possible with the Siemens miniTek™, which is separately available. See page 20 of this brochure for further details.

Please also read the SAMBA Audio Processor manual. You will find it provides helpful information.

* Wireless connectivity feature is available with the Siemens miniTek™. Sivantos is not responsible for operation in combination with SAMBA or its compliance with safety and regulatory standards when using SAMBA.
How Can I Best Support my Child During the Initial Stages of Their New Way of Hearing?

This section gives you tips for everyday situations and for school, as this is where your child is most reliant on the hearing system. Even if you are not present during lessons, it can help you to know how your child can be supported there. Of course, this information is also very important for teachers, which is why this brochure includes a section summing up all of the most important information for teachers themselves. You can detach this section and give it to your child’s teacher.
Practical Tips

Acclimatisation period

In the first weeks with the implant system your child may need to get used to this new way of hearing. They may not be familiar with some sounds or may need to relearn them. Many children find it unpleasant or even embarrassing to have to keep asking people to repeat something that they haven’t understood. However, it is important for your child to keep asking until they have understood everything. This is part of the learning process and helps them learn new sounds and words more quickly.

Daily life

Encourage your child to keep asking until they have understood everything. Many people tend to speak louder when they are communicating with someone with a hearing loss. However, this is not always necessary with hearing implant users. Often it is sufficient to speak clearly and try to rephrase something if your child looks at you questioningly.

At school

For teachers it is important to encourage children to ask questions and to attract attention when they haven’t understood something. This is the only way for them to follow lessons properly. Teachers should also try to speak clearly. They shouldn’t simply try to speak more loudly, instead they should also rephrase something if a child still hasn’t understood after repeating it. It is also helpful to write new words, important messages, dates and tasks on the blackboard/whiteboard. FM systems (see page 20) can also help children understand.
Orientation

If both ears can process sound signals normally, the brain can calculate which direction a sound is coming from. As soon as one ear stops functioning properly, orientation is equally hampered. Implanted children can still learn the ability to locate sources of sound; the younger the child is, when they receive hearing assistance, the better this function can develop. Therefore, your child may be able to indicate the rough direction or actually tell precisely where a sound is coming from. Therapeutic measures can help your child become accustomed to hearing with both ears again.

At school

The teacher can also point out sources of sound and when other pupils are talking and always aim to call all pupils by their name.

Background noise

At school, during family meals or at birthday parties – background noise is always there and a challenge for everyone. Although the brain has the capacity to distinguish important from unimportant sounds and to filter them, we still perceive background noise as a strain.

SAMBA has special technology that automatically detects and reduces background noise. Your child can benefit greatly from this function and focus better on what the other person is saying.

Daily life

Point out sources of sound and people who are talking.
Daily life
Although SAMBA assists your child very effectively when it comes to background noise, it is helpful to make as little background noise as possible. For example, switch off the radio if you’re not really listening to it or don’t have the television or music on while you’re having a conversation.

At school
A seat some distance from sources of noise (air-conditioning, doors, wash-basins, etc.) reduces unnecessary distracting sounds.

Sports
During sport it is very important to protect the audio processor and the implant. Therefore, when playing ball games, make sure that no balls get thrown at the head, as this can not only damage the audio processor, but also the implant.

Daily life
Use one of the many handy accessories that can assist your child during sport. See pages 24–26 for further details.

At school
Ask the PE/games teacher to be careful when children are playing ball games. Show the teacher the various accessories too. Make sure that the child takes off the audio processor during swimming lessons.

On excursions
There’s always a lot of things happening on excursions – children discover new things, laugh and talk a lot. This quickly creates a muddle of sounds. Additional resources can make it easier for implanted children to understand in such situations.

Daily life
FM systems or telecoils are very handy in such situations. Many museums, public venues and even some cinemas are equipped with telecoils, which can really help your child understand more easily. More details on FM systems and telecoils can be found in this brochure (see pages 20–22).

At school
The above systems can also be used on school excursions.
The Classroom

Packing list for holidays & excursions
- Remote control/miniTek
- Spare batteries for SAMBA and remote control
- Interchangeable covers
- SAMBA Sleeve
- Activity Clip
- Headband
- Patient ID card
- miniTek accessories, if necessary

The acoustic situation in the classroom can influence how well your child is able to follow lessons. This section provides information about possible helpful measures which can be taken in the classroom.

Ideal room acoustics
1. Soundproof ceilings reduce reverberation time.
2. Curtains and net curtains absorb sound.
3. A seat near the front of the classroom allows direct eye-contact with classmates and teachers.
4. A seat some distance from sources of noise (air-conditioning, doors, wash-basins, etc.) reduces unnecessary distracting sounds.
5. A swivel chair allows the child to turn quickly to face the source of a sound.
6. Rubber tips on chair legs prevent distracting noises.
7. Carpets and fabrics muffle distracting noises.

Ideal acoustic environment
8. Generally, it will be best for your child not to sit next to their loudest classmates.
9. FM systems make it easier to hear in distracting noise as speech is transmitted directly into the audio processor.
Spare batteries

The audio processor is like a new ear for your child, and it must be reliable at all times. To make sure that this is the case, the audio processor obviously needs batteries. They last for an average of five days, so that your child doesn’t have to carry spare batteries around with them all the time. The school should, however, have a pack of spare batteries ready to hand so that your child can always follow lessons without any restrictions. You can also show teachers how to replace the battery so that they can help your child with this.

Helpful accessories

There is a range of helpful accessories for handling the SAMBA Audio Processor. Read on for details:

Siemens miniTek™ remote control

The Siemens miniTek is an optional remote control for SAMBA. It is smaller than the standard remote control and can be attached to clothes. The miniTek can be used not only to control SAMBA (adjusting volume and switching programs), it also offers your child the option to connect wirelessly to external devices. For example, SAMBA can be connected to an FM system or a telecoil. This is particularly useful at school or on excursions. It also allows you to make phone calls and listen to music through Bluetooth. When using a miniTek, make sure that the remote control is positioned for best effect: In order to ensure stable signal transmission, the distance between the SAMBA Audio Processor and the miniTek should be as small as possible. Therefore, the best thing is to fasten the miniTek on your child’s clothes using the clip, with the longer sides of the remote control placed vertically (see Figure on page 13). Please note that the miniTek is not included in the SAMBA package and can be ordered separately. For more information and ordering options, please contact your local MED-EL representative or your audiologist.

FM systems

FM systems can vastly improve how well your child understands speech. These systems are particularly useful with relatively large distances between the speaker and your child, with additional sources of sound creating background noise (for example at school). It is especially difficult to understand speech in such situations. FM systems can help here as they transmit sound from the speaker’s microphone straight to the audio processor via the miniTek. This not only reduces the acoustic distance between the speaker and listener but also lessens background noise that could otherwise drown out speech. FM systems can greatly improve your child’s behaviour in class and their performance.

* Wireless connectivity feature is available with the Siemens miniTek™. Sivantos is not responsible for operation in combination with SAMBA or its compliance with safety and regulatory standards when using SAMBA.
When using an FM system, the teacher wears a small microphone and a transmitter. Your child wears an FM receiver, that is connected to the miniTek. The receiver receives the signals from the transmitter and transmits them straight to SAMBA via the miniTek. Your audiologist or hearing aid acoustician will be happy to advise you about FM systems.

Telecoil
SAMBA and miniTek are not only a great combination for your child at home and at school. They can optimise your child’s hearing experience for other activities, too.

Many cinemas, museums, sports stadiums, religious buildings and public venues are equipped with “telecoils” (audio induction loops). These systems transmit signals that are received by the miniTek and transmitted to SAMBA. This allows your child to hear these signals very clearly, thus improving speech understanding significantly. Examples of signals that can be transmitted to SAMBA via telecoil and miniTek include audio
guides or lectures. Apart from the miniTek, no other equipment is required to transmit signals via telecoil. Facilities equipped with an induction loop usually have a sign indicating this service in the entrance area (see drawing on page 21 for the symbol). You can also check the internet for nearby facilities equipped with such systems.

Telephoning via Bluetooth²
SAMBA and miniTek are also handy for your child when it comes to using the phone. The miniTek can receive Bluetooth signals from a mobile phone and transmit them directly into SAMBA, thus ensuring that a clear signal is received by the audio processor. Your child’s voice is picked up by the miniTek microphones instead of the phone’s. Therefore, please remember to position the miniTek close to the mouth when speaking on the phone (fasten it to a collar, for example, using the clip). Bilaterally implanted children can also pick up the phone signal with both audio processors and thus improve the clarity of speech even more.

Audio streaming via Bluetooth
With the aid of the Bluetooth function your child’s SAMBA can be easily connected to any other Bluetooth-ready device. Whether it’s a Bluetooth-ready MP3 player or laptop – audio signals can be fed straight into the SAMBA Audio Processor via the miniTek, thus enhancing acoustic quality and clarity for your child.

² The distance between the Bluetooth source and the miniTek can be up to 10m. The miniTek and SAMBA should not be further than 50cm apart. A direct line of sight between the miniTek and SAMBA improves the quality of transmission.
Direct audio input

It is possible to connect various audio devices (e.g. MP3 player, tablet, etc.) to the miniTek using an audio connector. The miniTek transmits the audio signals wirelessly to SAMBA. This option allows your child to connect a variety of devices to their SAMBA and enjoy a positive hearing experience. Various common connectors are included with the miniTek.

Transmitter

If the device is too far away to connect the miniTek with an audio cable, or if the device is not Bluetooth-ready (e.g. TV), it is also possible to connect it using the transmitter (included with the miniTek). Just connect it to the device to transmit the audio signals wirelessly to the miniTek. The transmitter can transmit the audio signal up to 10 metres from the audio source to the miniTek and on to SAMBA. Your child benefits from this connection option for example when watching television or streaming. If you connect a microphone to the transmitter, this combination can be used at school as an alternative to an FM system.

The miniTek has a rechargeable battery. You can carry on using the remote control as usual while it is charging. You can also charge via an external battery (e.g. power bank). This option can be very useful at school to prevent the battery from draining during lessons. When using SAMBA in combination with a miniTek, your child will hear the signals that the miniTek transmits directly to the audio processor (e.g. from a television or FM system) and the ambient noise (e.g. talking). Your audiologist can adjust the volume ratio between the two signals.

For details on using the miniTek please read the appropriate manual.

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1 Streaming involves playing music and videos on the internet, for example, without having to save them locally.
SAMBA Kids

For children, every day is full of new adventures and possibilities. The SAMBA Kids set gives your child a range of handy accessories.

SAMBA Kids contains:

- 7 colourful interchangeable covers specially designed for children: changing the cover is child’s play (see short instructions on page 27) and turns your child’s audio processor into a cheerful or stylish companion. Bright colours can be an advantage when it comes to increasing people’s awareness and acceptance of hearing systems. Hair colours, on the other hand, can offer a more discreet option. Easy replacement allows you to quickly customise the device to suit your child’s needs.

- SAMBA Sleeve: SAMBA can be placed in the SAMBA Sleeve to protect the audio processor, for example, in case it is dropped. The SAMBA Sleeve is also connected to a clip that can be fastened to clothes. This also prevents the audio processor from falling off.

- SAMBA Nightstand: SAMBA Kids also contains a little friend who holds the audio processor while your child is sleeping or not using the audio processor. SAMBA is held on the figure by a magnet, thus ensuring it doesn’t get lost or misplaced when it is not being worn.
MED-EL Sports Headband

Driven by their natural curiosity, children are constantly on the move, playing in the garden or exploring outdoors with their friends. With the MED-EL Sports Headband you can be sure as a parent that the audio processor stays put where it is supposed to be when your child is out and about exploring. Thanks to the specially designed pockets within the headband, the audio processor can be kept securely in place over the implant. The breathable microfiber material also protects the audio processor from sweat and moisture and is comfortable to wear.

The MED-EL Sports Headband is not suitable for water sports.
SAMBA Design Covers

SAMBA offers interchangeable covers in a variety of colours and designs. In addition to the 8 interchangeable covers in different hair colours, your child can also choose from a number of fun design covers to express their style or mood. These 12 interchangeable covers can be ordered separately.

Activity Clip

The Activity Clip holds the SAMBA Audio Processor exactly where it is supposed to be. It is simply positioned between the audio processor and the hair to provide additional grip. This little accessory allows your child to move about freely and unhindered.

Hair Clip

Different hair clips are available to fasten the audio processor in the hair. You can choose the hair clip that suits your child best or use their own favourite hair clip.

1 The Activity Clip is a sundry and is not suitable for children under the age of three.
Short Instructions for Using SAMBA

Changing the Battery

1. To change the battery, hold the device between two fingers. First open one side of the battery case, then open the other side.

2. Open the battery case until the battery is completely visible. Carefully turn SAMBA upside-down, allowing the battery to drop out.

3. Remove the sticky tab from a new battery. Insert the new battery into the battery case. To activate SAMBA, slide the battery case into the audio processor with two fingers.

Changing the Cover

1. First remove the battery (see above). Place SAMBA on an even surface, e.g. a table, and put one finger on top. First lift one side of the cover, then the other.

2. Remove the cover completely from the audio processor. Place the new cover on SAMBA by firstly positioning the rear side of the cover onto the audio processor. Press the cover down: first on the rear side, then on the front side. Make sure that the cover snaps into place.

3. Press the sides together to ensure that the cover is in the correct position. Insert the battery and close the battery case with two fingers.

Attaching the Hair Clip

1. First remove the battery and the cover (see above).

2. Feed the attachment thread through the notch under the battery case. Press the attachment thread down with a pointed object (e.g. pencil) to fasten it onto the audio processor.

3. Place the cover onto SAMBA, insert the battery, and close the battery case with two fingers.
SAMBA Care

These tips will help you make sure that the SAMBA Audio Processor works to best effect.

**Cleaning**: Clean the SAMBA Audio Processor once a week with a damp cloth. Only clean the outside of the audio processor in this way. Do not hold the audio processor under water. If necessary, you can wipe SAMBA with a non-abrasive detergent. Do not use any aggressive detergents.

**Storage**: When your child is not using SAMBA, store the audio processor in the SAMBA case or on the SAMBA Nightstand (included in the SAMBA Kids set). You can take out the battery or simply open the battery case to extend battery life.

**Drying**: If you live in a humid climate or if your child sweats a lot, do not store the SAMBA Audio Processor in the case but rather in a drying container, when it is not in use.

**Moisture**: Protect SAMBA from exposure to water and make sure that no water can get into the microphone openings. Dry the audio processor with a soft, absorbent cloth if it does happen to get wet.

**Sun**: Don’t leave SAMBA in direct sunlight, particularly not inside vehicles. Store the audio processor in a dry place and protect it from extreme temperatures.

Please read the SAMBA Audio Processor manual for further details.

SAMBA Troubleshooting

In case you encounter any minor technical problems with SAMBA, follow these basic steps to identify possible causes and solutions:

1. Change the audio processor's battery. If this doesn't solve the problem, continue with step 2.
2. Check whether the audio processor is dirty or damaged. Clean the audio processor carefully with a damp cloth or non-abrasive detergent. Contact your MED-EL representative if any parts appear damaged.
3. Insert the battery in the audio processor and close the battery case. Continue with step 4 if the audio processor is still not working.
4. Read the detailed troubleshooting information in the SAMBA Audio Processor manual. If the information listed there doesn't solve the problem, continue with step 5.
5. Contact your MED-EL representative.
Statutory Compensation for Children With Hearing Loss

To make lessons as fair as possible for children with a hearing implant system, many countries have already passed important legislation to compensate for their disability. Some of the main points are listed below:

- Longer time allowed for tests
- Teachers explain contents before and during tests
- Special tools may be used (e.g. defining dictionary)
- Special texts for listening exercises
- Reading instead of listening comprehension for foreign-language tests
- Presentation, projects or additional design tasks instead of oral tests
- Teacher specialised in hearing disability support present during final exams

To find out about the exact provisions in your country, please contact the organisation which is responsible for such matters. These provisions may vary in different countries.

Self-help Groups & Associations for Those With Hearing Loss

Self-help groups and associations for those with a hearing loss can help your child and you as a family to exchange experiences with others and to get first-hand information.

We have put together a list of the most well-known self-help groups and associations in various countries on our website (www.medel.com/family-information). Take a look at their websites—you will find lots of additional and useful information.

www.medel.com/family-information
Some of the products and features mentioned here are not approved for all markets.
Please contact your MED-EL representative for details.
Live, Laugh, Learn
Information for Teachers of Pupils with SOUNDBRIDGE or BONEBRIDGE
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      Statutory Compensation for Children with Hearing Loss
What is a SOUNDBRIDGE?

The SOUNDBRIDGE is a middle ear implant system. It consists of an implant located under the skin and the SAMBA Audio Processor, that is held on the outside of the head over the implant by a magnet. The SAMBA Audio Processor acts as a kind of "external ear", gathering sound waves, converting them into electromagnetic signals and transmitting them to the implant through the skin. The Floating Mass Transducer (FMT) – the heart of the implant – transforms the signals into mechanical vibrations. The FMT is smaller than a grain of rice and is surgically connected to the middle ear structure. The mechanical vibrations cause it to vibrate in a controlled manner, thus moving the structures of the middle ear, too. From here, the signal is transmitted to the cochlea, thereby reactivating the process of hearing.

Hearing Implants in the Classroom

More and more children are benefiting from the VIBRANT SOUNDBRIDGE and BONENBRIDGE. Is there a pupil with a SOUNDBRIDGE or a BONEBRIDGE in your class too? We would like to explain briefly how the two systems work.
What is a BONEBRIDGE?

The BONEBRIDGE is a bone conduction implant system. Like the SOUNDBRIDGE it consists of an implant located under the skin and the SAMBA Audio Processor, that is held on the outside of the head over the implant by a magnet.

The SAMBA Audio Processor used in conjunction with the BONEBRIDGE works in the same way as with the SOUNDBRIDGE. It performs the task of the external ear, gathering sound waves and transmitting them to the implant through the skin in the form of electromagnetic signals. Here again, the implant transforms the audio processor signals into mechanical vibrations. The BONEBRIDGE transducer (BC-FMT) is implanted directly in the cranial bone behind the ear. By converting the electrical signals into vibrations, the BC-FMT starts to vibrate, transmitting these vibrations to the bone. Because bones conduct sound, it is possible for vibrations to stimulate the inner ear through the skull, and the vibrations can be processed like normal sound.
As a teacher, it is important for you to know that one of your pupils is using a hearing implant system. It is advisable to meet the pupil and their parents before the first day at school to discuss how you can give the pupil the best possible support.

Even if the child’s hearing becomes more “normal” by using the implant system, there are some aspects that you should take into account when working with implanted children. Always remember that these children may react differently and take in things differently compared to children with normal hearing.

In this brochure we would like to explain the main aspects and share a few tips and tricks with you that can help you and any pupil who may have a hearing implant system.

How do children with a hearing implant hear?
It is very difficult to describe the hearing impression of a child with a hearing implant – above all because this is always a subjective perception. It is useful to be aware of the following facts:

- Implanted children can “take off their ear”. When they take off their audio processor, their hearing is diminished significantly.
- The same applies when the battery fails: if the battery is flat, the child will hear a lot less or perhaps nothing at all.
- With some children, the audio processor is hidden completely under the hair. As a result, their impairment is not visible to other people, who may not show the appropriate consideration.
- Loud and sudden noises may frighten the children.
- They may need to develop their sense of orientation. Hence, the child may not be able to tell which direction a sound is coming from.
- Children with a SOUNDBRIDGE or BONEBRIDGE do not usually need any rehabilitation. The advantage of the implant will quickly become apparent for the children. However, many children may need to get used to the new mode of hearing and go through an acclimatisation phase. Talk to their parents if you get the impression that rehabilitation measures might be helpful.

One of my Pupils has a SOUNDBRIDGE or BONEBRIDGE – What do I Need to Know?
Practical Tips for the Classroom

Acclimatisation period

Some sounds may be unfamiliar or hard to classify. Many children find it unpleasant or even embarrassing to have to keep asking people to repeat something that they haven’t understood. However, it is important for a child to keep asking until they have understood everything.

Encourage children to ask questions and to attract attention when they haven’t understood something. This is the only way for them to follow lessons properly. Also, try to speak clearly. Many people tend to speak more loudly when they are interacting with people with a hearing loss. However, this is not necessary with hearing implant users. It is sufficient to speak clearly and rephrase things if the implanted child looks at you questioningly. It is also helpful to write new words, important messages, dates and tasks on the blackboard/whiteboard. FM systems also help the child understand. For more details on FM system, see page 12.

You can support children by pointing out sources of sound and other pupils who are talking and by always calling all pupils by their names when choosing them to answer.

Orientation

If both ears can pick up sound signals, the brain can calculate which direction a sound is coming from. As soon as one ear stops functioning properly, orientation is equally hampered. Implanted children can still learn the ability to locate sources of sound; the younger a child is when they receive a hearing system the better the chances are that this function develops well in the future. Therefore, implanted children may only be able to indicate the rough direction or tell precisely where a sound is coming from. Therapeutic measures can be helpful in such cases to help children become accustomed to hearing with both ears again.

Do not put implanted children in places with regular noise (e.g. air-conditioning, doors or wash-basins, etc.).

Background noise

Background noise is always there and a challenge for everyone. Although the brain can distinguish important from unimportant sounds, we still perceive background noise as a strain.

The SAMBA Audio Processor has special technology which automatically detects and reduces background noise as such. Implanted children benefit greatly from this function and can concentrate better on what you are saying.
Spare batteries

The audio processor is like a new ear for implanted children. If it happens to fail, things can get very difficult. If an implanted child stops reacting to your instructions, remember that the battery may be flat.

Talk to their parents and ask them to give you a pack of spare batteries. Ask them to show you how to change the audio processor’s battery so that you can help the child with this.

Practical Tips Outside the Classroom

Sports

Particular care must be taken when playing ball sports. Please make sure that no balls get thrown at heads if you have implanted children in your class. Of course, that can cause injuries for all children, but it can damage the implant system in implanted children.

There are handy accessories for sports that protect the audio processor. Ask the child or their parents whether they have such accessories. Also, make sure that the child takes off the audio processor during swimming lessons.

In museums, cinemas, public venues, etc.

There’s always a lot of things happening on excursions – children discover new things, laugh and talk a lot. This quickly creates a muddle of sounds. Additional resources can make it easier for children using a hearing implant system to understand in such situations.

FM systems and telecoils are very useful in these situations, as they can help children understand. Many museums, public venues and even some cinemas are equipped with telecoils. More details on FM systems and telecoils can be found in this brochure on pages 12 and 13.
The Classroom

The acoustic situation in the classroom can influence how well implanted children are able to follow lessons. This section provides information about possible helpful measures which can be taken in the classroom.

**Ideal room acoustics**

1. Soundproof ceilings reduce reverberation time.
2. Curtains and net curtains absorb sound.
3. A seat near the front of the classroom allows direct eye-contact with classmates and the teacher.
   A seat some distance from sources of noise (air-conditioning, doors, wash-basins, etc.) reduces unnecessary distracting sounds.
4. A swivel chair allows the child to turn quickly to face the source of a sound.
5. Rubber tips on chair legs prevent distracting noises.
6. Carpets and fabrics muffle distracting noises.
Ideal acoustic environment

1. It will generally be best for implanted children not to sit next to their loudest classmates.
2. FM systems make it easier to hear in distracting noise as the spoken word is transmitted directly into the audio processor.
FM Systems in the Classroom

FM systems are a very good way to support implanted children in difficult acoustic situations (e.g. if there is a lot of distracting noise).

What is an FM system?
With the aid of FM systems it is possible to transmit audio signals (e.g. from microphones) directly into hearing systems using radio waves.

How does an FM system work?
The teacher speaks into a little microphone and wears an FM transmitter (e.g. on his/her belt). The FM transmitter sends your voice signal to the FM receiver, which is connected to the child’s hearing system. The FM receiver transmits signals directly into the child’s audio processor via the miniTek. FM systems greatly enhance the signal quality for a child as they hear your voice as if you were speaking straight into their audio processor. The signal from the FM transmitter can also be sent simultaneously to multiple receivers, regardless of whether the pupils are wearing a hearing aid or the SAMBA Audio Processor. To use an FM system in conjunction with the SAMBA Audio Processor, your pupil needs the miniTek remote control. Ask the pupil or their parents whether they have this remote control.

Why does using an FM system help in the classroom?
By transmitting your voice directly into the audio processor, the child can hear you well even in distracting noise. Using an FM system also allows you to move around freely. Implanted children can hear you as if you were standing right next to them, which enables them to follow what you are saying much better – no matter where you happen to be standing.
Telecoils on Excursions

Many facilities are already equipped with telecoils (induction loops). They can be used to assist children on trips to museums, the cinema or other public venues. In museums, for example, this system can be used to transmit audio guides into the audio processor via the miniTek. With the aid of the miniTek, implanted children can benefit from telecoil transmission technology. Unlike FM systems, you or the children do not need any additional equipment.

FM systems and telecoils make things much easier for implanted children. Speak to your school management or headteacher about buying an FM system for the classroom and find out what facilities are equipped with telecoils. Facilities equipped with an induction loop usually have a sign indicating this service in the entrance area. You can also check the internet for nearby facilities equipped with such systems.

Siemens miniTek Remote Control

The Siemens miniTek* is an optional remote control for the SAMBA Audio Processor that allows your pupil to take advantage of the benefits of FM systems and telecoils. In addition, the transmitter can also be used to transmit audio sound from a TV set directly into the SAMBA Audio Processor via the miniTek. This makes it easier for your pupil to understand. By connecting the transmitter to a microphone, it can also be used as an alternative to an FM system, thus saving costs. It’s also interesting to know that the miniTek can be charged using an external battery (e.g. with a power bank). The implanted child can carry on using the remote control while it is charging. This option can be very useful on long school days.

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

In case you encounter any minor technical problems with SAMBA, follow these basic steps to identify possible causes and solutions:

1. Change the audio processor’s battery. If this doesn’t solve the problem, continue with step 2.
2. Check whether the audio processor is dirty or damaged. Clean the audio processor carefully and then dry it. Contact the pupil’s parents if you discover any damaged parts.
3. Insert the battery in the audio processor and close the battery case. Continue with step 4 if the audio processor is still not working.
4. Read the detailed troubleshooting information in the SAMBA Audio Processor manual. If the information listed there doesn’t fix the problem, continue with step 5.
5. Contact the pupil’s parents.

Statutory Compensation for Children With Hearing Loss

To make lessons as fair as possible for children with a hearing implant system, many countries have already passed important legislation to compensate for their disability. Some of the main points are listed below:

- Longer time allowed for tests
- Teachers explain contents before and during tests
- Special tools may be used (e.g. defining dictionary)
- Special texts for listening exercises
- Reading instead of listening comprehension for foreign-language tests
- Presentation, projects or additional design tasks instead of oral tests
- Teacher specialised in hearing disability support present during final exams

These provisions may vary in different countries. To find out about the exact provisions in your country, please contact the organisation which is responsible for such matters.
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