Cochlear Implants

MED EL

User Manual for

SONNET audio processor (Me1310)

AW31902_1.0 (English US)

1. Table of contents

2. Introduction

This user manual provides information and instructions regarding the MED-EL Cochlear Implant (CI) System with the SONNET audio processor (Me1310). It includes descriptions of available parts, wearing options, and accessories for the SONNET, as well as instructions for troubleshooting and proper care of the external cochlear implant equipment.

Your MED-EL Cochlear Implant System consists of the Mi1200 SYNCHRONY (hereafter referred to as SYNCHRONY), Mi1000 MED-EL CONCERT (hereafter referred to as MED-EL CONCERT), PULSARCI^{100}, SONATATI^{100}, C40+ or C40 implants, the external SONNET audio processor (including FineTuner and D Coil), the external components and accessories, and any external hardware and software used by your audiologist.

This symbol indicates information that is particularly relevant for parents of implanted children.

IMPORTANT
You are the operator of your / your child's SONNET audio processor, therefore we recommend that you read this manual in its entirety. Do not perform any maintenance activities other than those described in this manual (e.g. changing batteries). When performing these maintenance activities, always remove the audio processor from the ear.

The adjustment to a cochlear implant and adequate fitting of the device are gradual processes that occur over time. It is important to remember that your ability to hear with your new MED-EL system may take a little time while you become accustomed to this new method of hearing. You may choose to work with an aural rehabilitation specialist or other clinician to help you maximize your communication skills using the device. The audio processor can be activated for the first time after the surgical incision has completely healed and any remaining swelling has gone away. The implant cannot provide any sound information until the audio processor has been programmed by your audiologist, turned on, and placed on the head over the implant.

After your initial fitting, you will need to return to your CI center on a regular basis for reprogramming. Frequent reprogramming may be required during the first year of implant use. This is normal and necessary, and it reflects a learning process that occurs as you become more and more accustomed to stimulation through the implant. As more time passes, you will likely find that you may require fewer and fewer sessions. Most patients continue to require occasional adjustments for as long as they use their implant.
Please contact your CI center or MED-EL with any additional questions you may have.

3. Intended use – Indications – Contra-indications

INTENDED USE

The SONNET audio processor is an external part of the MED-EL Cochlear Implant System. The MED-EL Cochlear Implant System is intended to evoke auditory sensation via electrical stimulation of the auditory pathways for severely to profoundly hearing impaired individuals who obtain little or no benefit from acoustic amplification in the best aided condition.

INDICATIONS

The SONNET audio processor is an external component of the MAESTRO Cochlear Implant System and is indicated for use on patients who have been implanted with SYNCHRONY, MED-EL CONCERT, PULSARCI^{100}, SONATATI^{100} or C40+ cochlear implants. The MAESTRO Cochlear Implant System is indicated for:

- Adults eighteen (18) years of age or older who have bilateral, sensorineural hearing impairment and obtain limited benefit from appropriately fitted binaural hearing aids. These individuals typically demonstrate bilateral severe to profound sensorineural hearing loss determined by a pure tone average of 70 dB or greater at 500 Hz, 1000 Hz, and 2000 Hz. Limited benefit from amplification is defined by test scores of 40 % correct or less in the best aided listening condition on CD recorded tests of open-set sentence recognition (Hearing In Noise Test [HINT] sentences).
- Children aged twelve (12) months to seventeen (17) years eleven (11) months must demonstrate a profound, bilateral sensorineural hearing loss with thresholds of 90 dB or greater at 1000 Hz and above. In younger children, little or no benefit is defined by lack of progress in the development of simple auditory skills in conjunction with appropriate amplification and participation in intensive aural habilitation over a three (3) to six (6) month period. In older children, lack of aided benefit is defined as <20 % correct on the Multi-syllabic Lexical Neighborhood Test (MLNT) or Lexical Neighborhood Test (LNT), depending upon the child's cognitive ability and linguistic skills. A three (3) to six (6) month hearing aid trial is required for children without previous experience with hearing aids. Radiological evidence of cochlear ossification may justify a shorter trial with amplification.

The SONNET is intended to be used every day during a patient´s waking hours.

The user of a SONNET does not need any special skills or elevated level of education; however, the user (or custodian if the user is a child or a handicapped person not able to perform the actions listed below) shall at a minimum be able to perform the following actions:

- Switching ON/OFF
- Changing batteries
- Placing/removing SONNET on/from the ear
- Placing/removing coil over/from the implant site

As the SONNET is a component of the MED-EL Cochlear Implant System, all indications stated for the MED-EL Cochlear Implant System are applicable.

To obtain optimal benefit from the cochlear implant, candidates shall be sufficiently motivated and shall understand the importance of returning to the CI center for regular processor programming, assessment sessions and training.

CONTRA-INDICATIONS

A patient must not receive a SONNET if the individual is known to be intolerant of the materials used in the SONNET.

The SONNET and any external wireless device (e.g. FineTuner) are not intended to be used in environments where RF transmissions are prohibited (e.g. operating room).

As the SONNET is a component of the MED-EL Cochlear Implant System, all contra-indications stated for the MED-EL Cochlear Implant System are applicable.

NOTE:
Important information related to indications, contra-indications, warnings and risks for your cochlear implant are shipped in a separate document (instruction for use of the implant) to your clinic, together with the cochlear implant. If you want to review this information, please contact your clinic or MED-EL.

4. SONNET audio processor

THE PARTS OF THE SYSTEM

The MED-EL Cochlear Implant System is an active medical device that has internal (implanted) and external parts. The internal part of the device is surgically implanted behind the ear in the skull, while the external components are worn behind the ear or on the body.

Implants with titanium housing: SYNCHRONY (shown), MED-EL CONCERT and SONATA TI[100]

Implants with ceramic housing: PULSAR CI[100] (shown) and C40+

Fig. 1 The MED-EL cochlear implants

The external parts include the SONNET audio processor and the audio processor accessories. In its basic configuration, the SONNET audio processor consists of the control unit with the earhook attached, the battery pack (consisting of frame and cover), the coil and the coil cable. A separate device called FineTuner facilitates access to various audio processor functions.

The coil is held in place by magnetic attraction to the implant.

The audio processor uses batteries that provide sufficient power for both the external and the implanted electronics. The implanted part does not contain batteries.

1 Coil
2 Coil cable
3 SONNET control unit
4 CI earhook
5 Microphone cover
6 Microphone openings
7 Indicator light
8 Battery pack
9 Air inlets

Fig. 2 Your SONNET audio processor

ON/OFF SWITCH

The battery pack cover functions as an ON/OFF switch.

You may select the following positions:
Battery pack cover pulled back: OFF
Battery pack cover completely moved over the frame: ON

IMPORTANT

When trying to pull back the battery pack cover, make sure that the battery pack cover lock is in the unlocked position as shown in Fig. 7-1. When it is not in the unlocked position, use the screwdriver provided with your SONNET kit to turn it counter-clockwise into the unlocked position.

There is no need to completely remove the battery pack cover to switch off the SONNET. It is sufficient to pull it back to a position where you can see the whole labelling on the control unit (see Fig. 3).

Fig. 3 The SONNET audio processor in OFF position

Fig. 4 The SONNET audio processor in ON position

After switching on the SONNET audio processor, the indicator light will blink green up to four times indicating the activated program. For example, if the light blinks three times, then program 3 is currently active. The audio processor begins working as soon as the green light comes on and blinks.

In young children, the battery pack cover lock must always be turned clockwise into the locked position (see Fig. 7-2), once the cover has been moved completely over the frame, to prevent the child from disassembling the audio processor.

To activate your CI system, switch on the SONNET and place the control unit and battery pack, behind the ear and the coil, with the flat side to the head, over the site of the implant (see Fig. 5). As soon as the coil is approximately over the implant, it is automatically positioned correctly by attraction to the implant magnet.

An ear mold may help keep the processor in position on the ear. Contact your CI center or audiologist for assistance.

Fig. 5 SONNET behind the ear and coil over the site of the implant

In the OFF position, the audio processor is turned off. No current is drawn in this position. Make sure to pull back the battery pack cover of your audio processor when it is not in use, as this prolongs the lifetime of the batteries (see also chapter 7, Care and maintenance).

If the processor is turned off (i.e., the battery pack cover pulled back), make sure that young children do not have access to the audio processor to prevent disassembling the device.

The SONNET audio processor has an integrated telephone coil (telecoil). The telecoil picks up magnetic sound signals coming from telephone receivers or loop systems, which are installed in some public buildings, and converts them into audible signals.

To use the telecoil, proceed as follows:

- Activate the telecoil by pressing the key **T** (only signals picked up by the telecoil will be audible) or **MT** (signals picked up by the microphone and the telecoil will be audible) on your FineTuner, as described in chapter 4, SONNET audio processor, FineTuner, FineTuner controls.
- When you are using a telephone, position the telephone so that its earpiece is centerd over the SONNET control unit. Move the telephone slightly up or down as necessary to optimize the signal quality.
- When you are in an environment with a loop system, try to find a spot where the signal quality is best for you.
- To deactivate the telecoil when you do not need it anymore, press the key **M** on your FineTuner, as described in chapter 4, SONNET audio processor, FineTuner, FineTuner controls.

When you switch on the audio processor, the microphone is active, even if you had the telecoil selected before you switched off the audio processor. When the telecoil is active, you may hear buzzing sounds when operating a FineTuner key. The buzzing is normal and indicates that a command is being sent. To reduce interference with various electronic and electrical equipment when the telecoil is active, we recommend you reduce audio sensitivity (see chapter 4, SONNET audio processor, FineTuner, FineTuner controls).

FINETUNER

Your audiologist will program your SONNET audio processor to suit your needs. The FineTuner is provided to help you optimally use your audio processor in different listening situations.

The SONNET audio processor itself has only an ON/OFF switch. All other functions are accessed with a separate device, the FineTuner, which transmits commands to your SONNET audio processor via a radio frequency (RF) link. Its ergonomic design and larger size keys facilitate changing the settings of your SONNET audio processor, just like a remote control allows you to change channels on your television.

Keeping the FineTuner out of the reach of children prevents them from inadvertently changing the settings of their audio processor.

The FineTuner is not necessary for the function of your audio processor. When switched on, the audio processor activates the same program, volume and audio sensitivity setting it had when it was switched off.

The FineTuner is configured for a specific (or target) audio processor, and only the target audio processor will execute the desired command when a certain key is pressed on the FineTuner. The typical maximum operating distance between the FineTuner and the audio processor is approximately 80 cm (2.62 ft.). This range might be less if you are close to electronic and electrical equipment even if this equipment complies with all applicable electromagnetic emission requirements.

How to configure your FineTuner

The FineTuner is configured for your individual audio processor and cannot be used by another cochlear implant user. Your audiologist or clinical staff will configure the FineTuner to suit your needs. Sometimes it may be necessary for you to synchronize your FineTuner and audio processor (e.g. if you purchase a backup FineTuner). To do so, first switch off your audio processor and place the coil on the keyboard of the FineTuner (approx. over key **MT**). Then switch on your audio processor. The audio processor and FineTuner will be synchronized automatically. Successful synchronization is indicated by a short blinking signal of the two amber indicator lights on your FineTuner.

For bilaterally implanted users

One FineTuner can be configured for use with one audio processor per ear. If you want to use your FineTuner for both audio processor systems, your audiologist or clinical engineer has received the MED-EL application software manual with detailed programming information and will assign two audio processors to your dataset. Once your audio processors are programmed correctly, the synchronization procedure described above should be performed with both audio processors.

FineTuner controls

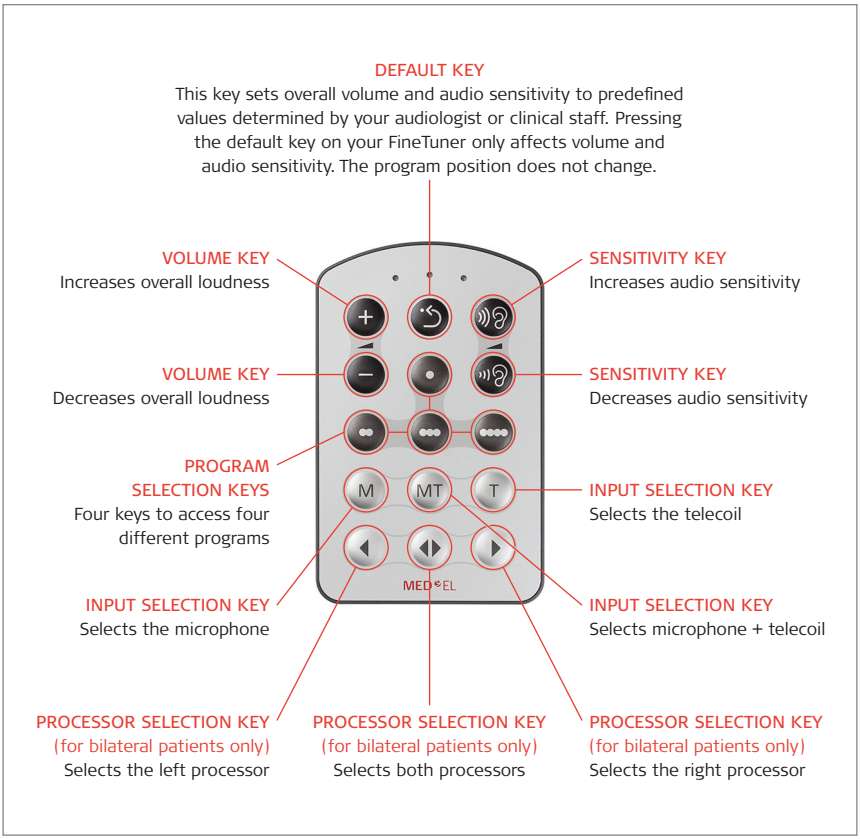

Fig. 6 FineTuner

All FineTuner functions can be selectively disabled by your audiologist or clinical staff by disabling the respective command in the control unit (via the MED-EL application software). Your FineTuner will still be able to transmit all commands, but your control unit will not execute disabled commands.

FineTuner functions

Automatic keyboard lock: To avoid unintentional operation of a key, the FineTuner features an optional automatic keyboard lock. This function electronically locks the keyboard if no key is pressed for more than 10 seconds.

To activate the keyboard lock feature of your FineTuner, hold down the ◄► key for more than 5 seconds to enter the program mode (the red and both amber indicator lights on your FineTuner will start blinking alternately, indicating that you have successfully entered the FineTuner's program mode) and, then, the ► key to activate the automatic keyboard lock (the FineTuner will confirm successful activation of the automatic keyboard lock by a short blinking signal of the two amber indicator lights).

To deactivate the automatic keyboard lock, press the ◄► key twice to unlock the keyboard for 10 seconds, then hold it down for more than 5 seconds to enter the program mode. Press the ◄ key to deactivate the keyboard lock. Just as described above, the FineTuner will confirm successful deactivation of the automatic keyboard lock with a short blinking signal of the two amber indicator lights.

To activate a certain function while the keyboard lock is active, press the desired function key twice. The first click temporarily unlocks the keyboard, the second click executes the command. After 10 seconds without pressing another key, the keyboard is locked again.

Battery low warning: If you press a key and see the red indicator light on your FineTuner flashing 3 times, then the voltage level of your FineTuner is critically low (see also chapter 7, Care and maintenance, Batteries, Changing the battery of your FineTuner).

Transmitter time-out: The FineTuner stops transmitting after 3 seconds to save energy, even if the key is still pressed.

Your FineTuner does not have an ON/OFF switch.

Three indicator lights with different colors (2 amber, 1 red) indicate various conditions of the FineTuner. For a detailed description of their function see chapter 8, Troubleshooting. The FineTuner does not affect connected assistive listening devices.

BATTERY PACK

The SONNET battery pack (product code Ma060106) consists of the battery pack frame, holding two hearing aid batteries, and the battery pack cover. The battery pack cover, which also functions as the ON/OFF switch of the SONNET (see Fig. 3 and 4) slides over the battery pack frame. This configuration allows the entire audio processor to be worn on the ear. Changing the batteries is described in chapter 7, Care and maintenance, Batteries, Changing the batteries of your SONNET audio processor.

To remove the battery pack from the control unit (e.g. to connect a MAX programming cable instead), proceed as follows:

1. Make sure that the battery pack cover lock is in the unlocked position, as shown in Fig. 7-1. When it is not in the unlocked position, use the screwdriver provided with your SONNET kit to turn it counter-clockwise into the unlocked position.
2. Pull back and completely remove the battery pack cover.
3. Press the release lever (1) on the battery pack frame as shown in Fig. 8–1, and separate battery pack frame and control unit (2).

To attach the battery pack to the control unit, proceed as follows:

1. Insert the rib on the control unit into the matching groove of the battery pack frame (3), as shown in Fig. 8-2.
2. Push the opposite end of the battery pack frame onto the control unit (4) until the release lever engages.
3. Make sure that the battery pack cover lock is in the unlocked position as shown in Fig. 7-1. When it is not in the unlocked position, use the screwdriver provided with your SONNET kit to turn it counter-clockwise into the unlocked position.
4. Slide the battery pack cover completely over the battery pack frame to switch on the SONNET (see Fig. 4). Mind the correct orientation of the battery pack cover when sliding it over the frame, and do not use excessive force. The orientation is correct when the air inlets (5) on the battery pack cover are on the same side as the coil cable socket in the control unit (see Fig. 8-3).

In young children, the battery pack cover lock must always be turned clockwise into the locked position (see Fig. 7-2), once the cover has been moved completely over the frame, to prevent the child from disassembling the audio processor.

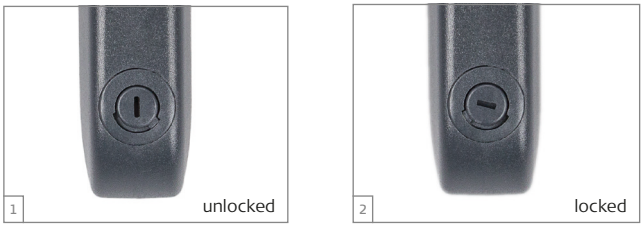

Fig. 7 Battery pack cover lock

Fig. 8 How to remove/attach the battery pack from/to the control unit

The battery pack cover is available in several colors allowing you to personalize your SONNET.

Only parents/adults should disassemble the device to change defective parts. Parents/adults must check the device at least once a week for damages or missing parts.

COIL

The coil connects the SONNET audio processor with the implant. It sends both energy and the coded audio signal through the skin to the implant. A small magnet is located in the center of the coil to hold it in place on the head over the implant. The magnet can be changed to adjust the magnet strength to your needs. The magnet strength chosen should be appropriate for the individual patient. Strong magnets are not recommended for patients with thin skin flaps (e.g. young children or very slim patients), as excessive magnetic attraction could potentially increase the likelihood of skin irritation.

The SONNET audio processor can be used with the MED-EL D Coil, it cannot be used with the previous generation COMT+/COMT+ P coils.

Fig. 9 Coil (D Coil)

IMPORTANT

Depending on the type of implant, two variants of magnets (i.e. magnet inserts) are available for the D Coil. These two variants differ in magnet polarisation. The type of implant is stated on your Patient Identification Card.

For patients implanted with a SYNCHRONY implant, the magnet insert must contain triangles as shown in Fig. 11.

For patients implanted with any other type of implant (MED-EL CONCERT, SONATA TI^{100}, etc.), the magnet insert must contain circles as shown in Fig. 12. It is essential that, based on the type of implant, the correct variant of magnet is used!

If the wrong variant of magnet is inserted, the coil may still be held in place over the implant. However, due to different polarisation of the magnets, a slight dislocation between the implant and coil will occur which may result in improper communications between implant and coil.

The D Coil allows changing the magnet insert in the center of the coil to adjust the magnet strength to your needs. To remove the magnet insert, turn it to either side until it disengages, and lift it off.

To attach a new magnet insert, place it over the recess in the coil, as shown in Fig. 10. It should glide into the recess easily. Now turn the cover until it engages. You will feel a slight resistance when the cover snaps in place.

Fig. 10 Removing/inserting the magnet

Four magnet strengths are available. Magnet strength is indicated by the number of filled triangles or circles on the magnet.

Fig. 11 Magnet strengths for SYNCHRONY implant

Fig. 12 Magnet strengths for all other types of implants

The serial number of the coil is indicated in the magnet compartment.

Fig. 13 Serial number of D Coil

IMPORTANT

MED-EL strongly recommends that you do not change the magnet yourself, but have your audiologist or clinical staff do it. If you notice any signs of skin irritation around the coil, contact your clinic or CI center.

Your coil contains a strong magnet. Keep clear of metallic items, as they attract the magnet.

Never place the coil or a magnet on the SONNET control unit.

It is easiest to observe children when playing or in everyday situations to determine whether the coil is properly attracted to the implant. If the coil falls off too easily, your child may develop an aversion to wearing the coil. During the first months after surgery, you should regularly check the skin under the coil for irritation. As the child grows, skin thickness will increase and the magnetic attraction force may have to be adjusted by increasing the magnetic strength.

COIL CABLE

The coil and audio processor control unit are connected by the coil cable. The coil cable must be disconnected for maintenance purposes or if you want to replace the cable. It is not necessary to disconnect the cable when changing the batteries.

Although the coil cable is designed for maximum durability and flexibility, this part of the MED-EL Cochlear Implant System is the most likely to wear out.

If the coil cable fails, order a new one immediately.

IMPORTANT
Do not use the cable with devices other than the SONNET audio processor.

To replace the coil cable, proceed as follows:

1. Make sure that the battery pack cover lock is in the unlocked position as shown in Fig. 7-1. When it is not in the unlocked position, use the screwdriver provided with your SONNET kit to turn it counter-clockwise into the unlocked position.
2. Pull back the battery pack cover until you can see the whole labelling of the control unit (see Fig. 3).
3. Grab the plug of the cable on the control unit side and gently pull the plug (1) out of its socket in the control unit, as shown in Fig. 14-1.
4. Grab the plug of the cable on the D Coil side and gently pull the plug (2) out of its socket in the D Coil, as shown in Fig. 14-2.
5. Plug a new coil cable into the D Coil.
6. Plug the other end (3) of the coil cable into the control unit, as shown in Fig. 15. Make sure that the cable plug is correctly positioned. The slanting edge must face down.
7. Make sure that the battery pack cover lock is in the unlocked position, as shown in Fig. 7–1. When it is not in the unlocked position, use the screwdriver provided with your SONNET kit to turn it counter-clockwise into the unlocked position.
8. Slide the battery pack cover completely over the battery pack frame to switch on the SONNET (see Fig. 4). Mind the correct orientation of the battery pack cover when sliding it over the frame, and do not use excessive force. The orientation is correct when the air inlets on the battery pack cover are on the same side as the coil cable socket in the control unit.

In young children, the battery pack cover lock must always be turned clockwise into the locked position (see Fig. 7-2), once the cover has been moved completely over the frame, to prevent the child from disassembling the audio processor.

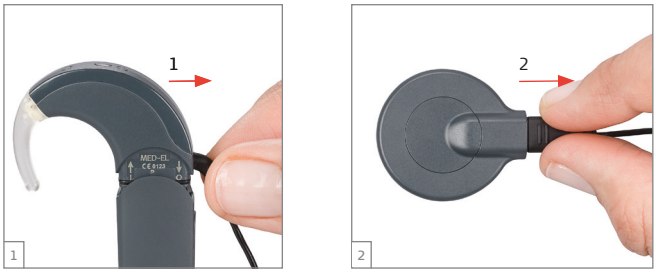

Fig. 14 Disconnecting the coil cable

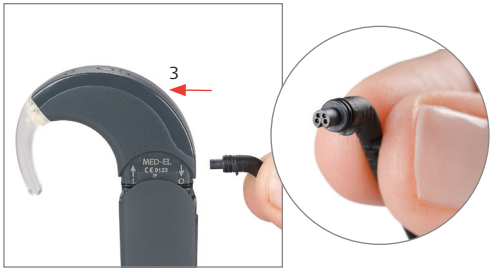

Fig. 15 Plugging the coil cable into control unit

IMPORTANT

To prolong your cable's life, we recommend the following:

- Do not bend the cable.
- When unplugging the cable, pull on the plug and not on the cable itself.
- Do not lift the audio processor by the cable.
- Do not use excessive force when unplugging the cable.

EARHOOK

Your SONNET audio processor is shipped with an earhook intended to keep the audio processor behind the ear.

Fig. 16 Earhook

Your SONNET audio processor is shipped with a pin securing the earhook to the control unit.

To replace the earhook, proceed as follows:

1. Remove the earhook pin by pushing it through the holes (see Fig. 17) using the tool supplied with your SONNET kit, then grab it and pull it out completely.
2. To remove the earhook, gently push it downwards (1), (2), separating it from the control unit (see Fig. 18-1).
3. Attach the new earhook over the lip in the lower part of the control unit (3), and push it gently upwards (4) until it snaps into place (see Fig. 18-2). Make sure that the new earhook is of the same type (i.e. CI earhook or EAS earhook) as the replaced one.
4. Re-insert the earhook pin.

Fig. 17 How to remove the earhook pin

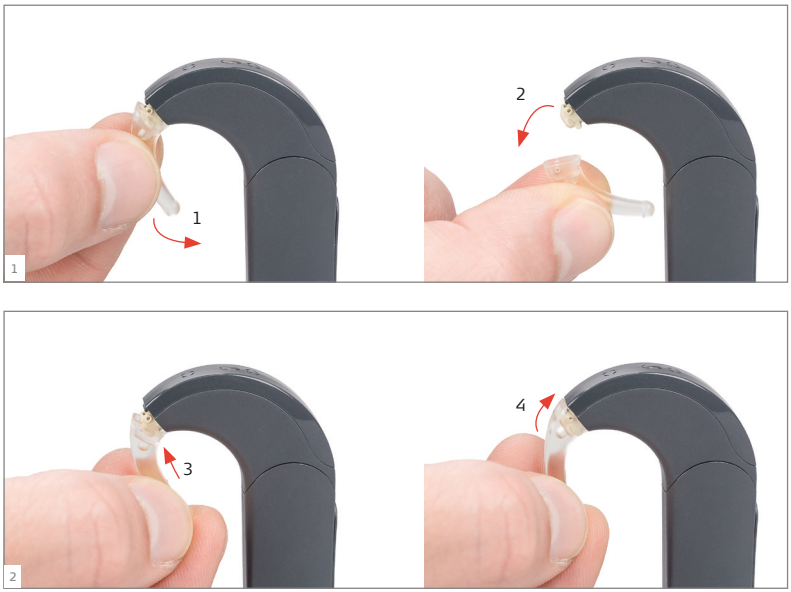

Fig. 18 Removing and attaching the earhook

Be sure to always insert the earhook pin when attaching the earhook. This will prevent the child from removing the earhook. Keep the supplied pin removal tool out of the reach of children.

MED-EL also provides the earhook in a slightly longer version. If you and your audiologist or clinical staff decide that the longer version is needed, please order such an earhook from MED-EL. Two marks on the inside of the earhook help identify the longer version (see Fig. 19).

Fig. 19 Markings of longer earhook version

MICROPHONE COVER

The microphone cover protects the two microphones in the SONNET from moisture and dust. It is recommended to replace it every three months, when the microphone openings appear dirty or when you experience degraded sound quality.

The microphone cover should either be dried or replaced when the microphone openings have become wet as such wet openings may degrade sound quality.

To replace the microphone cover, proceed as follows:

1. Remove the earhook, as described in the previous section.
2. Snap off (1) the microphone cover from the control unit, as shown in Fig. 20-1.
3. Insert the two lips of the new microphone cover into the two recesses of the control unit (2) as shown in Fig. 20–2, and push the cover gently onto the control unit (3) until it snaps completely into place (see Fig. 20-3).
4. Re-attach the earhook and insert the earhook pin, as described in the previous section.

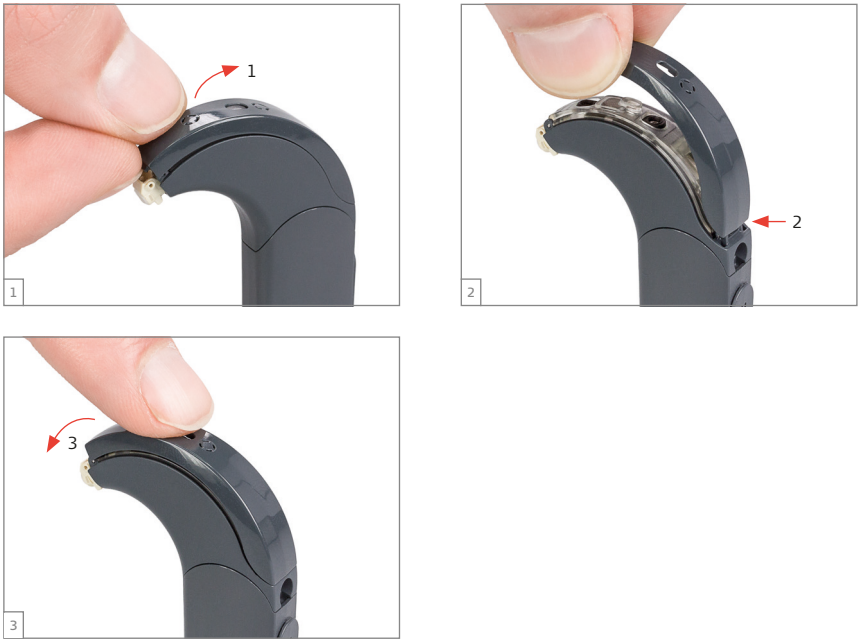

Fig. 20 Removing and attaching the microphone cover

Be sure to always insert the earhook pin when attaching the earhook. This will prevent the child from removing the earhook. Keep the supplied pin removal tool out of the reach of children.

The microphone cover is available in several colors allowing you to personalize your SONNET.

CONNECTING ASSISTIVE LISTENING DEVICES

A special battery pack cover (product code Ma070103) is provided to allow connection of assistive listening devices (e.g. FM systems) or other external audio devices such as portable CD players, MP3 players, AM-FM radios, etc. to your SONNET audio processor. This FM Battery Pack Cover is slightly longer than the standard cover to accommodate the integrated EA (Euro Audio) socket.

To replace the standard cover with the FM Battery Pack Cover, proceed as follows:

1. Make sure that the (standard) battery pack cover lock is in the unlocked position, as shown in Fig. 7-1. When it is not in the unlocked position, use the screwdriver provided with your SONNET kit to turn it counter-clockwise into the unlocked position.
2. Pull back and completely remove the standard battery pack cover.
3. Make sure that the lock of the FM Battery Pack Cover is in the unlocked position, as shown in Fig. 7-1. When it is not in the unlocked position, use the screwdriver provided with your SONNET kit to turn it counter-clockwise into the unlocked position.
4. Slide the FM Battery Pack Cover completely over the battery pack frame to switch on the SONNET (see Fig. 4). Mind the correct orientation of the FM Battery Pack Cover when sliding it over the frame and do not use excessive force. The orientation is correct when the air inlets on the FM Battery Pack Cover are on the same side as the coil cable socket in the control unit.

In young children, the battery pack cover lock must always be turned clockwise into the locked position (see Fig. 7-2), once the cover has been moved completely over the frame, to prevent the child from disassembling the audio processor.

Proceed as described above to replace the FM Battery Pack Cover with the standard cover.

An external audio device can be connected to the SONNET via an adapter cable. To do so, first insert the three-pin plug of the adapter cable (grey end) into the openings at the bottom of the FM Battery Pack Cover (mind the orientation of the three pins and do not use excessive force when connecting the cable. Then insert the yellow or red plug of the cable into the audio output (headphone socket) of the audio device.

Direct-link FM systems (e.g. Oticon Amigo) may be connected to the FM Battery Pack Cover without an adapter cable.

Fig. 21 Connecting the adapter cable and direct-link FM systems

IMPORTANT

The provided cable is intended for the connection of external audio devices, such as portable CD players, MP3 players, AM-FM radios, etc. To connect body-worn FM or infrared systems, use the respective manufacturers' adapter cables.

WARNING

Do not use cables longer than 1 m (3.28 ft.) as these cables may result in increased electromagnetic emissions or decreased electromagnetic immunity of your audio processor system.

Cables from MED-EL are available for unilateral and bilateral implant use and for Mix and Ext mode. For more information, please contact your local MED-EL office.

Mix mode:
When connected to an external device, the SONNET microphone remains active. This allows you to hear input from the external device and the audio processor. Use this mode when you want to continue hearing both the external device and the sounds around you (for example, both music and someone talking to you).
Mix cables are indicated by a yellow 3.5 mm plug.

Ext mode:
When connected to an external device, the SONNET microphone is deactivated. You will hear input from the external device only.
Ext cables are indicated by a red 3.5 mm plug.

5. Special considerations for young children

The SONNET audio processor has several features that are designed especially for young children. They are:

- Lockable earhook: The earhook is secured to the control unit with a small pin.
- Battery pack cover lock: To prevent small children from disassembling the audio processor and getting access to the batteries.
- Deactivation of certain FineTuner controls: To prevent accidental program, volume or sensitivity changes, it is possible to deactivate these FineTuner controls. Please contact your CI center for assistance.

Only parents/adults are allowed to disassemble the device to change defective parts. Parents/adults should check the device at least once a week for damages or missing parts.

IMPORTANT

If the user of the SONNET is a child who also uses an ear mold, parents/caregivers should regularly check to make sure the ear mold still fits as the ear grows. The ear mold must be adjusted regularly as necessary.

6. General precautions and warnings

This section contains information on the safe use of your MED-EL Cochlear Implant System. Please read this information carefully. Your CI center or nearest MED-EL office will assist you with any additional questions you may have.

Before you undergo medical treatments or examinations, always inform your doctor that you have a cochlear implant.

Expected performance with the cochlear implant cannot be predicted accurately. Past experience with the MED-EL Cochlear Implant System may provide some general guidelines. Duration of deafness, age at implantation, primary communication mode, communicative ability and the patient's auditory environment all impact success with the cochlear implant, as do other factors, including some which may be unknown.

Do not use the MED-EL Cochlear Implant System with any device other than those listed in this manual or approved by MED-EL. If you have problems with any component of the system, refer to chapter 8, Troubleshooting.

IMPORTANT

If you ever experience uncomfortable hearing sensations, we strongly recommend that you no longer wear your external system components. Please contact your clinic or CI center immediately.

If your child refuses to wear the system or indicates uncomfortable hearing sensations, remove the system immediately, and have your child's system checked at your clinic or CI center.

GENERAL PRECAUTIONS FOR YOUR MED-EL COCHLEAR IMPLANT SYSTEM

The audio processor and other parts of the system contain sophisticated electronic components which require special precautions regarding electromagnetic compatibility (EMC). When activating your audio processor always follow the guidelines outlined in this section and chapter 9, Technical data, Guidance and manufacturer's declaration.

The electronics are durable but must be treated with care.

- Never open the housing of your audio processor. Unauthorized opening invalidates the warranty. To change the batteries or clean the battery contacts, perform the steps described in chapter 7, Care and maintenance.
- Before switching on the audio processor, check the external parts of the MED-EL Cochlear Implant System for proper mechanical condition, e.g. for loose or broken parts. In case of problems, the audio processor should not be switched on. Read chapter 8, Troubleshooting, or contact your CI center or MED-EL.

IMPORTANT

If you plan to enter an environment that could potentially adversely affect the operation of your MED-EL Cochlear Implant System (e.g. an area that is protected by a warning notice preventing entry by patients fitted with a pacemaker) it is advisable to first contact your clinic or MED-EL.

Everyday life

The implant package and the electrodes are located directly under the skin. In order to avoid damage to the implant you/your child should not unnecessarily rub, stretch or scratch the skin above the implant site and should also avoid mechanical pressure on the site. When brushing or styling the hair at the site of implantation, you should be careful not to harm the skin (at the site of the implant there may be a slight bulge).

For the external components, please observe the following:

- Your audio processor (including FineTuner and coil) does not require regular maintenance by clinic personnel or other experts.
- The defined operating temperature range is between +0 °C and +50 °C (32 °F and 122 °F) for the audio processor (including FineTuner and coil). Normally, when the audio processor is worn on the body, natural body heat helps maintain this temperature range.
- Do not leave the audio processor or FineTuner in direct sunlight (especially inside a car).
- If you ever experience loud or uncomfortable sounds, please remove your coil and audio processor immediately: this will stop stimulation at once.
- Do not use the audio processor or FineTuner of another cochlear implant user. Your audio processor and FineTuner have been adjusted to your individual needs. Using another audio processor may cause painful or uncomfortable stimulation.
- Avoid getting your audio processor or FineTuner wet as this may impair its function. Always remove and switch off the external parts of your implant system and keep them in a dry place before bathing, showering or engaging in other water-related activities.
- If the external parts become wet, switch off your audio processor as quickly as possible, remove the batteries from the battery pack, unplug the battery pack from the control unit, and gently wipe all external parts dry, using a soft absorbent cloth. Then put the audio processor in the supplied drying kit to allow the audio processor to dry out (preferably overnight). If in doubt, repeat the drying process. If the FineTuner becomes wet, wipe it off with a dry tissue.
- Take care of the external components of your/your child's MED-EL Cochlear Implant System. They should not be dropped or subjected to dangerous areas (e.g. machines or high voltage, which could result in damage to the components.
- Do not use the audio processor and the FineTuner in environments where radio frequency (RF) transmissions are prohibited.
- Do not try to shape the earhook with hot air.
- Do not use your audio processor in the vicinity of strong ionizing radiation (e.g. x-ray machines) or electromagnetic fields (e.g. MRI machines).
- Do not modify the housing, the electronics or any other parts of your audio processor in any way.
- Never place the coil or a magnet on the control unit.

Children shall be instructed not to swallow or put any components of their MED-EL Cochlear Implant System into their mouths or to play with any components. In young children, the battery pack cover lock must always be turned clockwise into the locked position (see Fig. 7-2), once the cover has been moved completely over the frame, to prevent the child from disassembling the audio processor.

Technology in everyday life

Metal detectors, anti-theft systems and other radio frequency (RF) transmitters

Metal detectors, some anti-theft security systems and other RF transmitters may produce a buzzing sound, heard by the implant user, when you are near or walking through the field emitted by these systems. To avoid the buzzing sound, switch your audio processor off when walking through metal detectors and anti-theft systems or when you are close to RF transmitters. Please note that your FineTuner will not be able to communicate with your processor until the processor is switched back on. In rare cases, a cochlear implant may trigger a security system alarm, so make sure that you always carry your MED-EL ID card with you in order to identify yourself as a cochlear implant user.

If an audio processor map becomes corrupted, it can easily be reprogrammed at the CI center. If your audio processor has more than one program, you can usually use one of the others in the meantime.

Air travel

During takeoff and landing, airlines request that computers, cell phones and other electronic devices be switched off to avoid interference with the airplane's communication instruments. This does not apply to your SONNET audio processor. US aviation law states that medical devices such as pacemakers and hearing aids are exempt from this law [US Federal Aviation Regulation 91.21]. If you decide to remove or to turn off your audio processor at any time during a flight, tell your airline attendant that you are a cochlear implant user and that you may require special instructions while your processor is off.

Interference with TV reception

In rare cases, your audio processor may interfere with reception when using certain TV sets (with indoor antennae). Move away from the TV set and turn the antenna to reduce interference.

Cell phones

Cell phones and other portable and mobile RF communications equipment may interfere (perceived as a buzzing sound) with the external parts of your MED-EL Cochlear Implant System, if they are used within a distance of less than 3 meters (9.84 ft.).

TV, radio, FM systems, etc.

When intending to connect an external audio device to the audio processor that is powered by mains power, i.e. plugged into the wall or a power strip, always make sure first that this mains-powered external audio device meets the safety requirements stated in the standards EN/IEC 60065, EN/IEC 60601-1 and/or appropriate national standards. If the mains-powered device does not bear a CE mark (CE), which is usually found on the device's type label, you cannot presume that the mains-powered device meets the above safety requirements and must therefore not be connected to your audio processor. You can safely connect battery-powered external audio devices to your audio processor. Special cables may be needed (e.g. for connection to FM systems). For more information please contact MED-EL.

Electrostatic discharge (ESD)

Electronic devices are influenced by electrostatic discharge (ESD). Although the MED-EL Cochlear Implant System has several internal safety features designed to reduce ESD, there is a small risk that the external or internal equipment can be damaged if the static discharge flows through the external equipment. Switching off your audio processor will not prevent damage from occurring. In rare cases, the user may experience uncomfortably loud hearing sensations, but the most likely occurrence in case of an ESD event is a short interruption of stimulation or a controlled audio processor shutdown.

Following these guidelines can reduce the probability of electrostatic discharge:

- If you believe that you or your child is statically charged, discharge by touching a radiator, a water tap, or any grounded metal object.
- Do not allow another person to touch the external parts of your implant system unless both you and the other person are "discharged".
- You should always discharge before taking off or putting on the audio processor. To do this, use this two-step approach:
  (A) When removing another person's audio processor:
  Step 1: Touch the person's body
  Step 2: Touch the processor
  (B) When picking up the audio processor from a table or other surface:
  Step 1: Touch the table
  Step 2: Pick up the processor
- You or your child should always be "discharged" when leaving the car. Touching the car door is a good way to discharge. The audio processor or cables should neither touch the car door nor other parts of the car body.
- Use an antistatic spray for upholstery and TV or computer screens to reduce static build-up. These sprays are also available for carpets or clothing.
- Always remove your audio processor before dressing and undressing, especially if garments include synthetic fibres. Generally, cotton and natural fibres are less likely

to cause ESD problems. Fabric softeners might also help reduce static electricity. When getting dressed, put your audio processor on last, and remove it first when undressing.

- Always remove the audio processor and coil before touching plastic play equipment (e.g. children's slides). Switching off the audio processor may not be enough to prevent ESD damage. Completely remove the audio processor from the body. Afterwards, do not touch the site of the implant. Make sure that you or your child "discharge" before touching the audio processor. If you have any doubt about a particular material, it is best to take precautions by removing the audio processor.
- Always remove the audio processor and coil when experimenting with static electricity and "high" voltage. Van de Graaff generators, as found in school science departments, should never be used by cochlear implant users, even if the processor is removed, because they produce very high levels of static electricity.
- When working at a computer, make sure the computer is grounded and use an anti-static mat under your work area to reduce static build-up. Never directly touch the screen of a computer or TV. The risk of problems from computer screens is very small but may be further reduced by attaching an anti-static screen to the computer.
- If your audio processor stops working and you suspect an ESD is the cause, switch off the audio processor, wait for a few minutes and switch it on again. If it does not come on again, contact your CI center.

Sports and play

It is important to protect the implant from sources of direct impact. Accidents like falling out of a chair or bumping into furniture with your head could damage the implant. As with any child, parents should take measures to prevent these accidents by using child seats and child locks where appropriate and by supervising outside play.

Avoid contact sports that might result in severe blows to the head or continuous pressure on the implant, since this could damage the implant. Other physical activity is generally allowed. Make sure that you wear the audio processor securely to protect it from physical damage. Sports that require a helmet are okay as long as they do not exceed the given capabilities of the user. Use a helmet whenever necessary to protect the implant site from any blows. Your/your child's helmet should be of high quality. It may need to be modified to meet your individual needs. For specific questions about contact sports, contact your CI center.

Most water sports should not cause any problem, as long as the external parts of the implant system are removed. If headgear or face masks are worn, care must be taken to ensure that the strap is not too tight over the site of the implant. In any case, you should consult an experienced physician about the possibilities and personal restrictions when performing water sports, especially in the case of SCUBA diving. The implant is robust against pressure changes which occur during SCUBA diving to depths up to 50 m (165 ft.).

If you have any concerns or questions, ask your physician for advice about participating in sports and any limitations of your/your child's health status.

PRECAUTIONS FOR MEDICAL PROCEDURES

Neurostimulation or diathermy

Neurostimulation or diathermy must not be carried out in the area of the implant, since it could lead to current induction at the electrodes. This may damage the implant and/or the surrounding tissue.

Electrosurgery and other treatment with electrical current

Monopolar electrosurgical instruments must not be used in the head and neck area close to the cochlear implant. Instruments used in electrosurgery can produce high-frequency voltages which may induce currents in the electrodes of the cochlear implant. Such currents may damage the implant and/or the surrounding tissue.

In general remove your audio processor from your head any time a medical treatment is given in which an electrical current is passed through your body, or at least carefully observe the correct functioning of your entire MED-EL Cochlear Implant System during the initial stages of the treatment.

Ultrasound

Therapeutic ultrasound treatment should not be applied close to the cochlear implant as the implant may inadvertently concentrate the ultrasound field and cause harm.

Electroconvulsive therapy

Electroshock or electroconvulsive therapy should not be used in patients with cochlear implants. Such therapy may damage the implant and/or the surrounding tissue.

Therapy using ionizing radiation

The MED-EL PULSAR, SONATA, MED-EL CONCERT and MED-EL CONCERT PIN Cochlear Implants are robust against 240 Gray ionizing radiation dose under 6 MV photon beam (pulsed radiation from a linear accelerator) with a field size FS = 30 cm × 30 cm, source to surface distance SSD = 100 cm, depth = 0.8 cm in a 30 cm × 30 cm × 15 cm perspex phantom. MED-EL external components need to be taken off during irradiation. Therapeutic ionizing radiation, in general, may damage electronic components of your MED-EL Cochlear Implant System and such damage may not be immediately detected. In order to minimize the risk of tissue necrosis, due to local overdose during radiotherapeutic treatments, the implant should not be placed in the direct radio-therapeutic beam.

Magnetic Resonance Imaging (MRI) Safety Information

	The external components of the SYNCHRONY Cochlear Implant System (audio processor and accessories) are **MR Unsafe** and need to be removed prior to scanning.	
	The implant components of the SYNCHRONY Cochlear Implant System are **MR Conditional**.	

The following section applies to the SYNCHRONY cochlear implant only.

Non-clinical testing has demonstrated that the SYNCHRONY cochlear implant is MR Conditional. It can be safely scanned under the following conditions:

0.2, 1.5 or 3 Tesla

Conditions:

- Static magnetic field of 0.2 T, 1.5 T or 3 T.
- Spatial gradient field of up to 8T/m (800 G/cm).
- Sequences in Normal Operating Mode only with a maximum head specific absorption rate (SAR) of 3.2 W/kg for 0.2 T and 1.5 T systems and 1.6 W/kg for 3 T systems.
- Head transmit coils or multichannel transmit coils must not be used in case of a 3 T scans.
- Before patients enter any MRI room, all external components of the implant system (audio processor and accessories) must be removed and a supportive head bandage must be placed over the implant in case of 1.5 T and 3 T scans.
- The implant is not damaged mechanically, electrically or in any other way.
- In case of additional implants, e.g. a hearing implant in the other ear: MRI safety guidelines for this additional implant need to be met as well.

Evidence has been provided for this implant type to pose no known hazard in specified MRI environments (without surgical removal of the internal magnet) when adhering to the conditions and Safety Guidelines listed below. The implant has a specially designed magnet which allows safe MRI scanning with the magnet in place, and there is no need to remove the implant magnet regardless of the scanner field strength. The implant magnet can be surgically removed if needed to avoid imaging artifacts. The physician/MRI operator should always be informed that a patient is a cochlear implant user and that special safety guidelines have to be followed.

Safety Guidelines:

- Before patients enter any MRI room all external components of the implant system audio processor and accessories) must be removed from the head. For field strengths of 1.5 T and 3 T, a supportive head bandage must be placed over the implant. A supportive head bandage may be an elastic bandage wrapped tightly around the head at least three times (refer to Fig. A). The bandage shall fit tightly but should not cause pain. Performing an MRI without head bandage could result in pain in the implant area and in worst case can lead to migration of the implant and/or dislocation of the implant magnet.
- Head orientation: In case of 1.5 T and 3 T MRI systems, straight head orientation is required. The patient should not incline his/her head to the side; otherwise torque is exerted onto the implant magnet which could cause pain. In case of 0.2 T scanners, no specific head orientation is required.
- For 0.2 T and 1.5 T scans sequences in "Normal Operating Mode" shall be used only. For 3 T scans the SAR limit must not exceed 1.6 W/kg to avoid any potentially dangerous heating at the electrode contacts. For the same reason head transmit coils or multichannel transmit coils must not be used in case of a 3 T MRI.
- During the scan patients might perceive auditory sensations such as clicking or beeping. Adequate counseling of the patient is advised prior to performing the MRI. The likelihood and intensity of auditory sensations can be reduced by selecting sequences with lower specific absorption rate (SAR) and slower gradient slew rates.
- The magnet can be removed to reduce image artifacts. If the magnet is not removed, image artifacts are to be expected (refer to Fig. B and Fig. C). The artifacts extend approximately 10 cm (3.9 in.) in radius around the device in a Spin Echo scan.
- The exchange of the magnets with the Non-Magnetic Spacer and vice versa has been tested for at least five repetitions.
- The above instructions should also be followed if areas of the body other than the head are to be examined (e.g. knee, etc.). When lower extremities are to be examined, it is recommended that the patient's legs are positioned in the scanner first.
- In non-clinical testing and electromagnetic in-vivo computer simulations, the implant produced a maximum temperature rise < 2 °C during 15 minutes of continuous MR scanning in the Normal Operating Mode at a maximum head averaged SAR of 3.2 W/kg for 1.5 T scans. For 3 T scans with a maximum head averaged SAR limit of 1.6 W/kg a maximum temperature rise of < 3 °C was evaluated.

If the conditions for MRI safety and the Safety Guidelines are not followed, injury to the patient and/or damage to the implant may result!

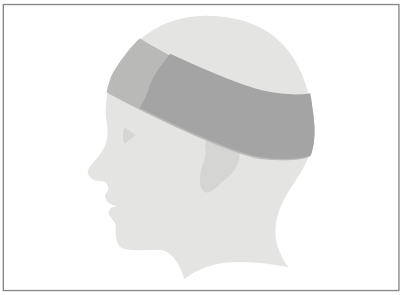

Fig. A Head bandage to support fixation of the implant

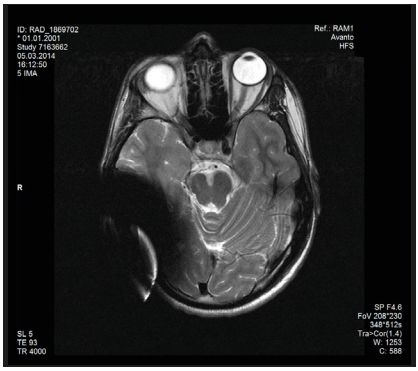

Fig. B Image artefacts arising in a 1.5T scanner. The left picture shows the artefacts obtained with the implant magnet in place whereas the right picture illustrates the image artefacts when the implant magnet is replaced with the Non-Magnetic Spacer.

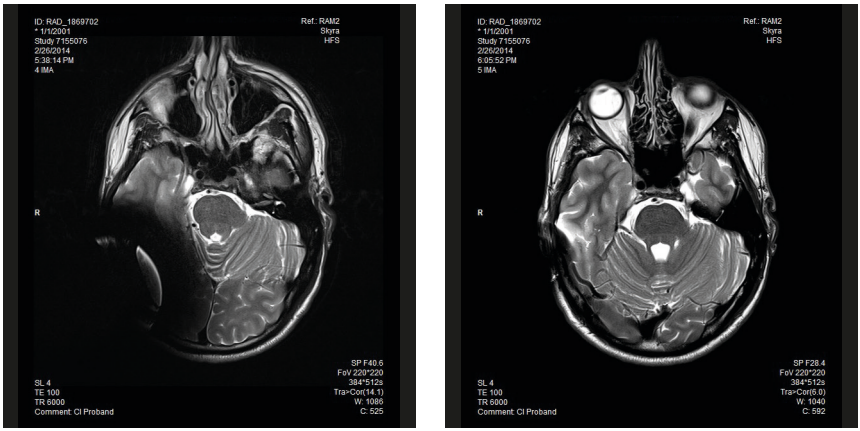

Fig. C Image artefacts arising in a 3.0T scanner. The left picture shows the artefacts obtained with the implant magnet in place whereas the right picture illustrates the image artefacts when the implant magnet is replaced with the Non-Magnetic Spacer.

Magnetic Resonance Imaging (MRI) Safety Information

	The external components of the MAESTRO Cochlear Implant System (audio processor and accessories) are **MR Unsafe** and need to be removed prior to scanning.	
	The implanted components of the MAESTRO Cochlear Implant System are **MR Conditional**.	

MED-EL PULSAR, SONATA, MED-EL CONCERT & MED-EL CONCERT PIN

Non-clinical testing has demonstrated that the MED-EL PULSAR, SONATA, MED-EL CONCERT and MED-EL CONCERT PIN cochlear implants are MR Conditional. They can be safely scanned under the following conditions:

0.2 or 1.5 Tesla

Conditions:

- **Bone thickness underneath the implant magnet of at least 0.4 mm. Bone thickness must be determined using CT images.**
- Static magnetic field of 0.2 T or 1.5 T.
- Spatial gradient field of up to 8 T/m (800 G/cm).
- Sequences in Normal Operating Mode only with a maximum whole-body averaged specific absorption rate (SAR) of 2 W/kg and a maximum head averaged SAR of 3.2 W/kg.
- Implantation performed at least 6 months ago.
- **Before patients enter any MRI room, all external components of the implant system (audio processor and accessories) must be removed.**
- The implant is not damaged mechanically, electrically or in any other way.

Additional MRI safety information for 0.2 or 1.5 T scanning:

- Large image artifacts are to be expected. The size and shape of the image artifacts depend on the MRI sequence. The artifacts extend approximately 10 cm (3.9 in.) in radius around the device in a Spin Echo scan (refer to Fig. B).
- A supportive head bandage must be placed over the implant before entering the scanner room. This may be an elastic bandage wrapped tightly around the head at least three times (refer to Fig. A). The bandage needs to fit tightly but should not cause pain.
- Head orientation: In case of 1.5 T systems, the longitudinal axis of the head must be parallel to the main magnetic field of the scanner. For example this is the case when the

patient is in a supine position with the head kept straight. The patient should not turn or bend his/her head to the side; otherwise partial demagnetization of the implant magnet is possible.

- During the scan, patients might perceive auditory sensations such as clicking or beeping. Adequate counseling of the patient is advised prior to performing the MRI. The likelihood and intensity of auditory sensations can be reduced by selecting sequences with lower specific absorption rate (SAR) and slower gradient slew rates.
- The above instructions should also be followed if areas of the body other than the head are to be examined (e.g. knee, etc.). When lower extremities are to be examined, it is recommended that the patient's legs are positioned in the scanner first to minimize any risk of weakening the implant magnet.
- In non-clinical testing and electromagnetic in-vivo computer simulations, the implant produced a maximum temperature rise < 2 °C during 15 minutes of continuous MR scanning in the Normal Operating Mode at a maximum whole-body averaged SAR of 2.0 W/kg and a maximum head averaged SAR of 3.2 W/kg.

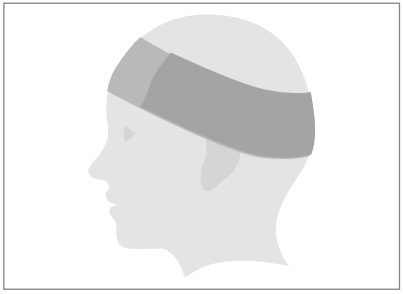

Fig. A Head bandage to support fixation of the implant

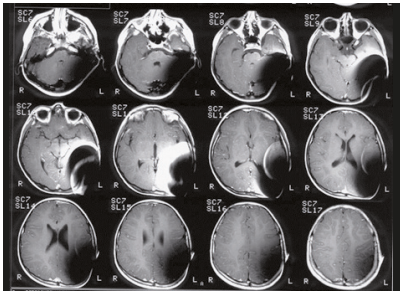

Fig. B MR images obtained with a 1.5 T scanner (8 year old child)

Non-clinical testing has demonstrated that the MED-EL C40+ cochlear implant is MR Conditional and can be safely scanned under the following conditions:

MED-EL C40+

0.2 Tesla

Only 0.2T MRI scanners should be used on patients who have MED-EL C40+ implants. There is no need to remove your implant's internal magnet, but you should always remove your OPUS 2 audio processor before undergoing a MRI scan. Most 0.2T MRI machines are "open MRI". Unlike other tube-like MRI scanners, the open MRI machines have a clear, unobstructed space on one or more sides allowing patients to see and talk to imaging personnel and loved ones during the exam. If you have difficulty locating 0.2T MRI scanners, MED-EL can provide a list of scanners and their locations.

Please have your radiologist contact MED-EL Corporation for details on the appropriate scanning techniques with MED-EL C40+ implants before scheduling your exam. The following is a list of some of the most important information that your radiologist should know before s/he begins your scan.

CAUTION:

MED-EL must be consulted prior to conducting a 0.2T MRI examination on any patient with a MED-EL C40+ implant.

- Do not, under any circumstances, scan a MED-EL C40+ patient with field strengths greater than 0.2T.
- When scanning at 0.2T, confirm that the patient is positioned so that the magnetic field of the internal magnet is in the same orientation as the magnetic field of the scanner. This is necessary to minimize torque on the internal magnet and induced voltage in the receiver.
- Straight orientation of the head is acceptable for bilaterally implanted patients.
- Please note that there exist many types of 0.2T MRI scanners. In some, the head coil used for head imaging is attached to the MRI bed. Further counseling and recommendations will be provided to the cochlear implant professional and radiologist in the event of head imaging.

MED-EL has prepared a MRI Examination Request Form containing precise information on device parameters (magnetic field strengths) and guidelines for a MRI examination under safe conditions. The MRI Examination Request Form must be completed by the requesting physician in cooperation with the applicable radiology department and reviewed and approved by MED-EL prior to performing the MRI examination with a MED-EL C40+ implant for safety reasons and to avoid loss of warranty coverage. External equipment should not enter or be in close proximity to the MRI machine.

Other treatments

The effects of a number of treatments are unknown, e.g. electrical examinations in the dental area. Please contact your clinic.

Ear infections

Infections in the implanted ear must be treated promptly by a physician who will prescribe antibiotics as necessary. Prophylactic use of antibiotics is recommended for all patients unless medically contra-indicated. The surgeon should prescribe adequate dosing for each patient's condition. Please inform your CI center of such infections.

Electrical lice combs

Cochlear implant users should not use these devices.

Meningitis vaccine and prevention

Bacterial meningitis is rare but has the potential to be serious. The risk of contracting meningitis after your CI surgery can be reduced by the meningitis vaccine, by using antibiotics before and after CI surgery and by using the surgical technique recommended by MED-EL. As with all cochlear implant surgery, preventative antibiotic usage is recommended for all patients unless medically contra-indicated. Talk to your surgeon about this. Your surgeon should prescribe adequate antibiotic dosing for you or your child and should check your or your child's immunisation status before your implant surgery.

The correct vaccinations and vaccination booster schedules are available at the cdc.gov website.

7. Care and maintenance

MAINTENANCE

Your SONNET audio processor is designed for durability and reliability. When handled with sufficient care, it will function for a long time. Although the coil cable is designed for maximum durability and flexibility, this part of the MED-EL Cochlear Implant System is the most likely to wear out. The battery pack and especially its cover may wear out due to frequent opening and closing and, therefore, must be replaced more frequently.

Do not clean the external parts in or under water. Use a damp cloth to gently clean the audio processor. Do not use aggressive cleaning agents.

Protect your SONNET audio processor from water (see also chapter 6, General precautions and warnings).

Do not try to repair electronic parts of your SONNET audio processor and do not try to open the control unit or any other part of your audio processor, as this invalidates the manufacturer warranty.

It is recommended to replace the microphone cover every three months, when the microphone openings appear dirty, or when you experience degraded sound quality (see also chapter 4, SONNET audio processor, Microphone cover).

In case an ear mold is used and you have to remove cerumen (ear wax) from the ear mold, do so only according to the advice of your hearing aid acoustician. If necessary, your hearing aid acoustician will clean the ear mold.

Do not touch the battery contacts. If the contacts need to be cleaned, use a cotton swab and a small amount of cleaning alcohol. Gently wipe dry after cleaning.

Handle your FineTuner with care. Avoid getting the FineTuner wet. Do not clean the FineTuner in or under water. Use a damp cloth to gently clean the FineTuner. Do not use aggressive cleaning agents.