ADHEAR – The new bone-conduction hearing aid innovation

MED-EL has world-wide launched a new kind of hearing aid, ADHEAR, for people who have an hearing impairment and want to prevent surgery. This little hearing aid, which is fastened with a special-made adhesive behind the ear, uses bone conduction to transfer sound. This new innovation is developed for children and adults who have a conductive hearing loss.

In this newsletter we are introducing the ADHEAR concept
1. What are the components of the ADHEAR system?

The ADHEAR system comprises two main components. These are:

a) ADHEAR hearing aid (comes in three colours)

b) ADHEAR adhesive adapter (comes in two colours)

2. What is the ADHEAR concept about?

ADHEAR is a non-surgical bone conduction hearing system which is intended to treat conductive hearing loss. Its mode of sound transmission is via a pressureless adhesive which is worn behind the ear, rendering the system both comfortable and discreet. Attached to the adhesive is the small hearing aid.

3. Who is the ADHEAR intended for?

The ADHEAR is intended for people with a conductive hearing loss. See also the audiogram below.
The ADHEAR can be tested by anyone.

4. What is the correct positioning of the ADHEAR components?

The ADHEAR adhesive adapter is placed on a hairless area of the mastoid behind the pinna. It is important that the adhesive adapter is applied to skin that is dry, clean and free from any hair. If the skin is oily, clean the skin with mild soap or baby wipes and let it dry completely before applying the adhesive.

The supplied positioning tool can be optionally used to assist in correctly positioning the adhesive adapter. In case the naturally hairless area behind the ear is too small to accommodate the adhesive adapter, the positioning tool may be used as a template for marking the area of the hairline which needs to be shaved with

5. How can the ADHEAR system transmit sound with no applied skin pressure?

Despite not applying pressure against the skin, the ADHEAR concept shows effective performance when compared to other non-surgical bone conduction concepts in its immediate product category. This is achieved by the *combination* of two major approaches.

The first is to take advantage of proven physical and physiological theories that have so far not been utilized in other systems; in particular, a very low mechanical transmission weight of the adhesive adapter. By reducing the weight of this adhesive adapter
‘interface’ to as close to zero as possible, a lesser force is required by the hearing aid transducer in transmitting vibration across the skin and finally onto the bone.

The second approach is the placement of the system in a more acoustically favorable position behind the ear, which is naturally closer to the cochlea.

6. What are the features of the ADHEAR hearing aid?

7. Is there a left- and right- version of the ADHEAR hearing aid?
No. The clever design of the ADHEAR hearing aid allows it to be worn on the left or right.
8. What are the audio processor pre-defined programs?

Program 1: This is the listening program for most situations. It automatically adapts to the environment and adjusts the audio caption. Feedback cancellation and noise reduction features are enabled. The device always starts up in this program. When operating the program button, entering this program is indicated by one beep.

The microphone mode in this program is automatic. When the incoming sound level is detected to be above approximately 55dB SPL, an analysis of the acoustic environment determines whether or not directionality is required, and if so automatically activates the adaptive directional microphone feature (otherwise, the microphone will remain in omni-directional mode).

Program 2: The microphone picks up sound from all directions (omni-directional) without any automatic adaptation. Feedback cancellation and noise reduction features are enabled. When operating the program button, entering this program is indicated by two beeps.

Program 3: The microphone picks up sound from all directions (omni-directional) without any automatic adaptation. Feedback cancellation and noise reduction features
are not enabled in this program, making this program a good one to try when listening to music. Additionally, this program can be used when you listen to equipment connected to the direct audio input (DAI) socket and still want to be able to pick up sounds around you (the ratio is 50% DAI and 50% microphone input). When operating the program button, entering this program is indicated by three beeps.

Program 4: Only sound from the DAI socket is heard. There is no sound input from the microphones. If no signal is connected to the DAI socket, program 4 can be used as a stand-by mode for the device to mute it. When operating the program button, entering this program is indicated by four beeps. You can return to program 1 by pressing the program button once more.

9. Is it possible to program ADHEAR?

Yes, it will be possible to program the ADHEAR. An own software will be available for this purpose.

10. What are ADHEAR's main signal processing features?
   - Automatic adaptive directional microphone system
   - 16-band Digital Equalizer
   - 16 independent compression channels
   - Noise Reduction Control
   - Feedback Reduction

11. What is the frequency range of the audio processor?
The frequency range goes from 250 Hz up to 8 kHz

12. How is the ADHEAR switched on/off?
To switch ADHEAR on, insert a battery and close the battery compartment completely. It is not necessary to press a button to switch ADHEAR on. To switch the ADHEAR off, open the battery compartment and/or remove the battery.

13. How is the volume control changed?
The volume control can be scrolled (horizontally) to adjust the volume. Scrolling outward away from the skin increases the volume. Scrolling toward the skin decreases the volume. This applies regardless of whether the hearing aid is worn on the left or right ear. The change of the volume is indicated by a beep.

14. What size is the battery and how long does it last?
The ADHEAR hearing aid requires only one p13 sized zinc-air battery. Battery lifetime is typically 1 to 2 weeks. This is based on an average daily use of 16 hours at an average volume level. The battery life may vary depending on the usage of the hearing aid, and whether external auditory devices are connected to it.
15. Does the battery door have a child-proof lock?
There is no child-proof lock option for the battery door. If providing the device to very young children, it is recommended that the ADHEAR sleeve be placed over the device to discourage access to the battery door.

16. In which colours will the ADHEAR hearing aid be available?
The ADHEAR audio processor will be available in the following three colours:

Dove Silver  Terra Brown  Jet Black