

Bone-Anchored Hearing Aid

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Many people who are hard of hearing wear hearing aids that amplify sound from the air around them and rely it into the middle ear of the user. For some who have hearing disabilities, this method of hearing is not enough. When the middle ear is blocked, and sound cannot get to the cochlea, the Bone Anchored Hearing Aid (BAHA), from the company Cochlear, is a better choice.

Bone, like air is able to conduct sound vibrations. The BAHA utilizes this characteristic called direct bone conduction, to treat hearing. The BAHA product consists of three parts. One of these parts is the Titanium Implant. This piece requires minor surgery where it

is implanted into the temporal bone, behind the problematic ear. The surgery takes 45 minutes to an hour to complete and patients can usually go home shortly after. After the titanium implant is

inserted into this bone, it begins to fuse with the bone in a process known as osseointegration. Another part of the BAHA is the sound processor. This is the actual functioning unit of the hearing aid. It picks up the sound and causes the titanium implant to vibrate. The third piece is called the abutment and acts as a “bridge” for the vibrations to travel across the sound processor to the implant and into the bone. This is where the hearing unit is snapped into place.

This hearing aid is most effective in treating certain deafness's such as single sided deafness, conductive hearing loss, and mixed hearing loss. Single sided deafness is usually permanent hearing loss in one ear due to damage of the inner ear. Conductive hearing loss is due to problems with bones in the middle ear and mixed hearing loss is a combination of conductive hearing loss and the failure of the auditory nerve.

With the BAHA, sound is send around the

problematic area, naturally stimulating the cochlea through bone conduction. These vibrations reach the cochlea and the organ hears in the same manner as through air conduction. These vibrations are then converted into natural signals and are transferred to the brain to perceive sound. For single sided deafness, the inner ear of one side is not functional at all; therefore, the vibrations are sent through the bone and enter the cochlea of the other side. Now, even though the user can not truly hear out of the deaf ear, the sounds from that side are still heard clearly. User's say the hearing is so good that is sounds like they are actually hearing from this ear.

The BAHA is the only system of its kind cleared by the FDA. The device costs approximately \$5,000 and the surgery costs from \$9,000 to \$10,000. In most cases insurance covers the cost of both the product and the surgery. On average, the sound processor must be replaced every 5 years. The Titanium implant does not need to be removed and upgraded

versions of the sound processor are still compatible so only one surgery is ever required. Most importantly, the BAHA does not involve any invasive surgery so the patient is not limited to any new advancement in future hearing technologies.

References:

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