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Page Title: Baha Implant

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## Center for Auditory Solutions

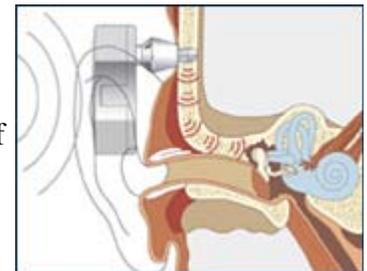
### Baha Implant

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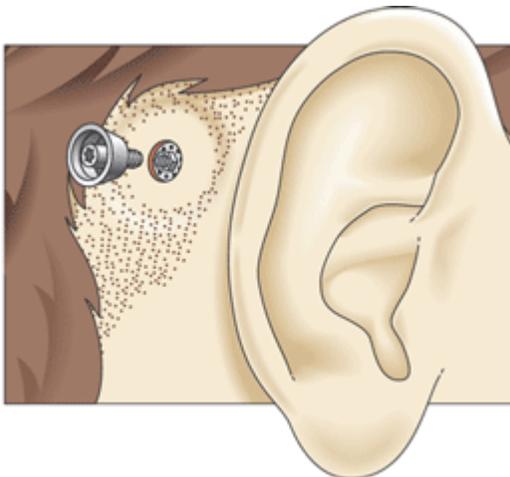
#### What is a Baha?

The Baha is a surgically implantable system for treatment of hearing loss that works through direct bone conduction. It has been used since 1977, and was cleared by the FDA in 1996 as a treatment for conductive and mixed hearing losses in the United States. In 2002, the FDA approved its use for the treatment of unilateral sensorineural hearing loss.

Baha is used to help people with chronic ear infections, congenital external auditory canal atresia and single sided deafness who cannot benefit from conventional hearing aids. The system is surgically implanted and allows sound to be conducted through the bone rather than via the middle ear - a process known as direct bone conduction.



#### How does a Baha work?



The Baha consists of three parts: a titanium implant, an external abutment, and a sound processor. The system works by enhancing natural bone transmission as a pathway for sound to travel to the inner ear, bypassing the external auditory canal and middle ear. The titanium implant is placed during a short surgical procedure and over time naturally integrates with the skull bone. For hearing, the sound processor transmits sound vibrations through the external abutment to the titanium implant. The vibrating implant sets up vibrations within the skull and inner ear that finally stimulate the nerve fibers of the inner ear, allowing hearing.

#### Who is a Candidate for the Baha System?

The Baha is used to rehabilitate people with conductive and mixed loss hearing impairment. This includes people with chronic infection of the ear canal, people with absence of or a very narrow ear canal as a result of a congenital ear malformation, infection, or surgery, and people with a single sided hearing loss as a result of surgery for a vestibular schwannoma (a tumor of the balance and hearing nerves).

#### Chronic Ear Infection

Treatment for hearing losses with the Baha is suitable for people with a conductive or mixed hearing impairment caused by a chronic infection of the middle or outer ear that results in a persistent and unpleasant discharge. The first goal, of course, is to manage the infection. In rare cases, chronic infections fail to respond to treatment, but are determined to be non-threatening. In other cases, infections respond to treatment, but recur with use of a conventional in-the-canal hearing aid. When a hearing aid is placed in a susceptible ear canal, a chronic or recurrent infection may be aggravated by the obstruction of the canal and the resulting excessive humidity and lack of drainage. In these cases, the Baha may be a good solution for hearing rehabilitation.

The Baha sound processor transmits sound directly to the hearing nerve without involving the ear canal. With Baha there is no occlusion of the ear canal to aggravate infection. A Baha sound processor offers sound quality at least as good as a conventional air conduction device. For those who need high levels of amplification, problems related to feedback and discomfort are usually resolved.

### **Congenital Hearing Loss**



Congenital conductive hearing loss caused by a malformation of the middle or external ear resulting in a missing or incomplete ear canal (external auditory canal atresia) are effectively managed with a Baha. Traditionally people with this type of hearing loss have been offered an old-fashioned bone conducting hearing aid. These are either held on the head using a steel spring headband or included in the frame of a pair of glasses. Traditional bone conductors have several disadvantages. The sound quality is poor as the skin acts as a barrier for the sound to travel to the inner ear. They are uncomfortable - patients complain of pain and headaches due to the constant pressure of the headband. They are also cumbersome, obtrusive and insecure.

The Baha system can be a real solution for people with this type of impairment. The Baha sound processor is directly integrated to the skull bone. Because of this direct interface, the Baha offers significantly better sound quality than that of a traditional bone conductor. The Baha sound processor works without pressure on the skin avoiding the headaches and soreness associated with the conventional bone conductor. Baha offers excellent wearing comfort and a better aesthetic result.

### **Baha for Unilateral Deafness**

One ear does not provide adequate hearing in many situations. Patients with severe hearing loss on one side, but normal hearing in the other ear have difficulty understanding speech in background noise (such as group conversations and restaurants) and determining which direction sound comes from. Unilateral deafness can result from viral infections, trauma, acoustic neuromas and other ear tumors and ear surgery.



Until recently, the best available approach for providing help in this situation has been the CROS (contralateral routing of offside signal) hearing aid. This technique utilized hearing aid microphones worn in both ears and routed sound from the deaf ear to the hearing ear. Unfortunately, most patients were unsatisfied with this system. Common complaints include the cosmetic appearance and discomfort of the headband, and the use of a hearing aid mold in the good ear. Most patients felt the benefit from the device is not worth the disadvantages.

The Baha, now an FDA cleared solution for unilateral deafness, provides a completely unique benefit. The Baha device is placed on the side of the deaf ear, transfers sound through bone conduction, and stimulates the cochlea of the normal hearing ear. The Baha effectively transmits sounds from the bad side to the normal ear and ultimately results in a sensation of hearing from a deaf ear. Stereo hearing results in improved

understanding of speech, especially in background noise and aids in the localization of sound.

The Baha offers significant advantages to the traditional CROS hearing aid. The device is placed behind the ear leaving the canal open. It is worn under the hair and is not perceptible to others. Because it is held in place by a clip and directly integrated with the skull bone, there is no need for a head band and pressure against the skin of the head. In recent clinical trials patients prefer the sound and speech clarity achieved with the Baha versus the CROS and versus the unaided condition.

### **Links**

1. [www.cochlear.com](http://www.cochlear.com)

If you would like to make an appointment or talk to an Audiologist, please call the Hearing and Balance Center at 410-328-5947.