

Implantable Technologies for the Ear

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Implantable devices are available for a variety of aural applications and are the subject of intense on-going research and development. While there are similarities across many of the devices their application and candidacy are often very different. A client who qualifies for a cochlear implant, for example, would not be a candidate for a bone anchored hearing appliance. Clients are often confused by this when seeking implants as they may want the 'smaller, less invasive' implant not understanding the difference in criteria and application. As Speech & Hearing Professionals it is helpful for you to have a working knowledge of the various implantable devices and their application. Seven categories of implantable devices, often representing distinct clinical populations though some have overlapping candidacies, include.

1. **Acoustic implants** are hearing aids that are partially implanted designed for mild to moderate sensorineural losses but still use acoustic stimulation. An example is the RetroX.
<http://www.retrox.info/eng/faq.php?lang=en#question1>
2. **Bone Anchored Hearing Appliances (BAHA)** designed for patients with single-sided deafness, moderate to severe conductive loss and some levels of mixed loss. Cochlear Corporation and Oticon Medical offer these devices. <http://products.cochlearamericas.com/baha> and <http://www.oticonmedical.com/>
3. **Middle Ear Implants** used for patients mild to moderate sensorineural loss with no middle ear disease. Three devices (MedEl Vibrant Sound Bridge, Ototronix Maxum and Esteem Envoy) are currently FDA approved while a third, Otologics Carina is in clinical trials and still others are in various stages of development. <http://www.medel.com/int/show/index/id/87/title/VIBRANT-SOUNDBRIDGE>, <http://www.ototronix.com/about-us/index.php> <http://www.envoymedical.com/> and <http://www.otologics.org/>
4. **Cochlear Implants** for patients with severe to profound cochlear impairment. Three of the four manufactures are FDA approved, Cochlear Corporation, Advanced Bionics, and MedEl. <http://www.cochlearamericas.com/>; <http://www.advancedbionics.com/index.cfm?langid=1> <http://www.medel.com/us/index/index/id/1/title/Home> (non FDA approved French device: <http://www.neurelec.com/>)
5. **Brain Stem Implants** for patients with profound deafness and no cochlea and/or auditory nerve. Approved only for bilateral acoustic neuroma in the USA these devices are implanted for other conditions in several other countries. <http://www.mayoclinic.org/auditory-brainstem-implant/>
6. **EAS (Electro Acoustic Stimulation) or Hybrid Cochlear Implants** combine acoustic and electrical stimulation for patients with severe to profound high frequency and variable levels of low frequency sensorineural hearing loss. In the UAS these devices remain in clinical trials.
<http://www.medel.com/int/show/index/id/86/title/EAS>
7. **Vestibular Implants** for balance are experimental, primarily being studied in animals though one device was recently implanted in a human subject. <http://uwnews.org/article.asp?articleID=60951>