

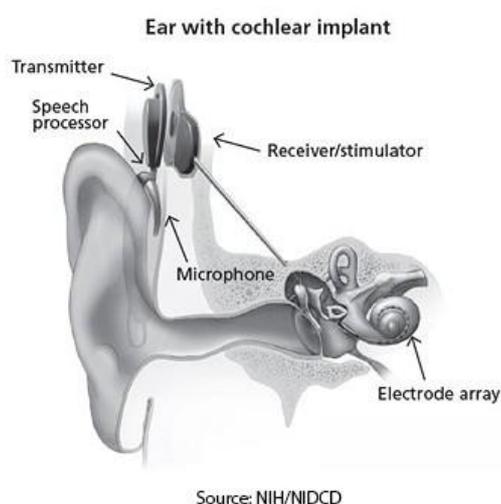
An extract from the Winter 2018 Newsletter



QUARTERLY
NEWSLETTER
OMNETICS
CONNECTOR CORPORATION

Omnetics' Contribution to Cochlear Implants & Conductive Bone Hearing

Omnetics offers many of the smallest fine wire interconnect cables used in the assisted hearing industry. Years of materials study and process design have helped Omnetics produce extremely thin wall overmolded insulation and connector jacketing in the industry.



Our ears and brain work together to help us hear through a three step process. Sound waves pulse through the air and are received by the Outer Ear, which is simply a collector and tubular router for channeling sound into the Middle Ear. Our Middle Ear is made up of the ear drum and a few tiny bones that resonate and transfer tuned audio vibrations into the Inner Ear. Hearing losses within these first two sections are often called conductive hearing loss. This kind of loss is often a simple issue such as an ear infection or a hole in the ear drum, which can be aided by a hearing aid or middle ear implant. As sound is processed into the Inner Ear, we have key apparatus such as the cochlea and auditory nerve. These apparatus begin to add more intelligence and understanding to the sound as it is passed onto the auditory nerve. Sensorineural hearing loss is often a result of missing or damaged hair cells in the cochlea and is usually permanent.

These types of severe losses are more often solved with cochlear implants. If there is even more severe damage, such as a missing auditory nerve, nearly total loss occurs and cannot be solved with cochlear devices because the nerve conducts the key electrical signals to the brain for understanding and processing.

Cochlear implants have shown to be quite successful in assisting with sensorineural hearing problems. Issues in the Inner Ear or nerve pathways may not function well in transferring information. An implant can act as a prosthetic substitute that bypasses the defunct hearing section and stimulates the auditory nerve directly

with and implanted electrode array. Cochlear implant systems have an external sound processor that sends digital signals through the skin to the implant which sends this signal down to the implanted electrode array in the inner ear. The electrodes stimulate the cochlea hearing nerve fibers that forward the sound to the brain.

Both Conductive and Sensorineural hearing devices contain electrical devices to help them operate and adapt to active daily lives of those using them. New conductive hearing-assist devices are also being developed that look like single headbands for audio entertainment assistance and during sporting and TV watching. More serious systems using cochlear designs with implanted stimulators are being used more regularly and have significantly benefitted from improved technology.

Omnetics' special processing techniques, miniature cabling, and miniature connectors help in the systems design and functional daily use for many users of cochlear type hearing devices. Our Nano connector technologies are used on the external sound processor of cochlear implant devices for their small size and durability. Cables and connectors utilized by cochlear implants must be light weight, offer simple connection ease, and maintain use for long periods of time. The external component of a cochlear implant can be used for up to five years, so durability and comfort are top design priorities. Omnetics' rugged flex pin design secures the connectors in place and allows for long-term use of the implant. Omnetics also uses extremely precise ultra-thin over-molding systems with 100% coverage to keep the cable connectors as small as needed for

the application. Santoprene and other special polyurethanes such as Evoprene materials are used to help serve this medical grade community of products, which allow for waterproofing and sterilization. When designing very thin wall over-molding or unique shapes of small connectors and cables, consider Omnetics Connector Corporation. We are masters of this niche in the cable technology world.

