Cochlear Implants
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Abstract—The purpose of this paper is to evaluate the present state of the Cochlear Implants which are used to help the partially and completely deaf have a sense of sound. The cochlear implant is a surgically implanted device that connects to the inner cochlea of the ear to provide the user with a sense of sound.

I. INTRODUCTION

Deafness is a known problem in society today and can produce a lesser quality of life for the person with this problem. This disability can be congenital, due to the aging process of the human body, caused by high levels of noise exposure, illnesses (such as the measles, mumps or meningitis) or Neurological disorders (such as multiple sclerosis or strokes).

The three classifications of deafness is conductive hearing impairment, sensorineural hearing loss, and mixed hearing loss. Conductive hearing loss is present when the sound is not reaching the inner cochlea and can be caused by scar tissue or dysfunction of the ear drum. Sensorineural hearing loss is when the nerve that transmits the impulse of sound to the brain is damaged and the brain does not receive the message of sound. Lastly, mixed hearing loss is a combination of conductive and sensorineural hearing loss and can be the outcome of a chronic ear infection or a ruptured or defective eardrum.

In this current age there are many assistive devices for the deaf such as videophones, text messaging and telecommunications device for the deaf (TDD), but the only device that functions as a cure for deafness is the cochlear implant.

II. METHODS

Figure 1 shows a hearing aid while Figure 2 shows a cochlear implant to show and evaluate the difference between the technologies.

III. DISCUSSION

Although this device is quite useful there are still some disadvantages. First the procedure is very expensive as well as the maintenance for the device to continue working properly. Also the procedure is very invasive and some effects of the implantation are irreversible, such as a loss of natural hearing.

This device is heading in the direction of trying to be completely internal so it is not noticeable. Other Future improvements include it becoming smaller and manufacturing the microphone to process the information better for a cleaner and more developed sense of sound for the patient. Also the use of laser stimulation in cochlear implants has been a breakthrough recently in which they use fiber-optics to stimulate the auditory nerve more effectively than products used now.

A new device called EAS (Electric Acoustic Stimulation) is another answer to partial hearing loss/ deafness that combines the usefulness of hearing aids with the highly technological cochlear implant to from a hybrid between the two.

REFERENCES