

# Cochlear Implants

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*BME 181 First Presentation, March 4, 2013 v\_gabbidon@my.uri.edu*

## I. INTRODUCTION

More than 20% of the United States population over the age of 12 years old suffers from hearing disorders that are severe enough to impact their ability to communicate. The innovation of the cochlear implant has been the most common and effective means of correcting hearing disorders.



## II. METHODS

A cochlear implant is a surgically implanted device that consists of both internal and external appliances. The purpose of the cochlear implant is to provide a sense of hearing in patients that suffer from severe hearing disorders, such as partial deafness. The most basic form of cochlear implants will not be able to fully restore hearing in a person that is completely deaf; they are designed to aid patients with sensorineural hearing loss. This is because a cochlear implant bypasses the hair cells in the basilar membrane of the cochlea, which in a natural functioning ear are responsible for transmitting sound vibrations to the brain. People with hearing disorders typically have a lower quantity of hair cells in their cochlea due to damage caused by either loud noises or natural means.

## III. RESULTS

The newest innovation in hearing implants come from the company Esteem®, who have managed to develop a device that eliminates the external parts found on basic cochlear implants. Their devices is implanted behind the ear and

activated by a magnet. These implants are more powerful and able to cure complete deafness in select patients.



## IV. DISCUSSION

The actual process of implanting the internal portion of the cochlear implant is a relatively simple procedure that requires just general anesthesia. The only risk or downfall of the implantation process is that it requires the hair cells of the cochlea to be shaved. This makes the implantation of a cochlear implant a nearly irreversible process in the sense that the patients will lose some or all of the residual hearing ability they had before the operation. This is why cochlear implants are encouraged at a young age in patients that have severe hearing disorders. The reasoning being that in youth the brain is more susceptible in its ability to interpret sound. Innovations are being made to these implants that can completely restore hearing in the deaf.

## REFERENCES

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