

## Assignment-1

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# 1 What Is Hearing Aid ?

In 1898, Miller Reese Hutchison created the first electric hearing aid which convert sound wave into electrical signals. A hearing aid is a small electronic device that you wear in or behind your ear. It makes some sounds louder so that a person with hearing loss can listen, communicate, and communicate easily with others .It is used when a person is not able to hear clearly.A hearing aid can help people hear more in both quiet and noisy situations.



## 1.1 Functioning Of Hearing Aid

A hearing aid has three basic parts: a microphone, amplifier, and speaker. The hearing aid receives sound through a microphone, which converts the sound waves to electrical signals and sends them to an amplifier. The amplifier increases the power of the signals and then sends them to the ear through a speaker.

## 1.2 Importance Of Hearing Aid

Hearing is the very important function of our body, It is very embarrassing moment when some people talk to you but you are not able to hear that clearly. So there is a device which can help in hearing i.e Hearing Aid. It can also eliminate some unwanted constant noise in background. If someone is suffering from hearing loss he/she will feel bad for themselves. In that situation Hearing Aid help them to feel as same all feel.



### 1.3 Innovation In Hearing Aid

A new type of concept is developing in hearing aid devices i.e through vibrations. It is designed to help increase the transmission of sound vibrations entering the inner ear. A middle ear implant (MEI) is a small device attached to one of the bones of the middle ear. Rather than amplifying the sound traveling to the eardrum, an MEI moves these bones directly. Both techniques have the net result of strengthening sound vibrations entering the inner ear so that they can be detected by individuals with sensorineural hearing loss.

## 2 What Is Camera Pill ?

As name suggest, it is some pill including camera. It is a technology designed to examine the internal part of our body, which is not seen easily. This capsule camera is not an electronic gadget, but it is a powerful medical device that is able to take clear and extremely useful photographs which help doctors to understand internal wound, infection or unwanted cell growth.

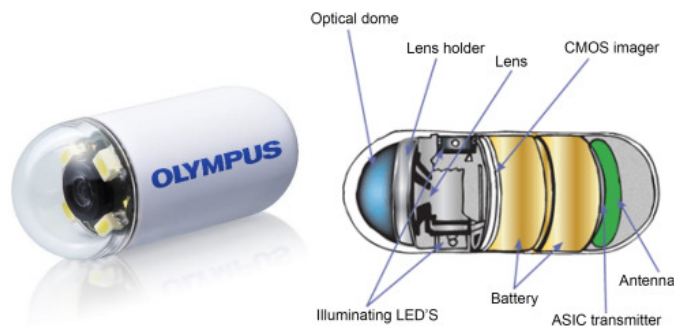


### 2.1 How It Work ?

step 1 : you swallow a tiny camera that's about the size of a large vitamin pill.

step 2 : The capsule contains lights to illuminate your digestive system, a camera to take images and an antenna that sends those images to a recorder you wear on a belt.

step 3 : After taking and sending all the pictures. It will simply get out of your body with body waste.



## **2.2 Benefits Of Camera Pill**

### **2.2.1 Diagnose cancer**

Capsule endoscopy can show tumors in the small intestine or other parts of the digestive tract. It is very important to know about that kind of disease as early as possible to cure it .

### **2.2.2 Diagnose celiac disease**

Capsule endoscopy is sometimes used in diagnosing and monitoring this immune reaction to eating gluten.

### **2.2.3 Examine your esophagus**

Capsule endoscopy has also been approved to evaluate the muscular tube that connects your mouth and your stomach (esophagus) to look for abnormal, enlarged veins (varices).

### **2.2.4 Diagnose inflammatory bowel diseases**

Capsule endoscopy can reveal areas of inflammation in the small intestine.

### **2.2.5 To See inner Body**

Some time children swallow coin or something then that thing get stuck in their lungs or food pipe. So this device would be very helpful to get know where it get stuck.

### 3 What Is Pulse Oximeter ?

A pulse oximeter is a little gadget that slides over your fingertip and measures how strongly oxygen binds to your red blood cells via infrared light refraction. The oxygen saturation measurement known as peripheral capillary oxygen saturation, or SpO<sub>2</sub>, is used by oximeters to report blood oxygen levels. Normally, a typical level of oxygen is 95 percent or above.



#### 3.1 where It Is Helpful?

In present scenario we already know that how much pulse oximeter is important, now pulse oximeter is an essential equipment just like thermometer. some of the uses are as following:-

- a. To check oxygen level in blood.
- b. To assess how well a new lung medication is working.
- c. To evaluate whether someone needs help in breathing

- d. To evaluate how helpful a ventilator is.
- e. To monitor oxygen levels during or after surgical procedures that require sedation.
- f. To determine whether someone needs supplemental oxygen therapy.
- g. To determine how effective supplemental oxygen therapy is, especially when treatment is new.

### **3.2 What We Can Do In Pulse Oximeter To Make It More Convenient ?**

oximeter is already a very portable device, but for curious mind there is some ideas to make oximeter more daily usable and convenient.

- a. We can reduce it's structure to ring like structure which is more convenient.
- b. We can replace battery of oximeter by human voltage or solar cells.
- c. we can add more things in that, example little information of vital parameters because we can wear it whole time if it is ring like structure.

## 4 What Is Magnetic Stimulator ?

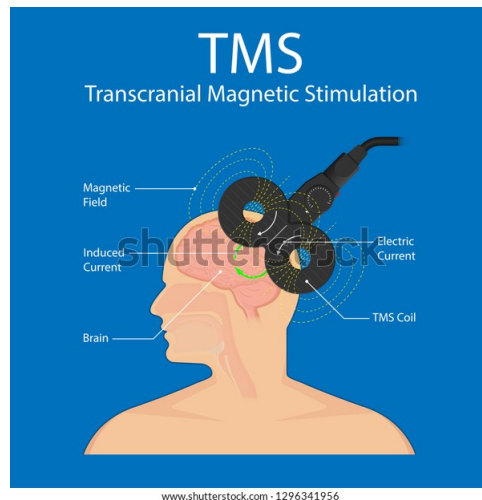
As name suggest, there is device which stimulates our brain signals through magnetic field. when we feel happy, depressed or any emotion there is some kind of pulses release in our brain, so this device just do reverse of it ,it stimulates nerve cell due to which we feel relax. overall this device stimulate our brain signals.



### 4.1 How Magnetic Stimulator work ?

During an rTMS(Transcranial magnetic stimulation) session, an electromagnetic coil is placed against your scalp near your forehead. The electromagnet painlessly delivers a magnetic pulse that stimulates nerve cells in the region of your brain involved in mood control and depression. It's thought to activate regions of the brain that have decreased activity in depression.





## 4.2 Benefit Of Magnetic Stimulator

Magnetic therapy has immense power to stimulate our brain signals. It can change our feeling at that time and many things. following are some tremendous benefits.

- a) Nothing bad then this when your love one committed suicide due to depression, so there is method to cure it i.e magnetic stimulation.
- b) It can also helpful to boost energy level.
- c) It can reduce pain too.
- d) It promote restful sleep for those who don't get sleep easily.
- e) Improve the body's immunity and help prevent infection.
- f) Help in control stress.
- g) Improve oxygen supply and circulation.

## 5 What Is Ultrasound And Electrical Stimulation ?

### 5.1 Ultrasound Therapy

Patients who want to get rid of pain, reduce edoema symptoms, and enhance tissue and muscle repair should consider ultrasound therapy. High-frequency sound waves are used to trigger tissue vibration in this widely used technology. This vibration generates heat and improves blood flow to the affected area. Waste will be eliminated from the tissue and nutrients will be provided to the cells as a result of the treatment, which will help the cells repair.

This type of Therapy are very important because without giving pain or without going inside of our body they can do tremendous job, such as fast healing of injury by helping in bone and tissue regeneration.



## 5.2 Electric Stimulation

Electrodes are used to send electrical currents to specific muscles in this new therapy. Stimulation can help relieve pain, reduce muscle contraction, and also enhancing circulation and range of motion of blood by strategically putting electrodes on affected areas.



## 5.3 Benefits Of Ultrasound And Electric Stimulation

The most effective treatment often comes by combining both ultrasound treatment and electrical stimulation. Both has its own importance. following are some uses:-

- a) It can cure swelling caused by fluid in body tissue.
- b) It increases blood flow.
- c) This stimulation also reduce stiffness.
- d) This effect can also help in tissue regeneration.
- e) While using this treatment person can not get pain.

f) Also we can use it to get rid of pain.

g) If some body part is paralysed we can control it through electrical signals given by Ultrasound and Electric stimulation to the brain and that body part.