

My 101 Inventions For Making Healthcare Affordable To Every Indian

- Most of the advanced therapies in Medical Sciences are not affordable
- I did research myself and reduced the cost of costly equipment 20 times
- I developed many machines 25 of which are invented for the first time
- The entire research was funded with my own money
- 50 patents have been registered for these inventions in Mumbai office
- Last 100 years not a single endoscope was made in India
- In past 5 years I made almost all endoscopes used in human body in India
- I founded a no profit organization called Vigyan Yog Foundation to sell my innovations to doctors on no profit basis
- I moved fore-wards with this project with a single intention of science to grow

Project Received 5 International Awards and 5 national Awards



Siemens Gapio Innovation Award



Antia Finseth Innovation Award

Jawale Hospital



Vigyan Yog Foundation – Innovation Workflow

1. Identify Need

Identify high-cost imported medical equipment

2. Research & Development

In-house design and prototyping of Indian alternative

3. Cost Reduction

Achieve 20–50× cost reduction through indigenous innovation

4. Module Creation

Single working module developed

5. Patent Filing

Intellectual property secured

6. Clinical Research

Initial clinical evaluation with pilot modules

7. CDSCO Approval

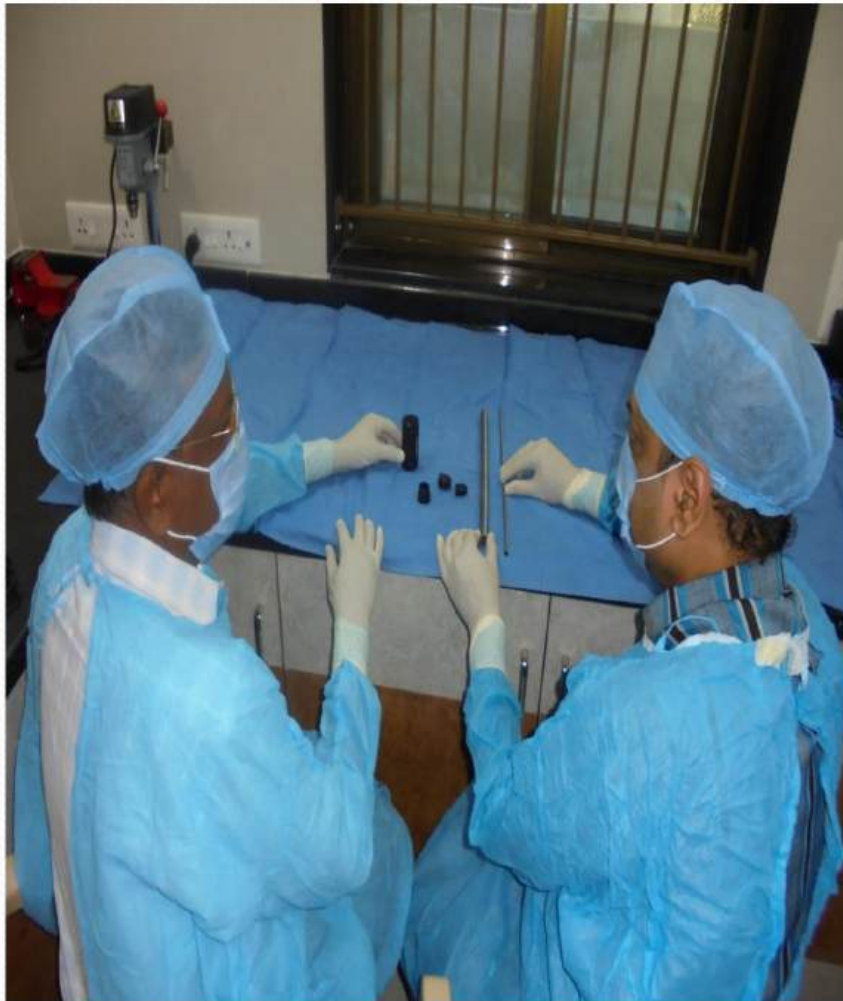
Regulatory clearance for safety and efficacy

8. Commercialisation

Scaled manufacturing and market introduction

Vigyan Yog Foundation – A Non-Profit Organization
Chairman: Dr. Sagar Jawale

Biomedical engineering lab and workshop



Vigyan Yog Company

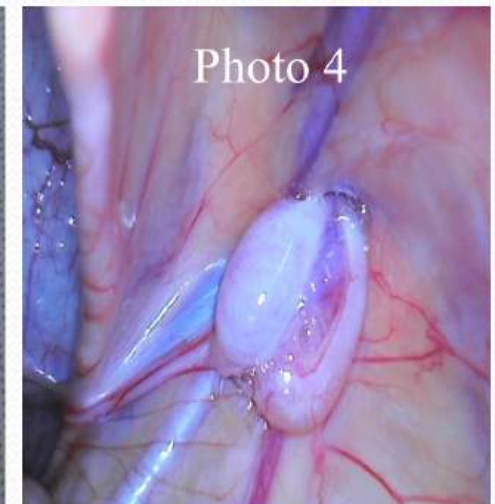
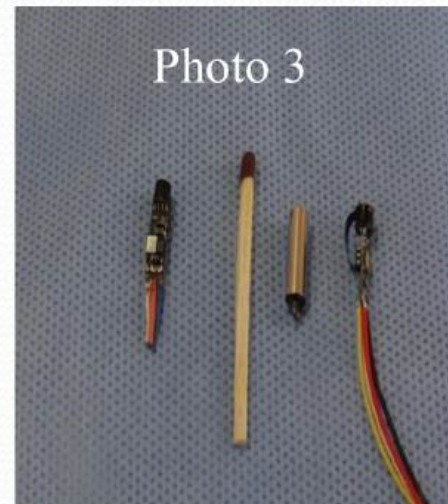
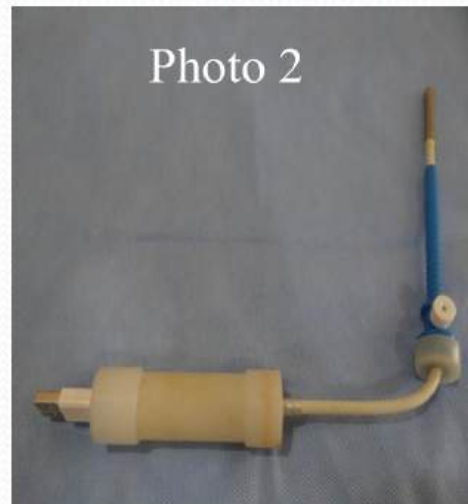
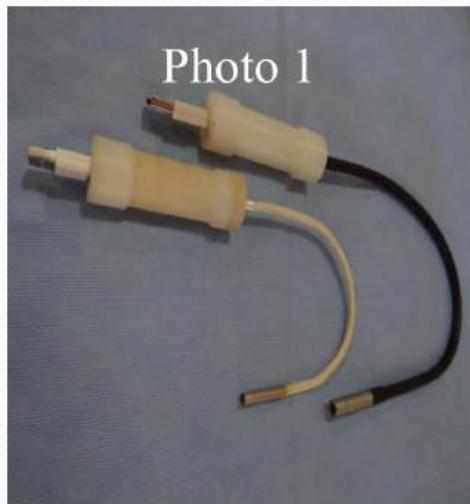
- Started in 2018 as a proprietary firm
- ISO: 13485:2016 certificate from government notified body
- Received MDR manufacturing license on May 2025
- 16 medical devices under Class A and B CDSCO approved
- Another 14 Medical devices under endorsement
- Permissions for making custom made devices in Class A and B
- Website: <http://www.vigyanyog.com>

What is common to all devises

- USB output and great compatibility to all devises
- Chip on Tip without rod lenses giving great picture quality
- LEDs for light instead of light bundle, no external light source
- Extremely light weight
- 10-20 times cheaper than peers
- Unique and reported for the first time in medical literature
- Huge field of view of 140 degrees compared to 90 degrees of rod lenses, thus making 30-degree telescopes obsolete
- Far less picture distortion after extensive dissection making 3 Chip cameras unnecessary

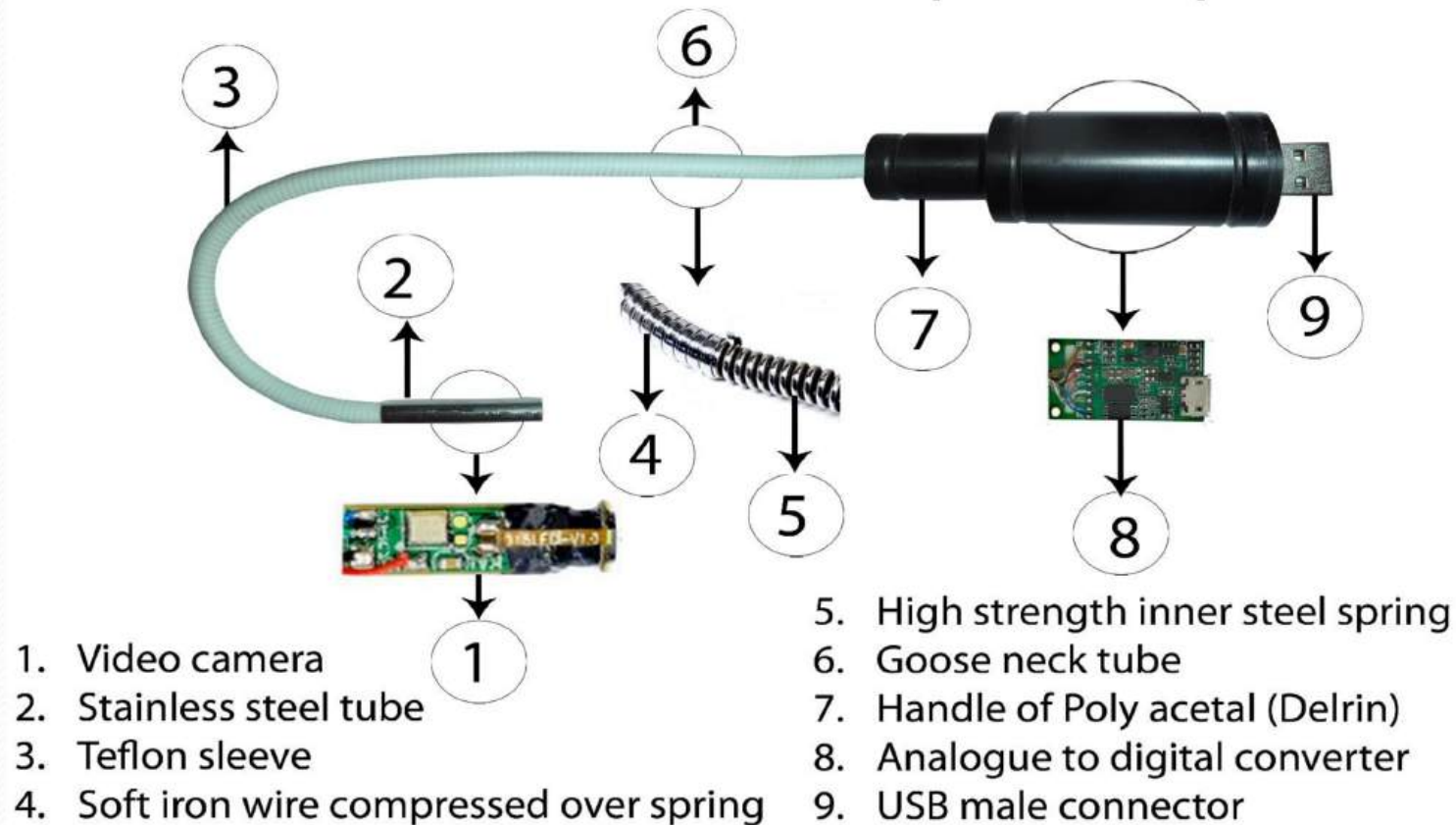
Flexible video laparoscopes

First of its kind in the world, designed in 5 mm and 8 mm, (Photo1) totally flexible at all points with a memory and a video camera with 6 leds (Photo3) fitted in the tip itself making rod lenses outdated. Since there is no image loss the image quality (Photo3) is much superior to the rod lenses. It can be flexed at 90 degree at port site (Photo2) to avoid tussle with other instruments during single incision laparoscopic surgery. More than 200 laparoscopies have been performed with it. Cost Rs.30,000. Estimated worth is Rs. 5 Lakh. It is published in Journal called Tropical Doctor.



Commercialized Flexible Video Laparoscope

Flexible Video Laparoscope



5.5 mm Flexible video endoscope in anesthesiology

The flexible video endoscope 5.5 mm can be used in anesthesiology as follows:

- 1) Coupled to a laryngoscope making it a video laryngoscope (Photo1)
 - 2) Put inside an endotracheal tube (Photo2,3) to see the glottis plus to see trachea and is superior to video laryngoscope
 - 3) Put inside endobronchial tube to guide tube into any bronchus for single lung anesthesia
 - 4) To put inside endobronchial tube to check for blocks
 - 5) Put inside tracheostomy tube to check blocks
 - 6) As a diagnostic video bronchoscope.
- Cost Rs.30,000.



Photo 1



Photo 2

4 mm flexible endoscope

4 mm flexible endoscope (Photo 1) can be used for nasal intubation, as a guide for endo-bronchial intubation (Photo 2), for guiding ET into single lung anesthesia And as a video laryngoscope by attaching to pediatric and neonatal laryngoscopes. Cost Rs.25,000.



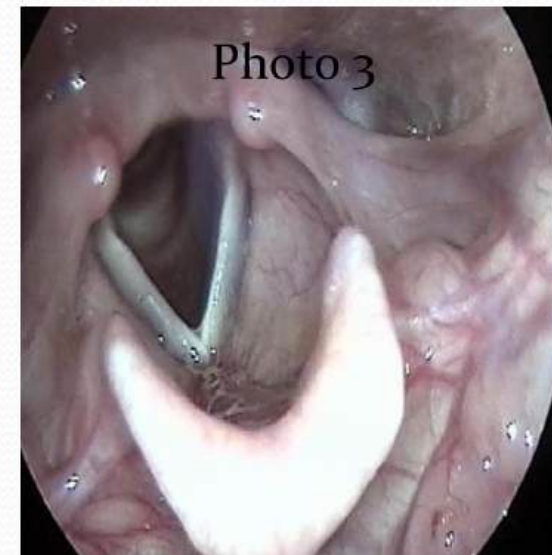
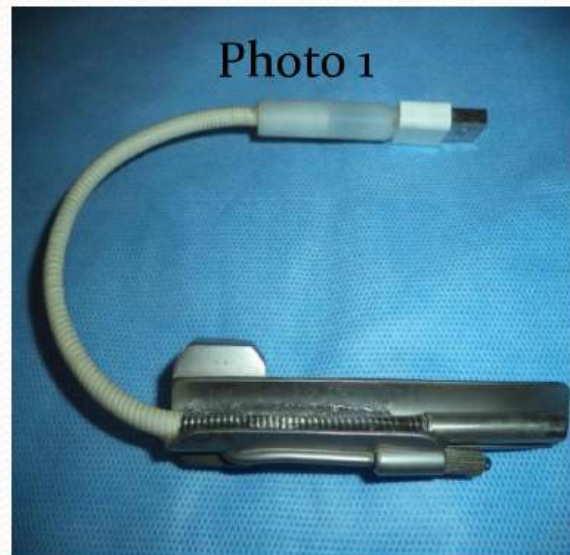
Photo 1



Photo 2

Video Laryngoscope

A video camera is fitted at the tip of the blade of a laryngoscope(photo1) and has usb output. It is computer compatible and the video can be seen on a mobile phone(photo2) or a computer(photo3). The laryngoscope has its own light which is operated by batteries inside the handle. The cost is Cost Rs.15,000 vs market cost of Rs.3.5 Lakhs.

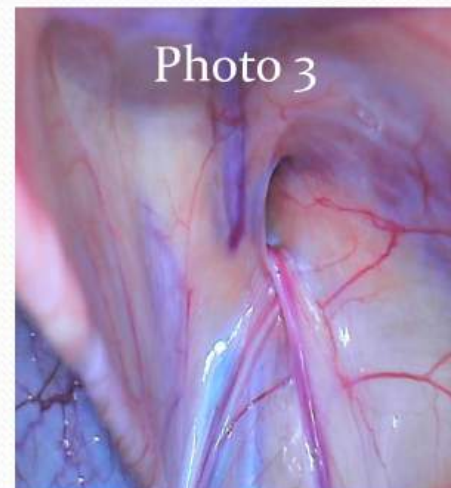
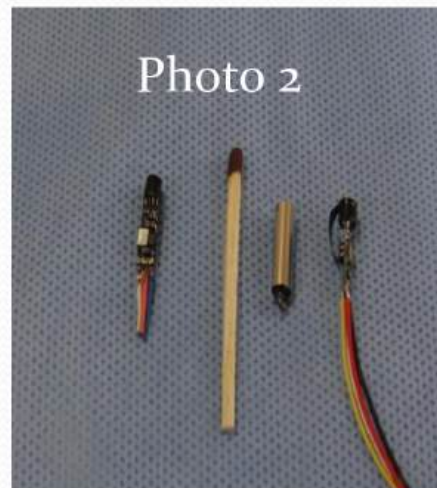
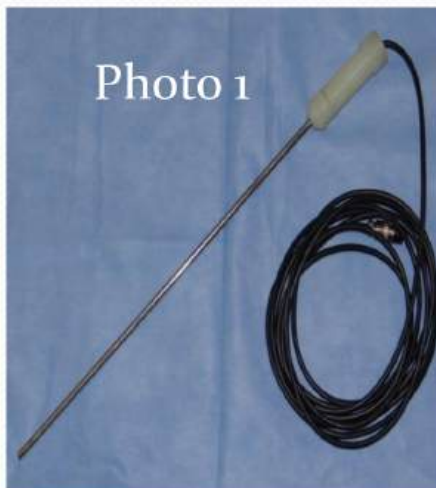


Commercialized Video Laryngoscope



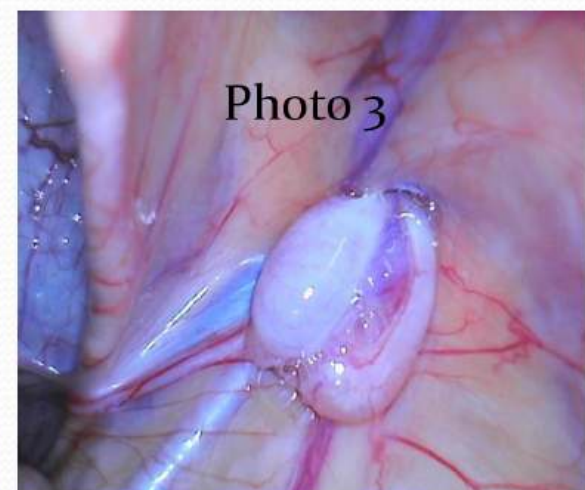
Rigid Video Laparoscopes

Made in 5mm and 8 mm and 10 mm sizes (Photo1) Olympus scope.(Photo4). The 5 mm camera (Photo2) with 6 leds is fitted at the tip of the scope. The image quality (Photo3) rivals that of a three-chip camera although this is a single chip camera as there is no image loss due to rod lenses. It is published in Journal of Minimally Invasive Surgery.



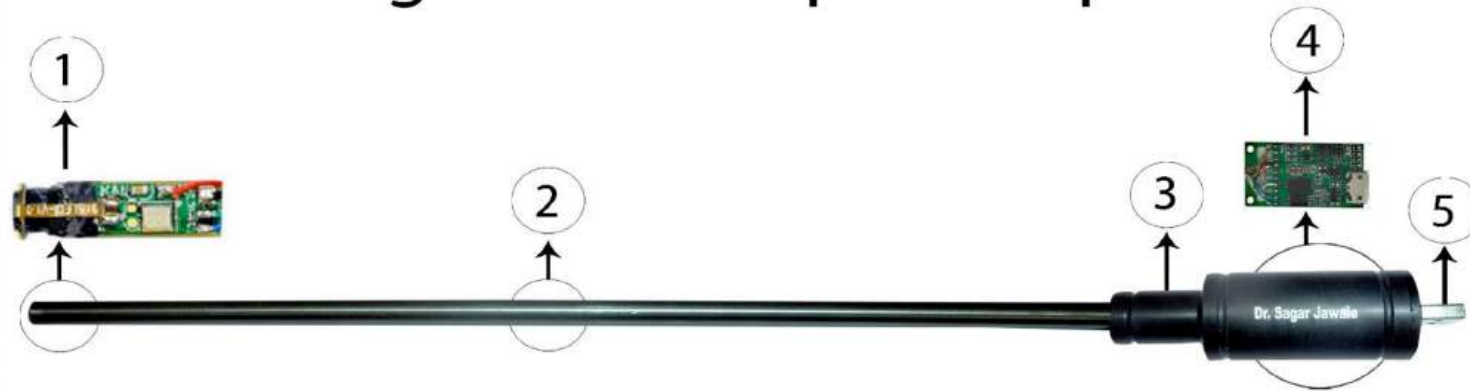
Commercialized Rigid Video Laparoscope

5- and 10-mm rigid video laparoscopes (Photo1,2) are commercialized at the cost of Rs.30,000 Vs. market cost of Rs. 6 Lakh. Endo-camera (Rs. 3 Lakh) Telescope (Rs.2 Lakh) and Led light source (Rs.1 Lakh) are not necessary. The image quality(Photo2) is phenomenal as there is no image loss due to fiber optics. It is published in international journal of Minimally invasive surgery.



Commercialized Rigid Video Laparoscope

Rigid Video Laparoscope

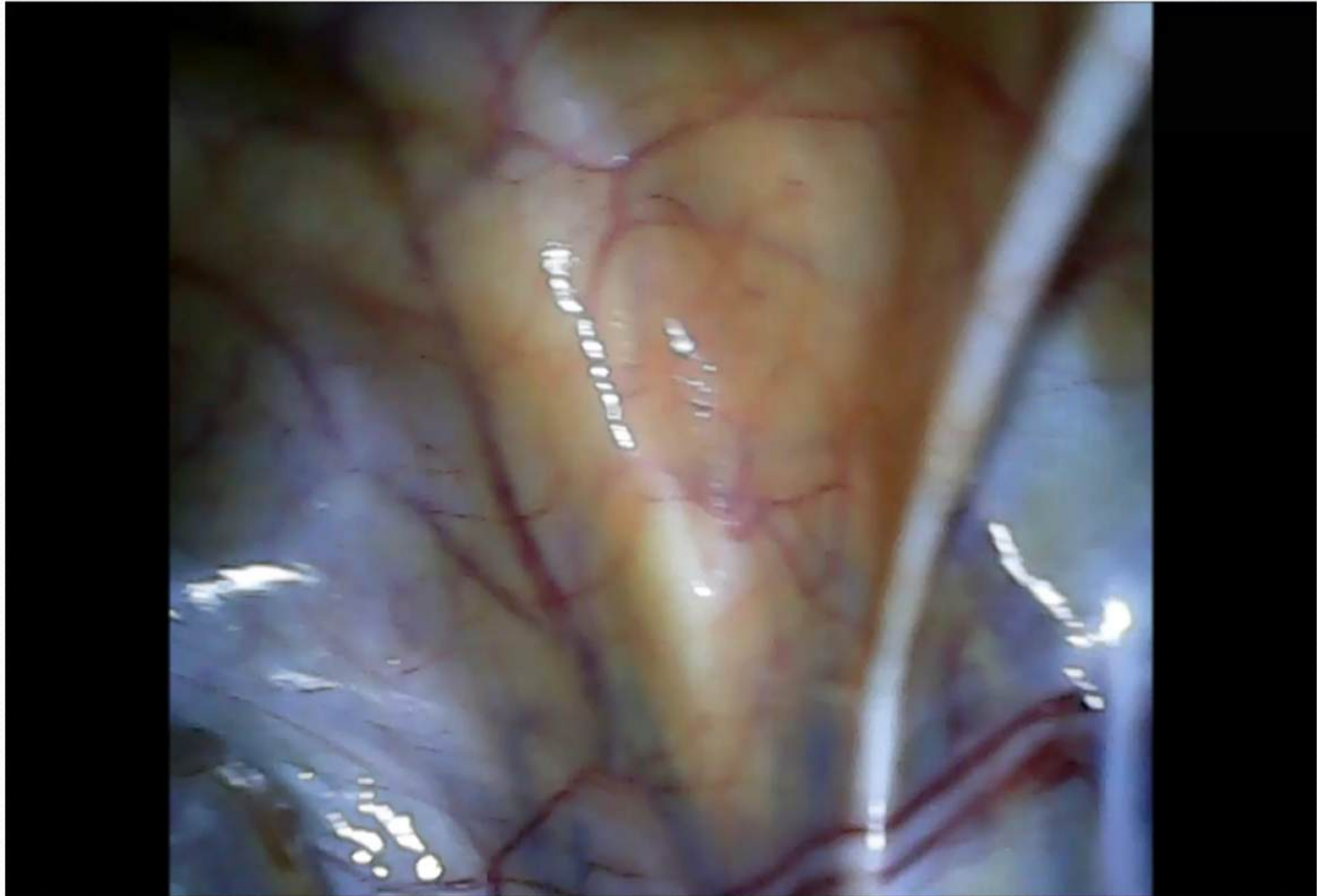


1. Video camera
2. Stainless steel tube

3. Handle of Poly acetal (Delrin)
4. Analogue to digital converter

5. USB male connector

Picture quality



Articulating Video Laparoscope

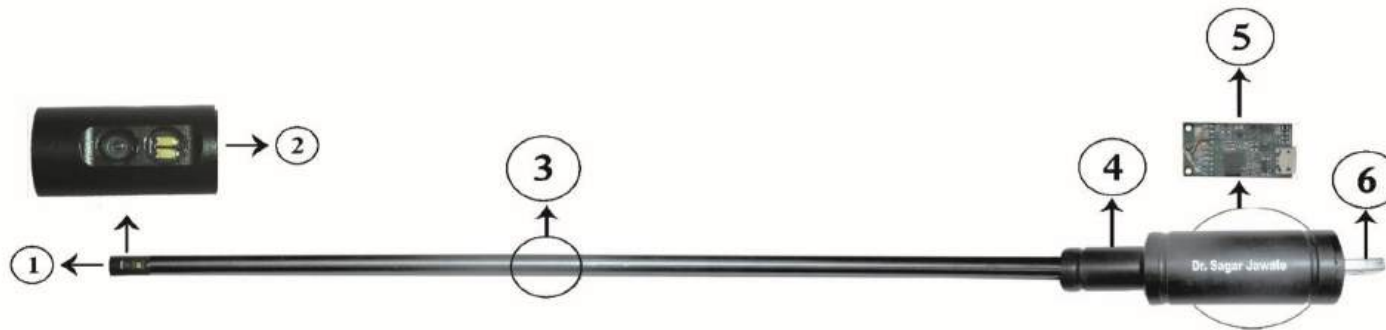
My articulating video laparoscope is first of its kind in India designed in 8 mm,(Photo 1) a video camera with 6 leds fitted in the tip itself making rod lenses and fiber optics outdated. Since there is no image loss the image quality is much superior to the rod lenses. It can be articulated to 180 degrees (Photo2,3) and rotated in 360 degrees making it to see in places where other scopes do not see. Sterilization is done by putting in Formalin chamber or ethylene oxide gas. The cost is Rs.50,000 vs market cost of Rs. 10 Lakh.



Dual Vision Video Laparoscope

It has a front zero degree and a side 90-degree cameras with LEDs. Useful in visualizing retro-Caecal areas, behind liver, hiatus and pelvic surgery. The cost is Rs.50,000 worth Rs.10 Lakhs.

Dual Vision Rigid Video Laparoscope



- 1. Front Video Camera
- 2. Side Video Camera
- 3. Stainless Steel Tube

- 4. Handle of Poly acetal (Delrin)
- 5. Analogue to Digital Converter
- 6. USB Male Connector

Flexible Video Endoscopes

Damaged flexible endoscopes such as gastroscope, colonoscope, sigmoidoscope, bronchoscope, ureteroscope (Photo1) were bought on eBay for just USD 300 each and made into functional video endoscopes worth Rs.15 lakhs each by inserting 3 mm video camera (Photo2) at the tip costing only Rs. 7,500. The camera also has 6 micro LEDS for illuminating light and image bundle and light bundle both are unnecessary. Flexible flat cable (Photo3) is used from camera to the computer which can withstand one million movements without breaking. Image quality (Photo4) is phenomenal as there is no image loss due to fiberoptic image bundle.



Photo 1

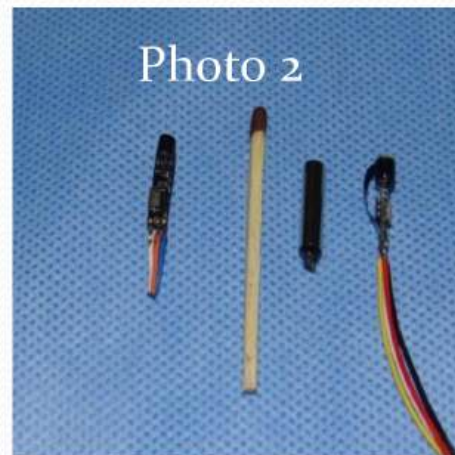


Photo 2

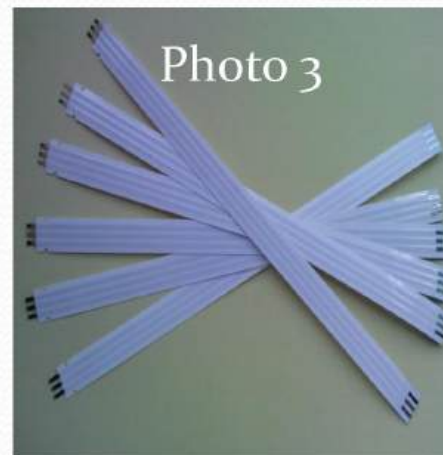


Photo 3



Photo 4

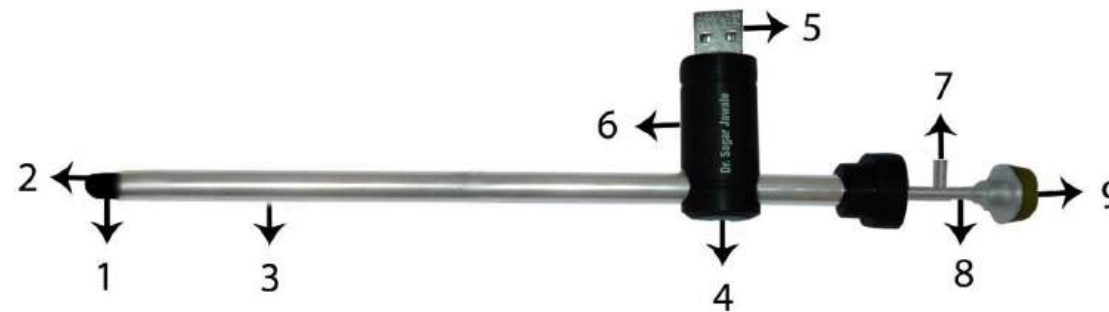
Rigid Video Sigmoidoscope

The instrument is designed for operative procto-sigmoidoscopic surgery. It has 4 mm operating channel that accommodates variety of 3 mm laparoscopic instruments. It has a 4 mm video camera with 4 LEDs fitted at the tip. The gas channel allows for gas insufflation during the procedure. It can do variety of diagnostic procedures such as endoscopic biopsy for Hirschsprung's disease and operative procedures such as polypectomy, coagulation of rectal ulcers, banding of piles etc. The cost is Rs.40,000 vs market cost of Rs.15 lakhs.



Rigid Video Sigmoidoscope

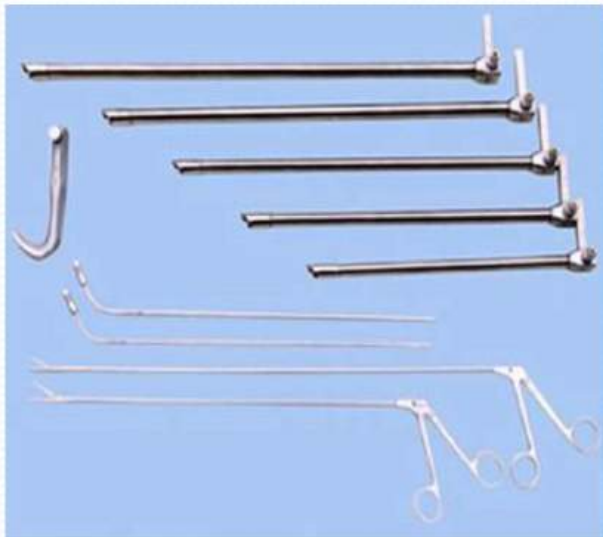
Rigid Video Procto-sigmoidoscope



- | | |
|-----------------------------------|----------------------------------|
| 1. PLASTIC OBTURATOR | 5. USB male connector |
| 2. Video camera | 6. Analogue to digital converter |
| 3. Stainless steel tube | 7. NOZZLE FOR GAS |
| 4. Handle of Poly acetal (Delrin) | 8. INSTRUMENTATION CHANNEL |
| | 9. SILICONE WASHER |

Rigid Video Esophagoscope

The instrument is designed mainly for esophageal foreign body removal. It has 2.5 mm operating channel that accommodates 2 mm grasping forceps. It has a 4 mm video camera with 4 LEDs fitted at the tip. The gas channel allows for gas insufflation during the procedure. It can do variety of diagnostic procedures such as diagnostic biopsies, esophageal variceal therapy and dilatation of esophageal strictures etc. The cost is Rs.40,000 vs market cost of Rs.15 lakhs



Rigid Video Esophagoscope

RIGID VIDEO ESOPHAGOSCOPE

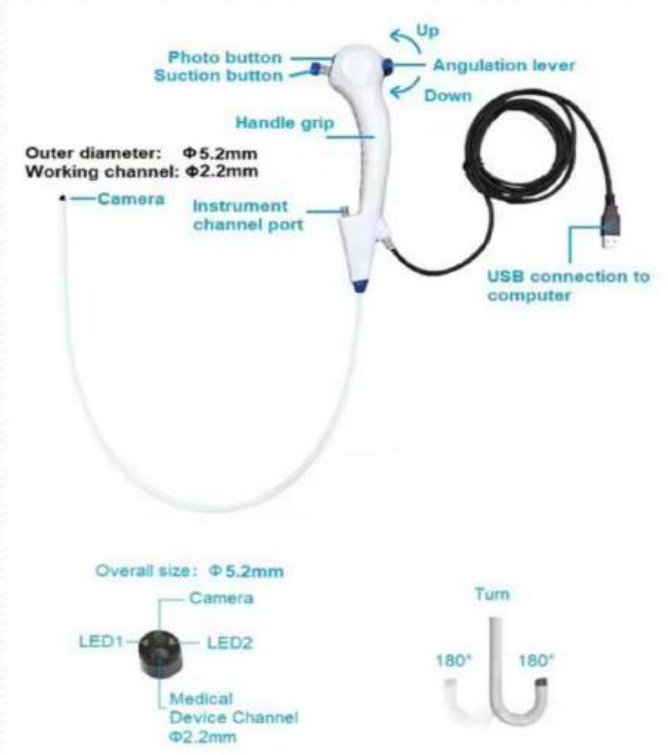
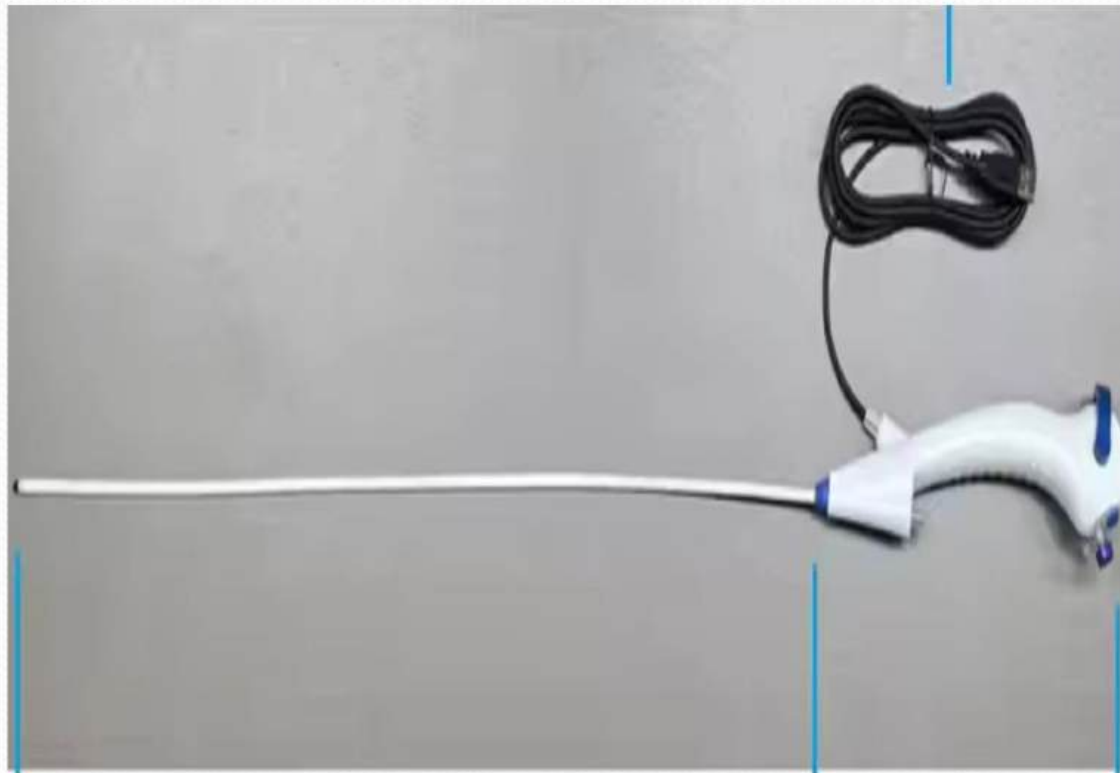


- 1. PLASTIC OBTURATOR
- 2. Video camera
- 3. Stainless steel tube
- 4. Handle of Poly acetal (Delrin)

- 5. USB male connector
- 6. Analogue to digital converter
- 7. NOZZLE FOR GAS
- 8. INSTRUMENTATION CHANNEL
- 9. SILICONE WASHER

Flexible Video Gastroscope and Colonoscope

It has 5.2 mm diameter with 2.2 mm instrumentation channel and working length of 60-100 CMS. It has a rotational head that moves the entire probe 180 degrees. The tip has 180-degree movement in both directions. Cost The cost is Rs.75,000 vs market cost of Rs.15 Lakhs.



Device for minimally invasive open surgery

It is a thee in one device with a retractor, a 5 mm video camera and 6 LEDs. It is designed for minimally invasive open surgery to compete with laparoscopic and robotic surgery. The device can do trans umbilical appendicectomy, trans umbilical pyloromyotomy, Tubal ligation, TOF surgery, VATS and minimally invasive open pyelolithotomy, pyeloplasty operations. The cost is Rs.30,000 and is worth Rs. 5 Lakhs.

USB Retrocam

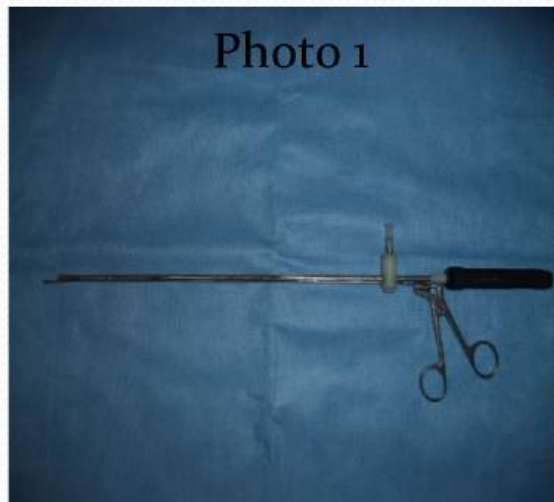
Video camera with LEDs mounted on a retractor



1. Video camera with LEDs
2. USB output
3. Analogue to Digital Converter

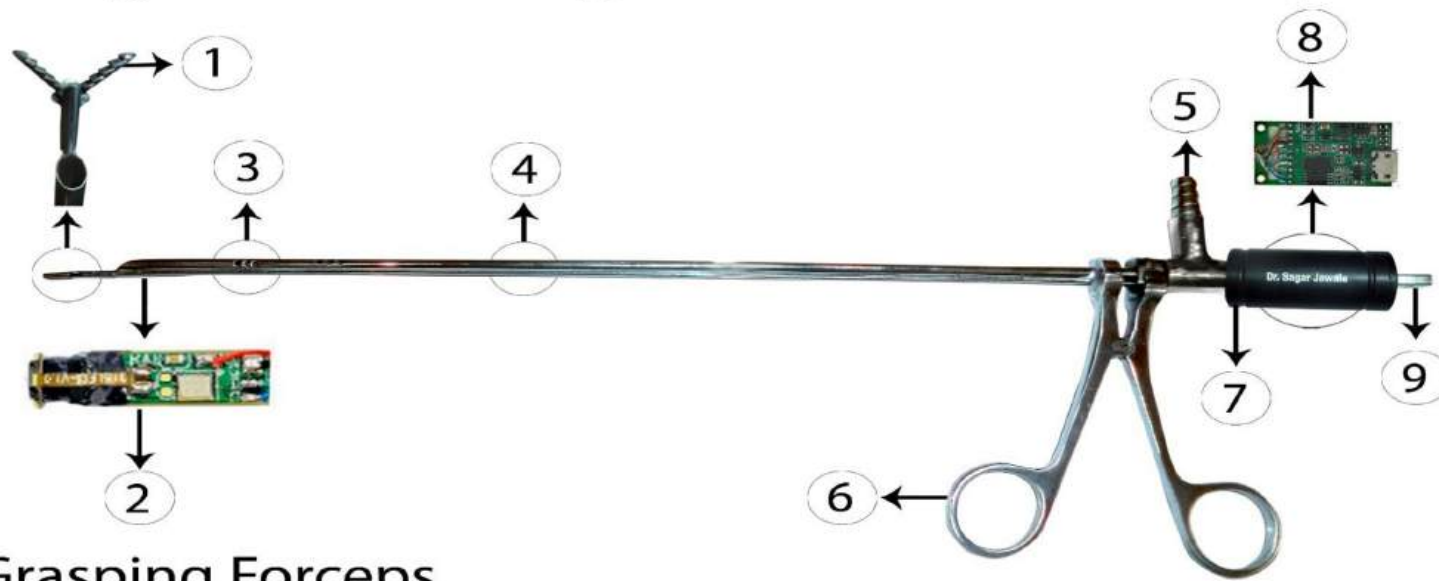
Rigid Video Bronchoscope with forceps

First of its kind in the world(photo1), a video camera is fitted at the tip of a rigid tube made up of surgical steel. The tube has holes on each side for ventilation during the procedure. A foreign body removing forceps is welded to the tube for removal of bronchial foreign bodies. A 3.5 mm video camera is fitted at the tip and there are no fiber optics and rod lenses, hence no image loss and it has excellent image quality(photo2). Outer diameter is 5 mm and working length is 50 cm. Sterilization is done by formalin chamber or ethylene oxide gas. Photo 3 are conventional rigid bronchoscopes. The cost is Rs.40,000 Rs. 5 Lakhs. It is published in International journal of Otolaryngology.



Commercialized Rigid Video bronchoscope with forceps

Rigid Ventilating Video Bronchoscope

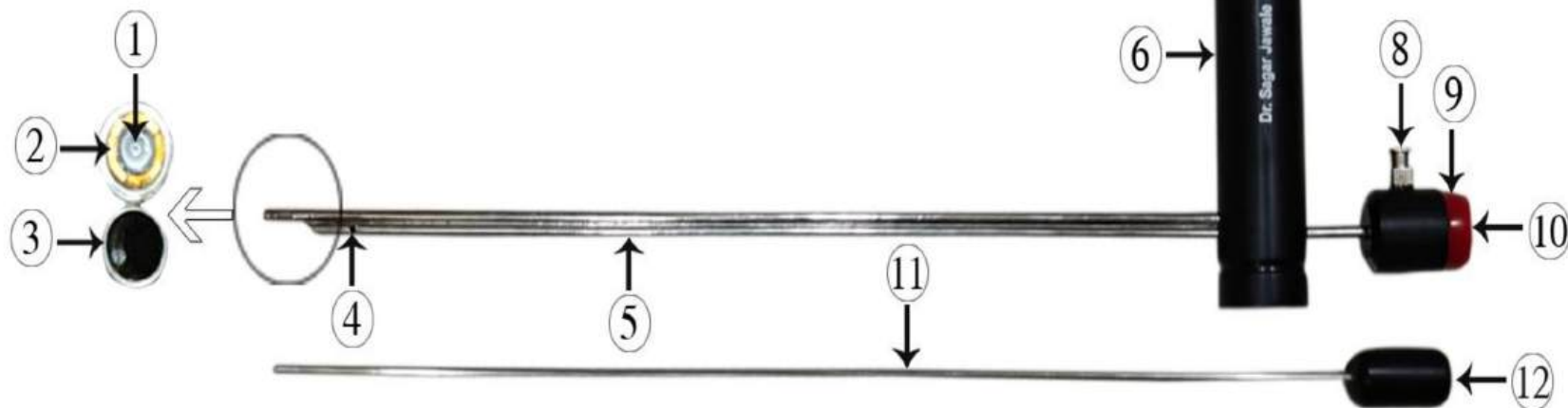


1. Grasping Forceps
2. Video Camera
3. Holes for ventilation
4. Stainless steel tube
5. Ventilating port

6. Handle
7. Handle of Delrin (Polyacetal)
8. Analogue to digital converter
9. USB male connector

Rigid Video Bronchoscope

Rigid video ventilating bronchoscope with stylet



1. Video Camera
2. LEDs
3. Instrumentation channel
4. Holes for ventilation
5. Ventilating channel
6. Holder
7. USB output
8. Port for ventilation
9. Washer
10. Instrumentation channel
11. Stylet
12. Stopper

Flexible Video Bronchoscope

5.2 mm outer diameter with 2.2 mm instrument channel and 38 cm working length, 180 degrees tip articulation.
Cost Rs.75,000.



T piece for flexible bronchoscopy



It is a connector that fits over the endo bronchial tube with a side channel for ventilation. It allows passage of a flexible bronchoscope through a straight channel for flexible bronchoscopy. Flexible bronchoscopes have a very small instrumentation channel, not enough for ventilation. It is done with sedation and while patient is actively breathing. It is very risky, particularly in children. This invention uses the endobronchial tube as a bronchoscopy sheath and makes flexible bronchoscopy with ventilation, making it very safe.

Rigid Video Neuroscope

Indicated in neuroendoscopy for hydrocephalus surgery, ventricular surgery etc.
The cost is Rs. 30,000 VS market cost of Rs. 7.5 Lakhs.

Rigid Video Neuroscope



- 1. Video camera with and LEDs
- 2. Stainless steel tube
- 3. Instrumental channel 1.2 mm ID
- 4. Instrumentation port

- 5. Delrin (Polyacetal) Handle
- 6. Male USB output port
- 7. Analogue to digital converter

Wireless Endoscopy

Wires of the laparoscope are disturbing to a surgeon. Wireless endoscope gives the surgeon freedom from the nuisance created by wires. By adding a small device at the end of all my previous usb endoscopes become wireless with 3 hour battery backup. The cost of this device is just Rs. 10,000.



Laparoscopic camera

Industrial CMOS usb camera (Photo1,2) of 5 MP video resolution, is used as a laparoscopic camera. It has 20 times the video resolution compared to a USD 5000-10,000 cameras (Photo3) in the market. The cost is Rs.30,000 VS Rs.3 Lakhs. It is published in Indian Journal of Rural Surgery.



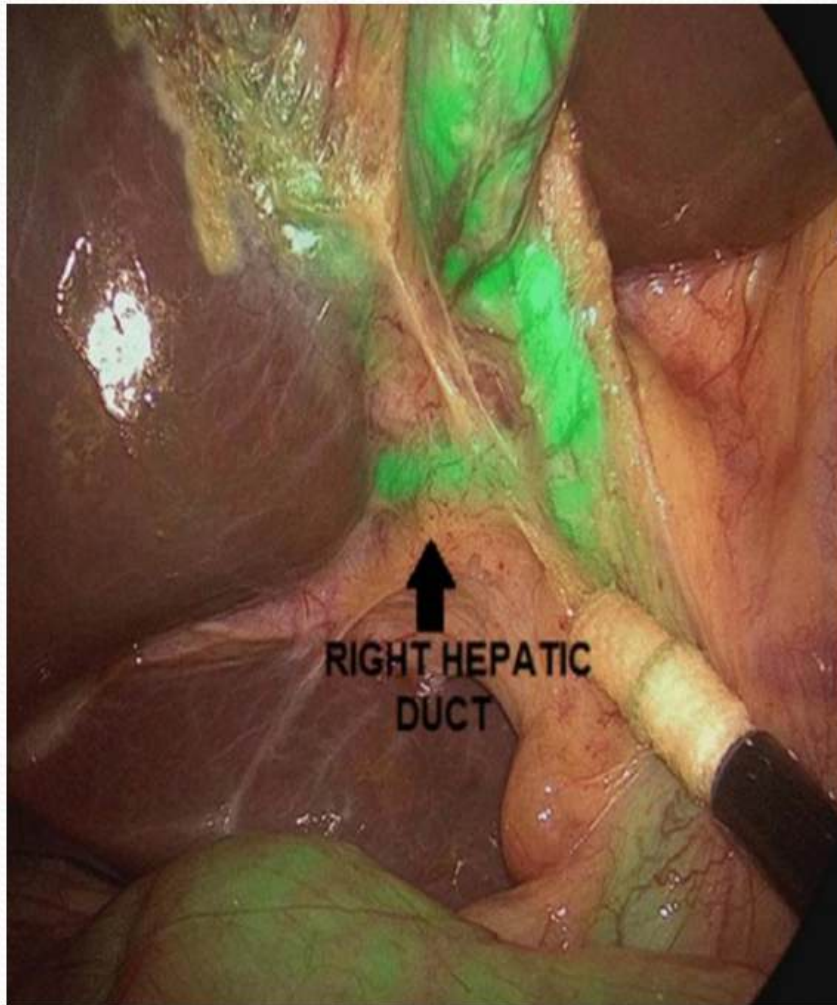
World's most Advanced Laparoscopic Camera 4K

It has 100 MP picture resolution and 4K (8MP) video resolution compared to 0.5 to 1 MP in the market. It comes with equally advanced adapter with zoom function which can get coupled to any scope from 1 mm to 10 mm diameter. It has on board 4K recording facility. The cost is Rs.50,000 vs estimated cost of Rs. 10-30 Lakhs.

Laparoscopic endo-camera Deluxe Model 4K (8MP)

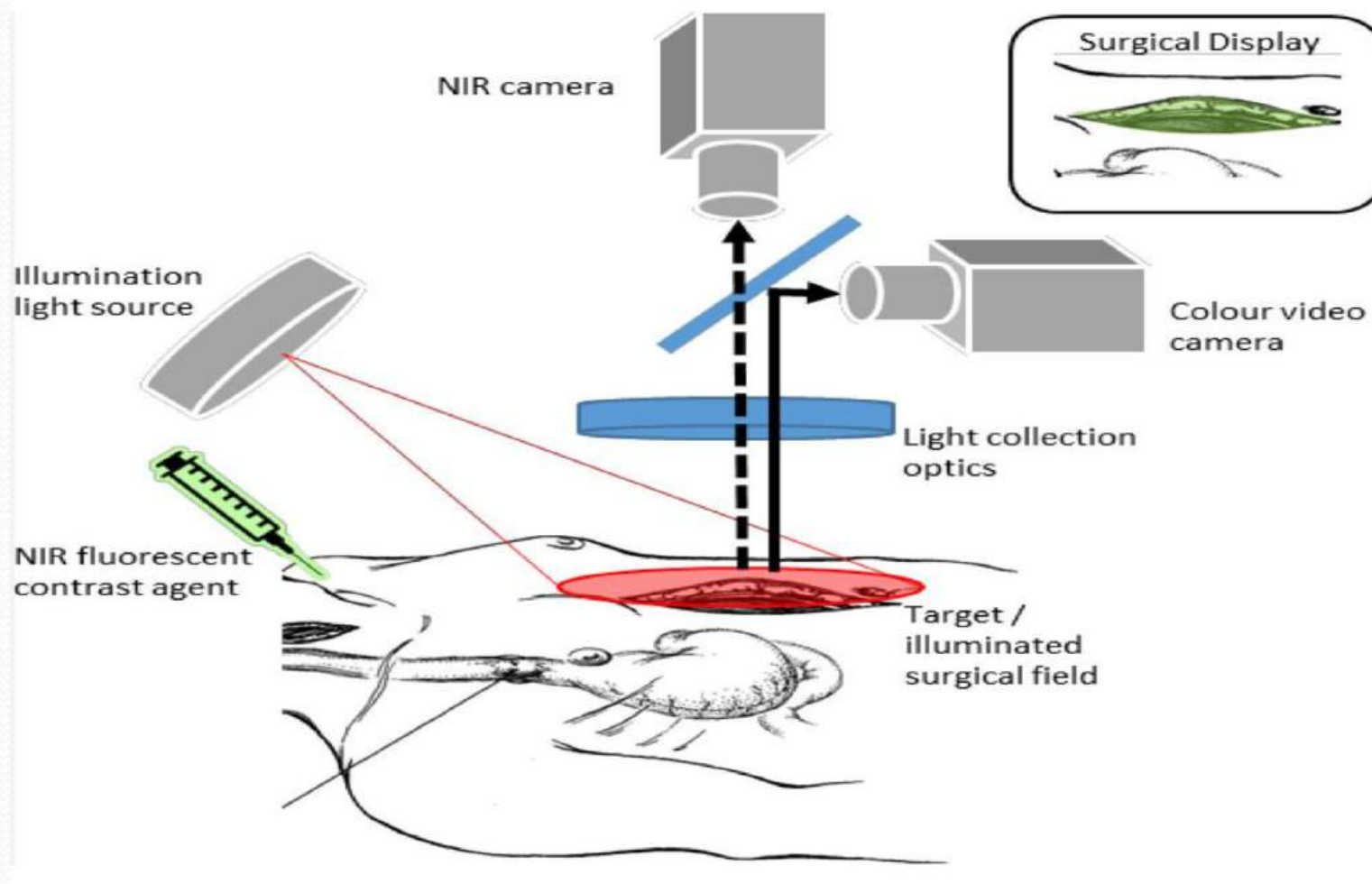


Indocyanine Green fluorescent laparoscopy (ICG)



ICG has applications in hepato Biliary surgery, urology, Onco surgery and gynecology. ICG is Injected IV and infra red light is illuminated Over it. ICG is illuminated by IR light which is captured by IR camera.

Stryker ICG camera



Infra-red video laparoscope



- 1.Video camera 2. White LEDs 3.Infra-red camera 4.Infra-red LEDs
5.Stainless steel tube 6. Holder 7. USB output of colour camera 8. USB
output of infra-red camera

My device gives simultaneous side by side images by a double USB output through Split Cam software. The chip on tip technology and simultaneous side by side vision and 100 times cheaper cost makes it far superior than the peers. It is getting commercialized for Rs.50,000 instead of Rs.50 Lakh cost of the peers.

3-D Laparoscopy

In laparoscopy, the 3D picture becomes 2D and the sense of depth and perception is lost making laparoscopy very difficult and prone to mistakes by the surgeon. To eliminate those problems 3 D laparoscopy system was developed by converting 2d images to 3d by an advanced computer processor(photo1) in real time. It is a real 3d system of side-by-side type(photo2) where the picture resolution remains constant. Each eye sees separate image when watched through stereoscopic goggles(photo3) creating 3 D image inside brain. The system was developed in The cost is Rs.50,000 VS market cost of Rs.30 Lakhs.



Photo1



Photo 2



Photo 3

VR Headset for 3-D Laparoscopy

Watching the TV screen constantly during laparoscopy by the surgeon and assistant becomes difficult and inconvenient. To solve this problem the VR Headsets(photo1) were used. Your own smartphone can be put into it and the picture in the TV is accessed by the smartphone in a wireless manner by screen mirroring technology(photo2). Alternatively, it can also be done by creating a wireless network by a cloud router in the operation theatre. The VR software in phone converts video into a 3D video in real time. The cost is Rs.7,500 vs market cost of Rs.10 Lakhs.



Photo 1



Photo 2

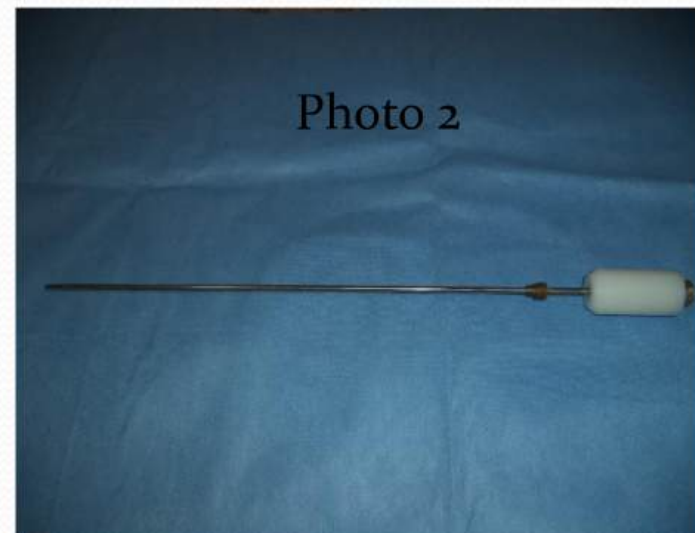
Video Magnifying Loops

First of its kind in the world. A usb video camera is coupled to a VR set to make 3D video magnifying loops(photo1,3). It shows a 3D video image of operative view in the VR set on your smartphone. Magnification is from 50-500 X. Its video can be enhanced by a number of apps available on play store. The cost is Rs.7,500 vs market cost of Rs.7.5 Lakhs.



Rigid Video Cystoscope

First device of its kind in the world(photo2). 3.5 mm camera with 2 leds were fitted at the tip of 4 mm stainless steel tube and the output was converted by an analogue to digital converter and given to the computer. Since there is no image loss the image quality is much superior to the rod lenses. Urologists have to bend down(photo1) for endo urological procedures putting them at risk for arthritis of neck joint. This product is going to solve that problem. The cost is Rs.40,000 vs market cost of Rs. 5 Lakhs.



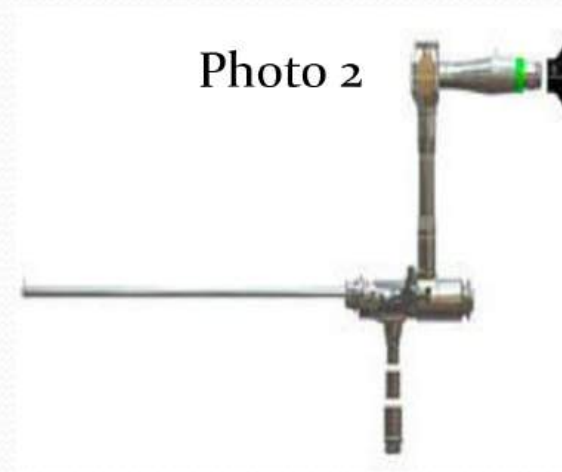
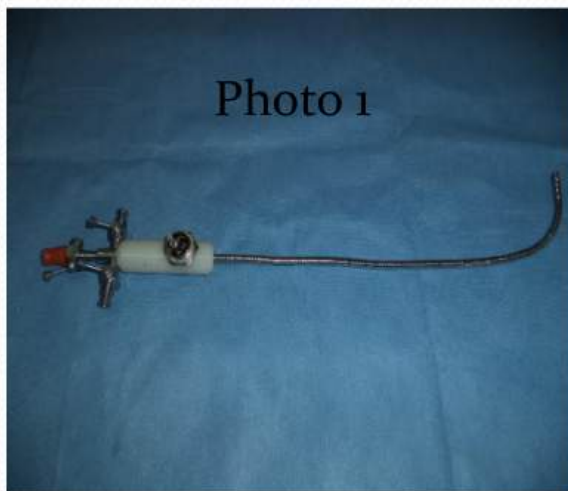
Telescope of Cystoscope



1. Video camera
2. LEDs
3. 316 grade SS tube
4. Notch
5. Wings
6. Handle
7. Male USB pin

Semi Flexible Thin Video Nephroscope

First device of its kind in the world(photo1). 5 mm in diameter and a 1.5 mm working channel with video camera fitted at the tip. The articulating channel accommodates 1 mm optical fiber for laser lithotripsy. It can be used for PCNL as well as for renal pelvic access lithotripsy due to its flexible nature. Photo 2 is the conventional rigid nephroscope with 10 mm diameter. The cost is Rs.40,000 and is worth Rs. 10 Lakhs.



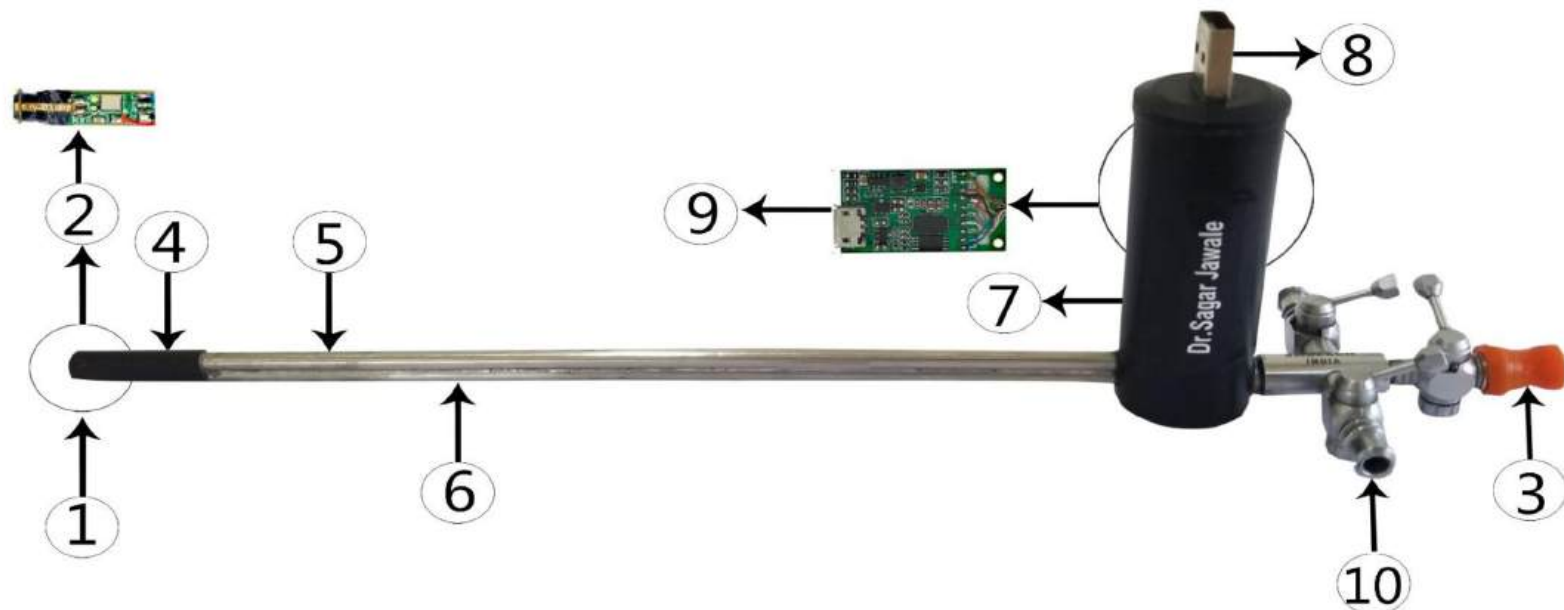
Rigid Video Cystoscope (24F)

The instrument is a three in one device in which the telescope, the light source and endo camera are in built. It has vertical diameter of 8 mm and transverse diameter of 5 mm. It has two stainless steel tubes welded to each other one below the other. The outer diameter of upper tube is 4.5 mm and inner diameter is 4 mm. To the back side of this tube, a three female stop cocks with luer locks are attached. The lower stainless-steel tube has outer diameter of 3.5 mm and inner diameter of 3 mm. This is a 10 F single straight channel for instrumentation. The side female stop cocks' channels are used for irrigation of fluid and the central channel is for instrumentation. The tip of the instrument is coated with 0.5 mm thick polylecithin plastic tube of one-inch length. It makes the tip of the instrument blunt and non-traumatic.

To the tip of the upper tube a video camera of 4 mm diameter with 4 white light LEDs are attached. The 10 wires of this camera pass through this tube and come out in the vertical black bar attached in front of the stop cocks. This vertical cylindrical bar contains a circuit, an analogue to digital converter which converts the analogue video signal from the camera into digital USB signal. The USB output is received at the male USB connector attached at the top of the cylinder. This cylindrical hub is made up of heat resistant and bio compatible plastic called Delrin-polyacetal. The cost is Rs.40,000 vs market cost of Rs. 5 Lakhs.

Continued

Rigid video cystoscope(24F)

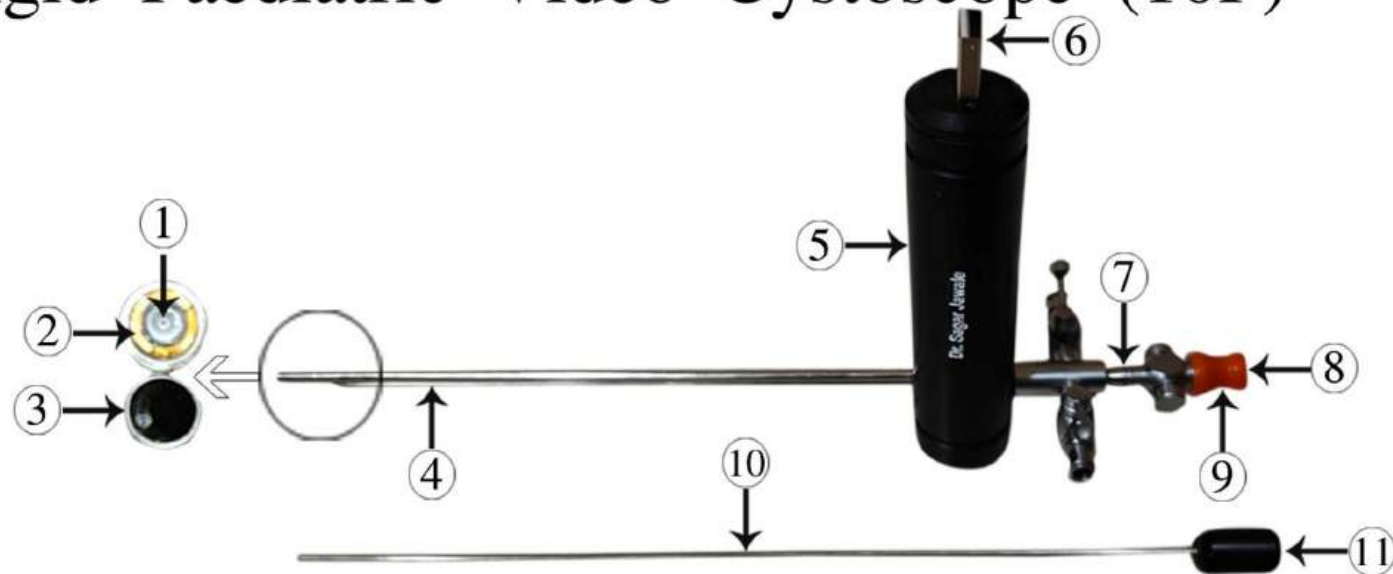


- 1. Tip of cystoscope
- 2. Video camera with 4 LEDs
- 3. Instrumentation channel(10F)
- 4. Polylecithin sheath
- 5. Upper stainless-steel Tube (OD:4.5 mm, ID:4 mm)

- 6. Lower stainless-steel Tube (OD:3.5 mm, ID:3 mm)
- 7. Cylinder of Polyacetal (Delrin)
- 8. USB male connector
- 9. Analogue to digital converter
- 10. Female stop cocks with luer locks

Pediatric Cystoscope

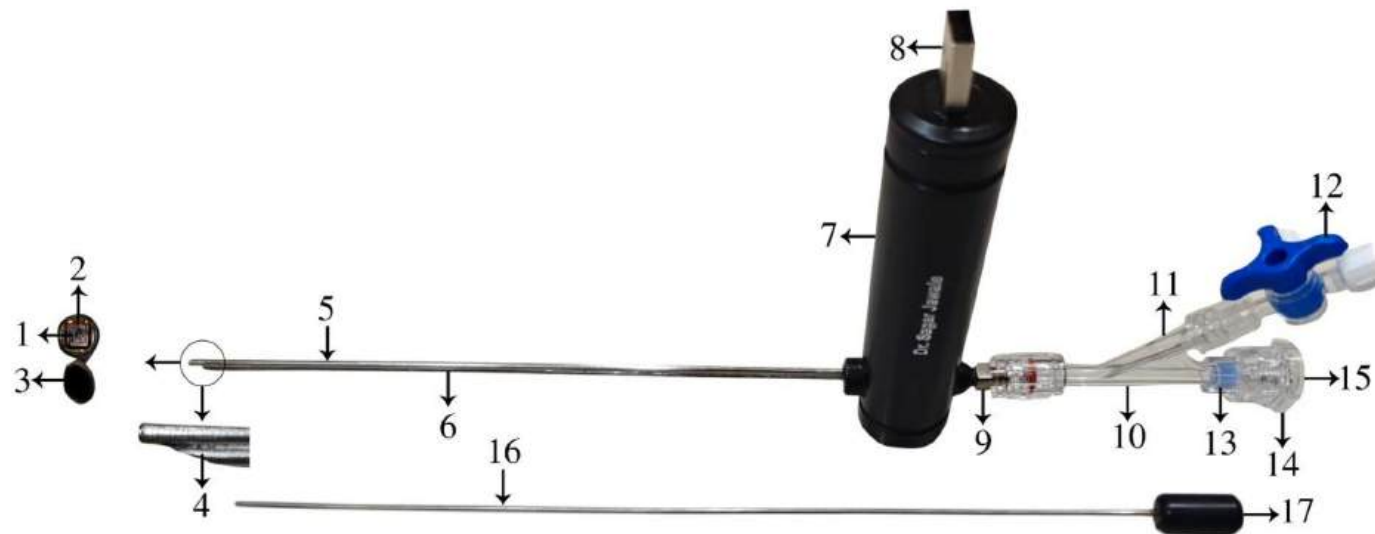
Rigid Paediatric Video Cystoscope (10F)



- 1.Video Camera 2. LEDs 3. Instrumentation channel
4.Instrumentation channel 5. Holder 6. USB output
7.3-ways stop cock 8. Port for instrumentation
9.Damru washer 10.Stylet 11.Stopper

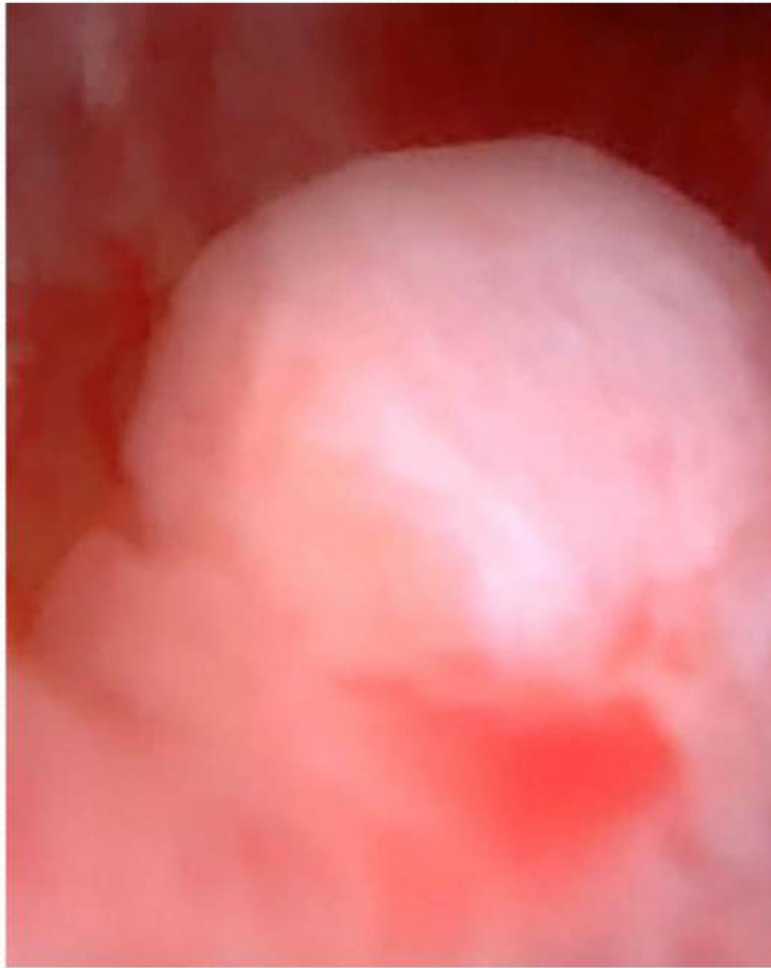
Neonatal Video Cystoscope (7.5)

Rigid Video Cystoscope (7.5F)



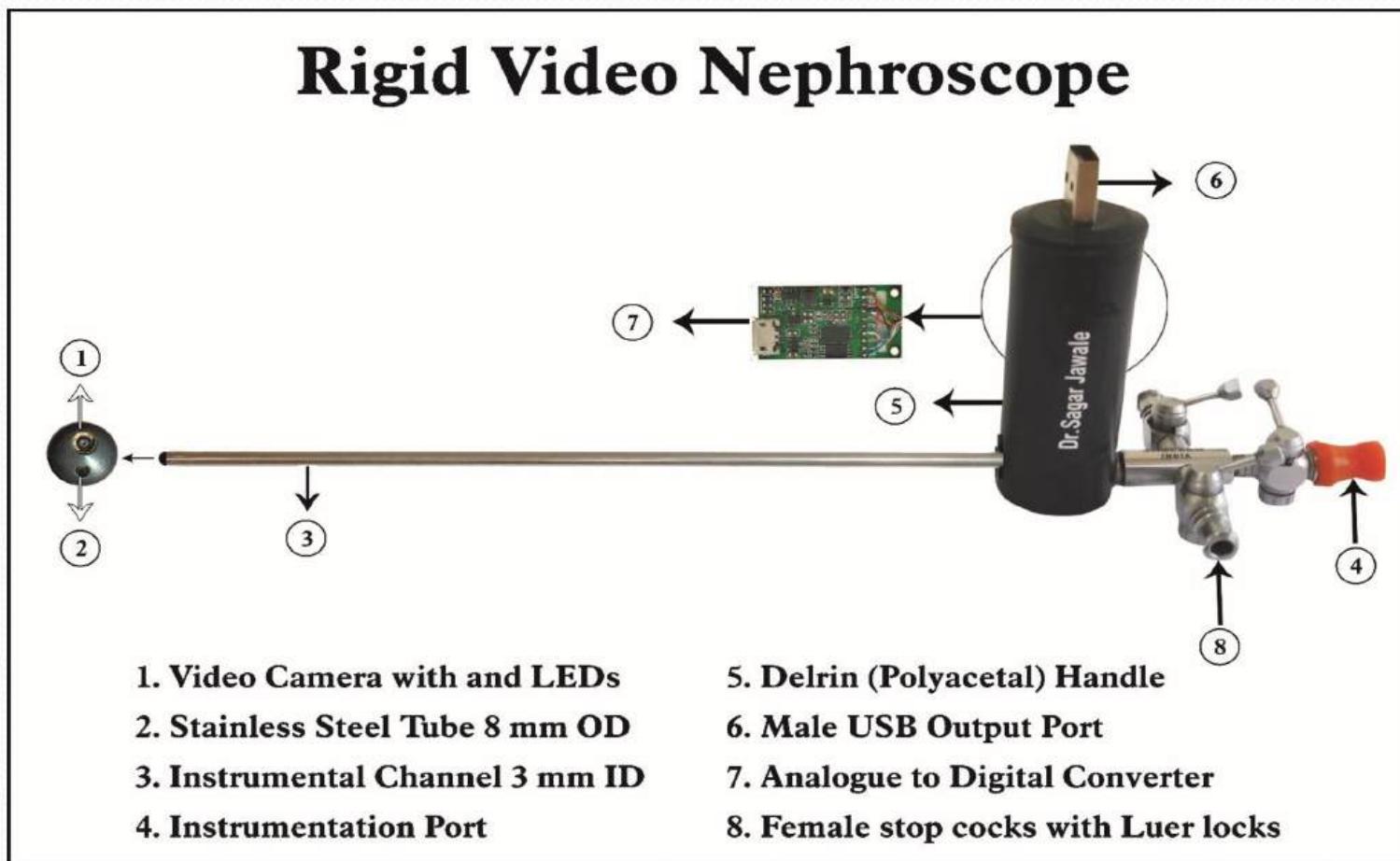
- 1.Video camera
2. LED
3. Instrument channel (front view)
4. Magnified Tip
5. Camera channel
6. Instrument channel
7. Cylindrical holder
8. USB pin
9. Female Luer lock
- 10.Disposable PTCA Y connector
11. Side channel for irrigation
12. Disposable Bi valve
- 13.Iris aperture
14. Knob to control iris mechanism
15. Hole for instrumentation
- 16 Stylet
17. Knob of Stylet

Picture quality



Rigid Video Nephroscope

Used for nephoscopy, nephrolithotomy etc. The cost is Rs. 50,000 vs market cost of Rs. 7.5 Lakhs.



Rigid Video Nephroscope

15 F diameter, 8.5 f instrument channel. Used for nephroscopy, nephrolithotomy etc. The cost is Rs. 50,000 vs market cost of Rs. 7.5 Lakhs.

Rigid Video Nephroscope (15F)



- 1.Video camera
2. LED
3. Instrument channel (front view)
4. Camera channel
5. Instrument channel
6. Cylindrical holder
7. USB pin
8. Female Luer lock
- 9.Disposable PTCA Y connector
10. Side channel for irrigation
11. Disposable Bi valve
- 12.Iris aperture
13. Knob to control iris mechanism
14. Hole for instrumentation

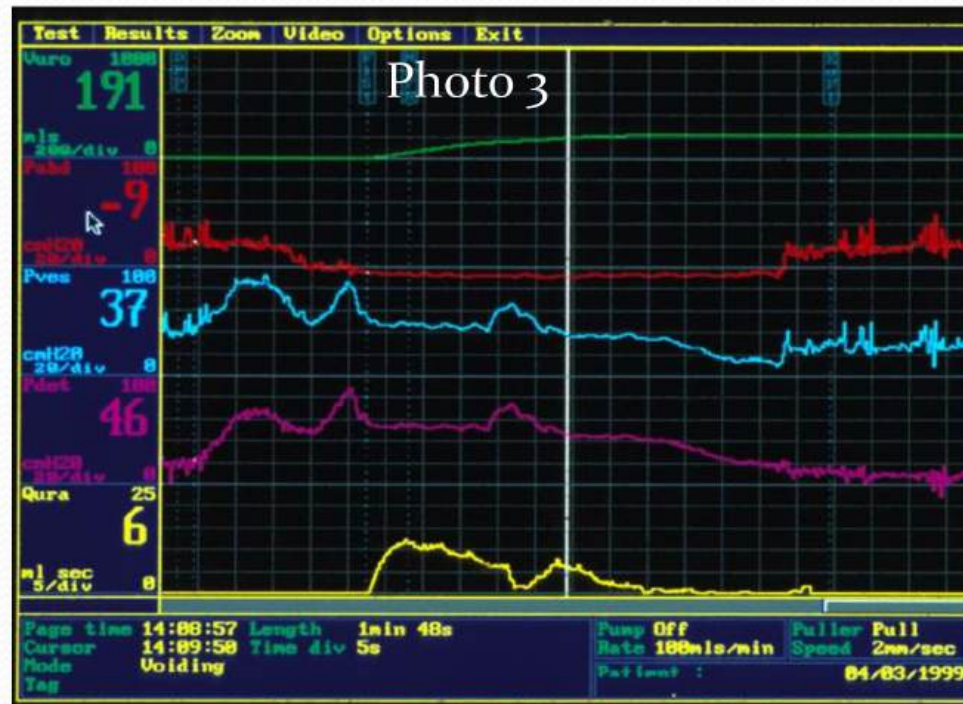
Flexible video ureteroscope with articulating tip



2.8 mm outer diameter with 1.2 mm instrument channel and a 210-degree tip deflection. It can be used as a cystourethroscope, nephroscope, ureteroscope, Bronchoscope, Esophago-gastroscope choledochoscope etc. It is reusable. Cost Rs.75,000.

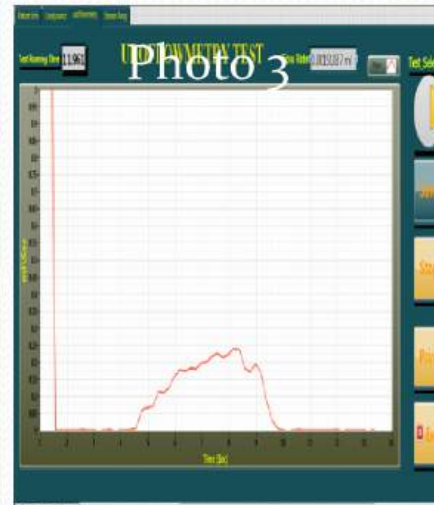
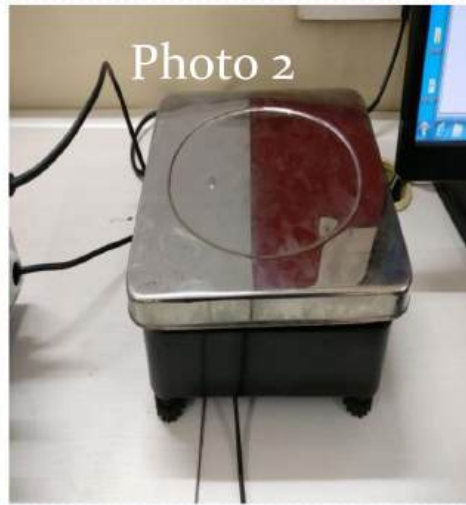
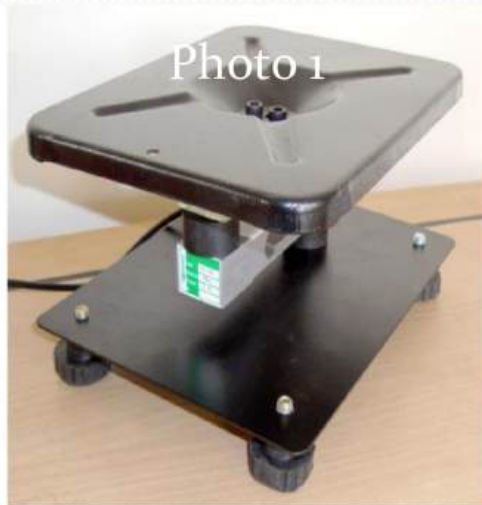
Urodynamics machine

The output of urodynamic catheter is given to multichannel digital pressure transducers(Photo1) and through a data acquisition device (Photo2) it is given to a computer. The software(Photo4) was developed under Lab view software. The machine(Photo3) is made in just The cost is Rs.50,000 vs commercially available machine(Photo4) costing Rs.30 Lakhs.



Uroflowmetry Machine

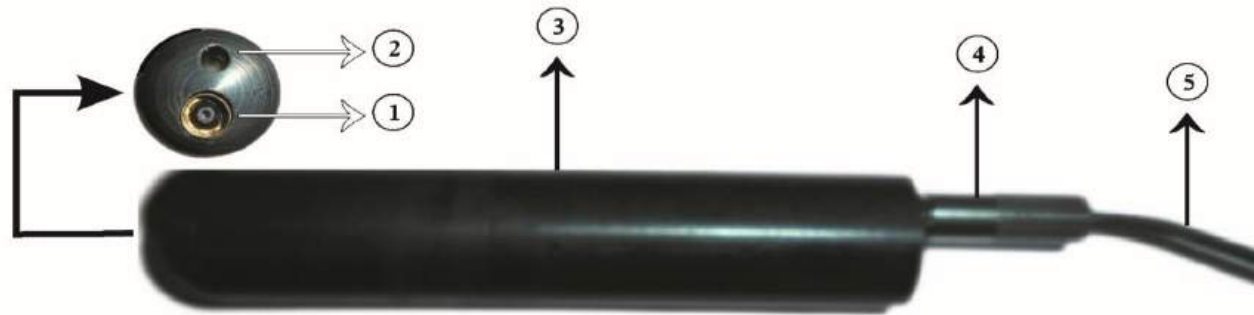
The output of a load cell(Photo1) is given to a computer. Software(Photo3) was developed by Lab view software. The machine(Photo2) is made in just for Rs.30,000 vs market cost of Rs.1.5 Lakhs. (Photo4)



Intravaginal Video Colposcope

Used for Colposcopy, to examine Cervix of Uterus. The cost is Rs. 40,000 vs market cost of Rs. 10 Lakhs.

Intravaginal Video Colposcope



- 1. Video camera with microscope and LEDs
- 2. Delrin (Polyacetal) rod
- 3. Instrumental channel

- 4. Focus ring
- 5. Wire with USB output

Rigid Video Hysteroscope

It has a diameter of 5.5 mm with 1.2 mm instrumentation channel. Used for examination of Uterine cavity. The cost is Rs. 30,000 vs market cost of Rs. 10 Lakhs.

Rigid Video Hysteroscope

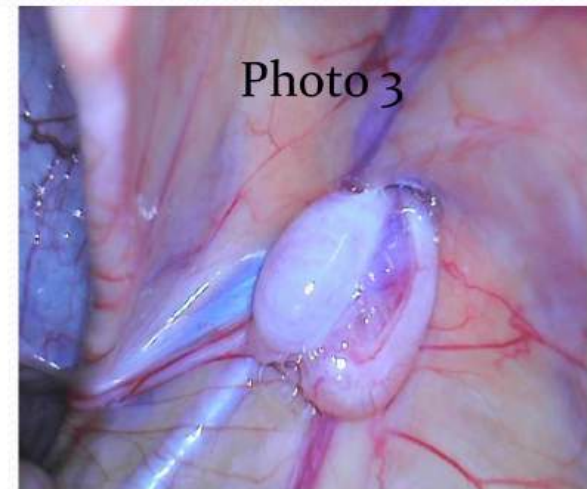
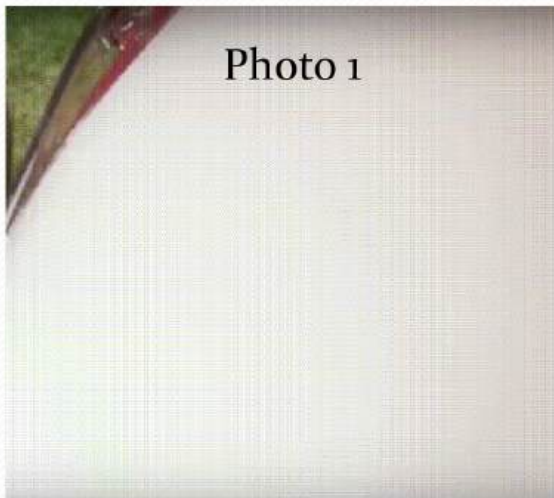


- 1.Video camera with and LEDs
- 2.Stainless steel tube
- 3.Instrumental channel 1.2 mm ID
- 4.Instrumentation port With Luer Lock

- 5. Delrin (Polyacetal) Handle
- 6. Male USB output port
- 7. Analogue to digital converter

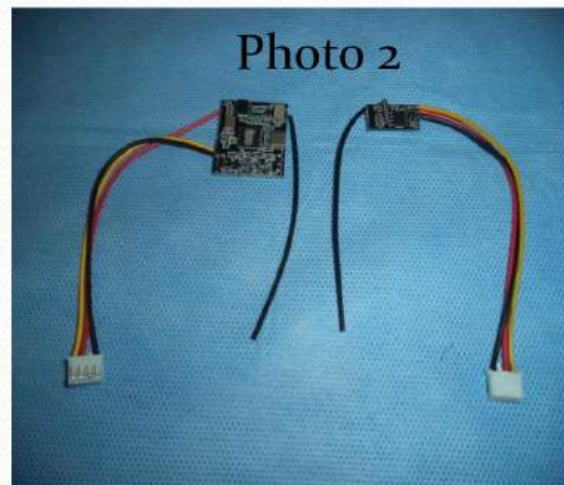
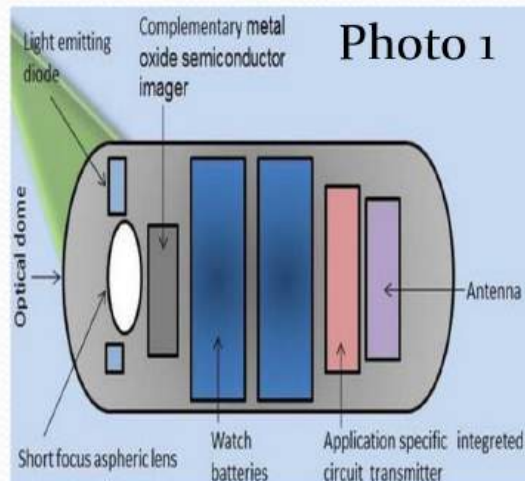
Hydrophobic Nano Silicon Coating

A hydrophobic nano silicon coating (photo2) when applied to any surface repels water and dirt and keeps the surface clean.(photo1) I brought this coating to pediatric surgery by coating the tip of bronchoscopes, laparoscopes, GI endoscopes etc. The blood and tissues do not stick to the surface of endoscopes and vision remains clean through out the procedure.



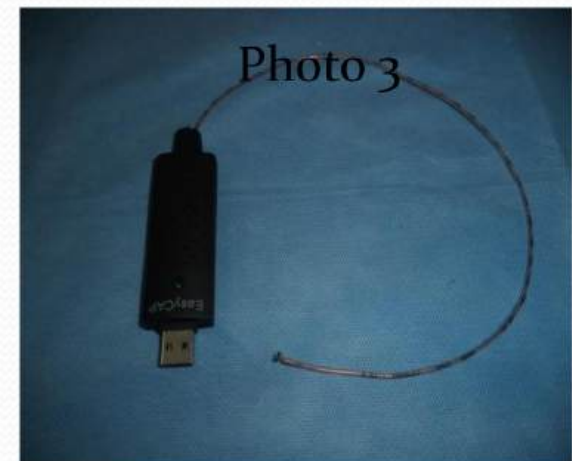
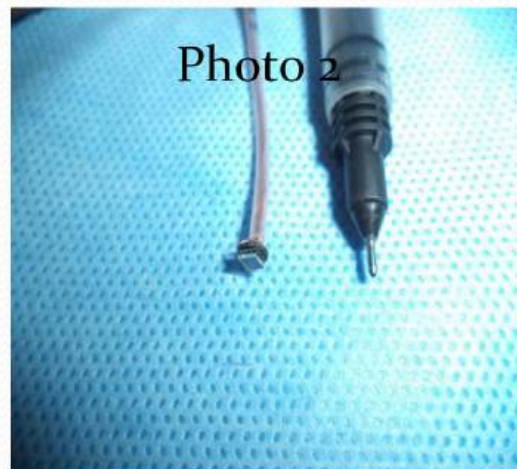
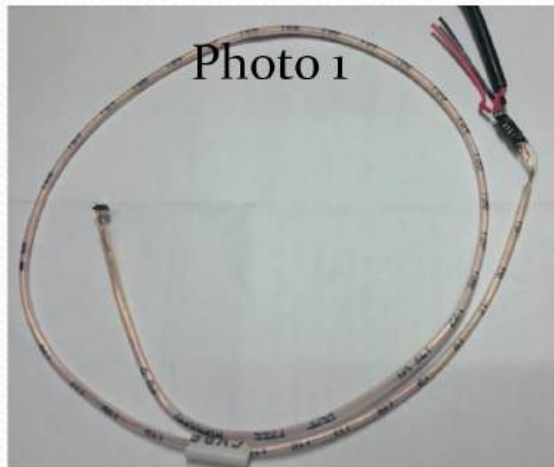
Capsule Endoscopy Device

A 5 mm camera module with 2 leds at the tip is used(photo1). It is powered by four batteries used in watches. The camera is put in a tube of stainless steel of surgical grade. The camera is placed to the side of the tube instead of the center as in the devices available commercially. On both ends of the device the stain less steel tube is sealed by plastic caps. The output of the camera is given to a RF video transmitter(photo2) with antenna for wireless transmission of video signal out of the body. A wireless RF receiver(photo2) receives the video images outside the body and connects to a computer where the images are recorded. The dimensions of the capsule are 10 mm diameter and 30 mm length. The cost is Rs.10,000 vs market cost of Rs. 3 Lakhs. Photo 1 is the schematic diagram of the device.



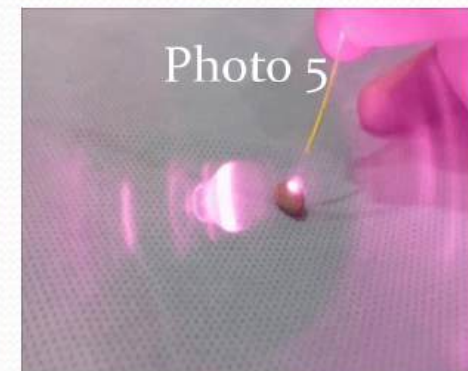
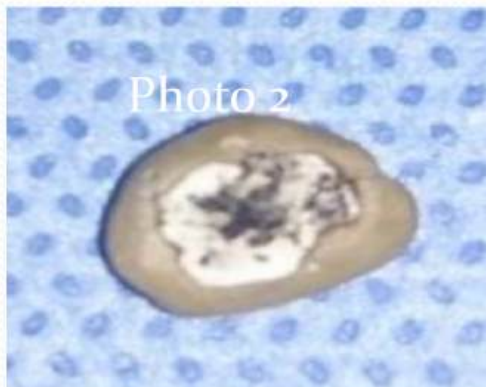
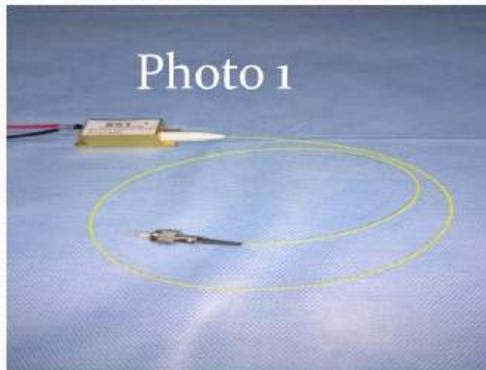
World's smallest Video Camera

It is made up of 1.2 mm CMOS sensor(photo2) which is smallest available in the world market. I took a video camera from the market and disconnected its CMOS sensor and connected it back to its small motherboard by 8,0.1 mm copper wires(photo1). The mother board was connected to an analogue to digital converter(photo3) which can be directly connected to a computer or a mobile phone. This camera has a potential to be used in devices such as a ureterscope, nephroscope, cystoscopes and variety of medical endoscopes. Rod lenses and fiber optics will get outdated with its use in course of time. The cost is Rs.15,000 vs market cost of Rs. 3 Lakhs.



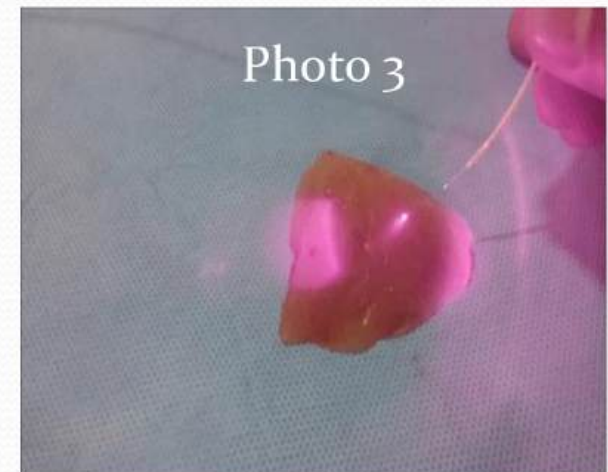
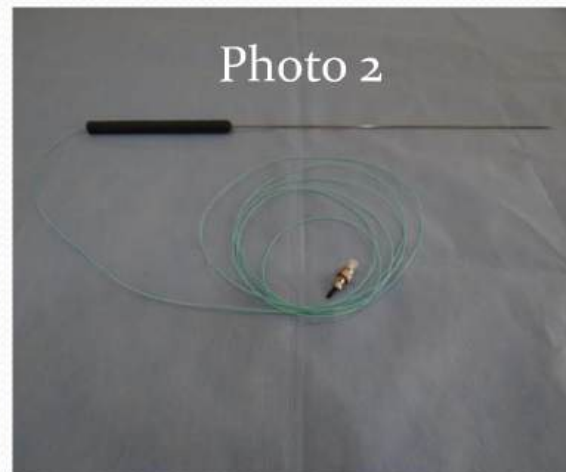
Laser lithotripter

Made by coupling a 0.1 mm optical fiber to a 20-watt 950 nm ND YAG diode laser(Photo1). The one mm optical fiber jacket can pass through working channel of rigid as well as flexible endoscopes breaking bladder, ureteric and kidney stones(Photo2,5). The machine(Photo3,4) is made in just The cost is Rs.30,000 vs market cost of Rs. 40 Lakhs. laser system in the market. Patent is applied at Mumbai office for this invention and it is brought here for a demonstration.



Laser Cautery

The same 20-watt 950 nm ND YAG diode laser machine can be used as a cautery machine by adding a laser guide(Photo1) to the optical fiber. It can be used as an endo cautery in laparoscopy(Photo2) by adding a long laser guide, both are shown in photos below. This cautery is far more versatile and superior to the electro cautery. Carbon does not form at the tip which needs to be cleaned periodically as in electro cautery. Laser cautery is far more precise and damage to surrounding tissues is negligible as compared to electro cautery. Both the laser guides are brought here for a demonstration.



Laser Tissue Welding

Laser tissue welding is a novel technique where 20 % human albumin is put into a wound and 5-Watt Infrared laser of 850 nm is applied over it. At 60-degree centigrade temperature it leads to a formation of a watertight bond of proteins over the tissues by the photo polymerization effect of laser and gives about two weeks of healing in just two minutes. A costly USD 5,000 machine(photo1,2,3) is used for the purpose which is also not commercially available. I made a hand-held laser gun of same specifications in just Rs. 7,500 and successfully achieved the same result. Tissues such as spleen, liver, pancreas, brain and kidneys where sutures do not hold well are indications for this technique. A patent is registered for this invention in Mumbai office and it is brought here for a demonstration.



Gluteraldehyde Albumin glue Induced Laser Tissue Welding

0.9 ml 40 % human albumin is taken in 1 ml syringe and mixed with 0.1 ml of 10 % glutaraldehyde solution. The syringe is shaken vigorously to mix both the components. Infrared Laser of 5 watts power and 850 nm illuminated over this bond for 60 seconds to polymerize it. It forms a watertight strong bond over the tissues. The technique has vast applications in surgery such as for sealing post-operative wounds, CLW closure, reinforcement of suture line of bowel anastomosis, Bowel perforation, sealing dura repair, hypospadias surgery, urological operations etc. Cost Rs. 50 vs Rs. 40,000.



Frenotomy Operation by Methylene blue Dye enhanced Laser Tissue Cutting

The new technique is reported for the first time in the medical literature. Cheap infra-red Lasers do not act on tissues which are of the same color and in fact reflected. To solve this problem, I infiltrated tissues with opposite color Methylene blue which is already FDA approved for use in human body. Infrared lasers now act only on blue infiltrated areas and saving surrounding tissues of any collateral damage. Because of the Methylene blue dye, a cheap infrared laser Rs. 30,000 can be used for this purpose. Otherwise, a high frequency 2000 nm and high wattage (40 Watt) laser has to be used which is extremely costly Rs.40 Lakhs and is not affordable to most surgeons. The only disadvantage of laser against electrocautery was cost which is eliminated in this technique. The technique also becomes a foundation as a learning experience for its wider application in other areas of surgery such as Photocoagulation in liver surgery, renal surgery, brain surgery, on pancreas etc.



Infrared Light Device for Infra-Red-Light Therapy

The device emits infrared light of 950 nm. wavelength and 100-Watt power, which is proved to stimulate local body stem cells and regenerate them. A successful trial is taken on allergic bronchitis. A possibility has now emerged that organs like kidney, liver and heart, thyroid may be regenerated with infrared light alone. Cost Rs. 10,000.

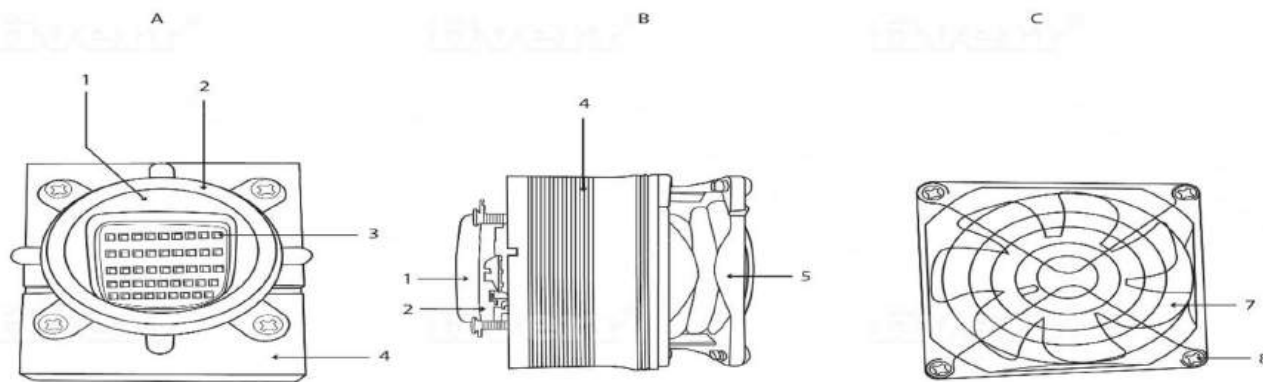


Figure 1 (A, B and C)

Non- Invasive Vagal Stimulation Device

The device is a cheap (USD 150) and non-invasive alternative to the costly Vagal stimulation device(Rs. 2.5 Lakhs). Through the ECG electrodes an electrical impulse of 50-100 cycles/Sec is given to left Vegas by the device. Although the device is originally developed for the treatment of epilepsy and depression, I propose it for constipation as Vegas is secretomotor to the bowel. Vagal inhibition can be done to treat acid peptic disorders. Cost Rs.10,000.



Transcranial Magnetic Stimulation Device(TMS)

Instead of using figure of 8 type butterfly coil, I have used electromagnet(photo1) with solid iron core. The iron core increases the magnetic field thousands of times and leads to diffuse stimulation of brain tissue(photo2). The magnet has a plastic holder for holding to variety of places on the brain. The power supply of the magnet is a 24 Volts AC power Supply with variable frequency from 0-99 Hz achieved by a PWM generator. By placing the magnet on various places of the brain and giving variable frequency of the current, a variety of effects can be produced on the brain. By giving a frequency of 50 hz the brain tissue can be stimulated and by giving 5 hz frequency the brain tissue can be inhibited. The cost is Rs.30,000 vs market cost of Rs. 40 Lakhs (photo3).



Photo 1

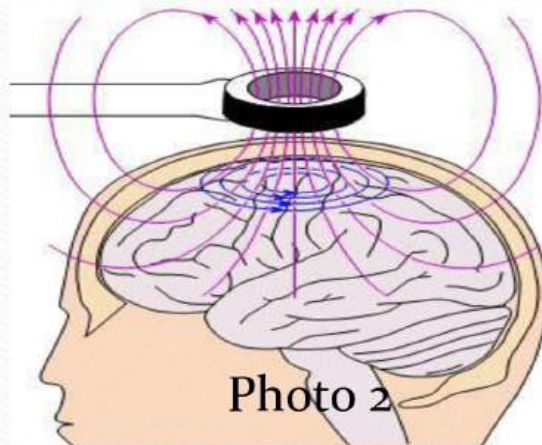


Photo 2



Photo 3

Transcranial Magnetic Stimulation of brain by a Permanent Magnet Therapy (TMS-PM)

By rubbing a permanent Neodymium magnet of 500 gauss power over the brain, electrical impulses are produced which are same as TMS. The therapy can be used for brain stimulation in a variety of neurological conditions. It is given to the patient to be used at home. The magnet cost only Rs.10,000 compared to Rs. 40 Lakhs. for the TMS device.



Transcranial electrical stimulation of brain (tES)



It involves stimulating various parts of the brain by electrical current passed through carbon electrodes. The therapy has a unique ability to synchronise both brain hemispheres which is not possible with any other therapy like TMS. The device only costs Rs. 20,000. tDCS therapy is useful for Autism, Cerebral Palsy, ADHD, Autism, Speech disorder, stroke, senile dementia and even spinal cord disorders. It can also be used to increase intelligence of normal children by brain stimulation.

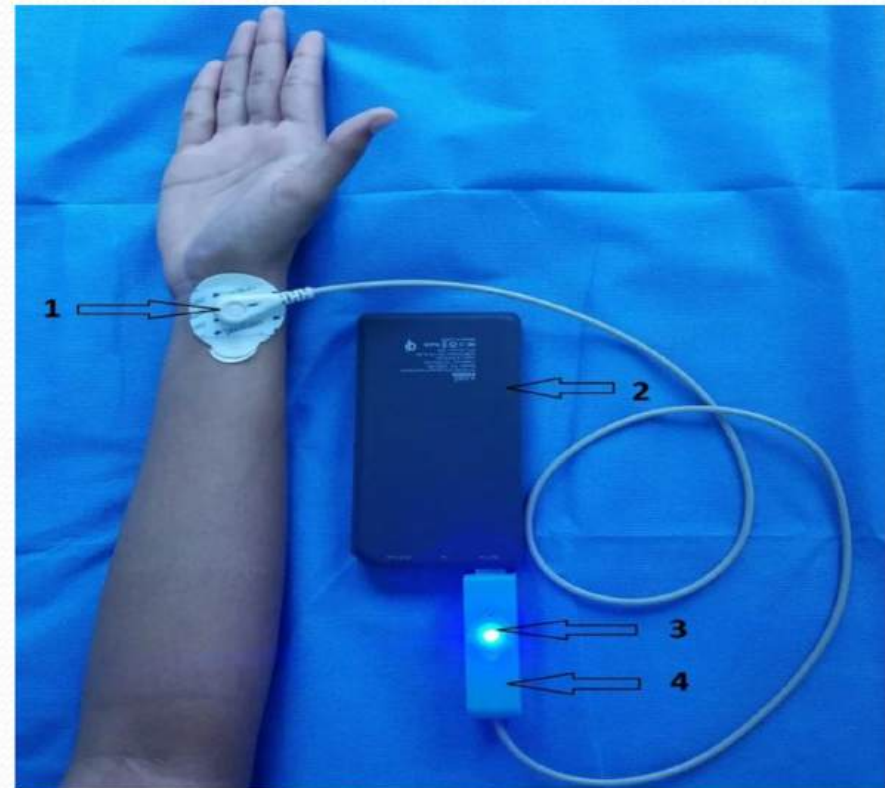
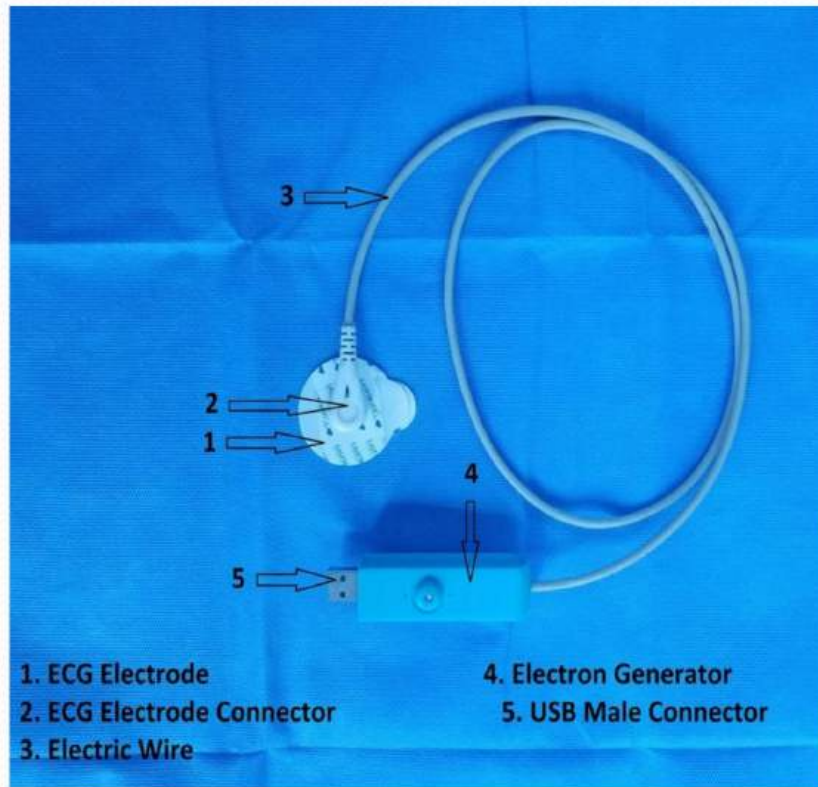
Transcranial Ultrasound stimulation of brain (TUS)



TUS stimulates the brain with 1 Megahertz frequency and 1 watt/square cm power. It has Potential same as TMS at a fraction of the cost of Rs.25,000 vs Rs.50 lakhs. It can treat a variety of neurological conditions. The depth of penetration is 5 cm. It can be given to patient for use at home, impossible for other modalities such as TMS.

Electroacupuncture Device

It passes tiny number of electrical impulses into acupuncture spots via disposable ECG electrodes treating almost all diseases. Cost Rs.10,000. CDSCO approved. More info <http://www.electroacupuncture.com>



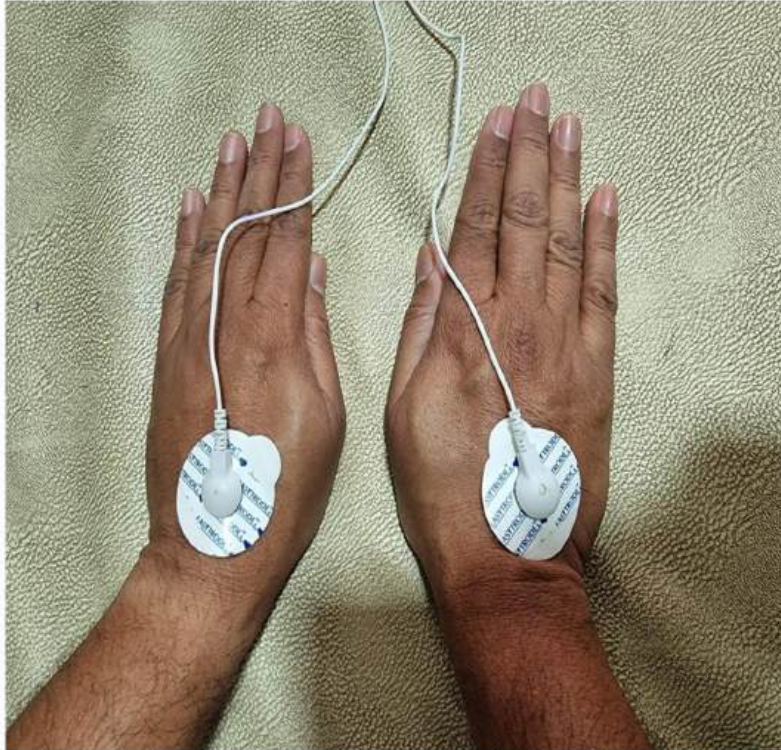
Transcutaneous electrical stimulation of nerve (TENS)

Drug free treatment of pain in which electrical impulses passed through nerves to repair it. Cost Rs.10,000



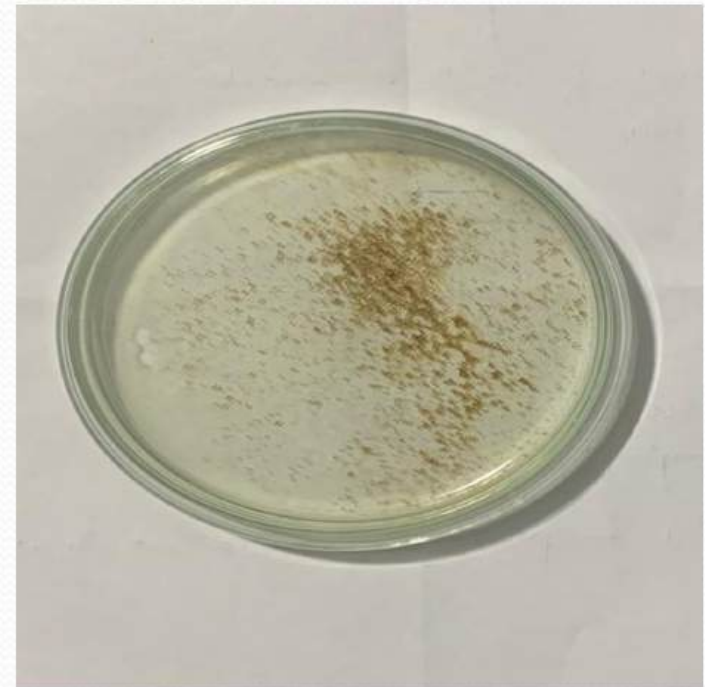
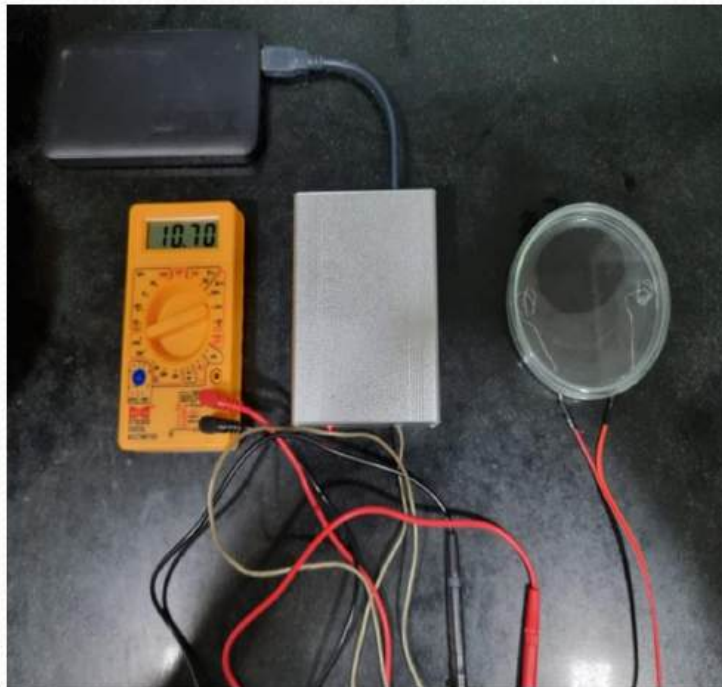
Microbes Electricidal Therapy- MECT

In MECT, tiny amount of AC current with 4000 Hz frequency is passed through disposable ECG electrodes placed over peripheral veins. The blood and tissues are highly conductive to electricity due to 0.9 MG/dl NACL content. ECG electrodes reduce skin resistance from 1,00,000 OHM to just 100 OHM, thus significant electricity can flow through the body. Cost Rs.25,000.



A device to kill micro-organisms with electricity in Vivo

In a Petri dish, in 0.9 gms/dl NACL solution, fresh colony of Klebsiella organisms were inoculated. AC current of just 3 volts and 4000 Hz frequency was passed through the solution for 30 minutes with 2 stainless steel electrodes, placed 3 cm apart. The current passing through the solution was 0.1 milliamp. Then, a sample is taken from the petri dish and was put to culture. The culture had no growth at the end of 48 hours.



Tumor treating fields (TTEs)

Cancer cells when exposed to an electrical field of 1 Volt per cm, when they divide, the distribution of genetic material is uneven, thus killing them. A US FDA approved therapy for brain tumors. I created a device for Rs. 25,000 vs Rs.5 crore. I propose it for a trial on all cancers. I propose to pass electricity through Jugular veins instead of skull bones.



tDCS Device

The Black colored Carbon electrodes of the size of 2 by 1 inch are attached from inside of the thermocol helmet(photo2). The electrodes are covered by sponges which are soaked with NaCl solution before use. The electrodes are detachable and can be placed anywhere inside the helmet. The electrodes are connected to a DC power supply of 3-9 volts and one ampere eliminator(photo1). The maximum current that flows through electrodes is less than 2 Milliampere. The Themocol helmet is worn by the person who wants to take tDCS. The cost of making was Rs.5000 vs Rs. 75,000 in the market.



Photo 1

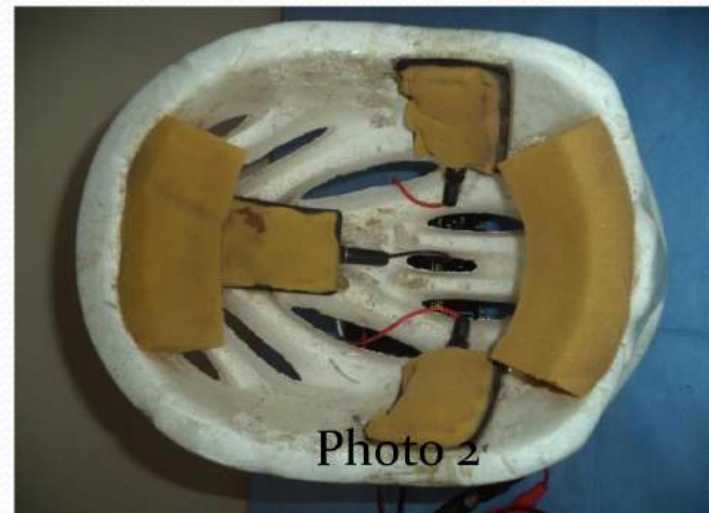


Photo 2

Portable tDCS Device

It works on principles of transcranial direct current stimulation of the brain. Various parts of the brain can be stimulated as well as inhibited with it. The device(Photo1) costs only USD 20 and is safe enough to be given to patients for daily home use. Upon electrical stimulation(Photo2) brain produces nerve growth factor(NGF) and brain derived neurotrophic factor(BDNF) which have a long list of positive benefits on the brain. 1mg NGF costs Rs 1 lac and does not cross the blood brain barrier.



Light and Sound Sessions for Mind Modulation

The brain can not develop resistance to light and sound impulses. Taking the advantage of that fact, digital drugs were made up of light and sound impulses for brainwave modulation to be delivered by a light and sound machine(photo1). Programs(photo2) were written for some of the commonest problems as for insomnia, anxiety, depression and also for bliss, alertness, peak performance and kundalini awakening etc.



Photo 1

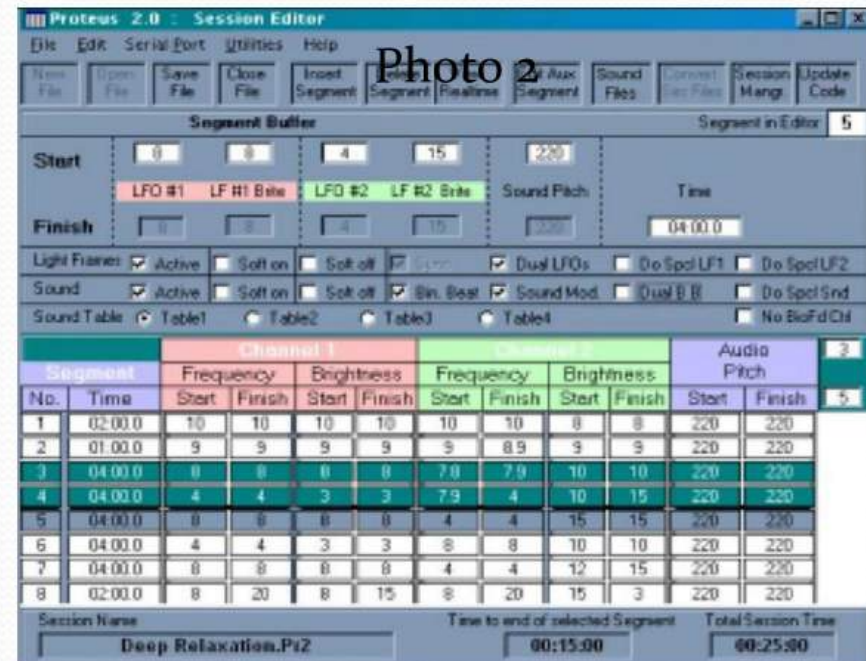
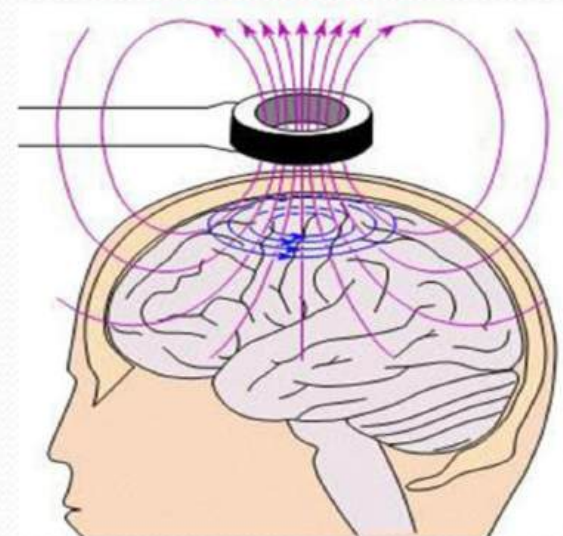


Photo 2

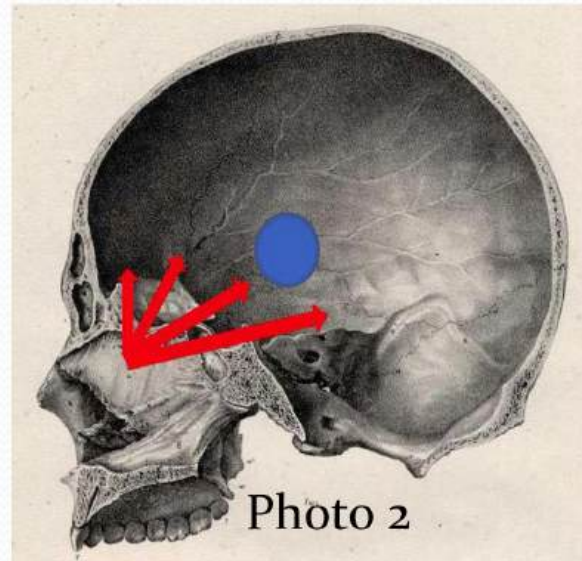
Vigyan Yoga

Vigyan Yoga is Yoga with science and technology instead of traditional methods. It includes stimulation and inhibition of various parts of brain with electricity, sound waves light and magnetic pulses. The sound waves such as mp3 files can be distributed to millions of people world wide free of cost through a website. Almost all mystical and spiritual experiences can be obtained by anybody with Vigyan Yoga. It is likely to revolutionize Yoga by making it fast enough for todays modern man. Spiritual enlightenment which is claimed to take life times is likely to be achieved in few weeks time with science and technology.



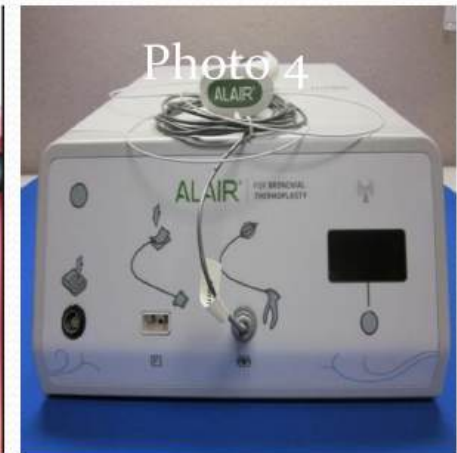
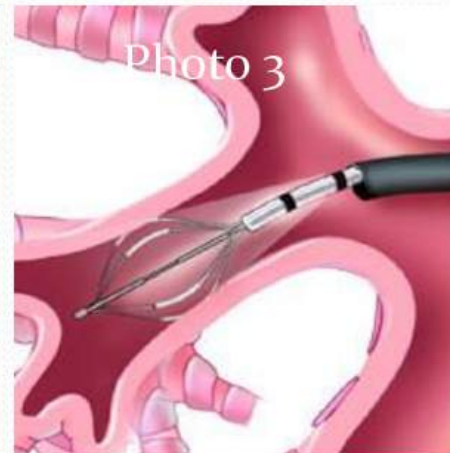
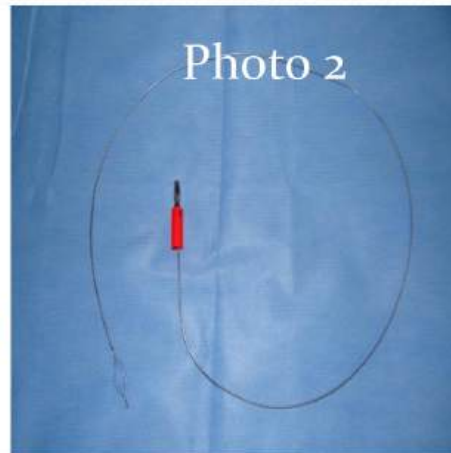
Intranasal Laser Therapy Device

A 5-watt red laser diode of 810 nm frequency is used along with its driver for the device(photo1). It is powered by a 3-volt AC power supply from the mains. The diode is coated with a biocompatible Teflon coated sleeve to avoid allergies to the nose. The diode is given a variable pulse of 1-50 Hz to stimulate the brain. A small soft clamp is put to the nose to hold the probe into the nose(photo3). The device can lead to deep brain stimulation(photo2) in a non-invasive manner to treat a lot of neurological conditions. Cost of making was Rs. 3000 instead of Rs.40,000 in the market.



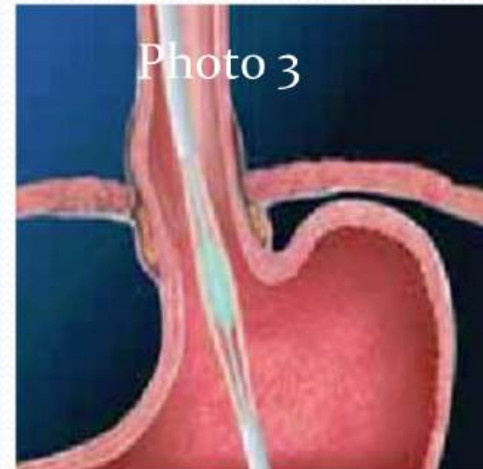
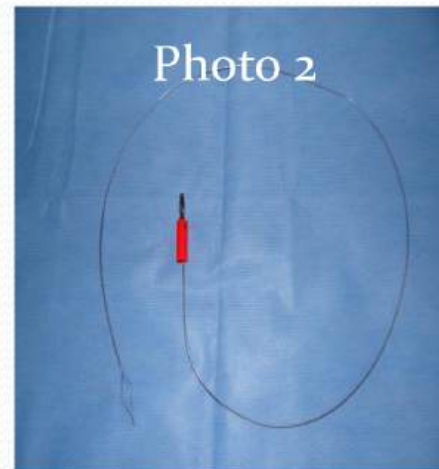
Bronchial Thermoplasty

Bronchial thermoplasty (Photo3) is a procedure indicated for bronchial asthma cases refractory to the conventional therapy. Through a flexible bronchoscope 500 KHz of radiofrequency is given to all bronchi each for 10 seconds. It has a healing effect and reduces the hypersensitivity of bronchi for at least five years. This procedure requires a costly Rs. 15 Lakhs machine(Photo4). I used a Rs.7,500 radiofrequency generator (Photo1) machine which has 500 KHz as a setting. The probe for thermoplasty was developed from a 1 mm dormia basket in just Rs. 750 (Photo2).



Stretta procedure

Stretta procedure(Photo3) is indicated for grade 1,2 and 3 gastroesophageal reflux cases. 500 Khz radiofrequency is delivered to the lower gastroesophageal sphincter for 60 seconds by an upper GI gastroscope. It tones up the sphincter and drugs are not necessary afterwards. The procedure needs a costly USD 2000 machine(Photo4). I used a Rs.7,500 radiofrequency generator machine(Photo1) as the source and the probe was made in just Rs. 750 from 1 mm dormia basket(Photo2).



Stem Cell Laboratory

Stem cell laboratory needs a centrifuge machine(Photo1), reagents(Photo3) for separation of stem cells by density gradient method, a microscope(Photo2) and photo activation device(Photo4) for photo stimulation of stem cells. Set up in just Rs. 30,000 instead of Rs. 50 Lakhs in the market. The cost of autologous stem cell transplantation dropped to Rs. 50,000 in my hospital compared to Rs. 30 Lakhs in USA.



Intrapancreatic Stem Cell Therapy for Type 1 and 2 Diabetes



I did India's first intrapancreatic stem cell transplant for Type 1 and 2 diabetes. When put into blood only 2 % stem cells make to the pancreas and in intrapancreatic, 90-95 % cells go into pancreas. The patient taking 50 units Insulin is now off Insulin in 6 months time.

Stem Cell Omental Pouch for Type 1 Diabetes



Stem cells are implanted Into an Omental pouch In a Type 1 diabetes patient Which get converted into Beta cells of pancreas and Produce Insulin as proved in Animal studies. Since Omentum Has little blood supply, the cells Are relatively protected from Auto immunity.

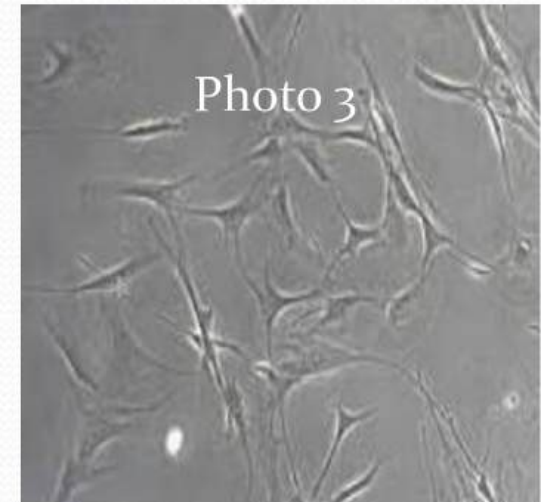
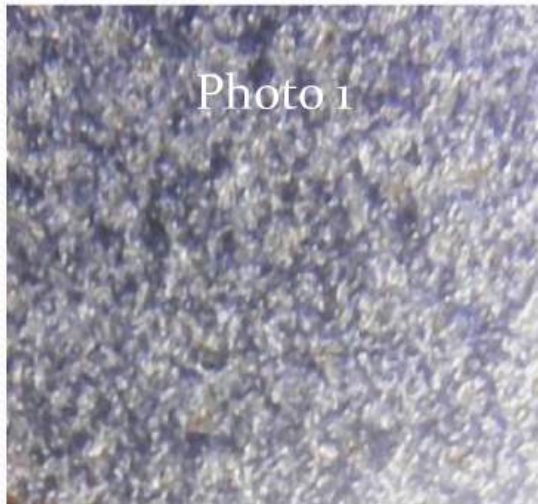
Co2 Incubator

Co2 incubator was made by modifying regular bacteriological incubator.(Photo1)
A co2 sensor(Photo2) was coupled with a solenoid valve of Co2 cylinder to maintain 5% Co2 levels in the incubator for stem cell culture. The machine was made in The cost is Rs,25,000 vs market cost of Rs.7.5 Lakhs Co2 incubators in the market.



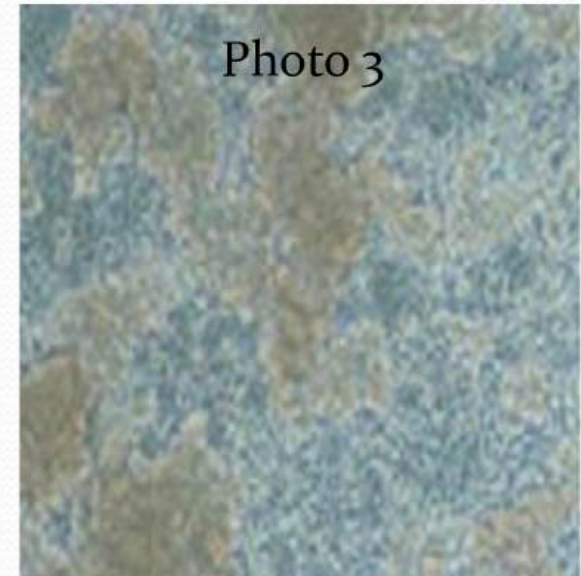
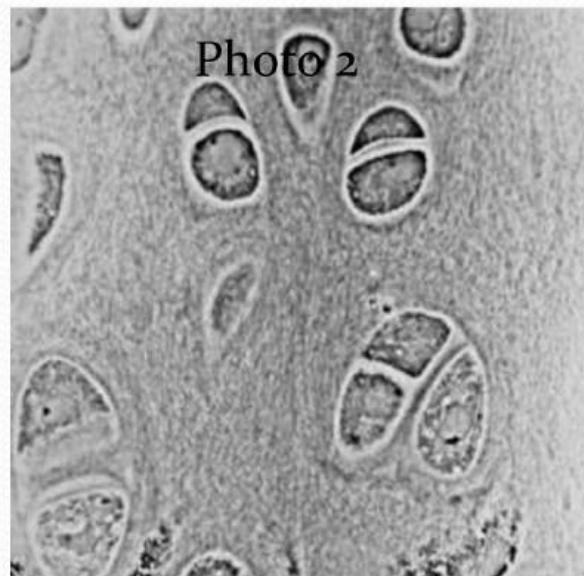
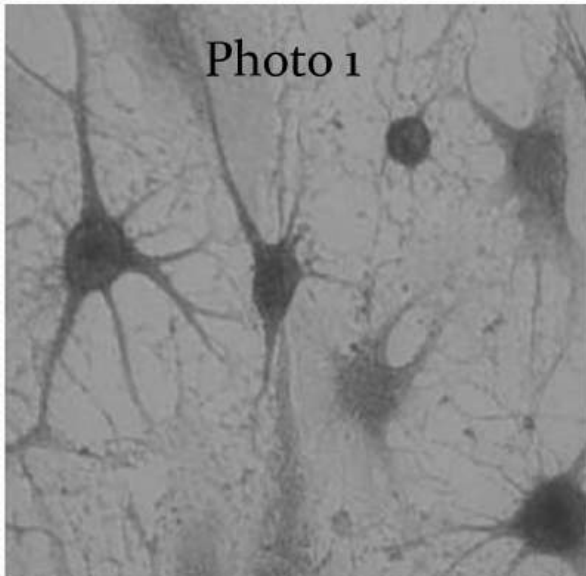
Cultured Stem Cells

A collaboration done with Diponed Labs, Hyderabad. Mesenchymal stem cells (Photo3) were cultured in the stem cell laboratory (Photo2) The cost of ten million cultured MSCs was just Rs.5,000, compared to Rs. 7.5 crore as sold by cell media companies.



Stem cell Trans differentiation

A collaboration done with Diponed Labs, Hyderabad. Mesenchymal stem cells were differentiated to neurons,(Photo1) chondrocytes,(Photo2) Islets of Langerhans(Photo3) on experimental basis at the cost of Rs.10,000 per ten million cells. For legal purpose the cells were not given to patient and discarded. Waiting for DCGI permission. In USA it costs USD one million for this treatment.



Tissue Culture Laboratory

The bacteriological incubator(photo1) was modified as tissue culture laboratory by using co2 non dependant culture media. The reagents (photo2)were imported and organs such as human urethra, vagina and skin and stem cells can be grown in it (photo3). It was set up in just Rs.10,000 instead of Rs.30 Lakhs laboratory in the market.



Pharyngeal Ultra Violet Light Therapy (PUVLT)

PUVLT illuminates pharynx of the patient with a C band UV light for the treatment of variety of upper respiratory tract infections. The device (Photo 1,2) has a UV LED of 254 nm. fitted in a glass tube with heat sink.



Photo 1



Photo 2

Rectal Ultra Violet Light Therapy (RUVLT)

(RUVLT) illuminates the blood of patient through rectum by ultraviolet light of 254 nm. making Ultraviolet blood illumination (UBI) possible in neonates and infants. The therapy can be effective for a variety of bacterial and viral infections.



Photo 1



Photo 2

Intravenous Ultraviolet Light Therapy (IVUVLT)

UV light of 254 nm. wavelength is illuminated into a peripheral vein by a PMMA fiber for the treatment of variety of viral and bacterial infections.

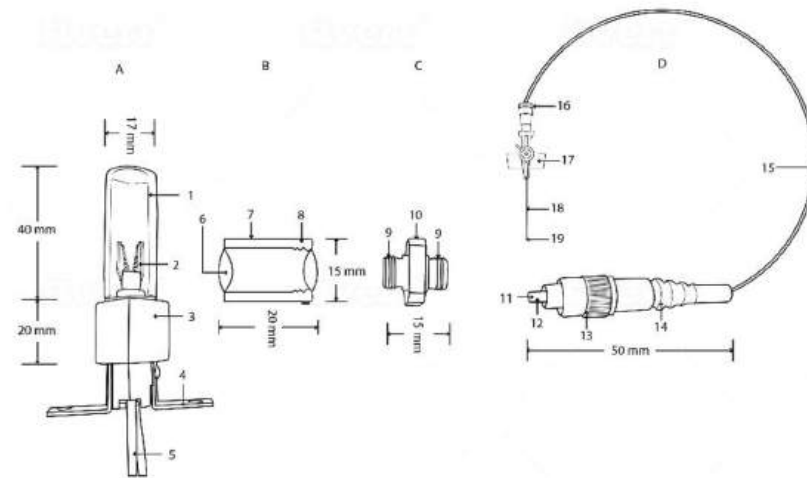
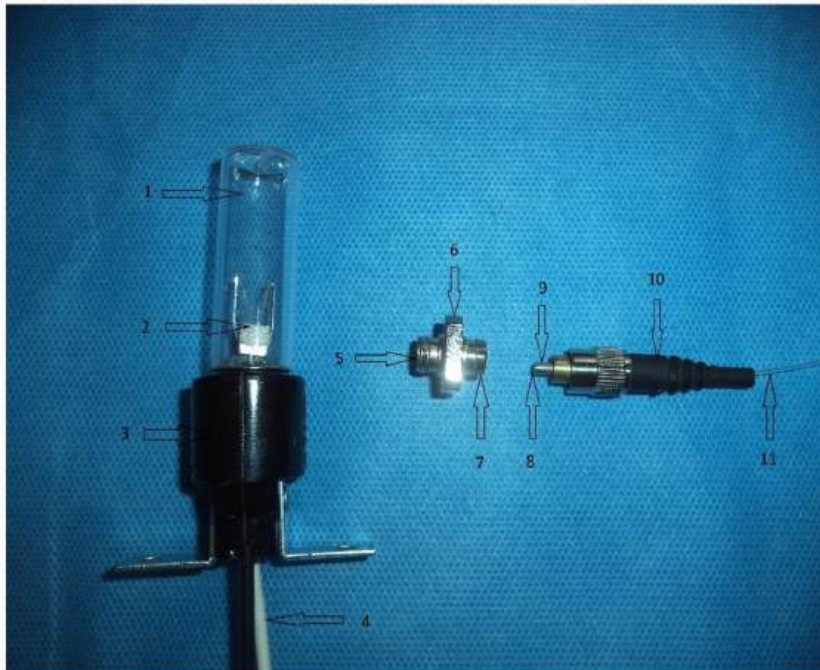


Figure 1 (A, B, C, and D)

Vaginal Ultraviolet Illumination Therapy (VUVIT)

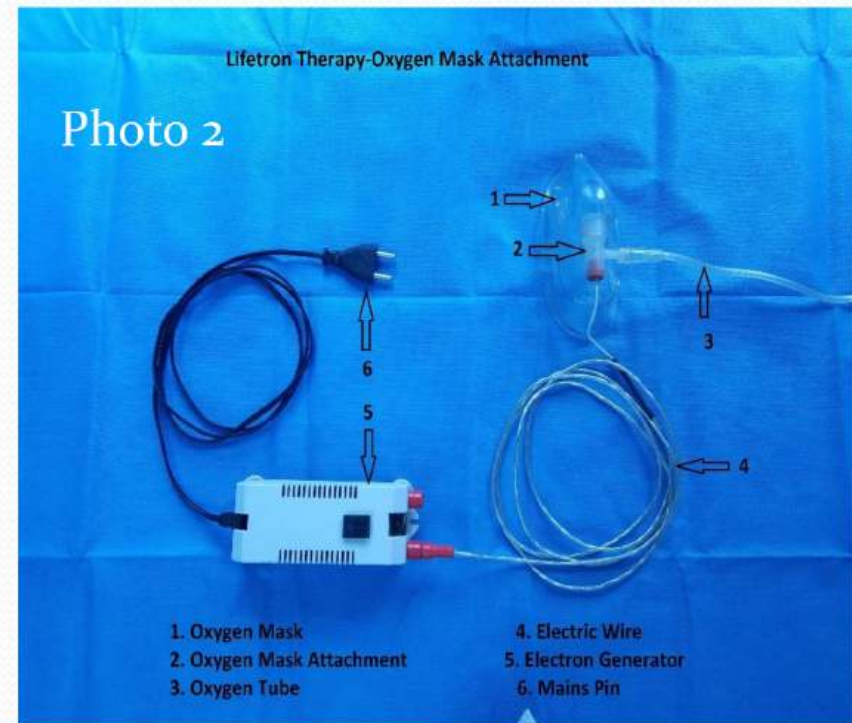
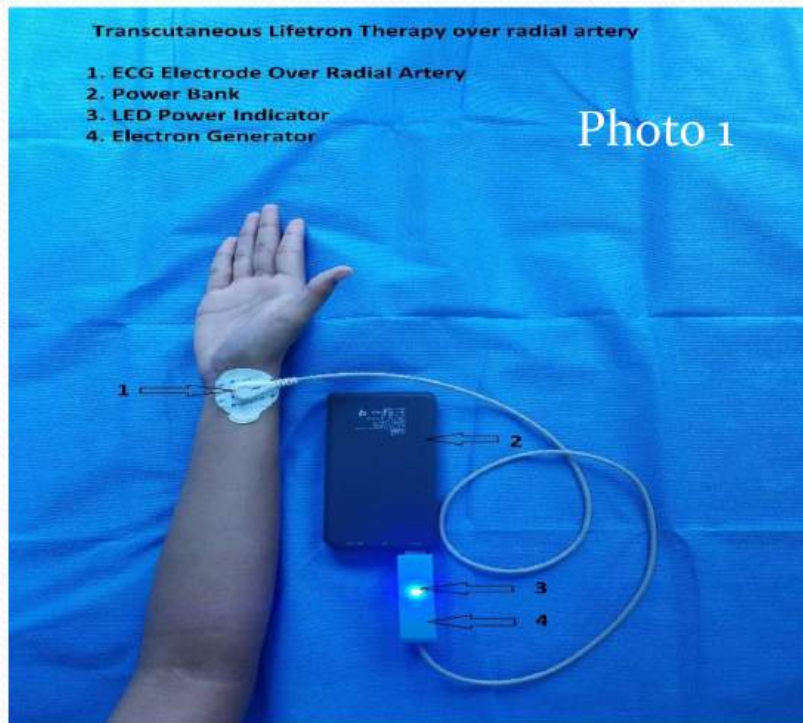
It illuminate UV light of 254 nm in vagina for a variety of bacterial, viral and fungal infections.



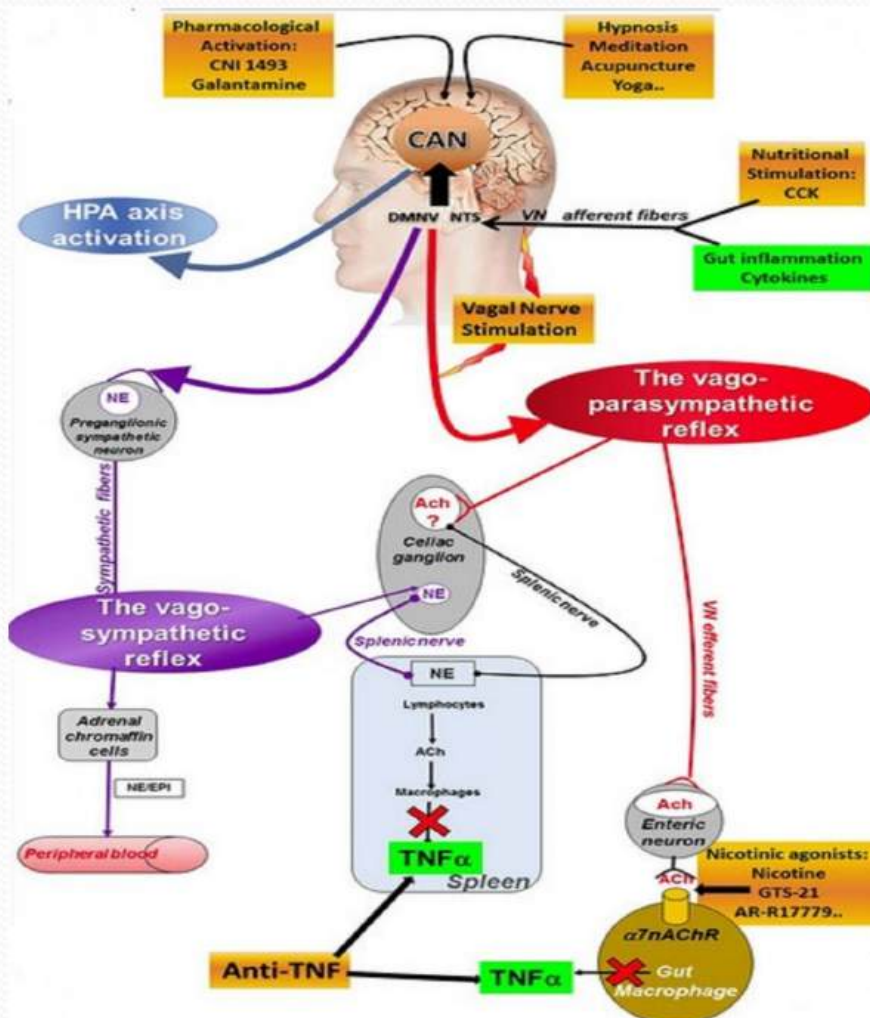
Lifetron Therapy

Therapy with electrons necessary for the life

Lifetron therapy delivers electrons in the body by Transcutaneous route (Photo 1) and via Oxygen mask (Photo 2). Electrons are delivered over a peripheral vein with a disposable ECG electrode for their easy entry into the blood stream. The device costs only Rs.10,000.



Lifetron Thrapy-Continued



Electrons get coupled with O₂ in blood which can donate electrons to free radicals neutralizing them. The electrons were found to stimulate Vegas nerve in various animal studies. Vegas stimulates the spleen to produce killer T cells. Hence the therapy is used for treatment against various bacterial and viral infections and cancer. The efferent limb of Vegas is anti-inflammatory; hence the therapy can be an alternative to NSAIDs and steroids. The therapy is also used against diseases of oxidative stress as it neutralizes free radicals. Vegas reduces heart and respiratory rate in critical patients, and releases cortical hormones to fight stress in ICU patients.

Ozonated Air Inhalation Therapy

OAIT It involves breathing Ozonated air of 0.1 parts per million (ppm) concentration by a mask for 15 minutes in adults and 5 minutes for children. Ozone is a safe gas that kills all bacteria, viruses, fungi, and molds in 60 seconds in concentration of 0.04 to 0.1 ppm, whereas the toxicity for small animals is 3 to 12 ppm. Resistance is not reported to Ozone. OAIT will be effective for vast majority of viral and bacterial respiratory infections. I developed the machine for it which costs only Rs.10,000.



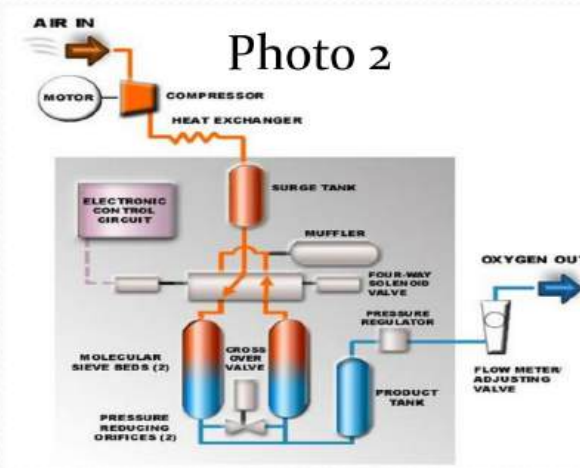
Oxygen from air

Oxygen concentrator (Photo1) was connected to a small compressor(Photo2) harvesting oxygen from air which is 20 times cheaper than cylinder oxygen. This oxygen can be stored in a tank or can be used in real time in ICU and in operation theatre through Boyle's machine. Total cost Rs.75,000, Rs. 70,000 for oxygen concentrator and Rs.5000 for the compressor, compared to a Rs. 10 Lakh for the commercial machine(Photo3).



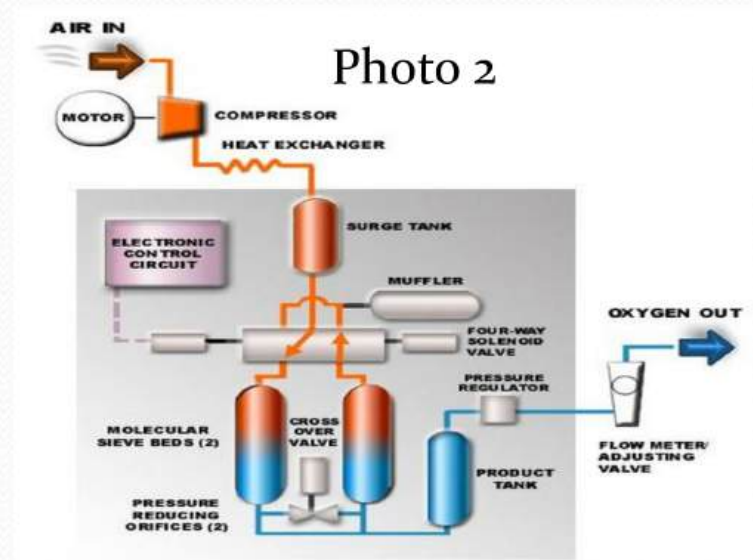
Portable Oxygen Concentrator

Portable oxygen concentrator was made by using two containers containing Zeolite crystals(photo1) through which air is pushed by an air compressor(photo3). Nitrogen in air is absorbed by the zeolite crystals and 95% pure oxygen 2 L/Min is obtained. This device(photo2) is going to revolutionize healthcare in rural India where oxygen is not available anywhere. It can be used with car battery, on mains or on solar power and can be used to transport critical patients to the hospital in any vehicle or in ambulance. Cost Rs. 7,500 instead of Rs. 75,000 in the market.



Large Oxygen Concentrator

Large capacity oxygen concentrators(photo2) with 100 liters per minute output can be made on above principles. Manufacturing cost will be only Rs.50,000 instead of Rs.30 Lakhs in the market(photo1) and every primary health center in India can be installed with it solving problem of oxygen forever in our country. It will have a large storage tank, hence although power goes off for 8 hours, oxygen in the tank can continue to the patients.



Central vacuum Machine

A metal tank(Photo1) from scrap market was connected to a kirloskar 1 HP vacuum pump(Photo2) and a pressure switch attached in the pipeline for automatic operation. Total cost Rs.15,000 compared to a Rs. 3 Lakh machine(Photo3) in the market.



Digital Stethoscope

My Digital stethoscope(photo1,2) is designed by fixing a condenser microphone in the tubing near the diaphragm of the conventional stethoscope. The output of the microphone is given to the analogue to usb converter device that digitalizes the sound. Anti alias audio filter is used to filter the high pitch sounds so that the lower pitch sounds such as heart sounds and bowel sounds should be loudly heard. The output of the usb is connected to an android device(photo1) or a computer where it is heard, processed and recorded by a variety of free applications available in the android market.



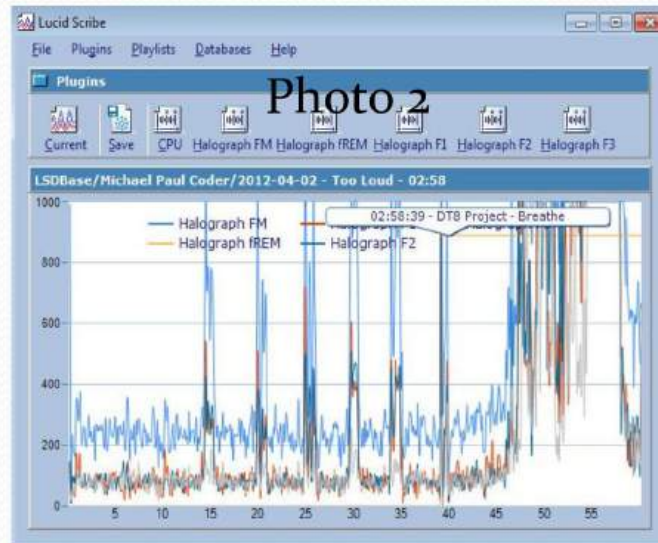
Pocket USB ECG Machine

A portable pocket size ecg machine(photo1) with mobile phone connectivity(photo2) weighing only 50 gms is made by converting the analogue signal of sensors to digital by a circuit in just Rs. 750 instead of Rs. 75,000 ECG monitor in the market that weighs 5 kgs. It is going to revolutionize healthcare in rural area of India. Even lay people can take ECG and send it to qualified doctors anywhere with click of a button through mobile phone and get the diagnosis. My device is compatible with variety of ecg apps(Photo3) on playstore.



Pocket USB EEG Machine

Pocket size 50 gms weight single channel EEG machine(photo1) was made by the think gear chip. It connects to mobile phone and think gear software(photo2) giving you eeg . It costs only Rs. 750 instead of Rs. 2 Lakh systems in the market(photo3). It can be used by doctors on rounds for follow up EEG of patients. It can be carried in emergency situations where basic diagnosis can be made immediately.



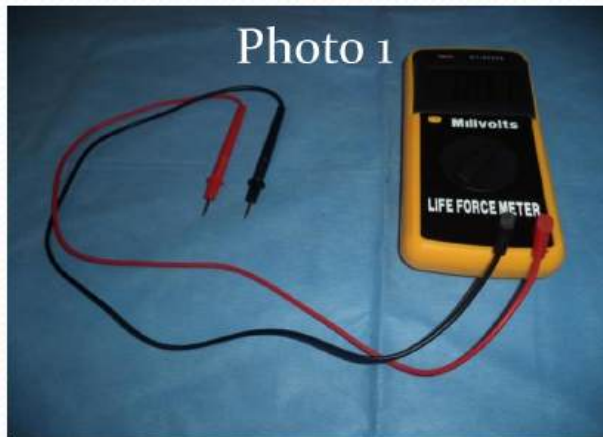
Pocket USB EMG Machine

It was made by converting the EMG signal of the sensors(photo1) by electronic amplifier and the output was converted to USB which connects to any mobile phone. There are many mobile apps that can show the result. Cost of manufacturing was Rs. 750 instead of Rs. 2 Lakh system in the market (photo2). This device can bring a revolution in physiotherapy.



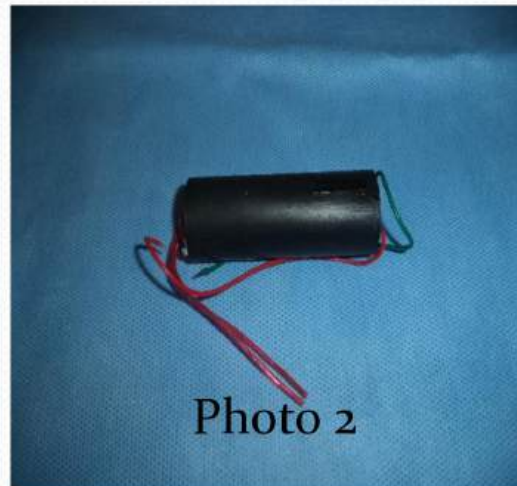
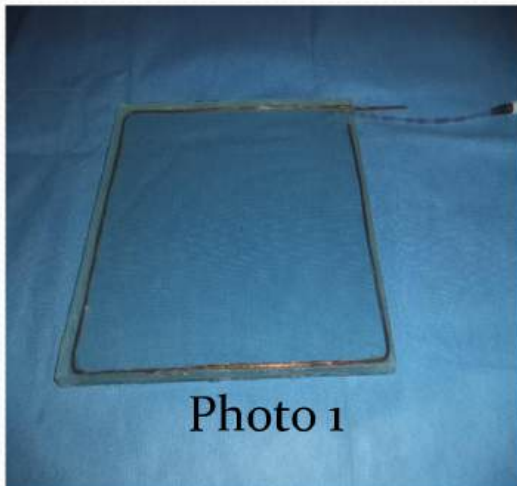
Life Force Meter

I decided to make a life force meter that measures the potential difference across the hands and legs. A digital voltmeter(photo1) with a range of 0-200 millivolts was made for the purpose. I measured the potential difference between both hands by putting electrolyte jelly on fingers and pressing the fingers over the pins of the meter hard (photo2). The average highest figure is about 50 millivolts. The voltage was found to be highest in the morning after getting up from the bed. It was lowest when you are tired. It is low when you go to sleep in the night. The voltage was significantly low when you fall ill. The voltage improved as your health improves. The voltage significantly dropped after sexual activity supporting the ancient knowledge of losing energy after sex and supports the lifestyle of celibacy. The voltage of a dead body was recorded as zero.



Kirlian Photography Camera

The transparent photo electrode(photo1) was made by sticking two glass plates together with a copper wire passed between them. NACL solution is filled in between the glass plates. The object to be photographed is put between the metal plate and the glass electrode. A high voltage DC current of 10,000 volts(photo2) is applied to the plate and the glass electrode to see the corona discharge(photo3). This is photographed by a digital camera and various interpretations are made. Cost of making was Rs.7,500 instead of Rs 2 Lakh system in the market.



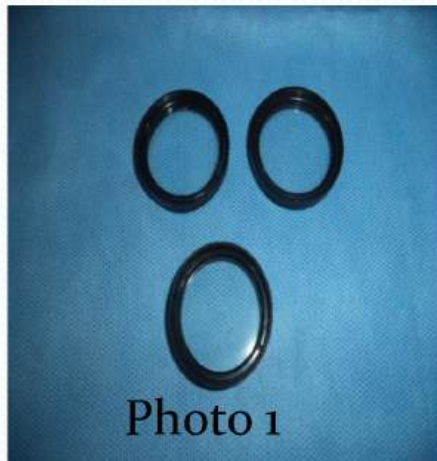
Ghost Camera

The human eye can see only 20 % of the total electromagnetic spectrum. The infrared filter(photo2) of a digital camera(photo2) is taken away and now the camera can see the complete electromagnetic spectrum. It can record many paranormal phenomenon and various shades of light which we do not see(photo3). Such a camera is also known as full spectrum camera. It can be used for paranormal research and ghost photography.



Magnification rings for Medical Photography

Medical photography requires photographs to be taken without disturbing the surgeon(photo2) and without disturbing the sterility of the operating field, that is from 5 feet distance. When photos are taken from 5 feet(photo3), the close ups of the part to be highlighted is not possible. When the cameras are attached with these photography rings(photo1), the close up of operative part can be easily taken from 5 feet distance(photo4). The cost of the rings is Rs.750.



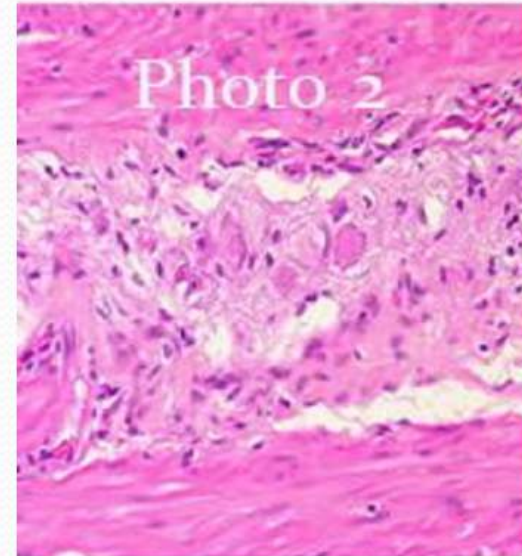
Ophthalmic Video Microscope

A video camera was coupled with optics to make an ophthalmic video microscope(photo1). It can be attached to the operation table with a flexible arm to focus on the eye to be operated. It has 50-500 X magnification. It has usb output that goes directly to the computer. It was made in Rs.30,000 . For the above purpose Carl Zeiss microscope(Photo2) is used which costs Rs.15 Lakh. This device can revolutionize ophthalmic surgery in rural India.



Pathology Video Microscope

A video camera was coupled with optics and attached to the body of conventional pathology microscope(photo1). It has 50-1000 X magnification(Photo2). It has usb output that goes directly to the computer and was made in Rs.7,500 instead of Rs. 2 Lakh microscopes in the market.



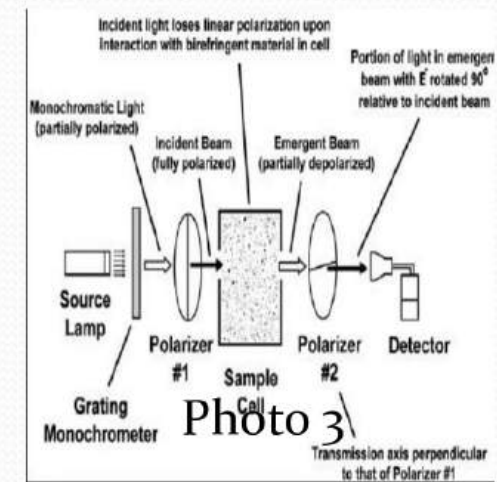
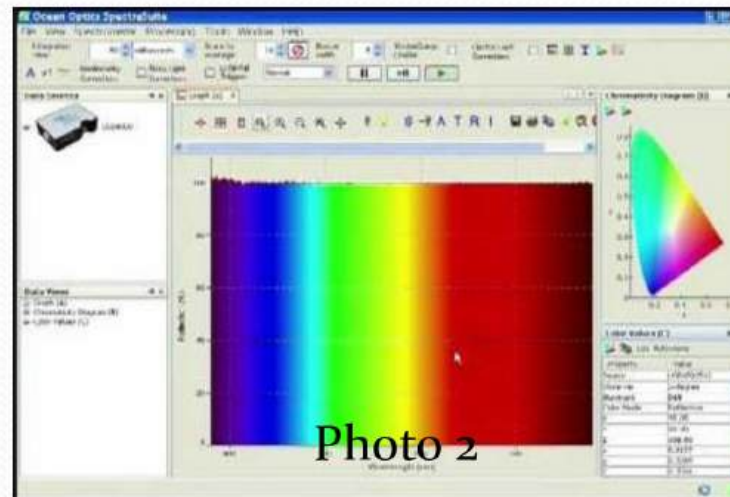
Video Microscope for Microvascular Surgery

A video camera was coupled with optics to make a micro vascular surgery microscope(photo1). It can be attached to the operation table with a flexible arm to focus on the part to be operated. It has 50-100 X magnification. It has usb output that goes directly to the computer. It was made in Rs.30,000. For the above purpose Carl Zeiss microscope(Photo2) is used which costs Rs. 15 Lakhs. This device can revolutionize micro vascular surgery in India.



USB Spectrometer

USB spectrometer does a lot of basic works in pathology. It can be used to make real time PH, Electrolyte, blood gas measurements in the human body. A light source passes light through the substance to be scanned and that image is passed through a screen(photo1) that splits light into a spectrum and it is recorded by a usb camera that sends the spectrum to the computer. Computer Software(photo2)reads the spectrum and immediately identifies the substance. It was made in Rs.7,500 instead of Rs. 3 Lakh systems in the market. Photo 3 is the schematic diagram me of a usb spectrometer.



IV Imaging System

Far infrared leds emit light on the body and its reflections are recorded by an infrared camera (photo1). Infrared light is absorbed by the veins more than surrounding tissues and they stand out as dark lines on the image (photo2). The computer software enhances the image(photo3) in various formats if required. This system was made in Rs. 2,500 instead of Rs.1.5 Lakhs system in the market.



Photo 1

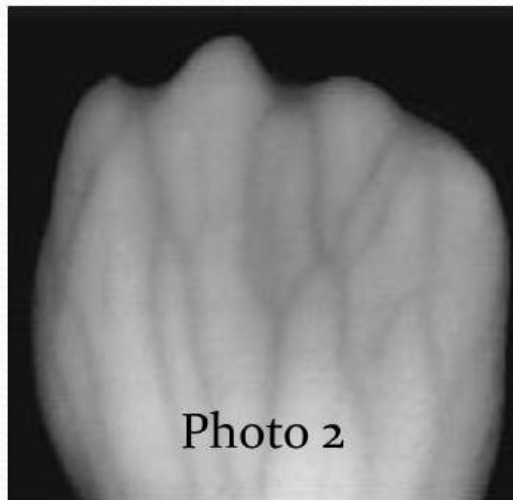


Photo 2

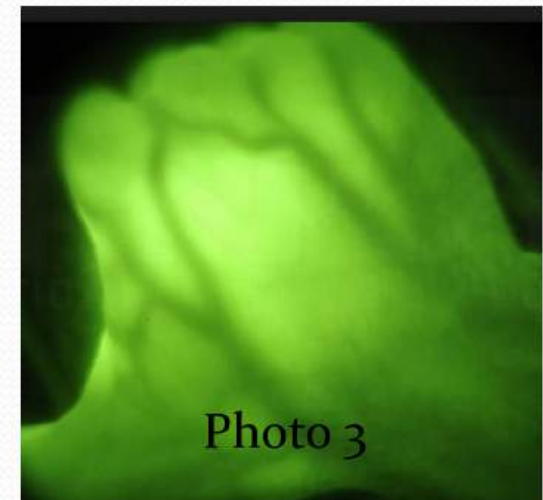
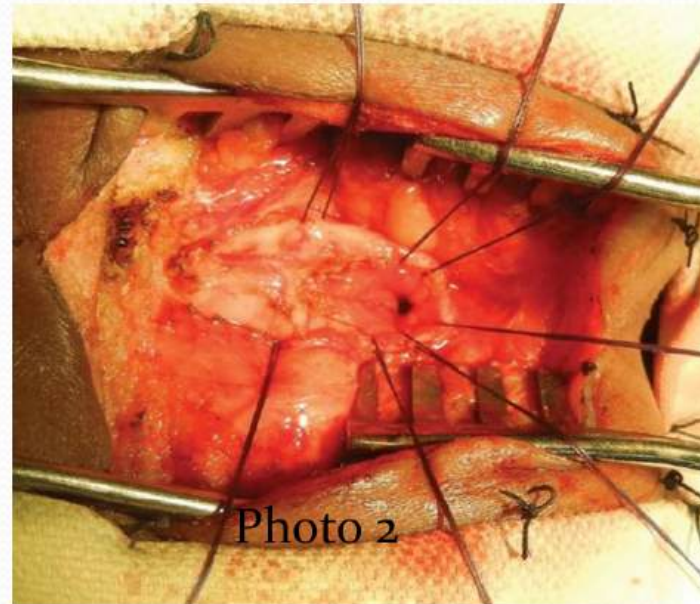


Photo 3

Muscle Stimulator

A 12 volts AC current with frequency of 50 Hz is used to make a muscle stimulator(photo1). It is used for identifying muscle complex in Penn's operation(photo2) for imperforate anus. It was made in Rs. 5000 instead of Rs.75,000 systems in the market.



Portable Muscle Stimulator

A 6 volts AC current with frequency of 50 Hz is used to make a muscle stimulator (photo1). It has 3 modes, one with low power, two with high power and 3 with continuous output. It is used for identifying muscle complex in Penna's operation (photo2) for imperforate anus. It was made in Rs. 10,000 instead of Rs.75,000 systems in the market.

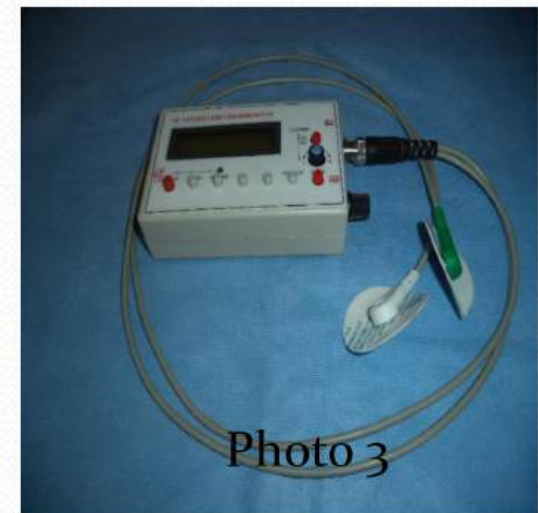
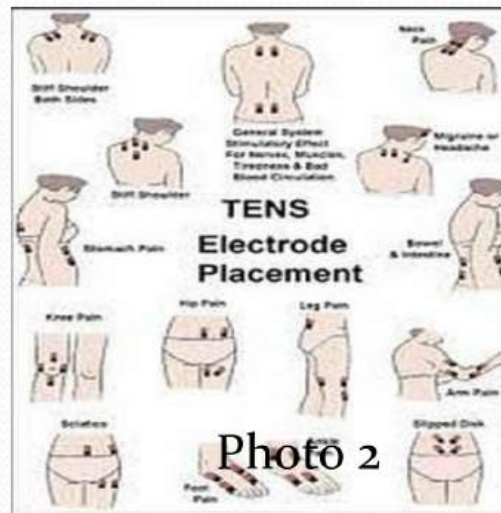
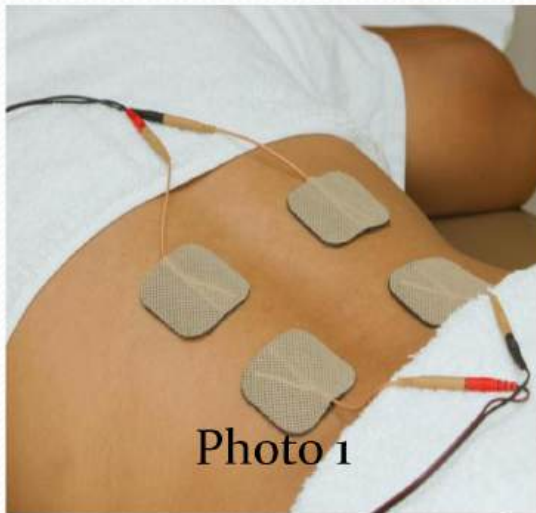


Photo 1



Nerve Stimulator

A 12 volts AC current with frequency of 100 Hz is used to make a peripheral nerve stimulator(photo3). It can be used in pain management(photo1,2) as well as in parotid surgery to identify facial nerve. It was made in Rs.10,000 instead of Rs,75,000 systems in the market.



Led OT lights

Halogen bulbs of OT lights(Photo1,2,3) were replaced by 400 watts leds lights in just Rs.7,500 . Commercially available Led OT lights of 400 watts cost Rs.3 Lakhs in the market.



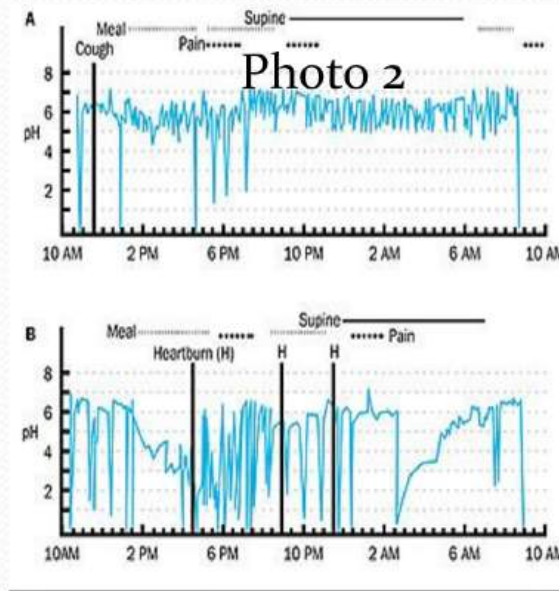
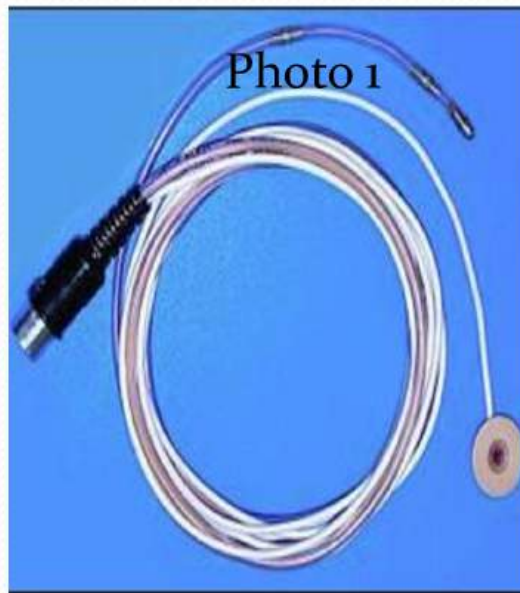
Led light cord

Led light cord(Photo1) was made by fitting a 3 watt Led bulb at one end of a cord. The led end of the cord fits directly to the light hub of an endoscope(Photo2). Total cost was Rs.10,000 and the Led bulb can be replaced in just 10 Cents. Led light sources and fiber optic cord(Photo3) in the market are bulky and cost Rs.1.5 Lakhs.



24 Hour PH Monitoring System

24 Hour PH Monitoring System is a gold standard for diagnosis of GER. It was made by an esophageal fiber optic probe(photo1) that transmits and receives light in real time and The above-mentioned USB spectrometer gives real time values of esophageal ph for 24 hours(photo2). It was made in Rs.30,000 instead of a Rs. 5 Lakh system in the market(photo3).



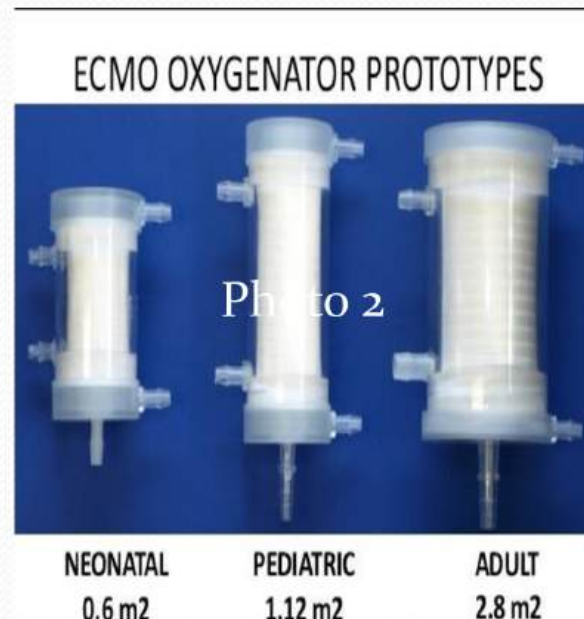
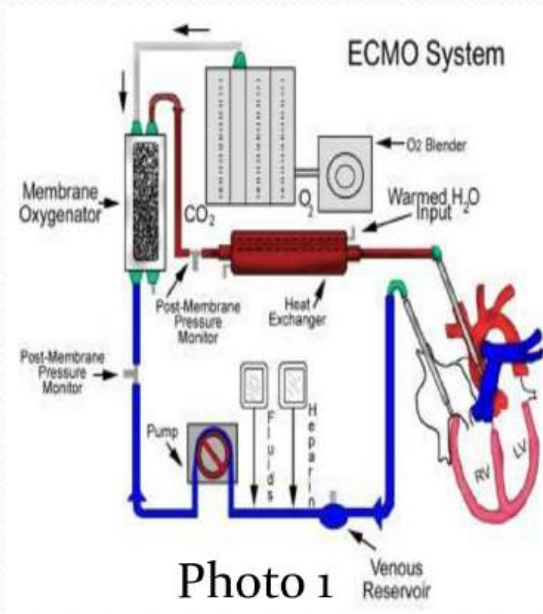
Hemodialysis machine

90 % of 2 lac people in India who require hemodialysis die due to lack of the facility. Hemodialysis machine(photo1) was made by passing the disposable tubes through a pulsatile flow pump (photo2) and pressure was measured by dial type pressure gauge of a sphygmomanometer. Another pulsatile pump circulates the dialysis fluid through the disposable dialyzer. It can be made in Rs.50,000 instead of Rs.30 Lakhs. systems in the market (photo3). This device is going to revolutionize kidney related healthcare in India.



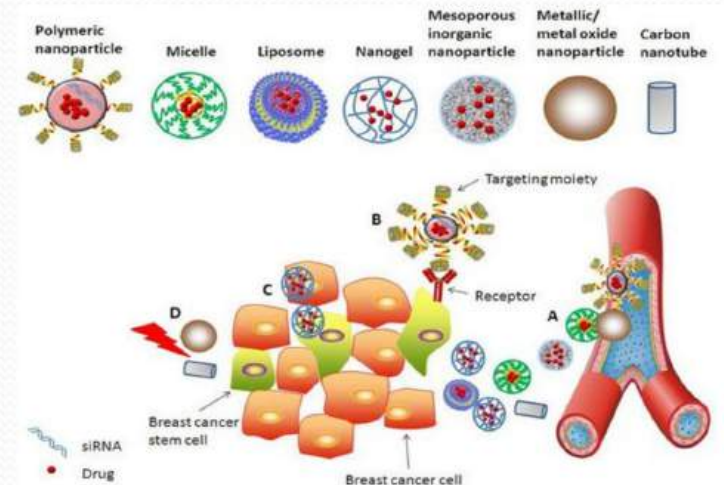
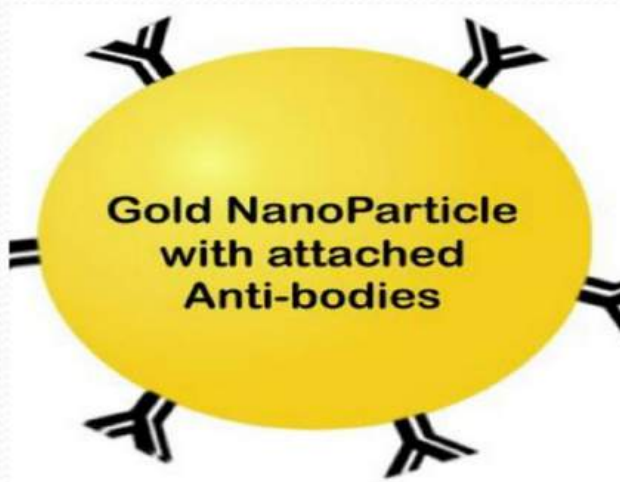
Partial ECMO Machine

Extracorporeal Membrane oxygenation bypasses the patient's lungs and oxygenates the blood till the lungs get well. Millions of children and adults worldwide die every year due to lack of this facility. The machine(photo1) was made by circulating the blood by a pulsatile pump(photo3) and passing the blood through the disposable lungs(photo2). It can be made in Rs.50,000 instead of Rs. 30 Lakhs systems in the market



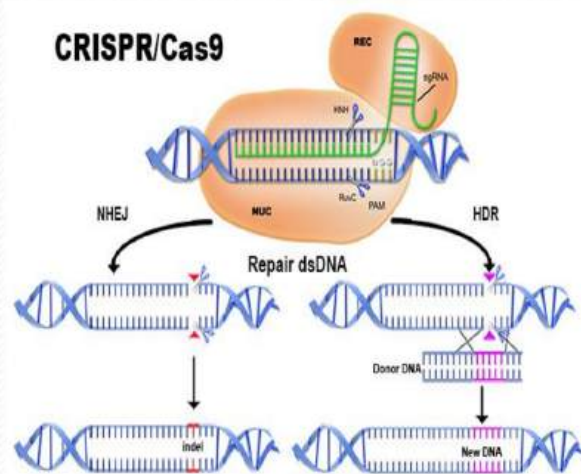
Gold Nanoparticle mediated hyperthermia in cancer therapy

Gold nanoparticles are given intravenously to a cancer patient and they accumulate in the tumor in 24 hours due to the leaky vessels of cancer tumor, the phenomenon known as “Enhanced Permeability and Retention” EPR effect. Now radio waves are fired to the place of cancer which increase the temperature of cancer cells to 45 degree centigrade selectively killing cancer cells without any damage to healthy tissues. My radio waves machine costs only Rs. 50,000 instead of Rs. 5 crore machine used in this research.



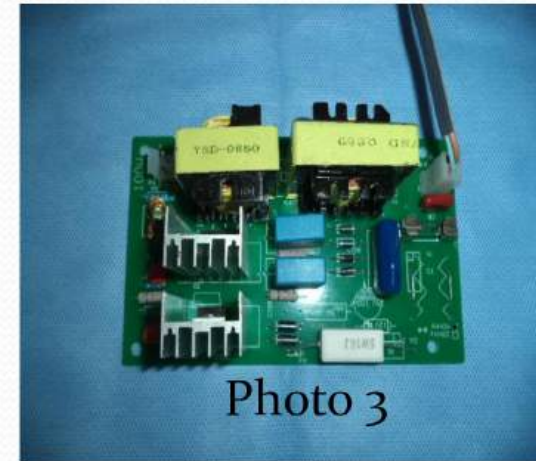
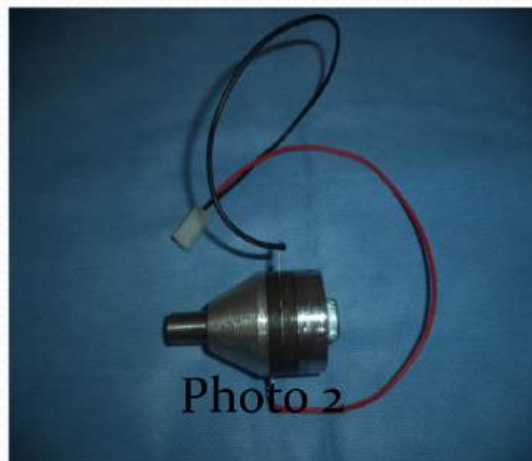
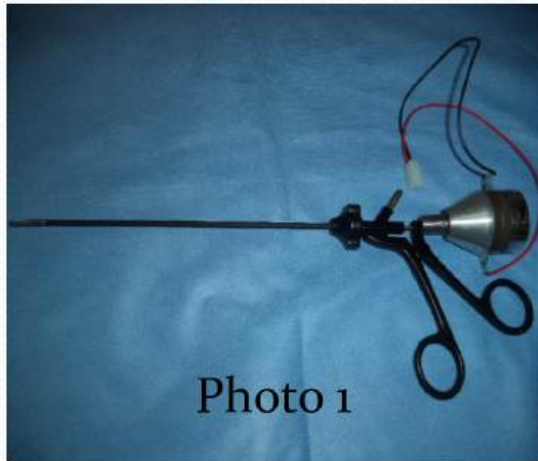
Crispr CAS 9 Genome Editing

Crispr Cas 9 is a genome editing tool which is precise for human genome editing for variety of genetic disorders. A viral vector along with endonuclease enzyme and mRNA enters the cell and into its nucleus. mRNA precisely take the endonuclease enzyme the “molecular scissors” to the area of DNA where it makes a double strand DNA cut excising the faulty gene and the cell immediately rejoins the DNA. With collaboration with Thermo Fischer Scientific company I have the ability to manipulate 6 lac genes in humans. It will only cost Rs.75,000 in my lab instead of Rs.8.5 Crores in USA.



Harmonic Scalpel

Harmonic scalpel was made by attaching a 60-watt piezo transducer to the end of a laparoscopic forceps(photo1). The transducer(photo 2) is powered by a 60 KHz radiofrequency driver circuit(photo3). Harmonic scalpel uses ultrasound to cut the tissues in laparoscopy and open surgery. It was made in Rs.30,000 instead of Rs.15 Lakhs systems in the market



Ultrasonic Lithotripter

It was made by connecting the metal probe(photo1) to a 60-watt piezo transducer(photo2). The transducer is powered by a 60 Khz radiofrequency driver circuit(photo3). It is used to break bladder and kidney stones. It was made in Rs.50,000 instead of Rs. 5 Lakhs systems in the market.

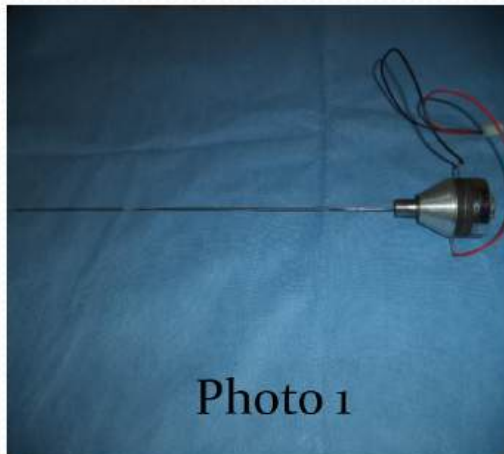


Photo 1

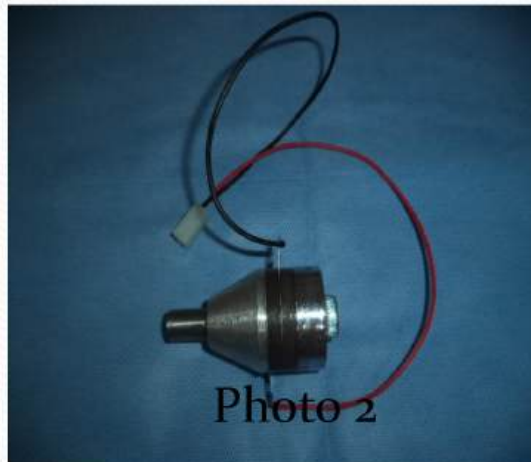


Photo 2

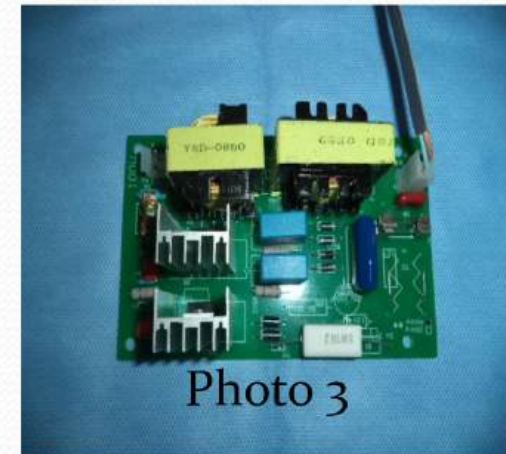


Photo 3

My future Innovations

My following inventions are ready in theory in my mind but yet to come down in reality.

Hands Free Robotic Camera Holder in USD 300

Da Vinci Laparoscopic Robot-like system in USD 3000 instead of USD 2 million in the market.

Cochlear Implant in USD 100 instead of USD 7500 in the market.

Artificial Urethral Sphincter in USD 100 instead of USD 7500.

A Digital Radiography system in USD 300 instead of USD 1,500,000 in the market.

A Laser Microscope with one million times magnification in USD 300 that compares to a USD million electron microscope.

Dirt cheap antioxidant

Tissue nano Transfection(TNT)

Cardiac catheterization Monitor

Portable MRI scanner

ESWL Machine

Gamma Camera (scintillation Camera)

Positron emission Tomography

Terahertz camera Imaging System

Terahertz Tomography



Thanks

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