



My 75 Inventions to Make Healthcare Affordable to Everyone

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Letter to Editor

To improve surgical care in developing countries I started a project called "My 75 inventions to make healthcare affordable to everyone"

Most of the advanced therapies in Medical Sciences were just a dream to 99.9 % of Indian people as they cannot afford them. I am watching from my early MBBS days that the cost of medical equipment is steadily rising. The medical companies make a minor modification and increase the cost eventually. I thought that these products will get off patent and the cost will drop. But that did not happen. I learned from the newspapers and from scientific data that majority people could not afford therapies as the cost of medical equipment is high and beyond the reach of most of the people. For example, only 10 % people who need hemodialysis get it and 90 % are left to die because the machine cost Rs. 30 Lakhs. The cost of cardiac stent was exorbitant to the tune of USD 3000, now Indian Government has put a cap on it and is now USD 400. The cost of artificial urinary sphincter and Cochlear implants are USD 8000 each and very few such operations are done in India. Cost of Laparoscopy set comes to about USD 20,000 which has limited its use in developing countries.

To bring this dream into a reality I decided to do research myself and reduced the cost of costly equipment in Medicine and Surgery about hundred times. The entire research was funded with my own money. 40 patents have been registered for these inventions in Mumbai office. This project is likely to have a huge positive impact

on public health and going to revolutionize healthcare in India and other third world countries.

The cost of equipment for laparoscopy equipment is very high and out of reach of most of the rural health care hospitals which do not perform laparoscopic surgical procedures. None of the primary healthcare centers I have visited had laparoscopy facility. Annually two lakh people in India develop advanced kidney disease. 90% of these people in India die because of lack of hemodialysis facility. The hemodialysis machine costs USD 40,000 and government cannot afford to install in rural hospitals. Endoscopy facility is very poorly available in rural hospitals. Most of the hospitals are without upper and lower GI endoscope, Laparoscopes cystoscopies etc.

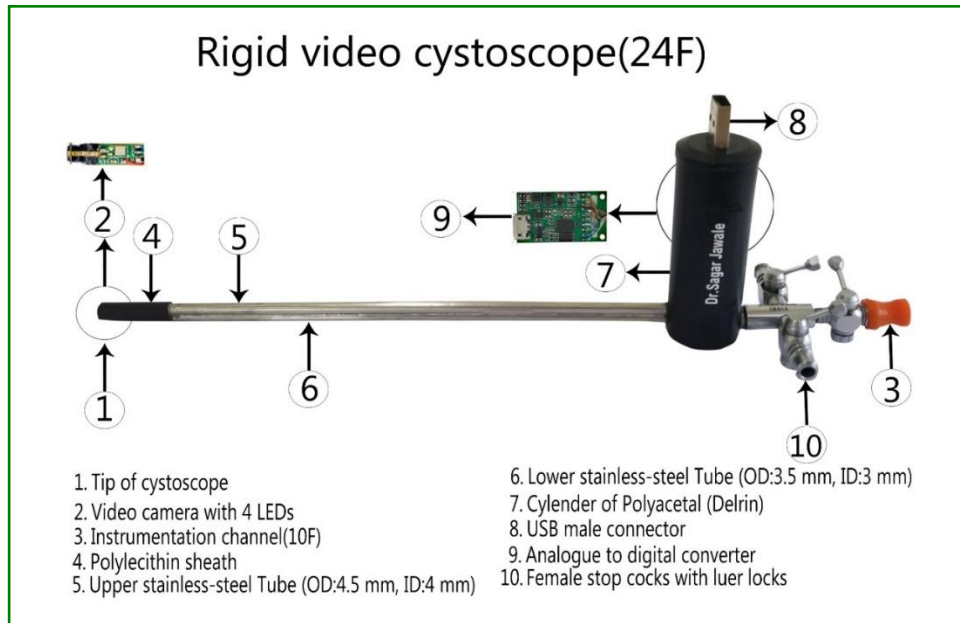
To address this problem of higher cost of medical equipment I started my own research. I studied the basics of most of the equipment and noted the costly components in them. I developed alternatives to these items and developed cheaper alternatives. I thus reduced the cost of costly equipment in Medicine and Surgery about hundred times. The entire research was funded with my own money. My project started about 3 years ago and it is active till date. I wish to continue to work on it till the end of my life as the necessity and scope are infinite.

I consulted many people in related faculties which include technicians, engineers, doctors, social workers etc. I created a team of people which includes people from various faculties. I got my work done from them on outsourcing basis since I did not have the necessary

capital and infrastructure. These people are the electronic engineers do the designing part. Electronic technicians who do the soldering job. The turners do job work on Lathe machine and make the endoscope handles. The cameras are imported from China, Japan. The laser engraving machine writes names over the products. In the end I take all the spare parts and assemble them in my laboratory in my hospital.

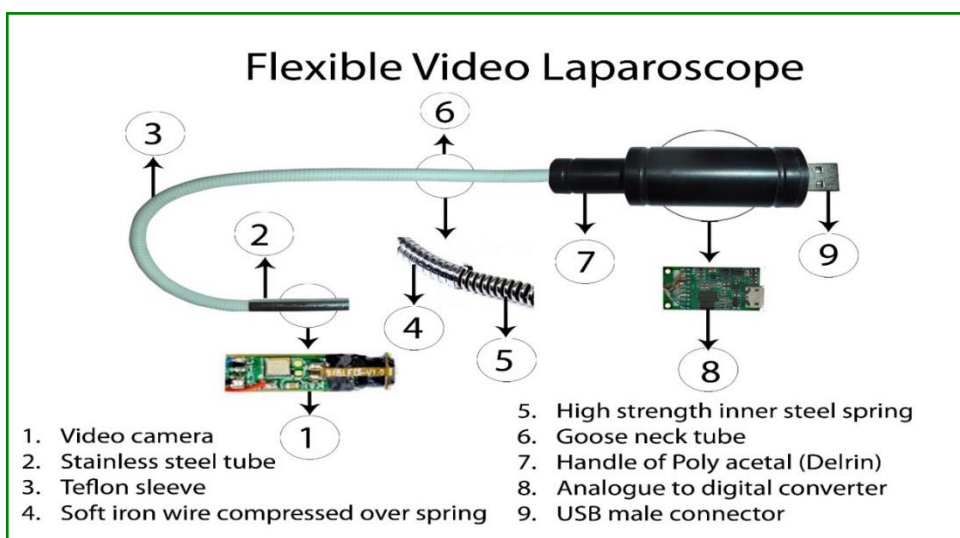
Some ideas were given to me by my colleagues on Facebook. I worked on those ideas and made them

commercially viable. I did research collaborations with many doctors in India to develop some products. I am working with many doctors nationally on variety of projects. One of such projects is with Dr. Gnanaraj Jesudian a urologist from Coimbatore, Karunya University. They have medical grants for a project in rural area from Leeds University UK. I developed world's first rigid video adult cystoscope for their project recently at just USD 400.



I wish to involve Indian government into this project where I can supply them hi tech medical equipment at manufacturing cost for their rural hospitals. My doctor colleagues are planning a project where we can supply my

flexible video laparoscope for Tubal ligation procedures in rural India. The Conventional laparoscopy set costs USD 20,000 in India. My laparoscopes with android device costs only USD 300.

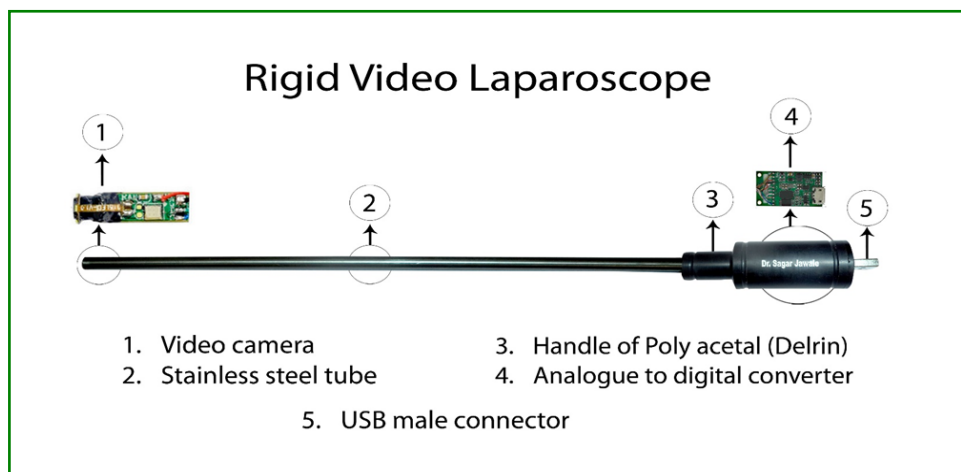


My intervention was essentially for poor people and directed towards rural areas. I donated some products in rural areas and the doctors there could easily adapt it and used it properly. My products are exclusive and unique in nature and are not available in national and international markets at any cost. Hence even big private hospitals want to buy them. Recently Lilawati hospital and D.Y. patil medical college have shown interest in buying them. I motivated doctors into my project instead of patients as they cannot use it themselves. Doctors cooperated and bought in big numbers for the rural and charitable hospitals in their areas. Hence the patients are the beneficiary in the end.

My research was presented in front of pediatric surgeons in national pediatric surgery conference held in Agra on 14 th September 2016. It received a stand ovation and best paper award in that conference. The project was presented in district IMA conference in Jalgaon with demonstration on 5th August 2017. The project was presented in Conference of association of rural surgeons of India in Nagaland on 16th November 2017 with demonstration and received prestigious Antia Finseth National Award for my 61 inventions. The award is given by ARSI and the Leeds university of UK and Lancet Commission together.

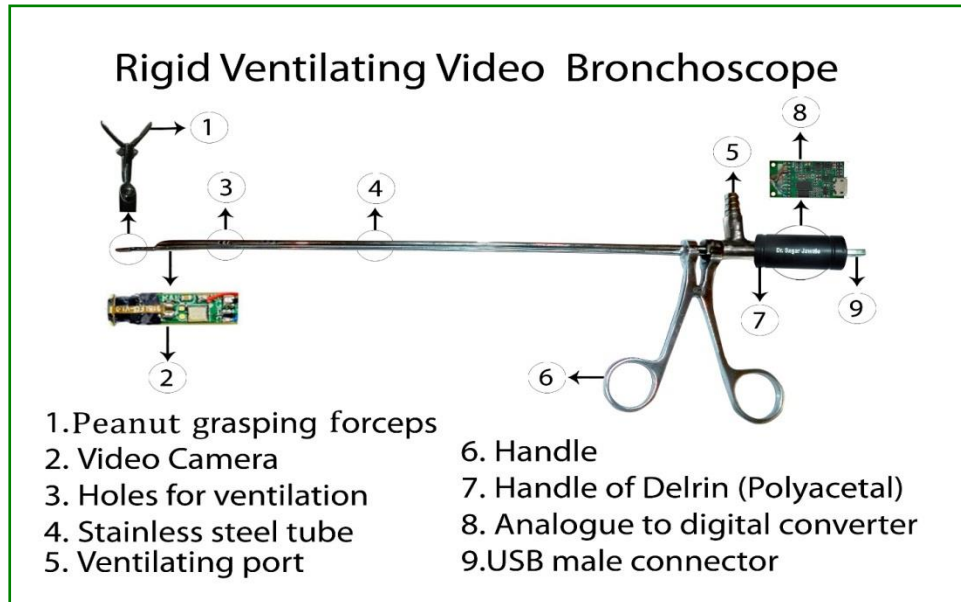
The project was presented in Maharashtra pediatric surgery conference on 16th July 2017 with demonstration. My project is an ongoing research and is active till date. Every monthly I have new innovative ideas and I bring them into reality from time to time. Every yearly I am making 25-30 new health related innovations. Because of my project many doctors who could not afford certain medical equipment started to buy them. I was told by many doctors that they could not buy laparoscopy equipment due to its cost from last 10 years. Many doctors bought my laparoscopes and donated to their nearby hospitals. These hospitals were waiting for decades for this equipment.

My laparoscope is a three in one device in the sense that It is the combination of a telescope, Led light source and laparoscopic endo camera. It is equivalent to \$ 10,000 as \$ 4000 for optical endoscope, \$ 4000 for endo camera and \$ 2000 for Led light source are incorporated in it. With great hard work I have commercialized it with a cost of Rs. 20,000 which is the cheapest laparoscope in the market today. It is being distributed in India and world over through a no profit organization called Vigyan Yog Foundation founded by me.



To overcome these limitations of the traditional equipment I designed my own equipment by my 15 years of experience of bronchoscopy. Rigid Video Ventilating Bronchoscope with forceps is the first of its kind in the world, a video camera is fitted at the tip of a rigid tube made up of surgical steel and its 4 wires pass through the empty tube and connected to another end to video to USB converter. The device is an ingenious combination of bronchoscope sheath with attached forceps. 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. There are no fiber optics and rod lenses, hence no image loss and it has excellent image quality. The product is easily worth Rs. 5 Lakhs but commercialized by in in just USD 400. It became an instant hit and more that 50 orders received in India and world-wide. Because of my innovations many pediatric surgeons have started performing bronchoscopic foreign body removal which is a life-saving procedure. Since the forceps is for the first time incorporated with ventilation, the risk of the procedure has dramatically reduced.



I founded a research foundation called Vigyan Yog Foundation a no profit organization which dedicates itself for research in medical sciences and Yoga. The foundation does research and the commercial activities are seen by another company I set named Vigyan Yog.

My project has become a routine now. I have commercialized 8 inventions which are as follows. USB Laparocam-the laparoscopic endo camera for USD 300. 8- and 10-mm rigid video laparoscopes for USD 300. 5- and 8-mm flexible video laparoscopes for USD 300. 8 mm rigid video laparoscope with 30,60, 90-degree mirror attachments for USD 300. Rigid video bronchoscope with forceps for USD 300. Led light cord for USD 150. All my inventions are original and unique. They are not a copy of any product. In fact products like my inventions are not available in the Indian and international markets. My inventions are 50 to 100 times cheaper than the peers. Many of them have no peers to compare with. The rigid ventilating video bronchoscope did reduce the risk of bronchoscopic foreign body removal dramatically.

Following of my inventions are for the first time in history of medicine. Flexible and rigid video laparoscopes, rigid ventilating video bronchoscope with forceps, adult rigid video cystoscope, semi flexible thin video nephoscope, wireless laparoscopy and endoscopy device, laser tissue welding device, pocket ECG, EEG, EMG devices and life force meter. These are produced at a record low cost of USD 100 each. Other inventions which are first made in India are, articulating video laparoscope, 3D laparoscope, Capsule endoscopy device, VR magnifying loops,

hydrophobic nano silicone coating, world's smallest video camera, video laryngoscope, laser lithotripter and laser cautery, Transcranial magnetic stimulation device(TMS), transcranial direct current stimulation device(tDCS), Intranasal lase therapy device, Machines for bronchial thermoplastic and Stretta procedure, Urodynamics and uroflowmetry device, CO2 incubator, Portable and commercial O2 concentrators, Central vacuum machine, Digital Stethoscope, Pathology video microscope, Ophthalmic video microscope, Microscope for microvascular surgery, USB Spectrometer, muscle stimulator, nerve stimulator, Hemodialysis machine, Partial ECMO machine, Harmonic scalpel and ultrasonic lithotripter and led light cord,24 hour PH monitoring. I also set up stem cell laboratory and tissue culture laboratory at record low cost of USD 500. I have set up Gene therapy facility with American multinational Thermo Fischer Scientific for Crispr Cas9 Genome editing to be done in India for USD 1000 instead of USD one million in USA.

My future innovations are hands Free Robotic Camera Holder, Da Vinci Laparoscopic Robot like system, Cochlear Implant, Artificial Urethral Sphincter, A Digital Radiography system, Electron Microscope, A Laser Microscope with one million times magnification, Alternatives to antibiotics and antivirals, Tissue nano Transfection(TNT), Usb Pocket Ultrasound Machine, Cardiac catheterization Monitor, Portable MRI scanner, ESWL Machine, Gamma Camera(scintillation Camera), Positron emission Tomography, Terahertz camera Imaging System, Terahertz Tomography.