Dr. N.G.P. INSTITUTE OF TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai)
(An ISO 9001:2008 Certified Institution)

Dr.N.G.P. - Kalapatti Road, Coimbatore-641048, India

DEPARTMENT OF BIOMEDICAL ENGINEERING

News Letter

Vol. 1, Issue No.3 **January 2015**

Contents

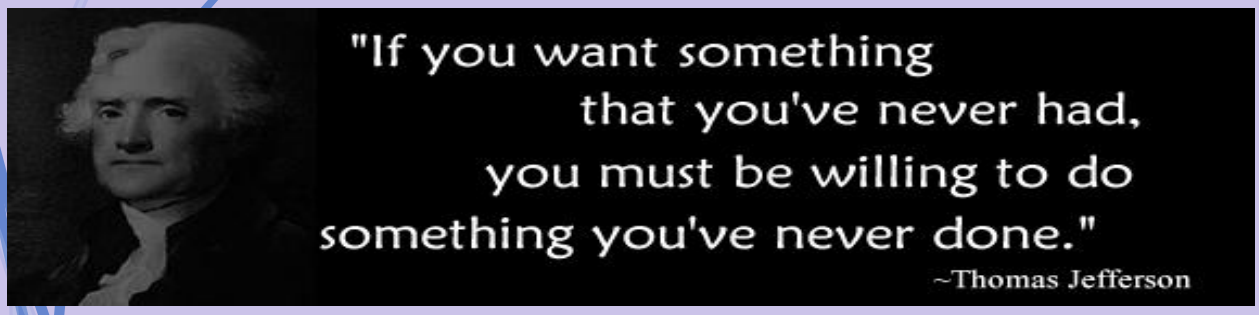
FACULTY TEAM

TEACHING STAFF

S.No	Name	Designation
1.	Dr.S.Prabakar	Professor & Head
2.	Prof. K.Yasoda	Associate Professor
3.	Ms. D. Hemapriya	Assistant Professor
4.	Ms. S. Gowthami	Assistant Professor
5.	Ms. R. Nithya	Assistant Professor
6.	Ms. MedhaMurali	Assistant Professor
7.	Ms. A. Mohanapriya	Assistant Professor
8.	Dr.S.R.Sathish Kumar	Assistant Professor
9.	Ms.R.Saranya	Assistant Professor
10.	Ms.S.Christy Esther	Assistant Professor
11.	Ms.Manisha Manoharan	Assistant Professor

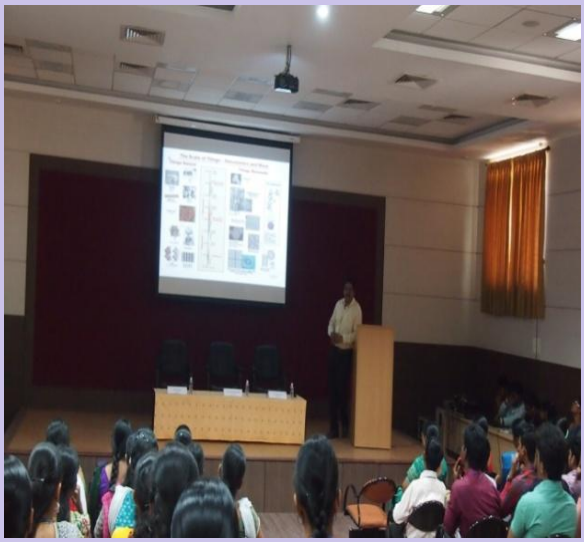
NON TEACHING STAFF

S.No	Name	Designation
1.	Ms. S. Rooparani	Lab Technician
2.	Mr. N. Ananthan	Lab Technician
3.	Ms. G. Sakthipriya	Lab Technician



GUEST LECTURES ORGANIZED

- Mr.K.Lakshmanan, Kavin Engineering Services Private Limited, Coimbatore delivered a guest lecture on “Soft Skills for Engineering Professionals”. The main objective of this program was to bring forward the soft skills knowledge of the students.
- Dr.N.Meenakshi Sundaram, Associate Professor, PSG College of Technology, Coimbatore delivered a guest lecture on “Perspectives of Nanotechnology in Biomedical Engineering”. The lecture focused on design aspects and future of Nanotechnology.
- Dr. K.Kumar Rajamani, Robert Bosch Engineering and Business Solutions, Bangalore delivered a lecture on “Research Opportunities and Challenges in Medical Image Processing” The lecture gave as a various Image Processing Techniques.



VALUE ADDED PROGRAMMES

- ✓ The department of Biomedical Engineering Organized a value added programme on "Calibration and Testing of Biomedical Equipments" was conducted by Helix Corporation, in college premises from 12.02.2015 to 14.02.2015.The third year BME students benefited from the program with good exposure to work with hospital critical care equipment. It will helps the students to enhances their knowledge about the latest technologies in which research is involved along with better opportunities for student projects, internships & placements.
- ✓ "LabVIEW" was conducted by National Instruments, in college premises from 12.02.2015 to 14.02.2015, 28.02.2015 to 01.03.2015. The second year BME students benefited from the program as it gave them good exposure to work with LabVIEW software.
- ✓ "C, C++" conducted by M/s Techno turf Info Services, in college premises from 07.01.2015 to 11.01.2015, 29.01.2015 to 01.02.2015. The second year BME students were benefited from the program as it gave them good exposure to work with Programming software.

CLINICAL TRAINING

- ✓ Visits to the KMCH hospital were conducted on a weekly basis to train the students on the functioning of the biomedical department and the multiple roles played by a biomedical engineer in a hospital. Several sessions were also conducted to demonstrate the working of various biomedical equipments and state-of-the-art medical technologies. The students visited to various departments, *viz*- Cardiology, Radiology, Nuclear Medicine, Imaging Equipment, Biochemistry Lab, Pathology Lab, which gave

them a head-start to the working of a biomedical engineer in a hospital setup in collaboration with all these departments

- ✓ Guest lectures by renowned doctors, healthcare industrialists and experts were organized frequently at KMCH, Coimbatore, so that students could obtain a platform to learn of the current developments and research activities carried out globally in the field of biomedical engineering.

SPECIAL LECTURES BY EMINENT SPEAKERS

- Mrs.Pavithra, Assistant Professor, KMCH College of Nursing, Coimbatore delivered a lecture on "Introduction to Microbiology" on 1^{8th} February 2015, which focused on Overview of Microbiology.
- Mrs.Jancyrani, Geting maquet, Coimbatore delivered a lecture on "Ventilator and its Principles" on 19th March 2015, which focused on the design aspects of ventilator.
- Mr.Prakash, Vital medical systems and solutions, Coimbatore delivered a lecture on "Overview about X rays" on 26th March 2015, which focused on principles of x rays.

RESEARCH PUBLICATIONS

- Mrs.D.Hemapriya, published a paper titled "Review on Glucose Monitoring Systems: Current and Emerging Technology", International Journal for Research in Applied science & Engineering Technology, Vol.3, No 43, Mar 2015.

INTERNATIONAL CONFERENCE

- Ms.R.Nithya presented a paper titled "Modelling and Analysis of Femur Bone Material" at International Conference on Biomaterials Tissue Engineering and Regenerative Medicine organized by Department of Chemistry, Anna University, Chennai during 05.02.2015 to 07.02.2015.
- Mrs.D.Hemapriya presented a paper titled "Review on Glucose Monitoring system: a current of Emerging Technology" at International Conference on Current Innovations in Engineering and Technology organized by NRS Sakithyan, Chennai during 01.03.2015 to 02.03.2015.
- Mrs.D.Hemapriya presented a paper titled "ICAAET,309-Evoluation Towards Closed Loop Glucose Monitoring Systems" at International Conference on Advances in Applied Engineering and Technology, Ramanathapuram during 14.05.2015 to 16.05.2015.

FDP/WORKSHOP/SEMINAR DELIVERED

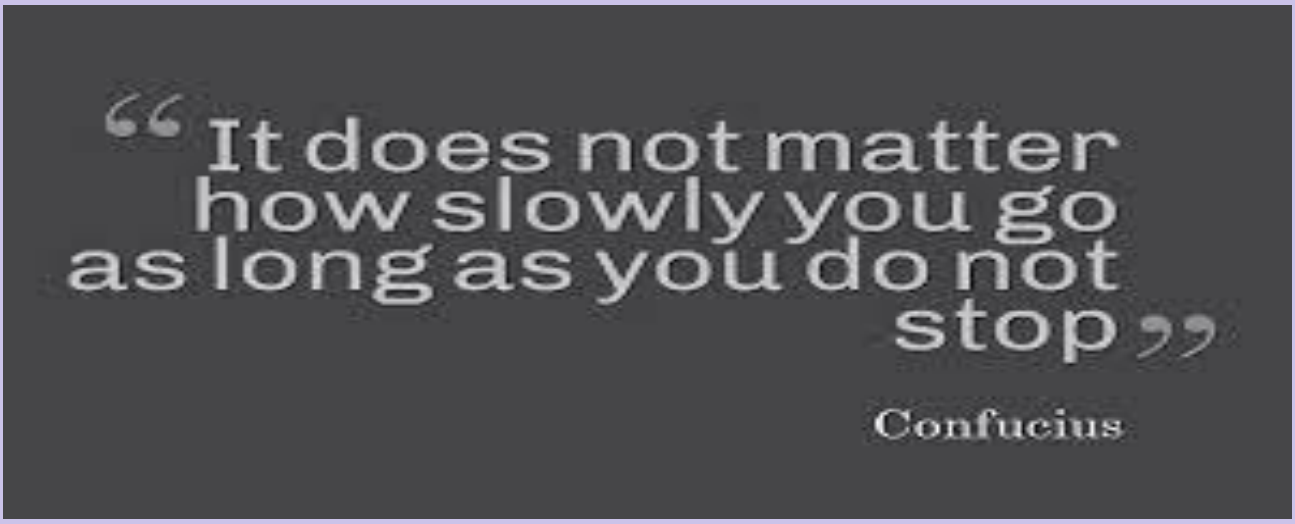
- Dr.S.Prabakar delivered a Faculty development Training Program on “Implementation and Attainment of PEOs, Pos, and COs in Outcome Based Education” at Dr.N.G.P. Institute of Technology, Coimbatore on 18.06.2015.
- Mrs.K.Yasoda delivered a Faculty development Training Program on “Dialysis and Lithotripsy “at Velalar College of Engineering and Technology, Erode during 09.06.2015.
- Dr.S.Prabakar delivered a Guest Lecture on “Image Segmentation for Anomaly Detection in Medical Images” in Anna university sponsored faculty Development Program on “Digital Image Processing” at Dr.N.G.P. Institute of Technology, Coimbatore on 08.06.2015.

FDP/WORKSHOP/SEMINAR ATTENDED

- Mrs. D.Hemapriya, Ms.S.Gowthami has participated in Faculty Development Program on Graphical System Design in Engineering Education on 29.01.2015 to 30.01.2015 at Hindustan College of Engineering and Technology.
- Ms.S.Gowthami, Ms.R.Nithya has participated in Research Workshop on LaTeX for Technical Paper Writing on 17.02.2015 at Dr.N.G.P Institute of Technology.
- Mrs.K.Yasoda, Ms.S.Malathi, Ms.A.Mohanapriya has attended a National Seminar on “Transforms and Medical Data Interpretation” on 18.02.2015 at Sri Ramakrishna Engineering College, Coimbatore.
- Mrs.D.Hemapriya, Mrs.Medha Murali has undergone a NI LabVIEW Core 1 & Core 2 Course at Dr.N.G.P Institute of Technology on 15.02.2015 to 17.02.2015, 06.03.2015 to 07.03.2015.
- Mrs.K.Yasoda, Mrs.Hemapriya, Ms.S.Gowthami, Ms.S.Malathi, Ms.Medha Murali, Ms.R.Nithya, Ms.A.Mohanapriya has undergone a Product Training Programme on Fluke Biomedical Testing and Calibration Equipment at Dr.N.G.P Institute of Technology on 04.03.2015 to 08.03.2015.
- Mrs.K.Yasoda, Ms.R.Nithya has attended Hands on training session for Biomedical and Technicians by GE Healthcare, South Asia on 16.05.2015.
- Ms.A.Mohanapriya has attended a Faculty Development Training Programme on “Biomedical Instrumentation” organized by Department of Biomedical Engineering, Velalar College of Engineering and Technology, Erode during 08.6.2015 to 12.06.2015.

SPECIAL ACHIEVEMENTS BY STUDENT

S.No	Date	Name of the Student	Year	Prize	Programme	Organized by/ Venue
1	19.03.15 to 20.03.15	B.Indhumathi J. Jareena Begam	III	Third	E-ART	SNS College of Technology, Coimbatore
2	04.03.15 to 05.03.15	P.Vinoda R.Agalya	II	First	National Level Techno Carnivel	Adhiyamaan College of Engineering, Hosur
3	05.02.15 to 06.02.15	Lalitha Lakshmi Jareena Begam	III	First	National Level Technical Symposium	Karunya University, Coimbatore
4	6.02.2015	K.Gayathri	III	First	Quiz	Dhanalakshmi Srinivasan Institute of Technology, Tiruchirappallit



STUDENTS PARTICIPATION

S.No	Date	Name of the Students	Year	Programme	Organized by/ Venue
1	10.4. 15	S.Subha Ranjitha R.Perumalsami	III	National Conference	Bannari Amman Institute of Technology, Sathyamangalam
2	27.3.15	V.Viswa Priya M.S.Revathi M.V.Sangeetha	III	Paper Presentation Quiz	Tamilnadu College of Engineering, Coimbatore
3	24.3.15	R.G.Tharangini P. Logambika	III	National Level Technical Symposium	Nandha College of Technology
4	20.3.15	G.Shruthi Sasikumar K.Gayathri K.Mythili P.Anuja R.Kiruthika C.Lalitha Lakshmi Kowalya B.Indhumathi J.Jareena Begum Guru Mownika G.Mathangi T.Lakshmi	III	National Workshop	SNS College of Technology, Coimbatore
5	19.3.15 to 20.3.15	G.Sruthi Sasikumar	III	National Level Technical Symposium	SNS College of Technology, Coimbatore
6	19.3.15 to 20.3.15	B.Indhumathi J.Jareena Beham	III	E-ART	SNS College of Technology, Coimbatore

7	16.3.15	Riffath Shehla.M R.Perumalsami	III	National Level Technical Symposium	Hindusthan College of Engineering,Coimbatore
9	12.09.14 to 13.09.14	T.Lakshmi R.Perumalsami	III	Paper Presentation	Erode Sengunthar Engineering College, Erode
10	29.09.14	M.Neveatha R.UmaMaheswari	III	Paper Presentation	Cheran College of Engineering, Karur
11	10.10.14	Anandhu S Sushi T.Lakshmi D.Madhuseguntha	III	EDC Awareness Programme	Codissia Trade Fair Complex, Coimbatore
12	11.10.14	M.Neveatha P.Logambika V.Vishwapriya V.G.Vignesh A.Vaishali M.MuthuVigneshKumar M.Priyanka R.Kiruthika G.SruthiSasikumar K.Gayathri	III	IIT Madras Outreach Programme	Higher Education Cell, Dr. N.G.P. Institute of Technology, Coimbatore
13	20.2.15	D.Durga V.Indhuja. S.Sowmiyasree D.Madhuseguntha	III	Paper Presentation	Easa College of Engineering, Coimbatore
14	20.2.15	K.Gayathri G.Sruthi Sasikumar	III	Paper Presentation	RVS Technical Campus, Coimbatore

15	18.2. 15	P.Mythili MuthuVignesh Kumar P.J.Ragul	III	National Seminar	Sri Ramakrishna Engineering College, Coimbaore
16	6.2.15	S.Sowmiyasree	III	Paper Presentation	Sri Krishna College of Engineering and Technology
17	05.02.15 to 06.02.15	Lalitha Lakshmi Jareena Begum	III	National Level Technical Symposium	Karunya University
18	06.02.15	G.Sruthi Sasikumar\ P.J. Ragul V.G. Vignesh	III	National Level Technical Symposium	Sri Krishna College of Engineering and Technology
19	05.03.15 to 07.03.15	Keerthana.S Amrudha Shree.K	II	National Level Technical Symposium	Amritha University
20	04.03.15 to 05.03.15	P.Vinodha R.Agalya	II	Paper and Poster Presentation	Adhiyamaan College of Engineering
21	02.03.15 to 03.03.15	C.Maheswari M.D.Ranjitha S.Shanmugha Priya M.Monica R.Agalya	II	National Seminar	Vivekananda College of Engineering for Women
22	02.03.15 to 04.03.15	Vidya Shree.P Divya Bharathi.D	II	National Workshop	Sri Krishna College of Engineering and Technology
23	01.03.15 to 02.03.15	B.Vaisali K.Mythili	III	International Conference	International Association of Engineering & Technology for Skill Development

CONTINUOUS GLUCOSE MONITORING -A NEW FOCUS

Diabetes has been regarded as one of the fastest growing diseases in both developing and developed countries. Modern lifestyle has led to unhealthy eating habits largely contributing to obesity. Too much fat, not enough fiber and too many carbohydrates, all contribute to diabetes. Eating right thing at right time can reverse or prevent type 2 diabetes. Sedentary lifestyle is causing damage to health and bears responsibility for the growing obesity problems. Towards a diagnosis of type 2, inactivity and being overweight go hand in hand. In comparison to fat cells, muscle cells have more insulin receptors. Therefore, a person can decrease insulin resistance by exercising as physical activity can lower a person's blood sugar level by helping insulin to be more active.

The prevalence of diabetes is growing at such an alarming rate that it has been called a "**global epidemic**". About 90% of all diabetics are diagnosed with type 2 diabetes. The main causes of increasing diabetes include aging population of baby boomers, the rising obesity rates, the sedentary lifestyle, and the emergence of diabetes at a younger age.

Blood Glucose Monitoring refers to the way of testing the concentration of glucose in the blood (glycemia). Monitoring blood sugar levels is an essential part of diabetes care, as waiting for symptoms of extremely high or low blood sugar levels can result in life threatening situations. Blood sugar monitoring is done with devices which obtain a drop of blood from a finger prick, which is then analyzed on a reagent strip. The test is generally referred to as capillary blood glucose. In the near future, the screening of patients at risk of diabetes will become widely available, regardless of the socio-economic level. In terms of treatment, the large choice of medications will allow an easier individualization according to the patients' preferences. In-hospital management of diabetes will be improved by the use of reliable monitoring systems and by the use of therapeutic algorithms. In the intensive care units (ICU), reliable and affordable intravascular monitoring systems will allow a tighter blood glucose control within individualized target blood glucose values.

Mrs.D.HEMAPRIYA

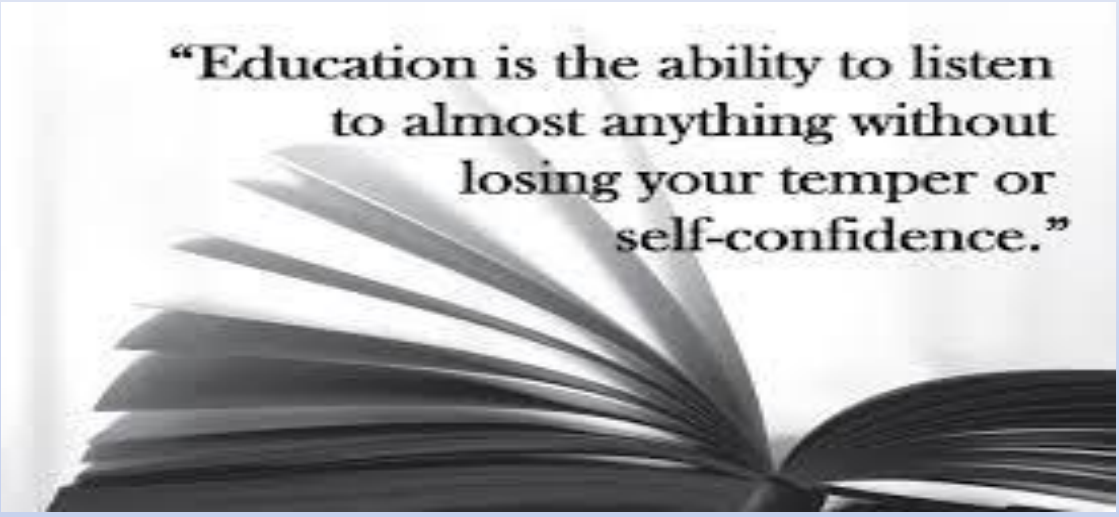
ASSISTANT PROFESSOR

TO BECOME THE SUCCESSFUL ONE

1. Appreciate your success by giving back.
2. Be honest and show integrity.
3. Execution, execution, execution.
4. Rely on your team.
5. Be flexible but persistent.
6. Trust your gut instinct more than any spreadsheet.
7. The road to success is going to be long, so remember to enjoy the journey.
8. Success only comes from hard work.
9. Focus intensely on your opportunity
10. You must be passionate about what you're trying to achieve.

Ms. R.NITHYA

ASSISTANT PROFESSOR



INTERESTING FACTS ABOUT THE BRAIN

The human brain is the most complex organ in the human body and probably the most complex creation present on this universe. It is evident that, the world's greatest man made wonders are a result of the human brain making it the most amazing feature in a human being. The human brain with its complexity acts like a storage device which holds safely a person's most cherished memories. A person's personality is by far influenced by the brain as well as generation of human consciousness which gives a person passion, motion and emotion. A command center for the central nervous system, the brain serves human beings with ample physical and cognitive abilities.

1. The human brain is the only organ in the human body that lacks nerves despite the fact that it acts as the central command for the central nervous system. This simply implies that, the human brain feels no pain.
2. The human brain consumes the largest portion of the total energy that is generated in the human body. To be precise, the brain consumes 20% of that energy despite the fact that it only represents only 2% of the total body weight. The energy is vital for maintaining healthy brain cells and fueling nerve impulses.

   The human brain has many properties that are common to all vertebrate brains, including a basic division into three parts called the forebrain, midbrain, and hindbrain, with interconnected fluid-filled ventricles, and a set of generic vertebrate brain structures including the medulla oblongata and pons of the brainstem, the cerebellum, optic tectum, thalamus, hypothalamus, basal ganglia, olfactory bulb, and many others. As a mammalian brain, the human brain has special features that are common to all mammalian brains, most notably a six-layered cerebral cortex and a set of structures associated with it, including the hippocampus and amygdala. All vertebrates have a forebrain whose upper surface is covered with a layer of neural tissue called the pallium, but in all except mammals the pallium has a relatively simple three-layered cell structure. In mammals it has a much more complex six-layered cell structure, and is given a different name, the cerebral cortex.

Ms. A.MOHANAPRIYA

ASSISTANT PROFESSOR

BIOMEDICAL BREAKTHROUGH FROM NASA

The NASA Biocapsule—made of carbon nanotubes—will be able to "diagnose" and instantly treat an astronaut without him or her even knowing there's something amiss. The Space Biosciences Division at NASA Ames creates medical technology for astronauts. They essentially provide healthcare for outer space. Dr. David Loftus is the man who invented the NASA Biocapsule and has been awarded a patent for it. If an astronaut is going to Mars, the round-trip journey will take between two and three years. During that time, the astronaut will not have access to a doctor, and there's a lot that can go wrong with the human body in space. So, prior to launch, the astronaut is implanted with a number of NASA Bio capsules.

How is it implanted?

A very small incision is made in the astronaut's skin for each Bio capsule (probably in the thigh), which is implanted subcutaneously. It's outpatient surgery that requires only local anesthetic and a stitch or two to close the wound. But after it's complete, the astronaut's body is equipped to deal with a whole host of problems on its own.

Features:

1. Each capsule could be capable of delivering many metered doses over a period of years. There is no "shelf-life" to the Biocapsules.
2. Extremely resilient, and there is currently no known enzyme that can break down their nanostructures.
3. The capsules' porous natures allow medication to pass through their walls, but the nanostructures are strong enough to keep the cells in one place. Once all of the cells are expended, the Biocapsule stays in the body, stable and unnoticed, until it is eventually removed by a doctor back on Earth.

Applications:

Protection from Radiation: One of the primary threats in space is exposure to high levels of radiation.

Heat Exhaustion & Sleep Deprivation:

Different capsules can be created to combat different threats like Heat, exhaustion, and sleep-deprivation. They are serious risks on an EVA (a "spacewalk"), and astronauts are usually on a very tight schedule. Different capsules can be created that contain unique triggers and treatments for different stress-factors. Naturally, DARPA has expressed a huge interest in the Biocapsules for potential military applications. But there are far loftier things planned for us Earthlings.

BioCapsule on Earth: - Diabetes—specifically, patients who need insulin

The capsule would contain pancreatic islet cells (from animals) or would contain engineered cells designed to behave like pancreatic islet cells, with both glucose-sensing and insulin secretion function. Patients with low-insulin requirement might benefit from implantation of a single capsule (containing perhaps a million to 10 million cells); patients with higher insulin requirement might require implantation of more than one capsule.

BioCapsule in cancer treatment (especially brain cancer):

A Biocapsule implanted directly into a tumor bed could deliver very high doses of chemotherapy right to the area where it is needed—and it would greatly reduce side effects by minimizing the amount of medication that gets to other sites in the body. There are also important applications in gene therapy.

Some children are born missing a gene, or are born with a defective gene. As a result, they can't make a needed protein. Hemophilia is a classic example. These patients are missing an important blood coagulation protein. The biocapsule could be used to implant cells that are engineered to release the missing protein. Successful therapy would mean that the patients are spared the need to receive periodic injections. Patients would be safely protected by the. protein released from the capsule, and they would be able to lead more normal lives.

NASA has scheduled to begin animal trials this year and next, and human trials would begin shortly after that. If all goes well we would likely see these implanted in International Space Station astronauts sometime this decade.

Mrs.S.CHRISTY ESTHER

ASSISTANT PROFESSOR

BRAIN ANEURYSM

A brain (cerebral) aneurysm is a bulging, weak area in the wall of an artery that supplies blood to the brain. In most cases, a brain aneurysm causes no symptoms and goes unnoticed. In rare cases, the brain aneurysm ruptures, releasing blood into the skull and causing a stroke.When a brain aneurysm ruptures, the result is called a subarachnoid hemorrhage. Depending on the severity of the hemorrhage, brain damage or death may result

Treatment of Brain Aneurysms

Not all aneurysms need to be treated and the physician may elect to closely observe the aneurysm. There are two main treatment options for patients who need to have their aneurysm treated.

- Open surgical clipping
- Endovascular coiling

Open surgical clipping

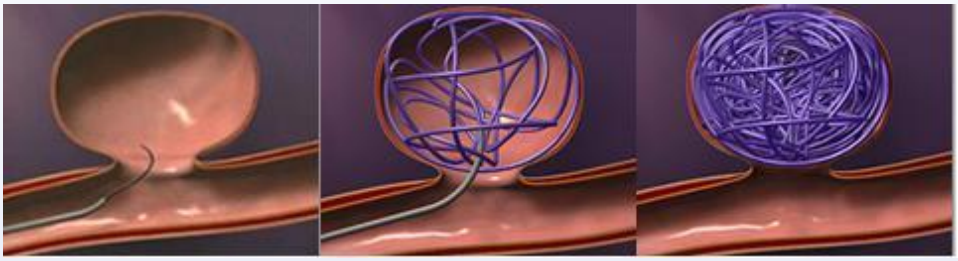
The "open surgical clipping" is performed by a neurosurgeon; he will make an incision in the skin over the head, make an opening in the bone and dissect through the spaces of the brain to place a clip across the aneurysm where it arises from the blood vessel. This prevents the blood flow from entering the aneurysm. Most elective patients spend 2-3 nights in the hospital and then will go home on light restricted activity for 1-2 months after surgery.

There have been considerable advances in open surgery techniques. Many neurosurgeons can now perform mini craniotomies, or eye brow incisions to clip an aneurysm. In select patients a small incision is made over the eyebrow. A small two inch window is then made in the bone over the eye and through this incision a small clip is placed across the opening of the aneurysm.

Endovascular "coiling":

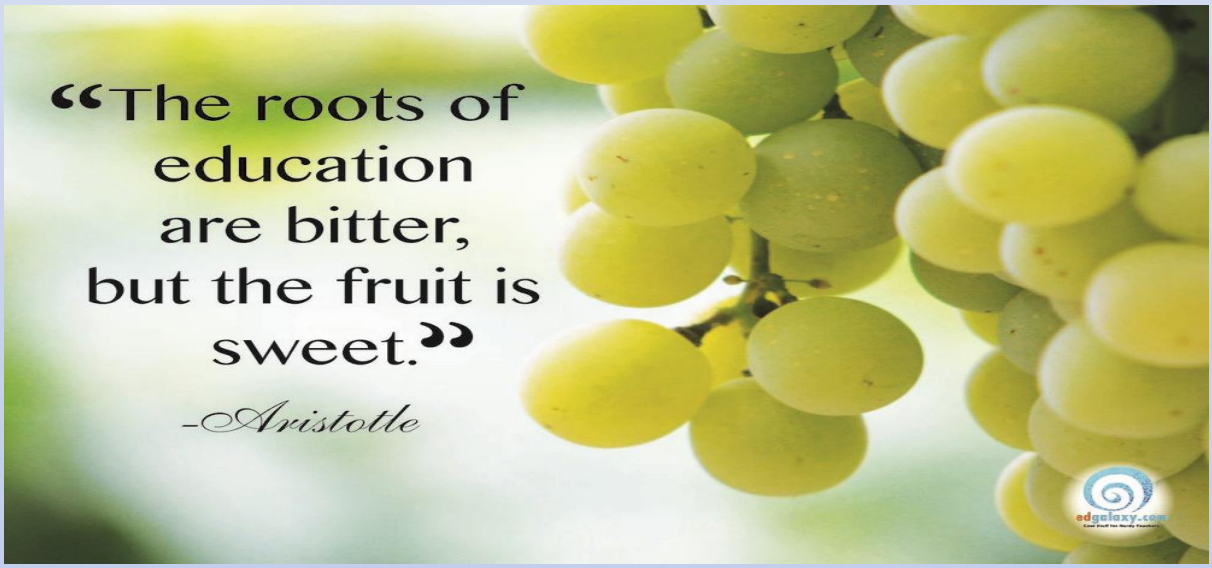
Endovascular treatment is performed by a neurointerventional surgeon who may be a neuroradiologist, neurosurgeon, or neurologist. Studies have shown that patients with a ruptured aneurysm tend to do better in the long term after a coiling procedure.

A coiling procedure is performed as an extension of the angiogram. A catheter is inserted into a vessel over the hip and other catheters are navigated through the blood vessels to the vessels of the brain and into the aneurysm. Coils are then packed into the aneurysm up to the point where it arises from the blood vessel, preventing blood flow from entering the aneurysm. Most elective patients will go home the next day after surgery and are back to normal activities the following day. More than 125,000 patients worldwide have been treated with detachable platinum coils.



Additional devices, such as a stent or a balloon, may be needed to help keep the coils in place inside the aneurysm. Stent assisted coiling involves permanently placing a stent in the vessel adjacent to the aneurysm to provide a scaffolding of support that keeps the coils within the aneurysm sac. Balloon remodeling involves temporarily placing a removable balloon adjacent to the aneurysm while coils are positioned in the aneurysm.

Ms.R.SARANYA
ASSISTANT PROFESSOR



LATEST MATERIALS INNOVATIONS FOR NEW MEDICAL DEVICES

The next frontier for electronics could lie inside the human body, with sensors that keep track of biomarkers and brain activity, systems to deliver drugs or monitor exercise levels, and communications networks that allow such devices to call on the processing power of your Smartphone and send your data to the doctor's office.

Glucose sensing: Goaran Gustafsson, an expert in printed electronics and bioelectronics at the Swedish research institute Acreo Swedish ICT, has used roll-to-roll printing techniques to build disposable glucose sensors, which cost less. Sensors can communicate their findings through flexible displays printed on polymer or by using antennas made of a silver ink to communicate with the wearer's smart phone.

Measuring Brainwaves: George Malliaras, head of the bioelectronics department at Ecole Nationale Supérieure des Mines de Saint-Étienne, France, is working on Organic Electrochemical Transistors (OECTs) can be either implanted or placed on the brain's surface both to monitor activity—for instance to measure brain function in Parkinson's disease—and to deliver a stimulus to brain. The transistors consist of a thin polymer film that forms a channel in contact with an electrolyte; tiny difference in electrical potential where the electrolyte touches the polymer drive ions in and out of the channel, creating a measureable change in the transistor.

Nervous system control: Gustafsson and his group are working on an implantable ion pump, based on conductive organic polymers. For every electron sent into the pump, an ion or a molecule—perhaps sodium or a neurotransmitter—comes out, providing a way to communicate with the nervous system. He'd like to use it, for example, to deposit the neurotransmitter gamma-amino butyric acid (GABA) onto a precise spot on the spinal cord of a patient suffering chronic pain.

Light control: Ifor Samuel, head of the Organic Semiconductor Optoelectronics group at the University of St. Andrews, Scotland has developed a sensor that uses an organic LED to measure muscle contractions, with an eye to using those measurements to control a prosthetic limb or a remote robot arm. Muscle fiber scatters light both parallel to and perpendicular to the direction of the muscle fiber, and that scattering changes when the muscle contracts. The device shines light into the skin and use four photodiodes—two along the muscle, two perpendicular—to measure the pattern of changes in the scattered light.

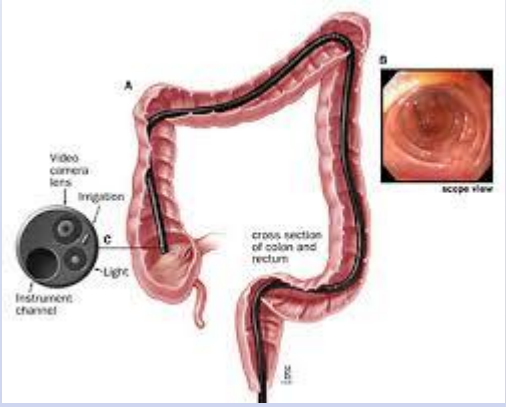
SNEHA PRABAHARAN
II-YEAR

COLONOSCOPE

Colonoscopes are used for the removal of foreign bodies, excision of tumors or colorectal polyps (polypectomy), and control of hemorrhage. Routine colonoscopy is important in diagnosing intestinal cancer, the second leading cause of cancer deaths in the United States. These endoscopic procedures reduce the need for invasive surgical diagnostic and therapeutic procedures.

DESCRIPTION

These devices consist of a proximal housing, a flexible insertion tube, and an “umbilical cord” connecting the light source and the proximal housing. The proximal housing, which is designed to be held in one hand, typically includes the eyepiece (fiber optic models only), controls for distal tip (bending section) angulation and suction, and the working channel port. Colonoscopes have several hollow channels for suction, water and air delivery, and insertion of accessory instruments and cannulae. The distal tip of video colonoscopes includes a charge-coupled device (CCD) that serves as a small camera and electronically transmits the image from the CCD to an external video-processing unit.



PRINCIPLES OF OPERATION

Video colonoscope insertion tubes contains a fiber optic light bundle, which transmits light from the light source to the tip of the endoscope. Each fiber optic bundle consists of thousands of individual glass fibers coated with glass causing internal reflections that allow light transmission through the fiber even when it is flexed.

OPERATING STEPS

The patient typically lies on his or her side on a procedure table. Patients typically will require

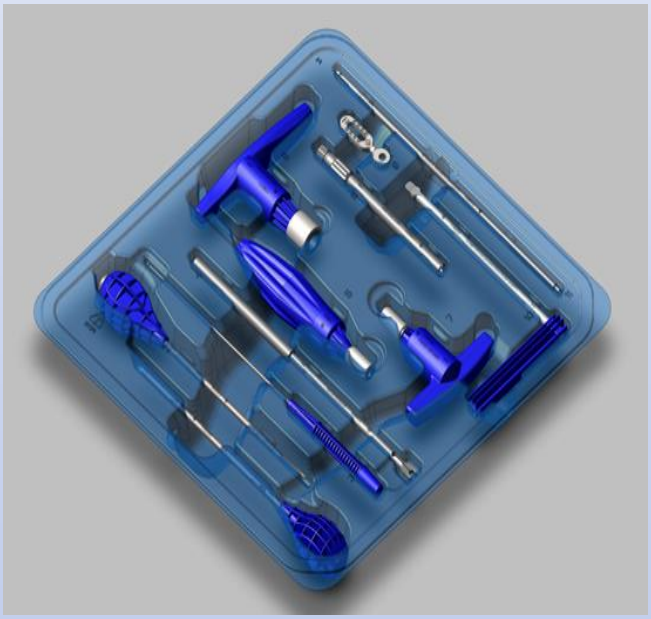
anaesthesia or conscious sedation before insertion of the colonoscope. The colonoscope is inserted into the colon via the rectum by a gastroenterologist. Video images are typically viewed throughout the procedure on a video monitor. These images can then be recorded, printed, stored on digital media, or transmitted to another location for simultaneous viewing. The gastroenterologist manipulates the direction of the device using controls on the colonoscope control housing.

REPORTED PROBLEMS

Although rare, trauma to the colon and adjacent organs during colonoscopy can result in complications such as bleeding, peritonitis, and appendicitis. ECRI Institute has received reports of difficulty in inserting forceps through the instrument channel of contorted colonoscopes, causing delays in procedures. Problems have occurred related to blockage of the air channel from inadequately rinsed disinfectant or retrograde flow of protein material into the channel during a procedure. Also, patient infection is a common mainly from improper cleaning and disinfection procedures.

K.GAYATHRI
III-YEAR

DISPOSABLE SPINE IMPLANT FIXATION KIT



ECA Medical Instruments, Inc. claims to have developed a "game changer" with the "potential to transform healthcare economics". The claim is based on FDA clearance of the company's disposable spine implant fixation kit announced on January 16, 2015.Calling it the first such sterile-packed kit to gain FDA clearance, the product "features a full complement of fixation instruments in a single sterile packed tray including proprietary and industry first cannulated torque-limiters, ratchets and fixed drivers." All the kits and instruments are disposable, biodegradable or recyclable. These specialized instruments are needed by surgeons to perform both open and minimally invasive surgeries (MIS) in both inpatient and outpatient facilities. This single tray of instruments is game changing for our industry and FDA approval [FDA clearance] signals a new era is taking hold with potential to transform healthcare economics, said John Nino, president and CEO of ECA Medical Instruments. Surgeons, hospitals, ambulatory surgical centers (ASCs) and patients all benefit from cost savings, increased safety and superb outcomes. The focus will be on serving ASCs.The instruments are to be used with the Intelligent Implant Systems, LLC's (IIS) Revolution Spinal System and will be available in the U.S. starting second quarter 2015. The announcement stated the ISS system offers a "simplified design for posterior spinal fixation implant of single or two-level constructs." By providing sterile state-of-the-art implants combined with a single sterile tray of disposable instruments by ECA, we are leading the way to a better approach for spinal surgery, said Marc Richelsoph, president and CEO of Intelligent Implant Systems. Nino's bold prediction may not be idle. According to the company, every 20 seconds of every day an ECA torque instrument is used to secure a medical implant in a patient. The company says it has manufactured and delivered over 25 million precision torque instruments to the world's leading producers of cardiac rhythm management, neuromodulation, cardiovascular and orthopedic and spine implants "resulting in over 500 million surgical actuations."

J.JAREENA BEGAM

III-YEAR

PACS

A picture archiving and communication system (PACS) is a medical imaging technology which provides economical storage and convenient access to images from multiple modalities (source machine types). Electronic images and reports are transmitted digitally via PACS; this eliminates the need to manually file, retrieve, or transport film jackets. The universal format for PACS image storage and transfer is DICOM (Digital Imaging and Communications in Medicine). Non-image data, such as scanned documents, may be incorporated using consumer industry standard formats like PDF (Portable Document Format), once encapsulated in DICOM. A PACS consists of four major components: The imaging modalities such as X-ray plain film (PF), computed tomography (CT) and magnetic resonance imaging (MRI), a secured network for the transmission of patient information, workstations for interpreting and reviewing images, and archives for the storage and retrieval of images and reports. Combined with available and emerging web technology, PACS has the ability to deliver timely and efficient access to images, interpretations, and related data. PACS breaks down the physical and time barriers associated with traditional film-based image retrieval, distribution, and display.

USES:

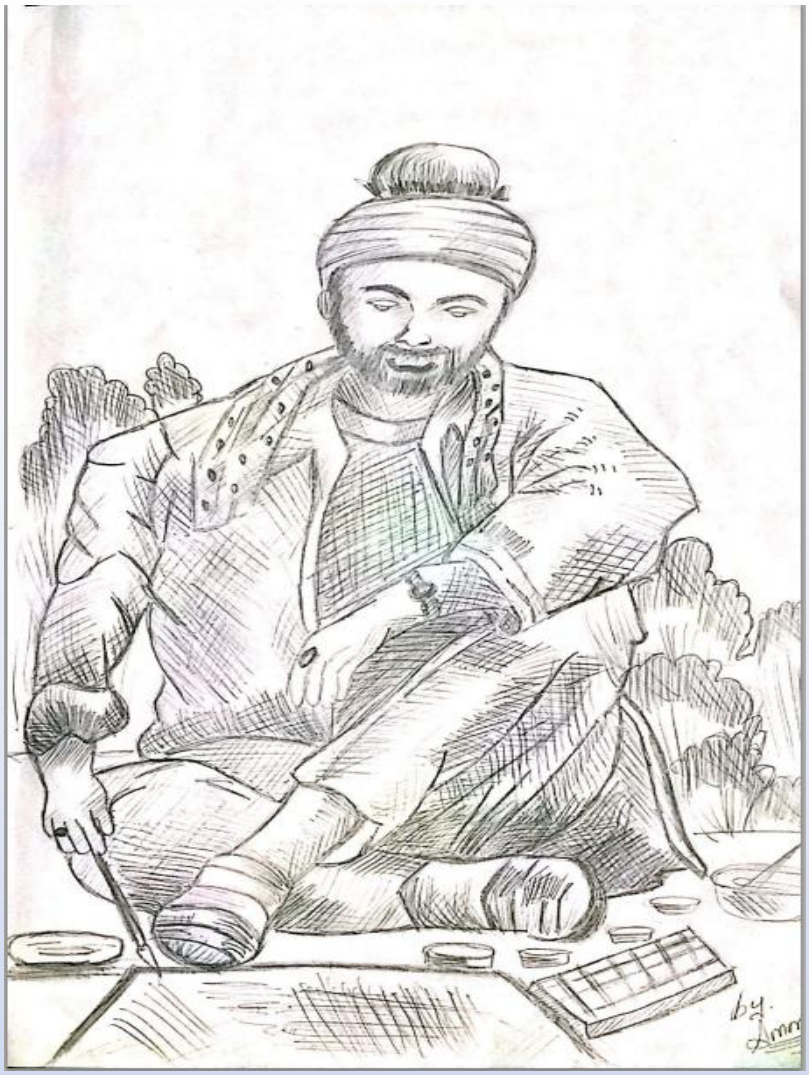
PACS has four main uses:

- Hard copy replacement: PACS replaces hard-copy based means of managing medical images, such as film archives. With the decreasing price of digital storage, PACSs provide a growing cost and space advantage over film archives in addition to the instant access to prior images at the same institution. Digital copies are referred to as Soft-copy.

- Electronic image integration platform: PACS provides the electronic platform for radiology images interfacing with other medical automation systems such as Hospital Information System (HIS), Electronic Medical Record (EMR), Practice Management Software, and Radiology Information System (RIS).

S.SUBHA RANJITHA

III-YEAR



K.AMRUDHA SREE

II-YEAR

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II-YEAR

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