

Medical Equipment & Automation

India's premium magazine on the diagnostic, medical equipment industry and technology

A walk through Prosthetic Device Industry

INSIDE

- ◆ ROBOTICS
- ◆ PREVENTIVE HEALTHCARE
- ◆ MEDICAL DEVICES
- ◆ ORTHOPAEDIC



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“Indian orthopaedic devices market to hit Rs. 16,000 Cr by 2030

The healthcare sector in India has evolved a great deal over the last couple of decades. This fast development has led to an impressive growth in the medical devices industry. Orthopaedic devices contribute to a major part of the medical devices industry and it plays a crucial role in providing pain relief, improving mobility, and enhancing the quality of life of the patients suffering from musculoskeletal disorders.

Further, osteoarthritis has emerged as the most prevalent form of arthritis in India, affecting over 15 million adults every year. It has been feared that India may become the 'osteoarthritis capital' of the world with over 60 million cases by 2025. Thus, futuristic orthopaedic devices will have a significant role to play in the time to come.

According to a research report by Global Market Insights Inc., the global orthopaedics devices market is expected to reach US \$ 53 billion by 2024. The Indian market for orthopaedic devices is expected to grow 20% every year to hit Rs. 16,000 crore by the year 2030.

India has emerged as a prominent hub for orthopaedic surgeries in recent years especially in the field of joint replacement. The exponential advancement in joint replacement technology is enabling doctors to provide mobility to patients immediately after the surgery, and patients can comfortably walk out the same day. Also, the effective adoption and application of robotics and Artificial Intelligence (AI) are generating unprecedented opportunities in the orthopaedic procedures.

Though, the cost factor remains the major drawback in the robotic orthopaedic surgeries, companies across the world are working towards bringing down the cost of orthopaedic surgical robots and increasing accuracy of the procedures. Experts believe that it will not take more than two years for the AI based robotic systems to claim a lion's share in orthopaedic surgeries.

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Pravita Iyer
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The Power of AI

Artificial Intelligence (AI) is revolutionising all industries in this digital age. It is transforming the way we interact, consume information, and obtain goods and services across industries. The AI sector, valued at about \$600 million in 2014, is projected to reach \$150 billion by 2026.

AI is redrawing the healthcare landscape too thanks to the Big Data and Machine Learning that help to predict, comprehend, learn and act. According to Frost & Sullivan, AI is expected to generate \$6.7 billion in revenue from healthcare globally by the year 2021.

Early-stage cancer detection could reduce breast cancer death rates. However, spotting and diagnosing breast cancer early remains a challenge. Detection today is performed through digital mammography, but reading breast x-ray images is a difficult task, even for experts, and this can often result in both false positives and false negatives. Of late, the tech giant Google claims to have developed an AI model that can spot breast cancer more accurately than a human radiologist.

"In an independent study of six radiologists, the AI system outperformed all of the human readers: the area under the receiver operating characteristic curve (AUC-ROC) for the AI system was greater than the AUC-ROC for the average radiologist by an absolute margin of 11.5 per cent," Google states in a blog post. The model was trained from de-identified mammograms of 76,000 women in the UK and 15,000 women in the US.

Google is looking forward to prospective clinical studies and the regulatory approval of how AI can aid in breast cancer detection and in the coming years, the company hopes to translate machine learning research into tools that benefit clinicians and patients.

Further, in this age of the genome, DNA research is coming of age. Genomics, defined as the study of genes and their functions, is at the forefront of the information revolution that is sweeping across healthcare. AI can enable gaining perspective on the particular genetic blueprint faster and more accurate. Thus, AI can power the healthcare sector to leapfrog into the future.

Subhojit Roy
Group Editor

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According to Frost & Sullivan, AI is expected to generate \$6.7 billion in revenue from healthcare globally by 2021.

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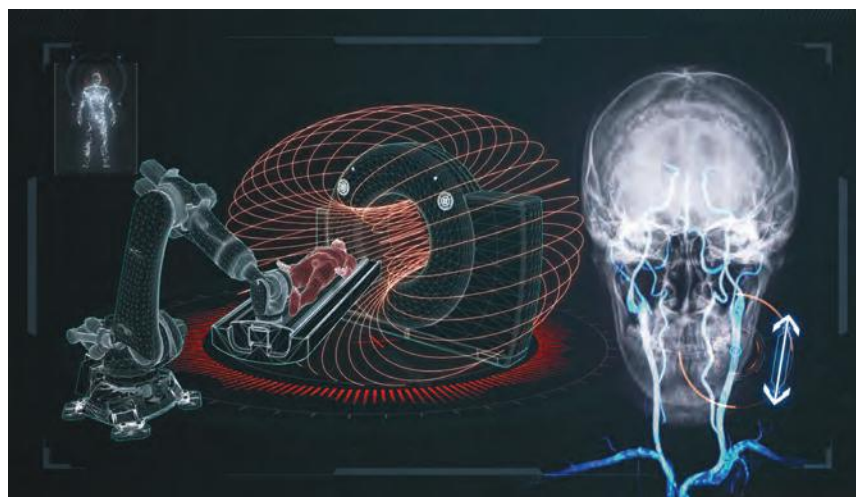
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A walk through Prosthetic Device Industry

Prosthetic is all about creating limbs for limbless. Here's a summary of the game-changing innovations in the field of prosthetics.

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Fortis Escorts hosts facial - trauma academic programme

Taking note of the rising incidents of accidents causing musculoskeletal disorders, the Fortis Escorts Hospital, Jaipur has begun a two-day course on craniomaxillofacial processes to manage facial trauma. The course, conducted by both national and international faculty members, including Dr Sandeepan Mukul, Director – Plastic and Cosmetic Surgery, Fortis Jaipur, is being held in association with AO CMF, a worldwide network of clinicians from the fields of oral and maxillofacial surgery, plastic surgery, ENT, head and neck surgery, ophthalmology and neurosurgery.

Orofacial injuries comprise a significant number of trauma patients in the emergency department. Such injuries are associated with high morbidity due to increased cost of care and varying degrees of physical, functional and cosmetic disfigurement.

“Facial trauma is one of the saddest outcomes of an accident. With the rise in numbers of accidents taking place in cities and settlements along the highways, the need of the hour is to augment the capabilities of our doctors to address the growing burden of disfigurement. Such incidents can seriously affect the confidence level of an individual and hence, deserve attention. This two-day course is a face-to-face interactive event delivered through a combination of short lectures, simulation, small group discussions and practical exercises. This combination enables participants to hear, discuss and apply the concepts of facial trauma management. With an aim to promote excellence in patient care and clinical outcomes of Craniomaxillofacial Surgery, we have initiated this academic programme.

“We have nearly 100 participants from India and abroad, fully qualified surgeons who are involved in the treatment of facial trauma with up to five years’ experience, as well as residents and fellows, attending the course,” says Dr Sandeepan Mukul, Director – Plastic and Cosmetic Surgery, Fortis Escorts Hospital, Jaipur. +

Transasia Bio -Medicals unveils “Lisa XL” in Jaipur

The Transasia-Erba group recently unveiled Lisa XL, India’s first six-plate ELISA processor at the 15th Asia-Pacific Federation for Clinical Biochemistry and Laboratory Medicine Congress (APFCB) in Jaipur. The device was formally unveiled by Prof. Praveen Sharma, Chairman, Organising Committee, APFCB Congress, in the presence of Ravi Kaushik, CEO, Transasia Bio-Medicals, Anil Jotwani, Sr. President, Transasia Bio-Medicals and Louis Villar, Commercial Manager, South-East Asia, Erba Group. Designed at Transasia-Erba’s European subsidiary, Lisa XL can perform upto 576 tests at one go, making it a preferred choice for laboratories and blood banks with high workload. Transasia also displayed its entire suite of products in Biochemistry, Urinalysis and Hematology at the conference. The new instrument is already registered with the Government e-Marketing (GeM) a government digital e-market platform to sell Lisa XL.

Commenting on the new equipment, Anil Jotwani, Sr. President, Transasia Bio-Medicals, said, “Today blood banks have



to ensure stringent screening with quality instruments and reagent kits. Considering the high volume of testing in India, there is a need to equip blood banks here with the latest technology that enables faster diagnosis without compromising on quality. Also shorter turnaround time also leads to lower cost per test which is important considering pricing is a major factor in India. Microplate processors in India are 1, 2 or 4 plates. By introducing a six plate processor, the first in the country, we are targeting large blood banks. The new Lisa XL is part of our commitment to making healthcare affordable in India through delivery of world-class diagnostics at competitive prices.” +

PD Hinduja Hospital & MRC conducts patient education seminar

PD Hinduja Hospital & MRC conducted a workshop on ‘Difficulty in Conception – Causes and Treatments’ for couples aspiring to enter parenthood. The attendees were addressed by the distinguished In-Vitro Fertilisation (IVF) expert Dr Indira Hinduja with a special focus on Management of PCOS, endometriosis and fertility preservation. The learnings shared by the expert through interactive sessions kept the couples engaged and was designed to provide a broader perspective on parenthood through IVF.

While addressing the gathering Dr Indira Hinduja, Honorary Gynaecologist, IVF and Infertility specialist, expressed, “Parenthood is a gift and every couple wishes to experience it. However, due to certain lifestyle and biological factors parenthood doesn’t naturally happen to a few. Most aspiring parents today in the urban cities willfully choose to embrace



IVF to enter into parenthood. Although the awareness still lacks around this topic, there is an urgent need to eradicate stigma about imperfections of conceiving with technology.”

During the sessions, the attendees were provided with information about the significance of age, physical and psychological factors involved to undergo the IVF treatment, mainly with its core focus on couples having issues like PCOS, Endometriosis and Fertility Preservation. The attendees were addressed by the distinguished In-Vitro Fertilisation (IVF) expert Dr Indira Hinduja. +



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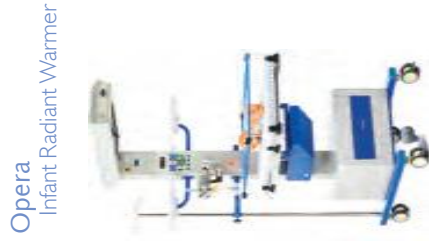
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Transport Infant Incubator

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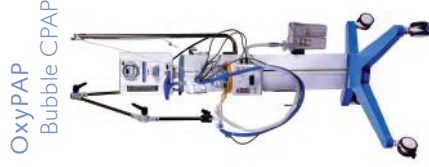
Opera Plus
Infant Radiant Warmer

nice 5000 RP



Opera
Infant Radiant Warmer

nice 2010 BC



OxyPAP
Bubble CPAP

nice 5060



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nice 4000 LED

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T- Piece Resuscitator



nice 5020

OxyM
Air/Oxygen Blenders



nice 5005

iSmart
Respiratory Humidifier



nice 8050

Infant Weighing Scale



nice 1000

RAN
Respiration Monitor



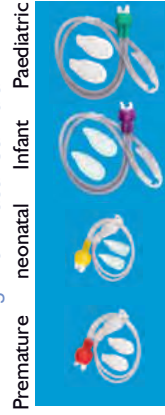
nice 5050

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FDA launches app for healthcare professionals

The US Food and Drug Administration announced the global launch of CURE ID, an Internet-based repository that will allow the clinical community to report their experiences treating difficult-to-treat infectious diseases with novel uses of existing FDA-approved drugs through a website, a smartphone or other mobile device. The platform enables the crowdsourcing of medical information from healthcare providers to guide potentially life-saving interventions and facilitate the development of new drugs for neglected diseases. The repository is a collaboration between the FDA and the National Center for Advancing Translational Sciences (NCATS), which is part of the National Institutes of Health (NIH).

"The CURE ID application focusses on drugs for infectious diseases lacking adequate treatments, including neglected tropical diseases, emerging infectious threats and infections caused by antimicrobial-resistant organisms. When healthcare professionals directly input their clinical cases into the app, CURE ID allows these real-world experiences to be organised and analysed much faster, making it easier to spot promising new uses for existing drugs," said Amy Abernethy, Principal Deputy Commissioner, FDA.

The app works by collecting a simple case report form from caregivers about their experience using an approved product for an unapproved use. Healthcare professionals can browse from a collection of cases that have already been documented, including successful and unsuccessful treatments, in addition to viewing relevant clinical trials and those open to enrollment at clinicaltrials.gov. App users can also participate in a treatment discussion forum where they can engage with fellow providers globally. The FDA plans to reach out to healthcare providers in various disciplines, including infectious and tropical diseases, to encourage them to use the app. 

MGM Healthcare appoints Harish Manian as CEO

MGM Healthcare has announced the appointment of Harish Manian as the Chief Executive Officer (CEO). Manian is a healthcare management professional with almost two decades of experience in the P&L role covering project management, operations, business transition and business development. He has worked across the healthcare ecosystem (hospitals, pharma consulting, medical technology consulting and ITES) across various geographies.

Confirming the appointment, Dr Prashanth Rajagopalan, Director, MGM Healthcare, said, "Ever since our inception last year, MGM Healthcare has aimed to lead the movement towards early and accurate diagnosis and treatment; and to deliver deep insights by making state-of-the-art technology and next-generation cure accessible and affordable to people, thus enabling better quality of life. And for this to be implemented in an organised manner, we need people with proven track record in the healthcare management space. In Harish, we see a highly business and process focused professional with a keen interest in product management and strategic business planning for new and existing hospitals. I am



happy to welcome him on board at MGM Healthcare; and am confident that he will implement a range of strategic initiatives to lead MGM to our next phase of growth." Commenting on his appointment, Manian said, "In a short span of a year, MGM Healthcare has today become a force to reckon with in the region, with unmatched potential across medical specialities. I am honoured and overwhelmed to be part of this dynamic 'healthcaring movement' promoted with a positive and holistic treatment approach. I look forward to closely working with the entire team in realising MGM's vision and mission. My primary focus will be to grow MGM to a strong position across healthcare verticals in the region and to model the desired changes for further growth and expansion." 


Masanori Matsubara assumes charge as new MD of OMRON Healthcare India

OMRON Healthcare India has announced the elevation of Masanori Matsubara as the new Managing Director of its India operations. Matsubara succeeds Kazunori Tokura who headed the operations of the company for about two years. Matsubara has been associated with OMRON Healthcare for more than 10 years and has led significant functions of the business across India and Japan. He has an astute understanding of key strategic aspects such as domestic sales management, new business development and corporate planning.

Talking about this, Frans Velkers, Chief Operating Officer (COO), OMRON Healthcare, Asia Pacific, said, "India is one of the most dynamic markets for us in Asia Pacific, where rapid economic growth is going hand-in-hand with increasing social challenges. OMRON is eager to fulfill its mission to improve lives and contribute to



a better society in India, too. Through this change in leadership, I am confident that OMRON will further strengthen its leading position in the digital blood pressure monitor domain and accelerate development of other healthcare categories, using innovation in healthcare to help fulfill social needs."

Commenting on his appointment, Matsubara said, "The role is definitely bigger and challenging. I aim to deliver the objectives with the continued support of my team and channel partners and will do the best for customers, channel partners and employees." 



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Manpreet Sohal appointed as Director & COO of Nanavati Super Speciality Hospital



Nanavati Super Speciality Hospital (NSSH) has announced the appointment of senior healthcare professional Manpreet Sohal as its Director and Chief Operating Officer (COO). Prior to Nanavati Hospital, Sohal was CEO of Gleneagles Global Hospitals and Zonal Director of Fortis Healthcare, Mumbai. He is credited with over 24 years of professional experience, including 10 years in Senior Health Care Management.

During his tenures at Gleneagles Global Hospitals and Fortis Healthcare, he excelled in hospital operations and improved the quality of care, physician and medical staff relations, supply chain management and total project management including medical equipment procurement and manpower sourcing.

Sohal completed his Bachelor's Degree in Law from Punjab University and Healthcare Delivery Management program from Harvard Business School. He assumed the office of Director & COO at NSSH from November 30, 2019.

"We are pleased to welcome Sohal as the COO and Director of Nanavati Super Speciality Hospital. His dynamic leadership qualities, operational focus and strong strategic perspective are well compatible with our great institution. Sohal's appointment will accelerate our mission to offer qualitative medical services with compassionate care," said Abhay Soi, Chairman & Managing Director, Radiant Life Care Private Limited. +

P&G Health launches PANACHE for India's Gen X doctors

Procter & Gamble Health announced the launch of PANACHE, a first-of-its-kind platform to support India's Gen X doctors in their medical education journey. India has over 65,000 medical students enrolled in 450 medical colleges, amongst whom 30,000 post graduate students will soon enter the professional world. Intended to supplement their core medical curriculum, PANACHE aims to assist students in honing crucial skills for holistic patient care viz medico-legal aspects, ethics, role of technology, emotional intelligence, decision making, good communication, teamwork, problem solving and leadership among others.

More than 10,200 students have already enrolled for PANACHE nationwide. Speaking about the initiative, Milind Thatte, MD, Procter & Gamble Health stated, "As India increases access to healthcare, patient expectations of care are rising. Today's doctors require multiple competencies for good practice. P&G Health's PANACHE goes beyond sharing medical expertise for any therapy area, to help equip the doctors of tomorrow with holistic skills that encompass all aspects of clinical practice.



We are thankful to the medical expert panel, who worked with us to design the PANACHE programme to ensure it covers the most relevant skills and topics, and to the Heads of Medical colleges who are partnering with us to take this programme to students across the length and breadth of India."

Participants from more than 250 colleges across 130 cities will go through two rounds of online quiz assessments culminating in a live quiz for the final round at the APICON 2020. All participating students will have access to tutorials and learning resources on www.panacheindia.org, as well as workshops conducted by leading experts on medico-legal guidelines, and patient-doctor interaction. Top 3 PANACHE winners will be offered a scholarship for further education by P&G Health. +

Dr Agarwal's Eye Hospital opens 10th centre in Bengaluru

Dr Agarwal's Eye Hospital, recently launched its super-speciality eye care centre at Rajajinagar in Bengaluru. This is Dr Agarwal's 10th centre in Bengaluru, making it easily accessible to patients in North and West Bengaluru. The speciality hospital has over 86 centres across the country and overseas.

Srujan Lokesh, Kannada Actor, along with Dr Manjunath MC, Medical Director, Dr Agarwal's Eye Hospital and Dr Ram Mirlay, Head Clinical Services, Dr Agarwal's Eye Hospital inaugurated the new facility at Rajajinagar. The aim of the new centre is to offer one-stop-solution for all kinds of eye ailments to the people of West and North Bengaluru.

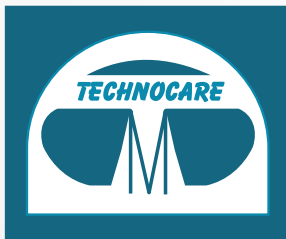
Inaugurating the new facility, Lokesh said, "With current lifestyle, stress and



increased pollution in our cities, a number of eye related ailments have cropped up. Dr. Agarwal's eye hospital is a renowned name in

eye care. This expansion ties well with the state government's focus on making the best medical services available to all people across Bengaluru."

Dr Manjunath MC said, "At Dr Agarwal's Eye Hospital it's our constant endeavour to provide the best facilities and services to all our patients. Our new centre is equipped with all the latest technologies which will be an added advantage to the patients suffering from varied eye problems. With this centre, we will be able to address the growing needs of eye patients who are looking for state-of-the-art treatment at competitive costs." +



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BABY WARMER & LED PHOTO THERAPY



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Training session to prevent stroke held in Mumbai



Mumbai Stroke Society in association with Global Hospital, Parel and The Rotary Club of Bombay Worli recently organised an informative training session for doctors catering to 108 ambulance on ways to prevent stroke. Present on the occasion were actor Shreyas Talpade, Dilip Jadhav, Project Director, EMS National Health Mission, Mumbai, Maharashtra, and Harjit Singh Talwar, District Governor (Rotary).

The state government of Maharashtra has come up with 108 emergency ambulance services that have been started to help patients deal with a stroke, fire injuries, road accidents, and cardiac arrest.

Dr Shirish Hastak, Regional Director, Neurology, Stroke & Neurocritical Care, Global Hospital says, "There are few steps to resuscitate the brain after a stroke and those steps are called ABCD3 that means A stands for Airway, B for breathing, C for circulation, D for the deficit, duration, and drug. ABC is well-established but D3 isn't. It is time to take stroke seriously and nip it in the bud."

Dr Vivek Talaulikar, CEO, Global Hospital, Mumbai says, "The training session will enhance the knowledge of the doctors of the 108 Ambulance regarding the management of stroke patients during the Golden Hour." +

300 transplant recipients participate at the 12th National Transplant Games held in Mumbai

Global Hospital, Mumbai with Narmada Kidney Foundation and Indian Society of Organ Transplantation joined hands to organise 12th National Transplant Games followed by Donors' felicitation program on 30th November 2019 at Worli Sports Club, Mumbai. Present on the occasion were Sameer Dighe, Indian Cricketer and Vishwanath, Football coach.

Organ donation is the biggest act of benevolence by any human being. It is because of the generous donors that so many patients with end stage organ disease are alive today. Transplant Games includes both outdoor and indoor games (running, walking, carom, pickleball, table tennis, archery and rifle shooting) for both transplant recipients and donors. The objective of these games is to show how transplant patients return to normal and donors continue to remain healthy. In this way, the games will also paint a positive and hopeful picture for the future donors and transplant patients.

Three hundred recipients and donors participated in this spectacular event. Sameer Dighe, Indian Cricketer and Vishwanath, The football coach graced the occasion and inspired the participants.

Dr. Bharat Shah, Managing Trustee of Narmada Kidney Foundation and Director,



Institute of Renal Sciences, Global Hospital, Mumbai highlighted "Our foundation-initiated Organ Donors" Day program felicitating living donors and family members of cadaver donors in 1997 and National Transplant Games in 2008. Till now, about 1815 recipients and 936 donors (altogether 2651) have participated in the games showing that donors continue to lead a normal life after donating kidney or part of their liver to their loved one and recipients return back to the near-normal quality of life.

Dr. Vivek Talaulikar, CEO, Global Hospital, Mumbai, said, "Global Hospital, Mumbai is relentlessly working hard towards educating and supporting organ donation and transplantation as every 10 minutes a new name is added to the waiting list of patients. The hospital encourages all to pledge their organs by signing an organ donor card through seminars, drives, and campaigns to save precious lives of those affected by end-stage organ failure." +

Trivitron Healthcare appoints Ravish Mittal as Group CFO

Trivitron Healthcare has appointed Ravish Mittal as Group Chief Financial Officer. Mittal, a qualified CA and Fellow member of the Institute of Directors (India & London) brings with him more than 25 years of varied experience



across strategic direction, business partnering and controlling, mergers and acquisitions, joint ventures, treasury and Forex management, fund raising, project and compliance management in multinational corporations and promoter-driven companies in India.

"We are delighted to have Mittal on-board Trivitron Group. In his new role, Mittal will be at the helm of the company's finances, organisational growth and

expansion plans. We look forward to an exciting journey along with him and wish him all the success," said Dr GSK Velu, Chairman and MD, Trivitron Healthcare.

Commenting on his appointment, Mittal said, "It's truly an exciting opportunity to join a market-leader like Trivitron Healthcare, especially in the current scenario wherein sizeable investment is expected in healthcare space."

Chandra Ganjoo, Executive Director, Group CPO & Head Corporate Communications, added, "We are optimistic about this appointment. With his enthusiastic approach and a strong performance track record, Mittal will continue to drive the growth of Trivitron Group." +

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Biomedical Refrigerators and Freezers Market: Hospitals to represent robust revenue growth



Growing prevalence of various diseases is projected to boost demand for vaccines in the healthcare institutions globally. In addition, increasing advancements in biobanking techniques is projected to impact the global market growth positively.

A report by Fact.MR states that the global market of biomedical refrigerators and freezers is projected to reflect a CAGR of 5.7 per cent over the forecast period of 2017-2022.

Factors fuelling the global market growth

Growth of the global biomedical refrigerators and freezers market is mainly bound to various macro-economic and micro-economic factors. Prevalence of various disorders is projected to boost demand for vaccines in various healthcare institutions. Treatment of various diseases will also continue to boost demand for blood and derivatives of blood. Biomedical freezers and refrigerators market is projected to witness significant demand in the research laboratories, blood banks, educational institutions, hospitals and diagnostic centres. Surge in demand for storage of biomedical samples will continue to fuel adoption of biomedical refrigerator and freezers globally.

Vaccination management is becoming a major concern in various healthcare and research institutions. Growing need for storing biomedical samples at exact and accurate temperature will further fuel adoption of biomedical freezers and refrigerators globally. Moreover, growth of the cell therapy has significantly revved up production of medicines, custom-made vaccine products and blood transfusion. Increasing demand for storage of the biomedical samples and products attributed to growing need for cell therapy is further projected to boost demand for biomedical freezers and refrigerators. These factors will continue to impact growth of the global

market of biomedical refrigerators and freezers throughout the forecast period.

In addition, demand for biomedical freezers and refrigerators will further continue to increase due to growing investment in the research and development. Researchers are significantly focusing on development of various innovative treatment procedures and medical products for the treatment of various diseases. Development of innovative techniques and products has led to increasing demand for various biomedical samples globally. Educational institutions are also increasingly investing in research and development in collaboration with various healthcare institutions. Growing developments in the biobanking technology has transformed various aspects of science including biospecimen science and biorepository. With the growing advancements in biobanking, adoption of automated technology and robotic processing and handling process of the samples is projected to make the process of biobanking more effective. Moreover, development of various software applications that helps in storage management of blood and other biomedical samples is further projected to impact the global market growth of biomedical refrigerators and freezers positively.

Sales to remain high through hospitals

As the requirement for storing blood and blood derivatives arise, demand for the plasma freezers is projected to increase globally. In terms of revenue, the plasma freezers product type segment is projected to represent the highest growth, representing more than US\$ 400 million by 2022-end. In contrary, the cryogenic storage systems product type segment is projected to reflect a significant CAGR throughout the forecast period.

By 2022-end, the hospitals end user segment is projected to represent a robust revenue growth, accounting for more than US\$ 300 million by 2017-end. On the other hand, the research laboratories end user segment is projected to reflect a healthy CAGR over the forecast period.

Market players

Major players in the global market of biomedical refrigerators and freezers are Arctiko A/S, Aegis Scientific, Inc., Biomedical Solutions Inc., Binder GmbH, Coldway SA, Bionics Scientific Technologies Co., Ltd., Eppendorf AG, Desmon S.p.A, Gram Commercial SAS, Froilabo SAS, Liebherr International AG, LabRepro Inc., Philips Kirsch GmbH, Panasonic Healthcare Co., Ltd., ThermoFisher Scientific Inc. and Terumo Corporation. +



A walk through Prosthetic Device Industry

Prosthetic is all about creating limbs for limbless. Here's a summary of the game-changing innovations in the field of prosthetics.

An artificial limb is also called a prosthetics device, which is used as a mechanical replacement for a missing limb. Artificial limbs are light in weight and high in strength, custom made-up devices that are used for amputees with lost limbs caused by diseases or injuries. The objects used in artificial limbs comprise plastic-coated fibers and plastics, willow wood, carbon-fiber composites, and

different clanging alloys. Arm prosthesis, leg prosthesis, and cosmetic prosthesis are some types of prosthetics.

According to a report published, the global artificial limbs market was valued at approximately USD 1,970 million in 2018 and is expected to generate around USD 2,758 million by 2024, at a CAGR of around 5.8 per cent between 2019 and 2024.

Innovations in Prosthetic Industry

The machinery segment of the artificial amputee market includes electrically power-driven, cable operated, and cosmetic prosthetics. The electrically powered segment held the largest market share in 2018 and is expected to show the highest CAGR over the forecast time period. This can be attributed to the high adoption rate and the customisations available according to patients' needs along with the ease and flexibility for stress-free movements.

"Today, more than 2 million people use some type of prosthetic limb due to the amputation of an arm or leg. When considering other types of prosthetics, including joints or teeth, the number skyrockets to more than 10 million people. Throughout the last 2 decades, prosthetic technology has advanced considerably to include lightweight running legs and more responsive legs and feet to allow for more effective navigation. Scientists are continuing to develop new and better limbs to ensure that those who lose a limb can have the most natural and functional prosthetic

possible," shared Rajendra Kumar, Regional Manager – North & Nodel Head, UEP Endolite India.

"By end-user, the market is segmented into prosthetic clinics, hospitals, and rehabilitation centers. Clinics and hospitals are estimated to dominate the global artificial limbs market in the future," Kumar said.

Dr Andreas Goppelt, Chief Technology Officer (CTO), Ottobock Healthcare said, "Over the last few years, technology such as motorised hand prosthetics controlled by sensors and 8-bit microprocessors has made it possible for those who have lost one or both hands to have a more functional prosthetic that very nearly imitates the abilities of a natural hand."

That technology is now extending into other prosthetic limbs, including the arm, leg, and foot—and has nearly advanced to the point where it can be fully controlled by the patient's thoughts and nerves, just like a natural hand.

"In fact, within a few years, it's very possible that some prosthetic limbs could be virtually indistinguishable from actual natural limbs," Andreas shared.

He further shares, There are three major trends that are currently dominating the prosthetic limb industry which are as follows:

3D Printing

While 3D Printing isn't exactly on the cutting edge of natural-looking and feeling prosthetics, it does offer a major advantage for patients: reduced cost. For a typical cosmetic-only prosthetic arm prices can approach

\$5,000. For a functional arm, that cost jumps to around \$10,000—and up to \$100,000 for an advanced arm with a hand that can be controlled by muscle movements. Considering that most prosthetic limbs need to be replaced every few years, the costs can add up for patients.

3D Printing, though, has the potential to make those costs significantly lower. In fact, a 3D-printed child's prosthetic may cost as little as \$50, making it an affordable option. These inexpensive limbs have limited functionality, but there are more functional designs in the works that will not cost that much more. One Japanese company has even developed a fully bionic arm using 3D printing that costs just under \$5,000.

More Sensitive Limbs

One thing that every amputee can attest to is the feeling of losing something. And while prosthetics can substitute the appearance and function of a missing limb, they are tools—not a part of the body. Without the sensitivity that an actual limb has, or the ability to be controlled by intention, patients can only tell what they are holding in their hand, stepping on, or touching by looking at it.

Scientists, however, have found a way to mimic the sensations of holding something in the hand. By wiring pressure sensors into the fingers of the artificial hand to the nerves in the upper arm, amputees are able to actually feel the shape and texture of objects. This both helps the patient feel less of a



Scientists are continuing to develop new and better limbs to ensure that those who lose a limb can have the most natural and functional prosthetic possible.

Rajendra Kumar,

Regional Manager – North & Nodel Head, UEP Endolite India



Many of the technologies are still in development, and given the complexity of correctly connecting sensors to nerves, it could be several years before the most advanced prosthetics reach the market.

Dr Andreas Goppelt,
Chief Technology Officer (CTO), Ottobock Healthcare

sense of loss and have more control over their motions.

Brain-Controlled Prosthetics

Most amputees dream of being able to control their limbs the way that others do, without even really thinking about it. In light of recent work by scientists at the Prosthetics and Orthotics Laboratory at the Rehabilitation Institute of Chicago and research scientists at the Center for Bionic Medicine, that may be possible. Scientists at the Institute have captured information about how brain signals travel down nerves and control limb movement, and used those signals to optimise bionic prosthetic limbs. Known as myoelectric control systems, these prosthetics can move prosthetic arms and legs without conscious thought.

While these advances allow for better, more natural movement for patients requiring prosthetics and help them move and function more effectively and more safely, there are drawbacks. According to Dr Andreas, "With the exception of basic 3D-printed models, the cost of these advanced limbs can be prohibitive to the average patient, even those with health insurance coverage. Many of these technologies are still in development, and given the complexity of correctly connecting sensors to nerves, it could be several years before the most advanced prosthetics reach the market."

Range of products

The product range in Endolite of lower

extremity prosthetic product cover all levels of amputation of the lower limbs and includes microprocessor controlled prosthetics knee joints like Orion and Smart IP and variety of dynamic yet stable foot pieces such as Echelon, Elite Blade, Espirit, Elite2, Navigator and Dynamic Response foot etc. to provide great degree of freedom to the user. Endolite also has a wide range of Hands.

Bionic Hand: A bionic hand is an advanced myoelectric hand with each finger moves separately to grasp the object in a natural pattern. It works on the principle of a Myo hand and signal from the surface of the residual limb using electrodes. It has several grip patterns to opt from for better functional need and outcome.

The bionic hand is an superficially powered prosthesis controlled by myoelectric signals, meaning it uses muscle signals in the patient's residual limb to operate terminal hand, electrodes are placed on the user's bare skin above two pre-selected muscle site. When a user contracts these muscles, the electrodes pick up the muscular single in the electrical pattern and send these signals to a microprocessor which instructs the hand to open and close. With this technology, the user will be able to hold intricately shaped objects with ease. The hand is programmed for individual needs and there are all together 18 grip pattern to chose from. The grip pattern can be changed suing a mobile app.

Myo-Electrical: This is one of the most advanced systems available. It is controlled by muscle stimulation which is converted to electrical pulses which operate a motor that proves mechanical energy for operation i.e. opening and closing of Prosthetic Hand. It is powered by batteries. It has Myo-Electric Hand with PVC or a silicone glove over it with two electrodes with Rechargeable Li-ion batteries with a mechanical elbow (for Trans Humeral Amputees). The prosthesis has an inner flexible and outer hard socket with a harness for suspension.

Mechanical: It has a mechanical hand operated with body power with the help of cable attachments. It has mechanical hand with PVC or a silicone glove over it with mechanical elbow (for trans humeral amputees) with inner flexible and outer hard Socket with harness for suspension.

Cosmetic: It is purely for cosmetic proposes and does not have any function. It has Cosmetic Hand with PVC or a silicone glove over it with manual free motion or mechanical elbow (for trans humeral amputees) with inner flexible and outer hard socket with harness for suspension.

Conclusion

Still, for those who have lost—or were born without—limbs, these advances represent hope that they will soon be able to function as close to normally as possible, even without actually thinking about it. +



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“AI TO MAKE REVOLUTIONARY CHANGE”

Dr Shalin Dubey, Senior Consultant: Department of Laproscopic, Robotics & Gastrointestinal Surgeon at Apollo Hospitals recently completed 50 cases of Robotic Hernia Surgery. In an interview with **Neha Wagle** he shares about starting a new journey with new technology for better outcomes.

How does it feel to complete 50 cases of Robotic Hernia Surgery?

Over the past decade robots have transformed surgery. Robotic surgery builds upon laparoscopic surgery and in short it's benefits could be summarised by a combination of changing the method of access and reducing the scale of the tools. I have done 28 robotic hernia surgeries till date and have been part of more than 50 robotic hernia cases in my hospital, Apollo Navi Mumbai. It is a great feeling of empowerment because with this technology of robotics the precision and vision it offers, I can assure my patients of a better outcome and no chances of conversion to open surgery.

It is also a feeling of excitement because it is a very different method of treating

patients. I strongly believe that robotics is going to make the minimal access surgery safer for the patients because the learning curve to do robotics is much less for any surgeon as compared to laparoscopic surgeries.

How do you see the level of acceptance of robotics in Indian healthcare?

As happens with anything which is new there is always some amount of suspicion and doubts about the safety of the technology and necessity of the technology in the medical fraternity. For patients there is always an element of doubt whether the surgery is safe for them or not and also sometimes they think that the robot is going to operate and not the surgeon himself or herself.

But with more scientific evidence coming it has already become the gold standard of care for most urological procedures and also standard of care for colorectal cancer surgeries. I am sure that in coming times acceptance for robotic surgeries for diseases like hernia, rectal prolapse and others are going to be more and more.

What are the new inventions happening in robotic surgeries?

Currently, it is the third generation of robotic equipment which most of the tertiary care hospitals are using which makes the surgical procedure seamless. I am sure that with introduction of Artificial Intelligence in robotics it is going to make most of the

surgeries very standardise which will ultimately benefit the patient's because the outcomes will be similar whether the patient is getting surgery done in a tertiary care hospital or in some other Hospital setup.

Can you share what are the drawbacks of robotic surgery as per your personal experience?

I have not noticed any drawbacks while using robotics for my patients, the only initial issue was lack of tactile sensation but as with all learning process and training that was not a cause of concern. The precision, dexterity, range of movements, trimmer filtration and high definition 3D vision which the robotics offer makes the surgery very smooth and safe.

What do you have to say about AI in healthcare segment?

I strongly feel that AI is going to make a revolutionary change in diagnostics and also in fields of neurology and neurosurgery. Only time can tell that whether it will enable us to diagnose cancers early by following some sort of patterns or not, but yes it is a wonderful tool for healthcare.

Share with our readers what are your plans for the new journey with new technology for better outcome.

In our country the quality health-care is limited by the fact that it has to be paid by the individual for any medical or surgical treatment and robotics has one disadvantage of increased cost. I would be happy to see the cost effective robotics with new companies

showing interest and investing in this technology.

It is just a matter of time that the robotics will become relatively cheaper for the masses to afford it. And when this happens I am sure it is going to make a revolutionary change in surgical outcomes. I see the robotics advancement something like that advancements in anaesthesia techniques. If one goes back in the time, they will remember anaesthesia was not very safe or pleasant just few years back but with rapid advancements in technology for monitoring and discoveries of new drugs anaesthesia has become very safe so as with robotics it is going to make surgery with minimal cuts very possible and it is going to make eventually surgery safe for heart patients. So I say 'new technologies for better outcomes' is not very far. +

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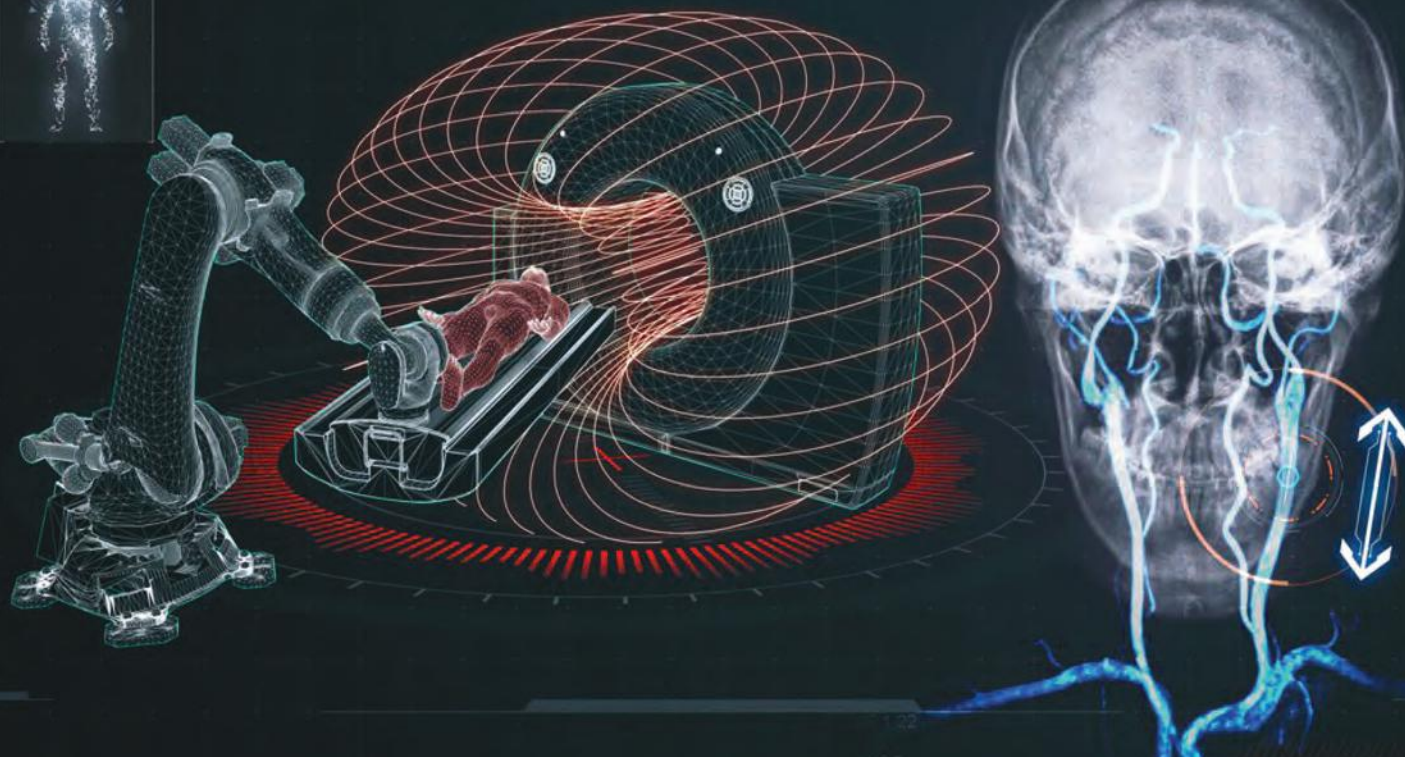


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Credit: Massouh bioMEDia for the Polytechnique Montréal Nanorobotics Laboratory

Robotic System for Deep Endovascular Instrument Guidance

Latest breakthrough by Professor Sylvain Martel's team at Polytechnique Montréal opens up new horizons for endovascular surgery.

Researchers at the Polytechnique Montréal Nanorobotics Laboratory have developed a novel approach to tackling one of the biggest challenges of endovascular surgery: how to reach the most difficult-to-access physiological locations. Their solution is a robotic platform that uses the fringe field generated by the superconducting magnet of a clinical magnetic resonance imaging (MRI) scanner

to guide medical instruments through deeper and more complex vascular structures. The approach has been successfully demonstrated in-vivo.

When a researcher “thinks outside the box”—literally

Imagine having to push a wire as thin as a human hair deeper and deeper inside a very long, very narrow tube full of twists and turns. The wire's lack of rigidity, along with the friction forces exerted on the walls of the tube, will eventually render the manoeuvre impossible, with the wire ending up folded on itself and stuck in a turn of the tube. This is exactly the challenge facing surgeons who seek to perform minimally invasive procedures in ever-deeper parts of the human body by steering a guidewire or other instrumentation (such as a catheter) through narrow, tortuous networks of blood vessels.

It is possible, however, to harness a directional pulling force to complement the pushing force, countering the friction forces inside the blood vessel and moving the instrument much farther. The tip of the device is magnetised, and pulled along inside the vessels by the attraction force of another magnet. Only a powerful superconducting magnet outside the patient's body can provide the extra attraction needed to steer the magnetised device as far as possible. There is one piece of modern hospital equipment that can play that role: an MRI scanner, which has a superconducting magnet that generates a field tens of thousands of times stronger than that of the Earth.

The magnetic field inside the tunnel of an MRI scanner, however, is uniform; this is key to how patient imaging is performed. That uniformity poses a problem: to pull the tip of the instrument through the labyrinthine vascular structures, the guiding

magnetic field must be modulated to the greatest possible amplitude and then be decreased as quickly as possible.

Pondering that problem, Sylvain Martel, Full Professor in the Department of Computer Engineering and Software Engineering at Polytechnique Montréal, had the idea of using not the main magnetic field present inside the MRI machine tunnel, but the so-called fringe field outside the machine. “Manufacturers of MRI scanners will normally reduce the fringe field to the minimum,” he explains. “The result is a very-high-amplitude field that decays very rapidly. For us, that fringe field represents an excellent solution that is far superior to the best existing magnetic guidance approaches, and it is in a peripheral space conducive to human-scale interventions. To the best of our knowledge, this is the first time that an MRI fringe field has been used for a medical application,” he adds.

Move the patient rather than the field

To steer an instrument deep within blood vessels, not only is a strong attraction force required, but that force must be oriented to pull the magnetic tip of the instrument in various directions inside the vessels. Because of the MRI scanner's size and weight, it's impossible to move it to change the direction of the magnetic field. To get around that issue, the patient is moved in the vicinity of the MRI machine instead. The platform developed by Professor Martel's team uses a robotic table positioned within the fringe field next to the scanner.

The table, designed by Arash Azizi—the lead author of the article and a biomedical engineering PhD candidate whose thesis advisor is Professor Martel—can move on all

axes to position and orient the patient according to the direction in which the instrument must be guided through their body. The table automatically changes direction and orientation to position the patient optimally for the successive stages of the instrument's journey thanks to a system that maps the directional forces of the MRI scanner's magnetic field—a technique that Professor Martel has dubbed Fringe Field Navigation (FFN).

An in-vivo study of FFN with X-ray mapping demonstrated the capacity of the system for efficient and minimally invasive steering of extremely small-diameter instruments deep within complex vascular structures that were hitherto inaccessible using known methods.

Robots to the rescue of surgeons

This robotic solution, which greatly outperforms manual procedures as well as existing magnetic field-based platforms, enables endovascular interventional procedures in very deep, and therefore currently inaccessible, regions of the human body.

The method promises to broaden possibilities for application of various medical procedures including diagnosis, imaging and local treatments. Among other things, it could serve to assist surgeons in procedures requiring the least invasive methods possible, including treatment of brain damage such as an aneurysm or a stroke. +



Sylvain Martel,
Full Professor in the
Department of Computer
Engineering and
Software Engineering
and Director of the
Nanorobotics Laboratory
at Polytechnique Montréal.



AI in Genomics

Deriving credible and actionable insights for bettering lives

If there is one technological innovation that has profoundly impacted our lives, it is Artificial Intelligence (AI). One of the biggest contributors to the economy across the globe, AI is used in healthcare, agriculture, education, banking. The innovation improves the precision of forecasting and makes responses more effective, even for simple things that are part of your daily life – whether a certain mail will go into your inbox or spam box, or whether the Cortana in your laptop can understand your need is governed by AI. AI can also deeply influence healthcare and become one of its most dependant lieutenants

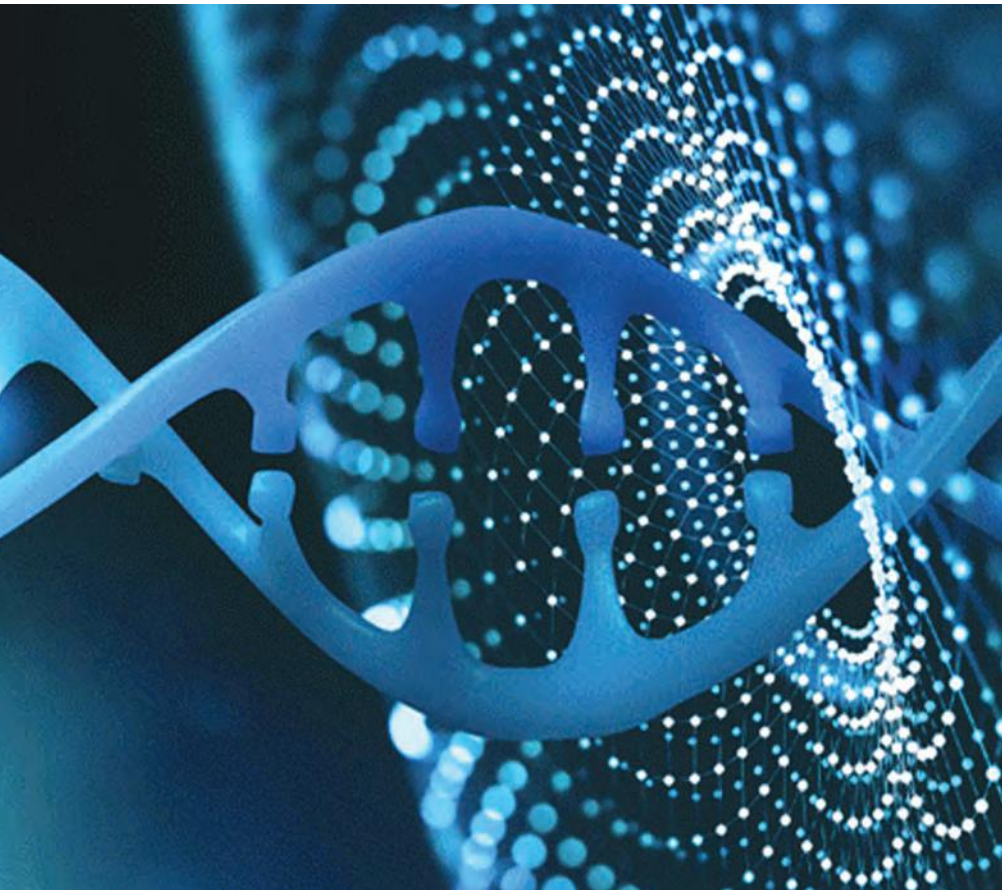
– its continuous growth only bolsters the position. In fact, a Frost & Sullivan report states that globally, AI systems will generate \$6.7 billion in revenue from healthcare by 2021.

A computing giant that can enhance output

Ever since the first human genome was decoded, it has gained rapid traction – so much so that estimates tell that the breakneck speed can surpass human capability. By 2025, between 100 million and 2 billion human genomes could be sequenced and the computational power required will be far more than

those of running channels on scores of YouTube channel with multimillion followers. AI systems are therefore making their way to the lab to make sense of the increasing trove of genomic data; after all, AI is unparalleled when it comes to performing repetitive tasks. Hence, it can prove crucial by making computing more agile to pave the way for researchers to interpret the data and bring out meaningful insights.

As a pioneering platform in India, The Gene Box (TGB) has leveraged this extraordinary tool by creating an AI-powered algorithm that can scan more data points. The reports from



partner labs come to the research team where they match the findings with the research reports, published in journals with high impact factor and other reputed publications from all over the world. The exercise uses the algorithm which is built on the AI-based selection of research papers and is instrumental to correlate the findings and generating insights. While genetic reports are usually prepared scanning about 2,500 data points, the proprietary algorithm developed in-house scans an astonishing 7 lakh data points, a leap of 28,000 times. Understandably, it helps in developing more meaningful and credible insights minus the judgement and possibility of a human error.

AI may help standardise data

When researchers sequence and analyse DNA with the help of AI systems, it makes

the process of gaining perspective on the particular genetic blueprint faster and more accurate. This insight can help them take decisions about care, susceptibility and mutations that might cause diseases – to make that individual future-ready. However, few people can access and use the genetic information as standardisation is yet to be attained. Besides, despite a buoyant scientific community, genome analytics is yet to make headway to bring substantial benefit businesses, primarily due to lack of awareness about how genomics work and its potential to add value to the niche products of an industry. Industries that can directly benefit from genomics include pharmaceuticals and nutraceuticals, insurance, fast moving consumer goods (FMCG), and many more, not only in India but globally. Having standard, comprehensive

genetic information of a population will also open the fields of precision medicine. Eventually, this will enable us to dive into social genomics to get a broader understanding and improve interventions for disease control and overall wellbeing.

Using AI to create datasets pertaining to genome sequencing is the stepping stone of a larger goal to create an acceptance of the reports among people. As the world celebrates the 30th anniversary of the launch of Human Genome Project (HGP), India has only stepped into the realm and moving ahead rationally will address many of its concerns.

About The Gene Box (TGB)

The Gene Box, a start-up, is an AI-powered platform that offers genomic solutions for preventive healthcare. It is committed to empower healthcare providers and researchers with state-of-the-art genomics innovation. The Gene Box collaborates with nutritionists, fitness experts, and healthcare providers to enable interventions through genomic reports. In this, the end consumer's DNA is translated into meaningful insights. TGB is working with consumer genomics companies in South-East Asia and South America that employ TGB's proprietary data-to-reports platform to generate reports for their customers. TGB's in-house team of researchers and data scientists and AI-powered research tools delivers the best in industry analytics. Digitised recommendations incorporating genomic predispositions are revolutionising personalised healthcare interventions. +



Pranav Anam,
Founder, The Gene Box



High pricing taking a toll on **medical device industry**

Out of the 24 regulated medical devices listed as drugs by the Ministry of Health, four devices have been included in the national list of essential medicines and ceiling on prices have been fixed on them.

Four medical devices - cardiac stents, drug-eluting stents, condoms and intrauterine; have been included in the national list of essential medicines and ceiling on their prices have been fixed, Union Minister Mansukh L Mandaviya said in Lok Sabha.

The Maximum Retail Prices (MRP) of 20 other medical devices are monitored by the National Pharmaceutical Pricing Authority (NPPA) to ensure that no manufacturer increases the price of a drug more than 10 per cent of

the MRP during preceding 12 months shared the Union Minister.

Experts from the Medical Device industry talk to Medical Equipment & Automation magazine and share their expert views on the topic.

Rajiv Nath, Forum Coordinator of Association of Indian Medical Device Industry (AIMED), said, "I feel extremely aggrieved to see India being ranked 145 among 190 nations, lower than even Bangladesh, Sudan and Equatorial Guinea by the 2018 Global Healthcare Access and Quality Index. To change this landscape, we need to provide quality and affordable healthcare and reasonably priced medical devices."

He further added, "In recent times, exorbitantly priced medical devices and medical treatment has caused distrust in the healthcare industry, adversely impacting healthcare business environment in the country. In this context, the government needs to protect consumers' interest as well as allow domestic industry to flourish in a level playing field with multinationals. Excessive pricing is stifling India's manufacturing growth story. In the absence of fair competition, reasonable price controls are desirable. One possible solution for ensuring reasonable MRP (maximum retail price) is keeping trade margin at a rational level along the supply chain. The trade margin is the difference between the price at which the manufacturers (indigenous / overseas) sell to trade and the final price to patients."



The trade margin is the difference between the price at which the manufacturers (indigenous /overseas) sell to trade and the final price to patients.

Rajiv Nath,
Forum Coordinator,
Association of Indian Medical
Device Industry (AIMED)

Atul K. Sethi, Managing Director, Shree Pacetronix Ltd., said, "Price fixing by the government is good so that foreign multi-nationals do not get away with exorbitant prices. Currently, medical devices are largely out of government price control. Just four items — cardiac stents, drug eluting stents, condoms and intra uterine devices — are in the national list of essential medicines and fall under government's purview. Apart from these, only knee implants have been recently brought under price control. While the government is ready with a plan to cap trade margins, the ceiling was under discussion and now has been included in the national list of essential medicines and ceiling on their prices have been fixed."

Sethi further said, "The DoP along with NPPA has proposed to cap the margin at 30 per cent of the price to the distributor. However, Niti Aayog had earlier suggested fixing it at 65 per cent but after intervention from the PMO — which felt 65 per cent may be too high — the government think tank has proposed a 50 per cent cap."

Niti Aayog had earlier suggested fixing it at 65 per cent but after intervention from the PMO — which felt 65 per cent may be too high — the government think tank has proposed a 50 per cent cap.

Atul K. Sethi,
Managing Director,
Shree Pacetronix Ltd.



Talking about rationalisation of trade margins in medical devices, Nath said, "The main aim of rationalisation of trade margins in medical devices should be not only to help consumers, but also allow rationalised and reasonable profits for traders, importers, distributors, and wholesalers and retailers and create a level playing field for domestic industry vis-à-vis foreign manufacturers. There should be clear objectives for any policy intervention to provide quality and affordability and avoid distress (to consumers), distrust (in industry) and disruption (to market)."

He said, "The market place is, unfortunately, skewed where suppliers induce hospitals to buy and push their brands based on profit margins to be made and not on basis of cost savings to be made on the procurement cost by a hospital, thus spiraling prices of medical devices leading to an artificial inflation."

Nath observes when it comes to trade margin rationalisation, importers of medical devices should also be included. He further questions, "Aren't MNC importers traders too be included? How can we have importers having irrational 200 per cent margin as was indicated in NPPA report analysing trade margins on catheters and guide wires and rest of supply chain only 35-50 per cent margin as was being recommended by MNC importers' lobby?"

The Government may consider to cap trade margins along entire supply chain of specific devices to maximum of 85 per cent. This will help in reducing



MRP of many medical devices to less than half of current prices while not being unreasonably detrimental to traders and hospitals. Additionally, manufacturers will be encouraged to attract clients on competitive features and hospitals will start buying on evaluating cost of purchase and quality, instead of considering margins to be made on higher MRP.

Based on evidence of successful price caps of stents, the Government must pro-actively make cohesive, industry-friendly policy giving at least a level playing field, if not a strategic advantage to domestic manufacturers while safe guarding consumers. "Devices are not drugs though both are medical products but differ in approach in marketing - any move to bring in Trade Margin Rationalisation that's based on PTS (Price to Stockist) instead of 1st point of sales (when goods enter India), may not meet objectives "to boost domestic manufacturing, end exploitative MRP and unethical Marketing," Nath said.

Conclusion

There is an urgent need for the

Government to define the following:

- First point of sale for manufacturer is price on which GST is charged first time.
 - On overseas manufacturer GST is charged on Import CIF landed price in bill of entry.
 - On indigenous manufacturer GST is charged on ex-factory price post discounts
- Indigenous manufacturers should be equated with overseas manufacturer and not with importers.

government to move towards ending over 80 per cent import dependence, expedite steps for patients' protection, stronger quality and safety regulations, judicious price controls to make medical devices and quality treatment accessible

and affordable and promote indigenous manufacturing.

Nath said, "There is a need to counter attempts to spread misinformation vis-à-vis any kind of government policy to control prices of medical devices. When MRP or trade margins are capped the manufacturers' margins are not impacted so fear mongering regarding detrimental impact on quality and innovations in medical devices on account of price control policy stipulations will not be in the interest of consumers or domestic manufacturers. Such misinformation by any particular lobby should be discouraged and countered effectively."

Sethi said, "Medical devices will be manufactured in India in all categories as the government is giving support for Indegenisation. Already they have brought down import duties on raw materials required for essential devices such as pacemakers, cochlear implants, etc. Also they are developing these devices for giving a chance for commercial production so that prices come down further for our citizens." +



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First implantable magnet resonance detector developed

Scientists develop a new miniature NMR implant measures neuronal activity

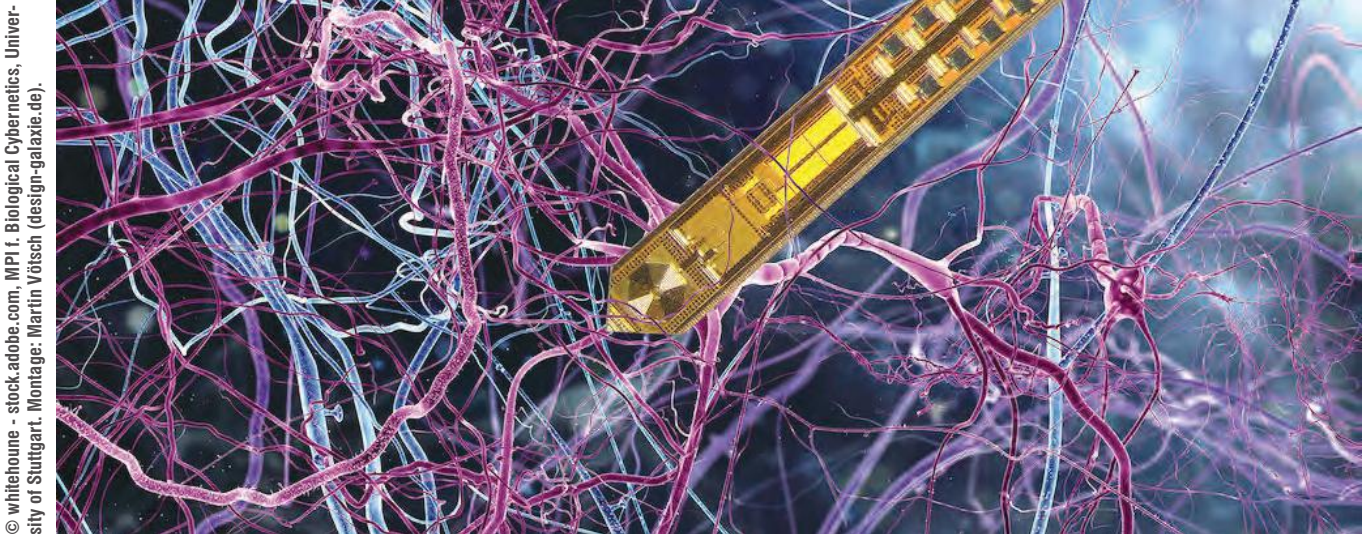


Illustration of the tiny MRT needle in the brain tissue.


A team of neuroscientists and electrical engineers from Germany and Switzerland developed a highly sensitive implant that enables to probe brain physiology with unparalleled spatial and temporal resolution. They introduce an ultra-fine needle with an integrated chip that is capable of detecting and transmitting nuclear magnetic resonance (NMR) data from nanoliter volumes of brain oxygen metabolism. The breakthrough design will allow entirely new applications in the life sciences.

The group of researchers led by Klaus Scheffler from the Max Planck Institute for Biological Cybernetics and the University of Tübingen as well as by Jens Anders from the University of Stuttgart identified a technical bypass that bridges the electrophysical limits of contemporary brain scan methods. Their development of a capillary monolithic nuclear magnetic resonance (NMR) needle combines the versatility

of brain imaging with the accuracy of a very localized and fast technique to analyse the specific neuronal activity of the brain. "The integrated design of a nuclear magnetic resonance detector on a single chip supremely reduces the typical electromagnetic interference of magnetic resonance signals. This enables neuroscientists to gather precise data from minuscule areas of the brain and to combine them with information from spatial and temporal data of the brain's physiology," explains principal investigator Klaus Scheffler. "With this method, we can now better understand specific activity and functionalities in the brain."

According to Scheffler and his group, their invention may unveil the possibility of discovering novel effects or typical fingerprints of neuronal activation, up to specific neuronal events in brain tissue. "Our design setup will allow scalable solutions, meaning the possibility of

expanding the collection of data from more than from a single area – but on the same device. The scalability of our approach will allow us to extend our platform by additional sensing modalities such as electrophysiological and optogenetic measurements," adds the second principal investigator Jens Anders.

The teams of Scheffler and Anders are very confident that their technical approach may help demerge the complex physiologic processes within the neural networks of the brain and that it may uncover additional benefits that can provide even deeper insights into the functionality of the brain. With their primary goal to develop new techniques that are able to specifically probe the structural and biochemical composition of living brain tissue, their latest innovation paves the way for future highly specific and quantitative mapping techniques of neuronal activity and bioenergetic processes in the brain cells. 



Technological development in orthopaedic equipment

India has emerged as a prominent destination for orthopaedic surgeries in recent years. Especially in the field of joint replacement, success rate of Indian orthopaedic surgeons at complicated surgeries is at par or even better than any other developed countries.

The technological development in surgical equipment, prosthesis and implants in experienced hands has shortened the recovery period. After 16000 joint replacement surgeries, 20 per cent of which were revision surgeries, across my career span, majority of my patients are able to walk shortly after the surgery due to sheer skill and technological support.

Technological Advancements

Unlike laparoscopic or other medical specialities, robotics in orthopaedic surgeries is a ubiquitous and young technology with vast research and development

projects undergoing in different parts of the world. Advancements in Robotic and navigational technology is enhancing accuracy and alignment of soft tissue balance in orthopaedic surgeries.

However, lack of long term studies in robotic orthopaedic surgeries are failing to prove their upper-hand over the traditional surgeries by skilled orthopaedic surgeons. Hence, until now, the accuracy and navigational support provided by the robotics in orthopaedic surgeries are only a complementary support to the surgeons and not an absolute must. A number of other developments in implants and surgical equipment have proved to be a boon to the speciality.

Rising number of orthopaedic surgeons and surgeries have witnessed a rapid rise in number of revision orthopaedic surgeries in recent years. Bone defects caused by the previous surgeries has emerged as the major hurdle in these revision joint replacement surgeries.

Keeping the demand in mind, a number of metal augments (support) known as 'Trabecular Metal Designs,' are now available in the market to provide both mechanical and biological support in the revision joint replacement surgeries. As opposed to the earlier implants which only provided mechanical support and tend to loosen up after 10-15 years, causing a number of health complications, the advanced metal augments stimulate bone

formation around them, for long term natural stability.

Technological developments in the metal joint designs also provide immediate weight bearing functions to allow the patients to walk almost immediately after the surgery. The early weight bearing not only improves the bone quality of existing bone structure but allows stability and mobility to the patients.

The new surgical equipments have proved to be a major support for surgeons in recent years. Unlike the electric saw blade which was used for orthopaedic surgeries, now we have battery operated advanced saw with surgical blades which offer precise and uniform output. Many such advanced equipment are shortening surgical duration, recovery period and enhancing accuracy.

Excellent infection prevention is another by-product of technological advancements in orthopaedic area. State-of-the art, specialised surgical units with laminar airflow to contain airborne contamination and special surgical suits which even prevent wound contamination through surgeon's breathing allows minimal complications rate.

Having said that, chances of infection during orthopaedic surgeries remains high with smaller, ill equipped surgical facilities. Thus patients are advised to opt for dedicated orthopaedic surgical units to ensure successful surgeries.

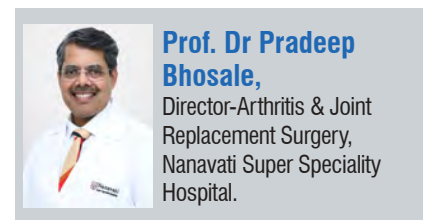
Future demands:

The future scope for improvement in

orthopaedic surgeries, specifically in joint replacement surgeries is reduction in admission duration. While we at Nanavati Super Speciality Hospital are able to provide mobility to patients immediately after the surgery, we intend to transform the joint replacement unit into a day care centre where the patients can comfortably walk out the same day.

Robotics and Artificial Intelligence (AI) support can offer a crucial support in realising this goal. Orthopaedic robotic market is on the brink of evolution and 2019 has witnessed their spread across the world for numerous orthopaedic procedures. Followed by North America and Europe, many countries across Asia-Pacific are investing into research and development of the orthopaedic surgical robots to bring down the cost and increase accuracy of the procedures.

The major drawback, remains the cost factor attached with the robotic orthopaedic surgeries and lack of the robotic instruments to increase the accuracy as compared to a skilled surgeon. However, the technology is exciting and it will not take more than two years for the AI based robotic systems to claim a lion's share in orthopaedic surgeries. +



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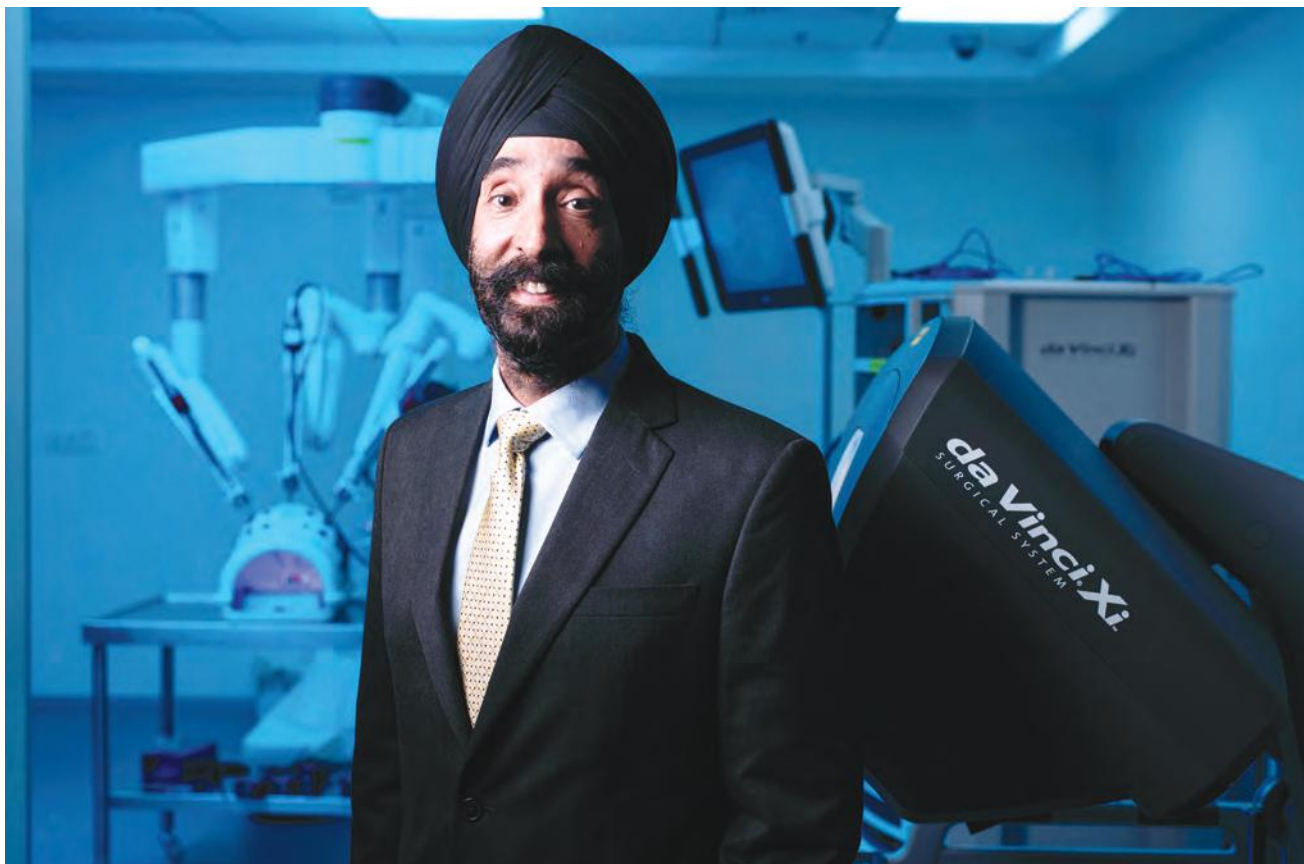
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INTUITIVE: PUTTING PATIENTS FIRST



Intuitive is a global technology leader in minimally invasive care and the pioneer of robotic-assisted surgery. Established a direct presence in India in the year 2018, today the technology is used in both government and private hospitals globally. **Mandeep Singh Kumar, Vice President and General Manager, Intuitive India** speaks to **Neha Wagle** about da Vinci technology, the growth and future plans. Excerpts:

Can you tell our readers about Intuitive surgical and its mission?

Intuitive India is driven deeply held belief that minimally invasive care is life enhancing care, and is dedicated to ensuring its technology expands the potential of physicians to heal without

constraints. Intuitive is the designer, developer and manufacturer of the da Vinci robotic assisted surgical system. To the date, over 6 million da Vinci procedures have been completed worldwide, with over 1 million completed in 2018 alone. Roughly every



Intuitive da Vinci SP Surgical System Operating Room Setup

30 seconds, somewhere in the world, a surgeon starts a da Vinci robotic-assisted procedure. Till date, over 40,000 surgeons worldwide have been trained on da Vinci surgical systems. There are immense benefits of robotic-assisted minimally invasive surgery. These benefits of robotic-assisted minimally invasive surgeries have been explored in more than 18,000 peer-reviewed scientific publications. These benefits include: less blood loss, less pain, fewer complications, less time to spend in hospital and shorter recovery times. For intuitive our mission is patients first. So for us first come the patient, then the surgeon, then the hospital, then the payer, then the employee and in last the stake holder or the share holder. So we go in the reverse sequence unlike the other companies. Our philosophy of Patients first has increased the value to the patients. If we speak about success rate, according to me success rate totally depends on the surgeons and patients. Globally there are 20,000 clinical papers which clearly establish the benefits of robotic-assisted surgeries. The benefits are in two buckets, first is the better clinical outcome and second is on patient's experience.

What is da Vinci? What kind of surgeries can be performed? Tell us more about this technology.

Da Vinci surgical systems are advanced robotic-assisted surgical platforms designed to expand a surgeon's operating capabilities and offer a state-of-the-art minimal invasive option for patients. By providing surgeons with superior visualisation, enhanced dexterity, greater precision and ergonomic comfort, da Vinci Surgical Systems make it possible for skilled surgeons to perform minimally invasive procedures involving complex dissection or reconstruction. In 2000, the da Vinci became the first robotic-

assisted surgical system cleared by the FDA for general laparoscopic surgery. Since then, da Vinci surgical systems have been used in more than 6 million minimally invasive procedures in surgical specialities including:

- Urologic Surgery (Male Prostate, Bladder and Kidney)
- Gynecologic Surgery (Benign and Radical Hysterectomy, Myomectomy)
- General Surgery (Ventral and Inguinal Hernial repair, Bariatrics)
- Thoracic Surgery (Lobectomy, Mediastinal Mass)
- Cardiac Surgery (Mitral Valve Repair, Pulmonary Resections)





Intuitive da Vinci Xi patient cart arms fan



Intuitive da Vinci Xi patient cart front

- Colorectal Surgery (Colectomy and Rectal Resection)

The earliest record of da Vinci surgeries in India goes back to 2002 when we had our first system that came in. Currently, we are in our fourth generation system, we have evolved the technology as we have gone along. The teaching in referral institutions like the AIIMS Delhi, Rishikesh or Jodhpur, they have been prolific users and have adopted da Vinci surgery. One of our latest installations has been at Safdarjung Hospital, Delhi which was inaugurated by Dr Harsh Vardhan, the Union Health Minister.

What is the difference between robotic-assisted surgery and traditional laparoscopy?

In traditional laparoscopic surgery, the surgeon performs the procedure holding rigid instruments, viewing through an endoscopic camera that is projected onto a monitor. With da Vinci surgical systems, the surgeon sits at a surgeon console while viewing a 3DHD image of the target anatomy. The surgeon's finger's grasps the master controls that control three to four robotic arms, which hold an endoscope camera and surgical instruments. The system seamlessly translates the surgeon's hand, wrists and finger movements into precise, real-time and tremor-filtrated movement of the surgical instruments positioned inside the patient's body, which can bend and rotate far greater than either

tradition lap instruments or the human wrist.

What is Intuitive's commitment to India?

In year 2018, Intuitive established a direct presence in India. Their headquarters office is located in Bengaluru and is Intuitive's 6th International office. While the decision to go direct was very recent, it was built on a foundation of many years of success and innovation in India. The first da Vinci robotic-assisted surgery took place in India nearly two decades ago – in a Delhi hospital in 2002. Prior to 2018, they have spent a number of years providing Indian hospitals, surgeons and patients with the access to robotic-assisted surgery through distributors. The decision to “go direct” in India is a reflection of our commitment to and investment in India's patients, surgeons, hospitals and healthcare system. There is a real and exciting opportunity for our technology to make a difference for Indian patients, and there is an existing pool of exceptional, committed robotic-assisted surgeons excited about using this technology and the benefits it can convey. Of particular importance to us here in India is not merely introducing the technology – our robotic-assisted surgical system – but assuring that we can support our customers in establishing strong robotics programs through everything that surrounds and supports the technology: training customer service and support.

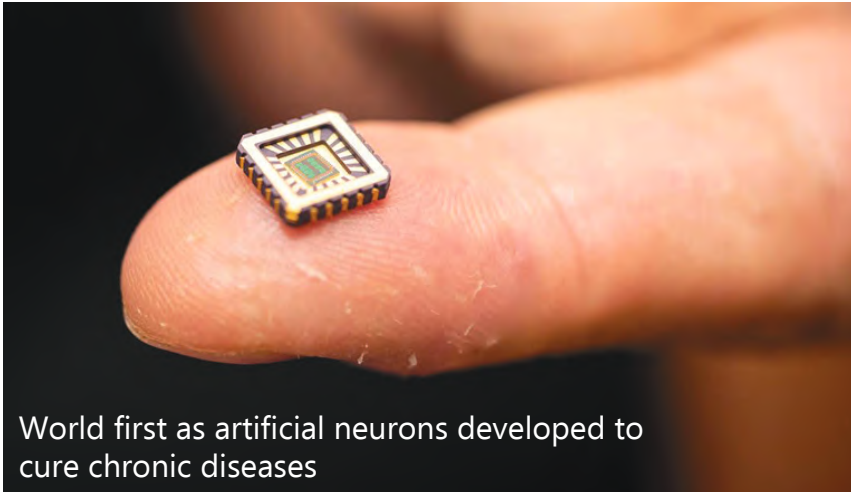
We call this our “ecosystem” and it helps us help our customers by ensuring the long term success of each robotics program. This process starts well before installation of a robotic-assisted surgical system at a hospital or institution. We evaluate to determine if a program will have the right patient flow, a pool of passionate surgeons who have the right skill and the potential to achieve the right clinical outcomes. We recently opened an additional training centre and we aim to provide best-in-class training and support for surgeons here in India throughout the careers. In addition we aim to provide Indian robotic surgeons with opportunities to learn from our network of 40,000 trained surgeons across the globe.

What are the future growth plans?

We plan to build a robust presence in India. Current focus is on hiring employees in sales, support, clinical affairs, marketing, training, regulatory and other areas in order to best support our customers and facilitate access to and expansion of robotic-assisted surgery to more patients and institutions throughout the country. Intuitive has a very strong, mission and vision driven global corporate culture, and we are excited to bring that to life here in India, working to build our team in order to develop and deliver the tools, technologies and solutions to help improve the lives of patients.

At Intuitive, we put patients first, always – we care deeply about patients and the impact we have on them. We also want to be recognised not only as a company that does good work, but as a great company to work for. We count on our team to improve the lives of patient's everyday – and while we are growing quickly, we are committed to bringing the company's high standards and culture to India by hiring well, finding the best talent and building a strong, mission driven team. +

Silicon Chips as Artificial Neurons



World first as artificial neurons developed to cure chronic diseases

Researchers at the University of Bath in the UK have developed silicon chips that mimic the electrical activity of neurons. The artificial neurons on silicon chips – a first-of-its-kind achievement with enormous scope for medical devices to cure chronic diseases, such as heart failure, Alzheimer's and other diseases of neuronal degeneration.

Critically the artificial neurons not only behave just like biological neurons but only need one billionth the power of a microprocessor, making them ideally suited for use in medical implants and other bio-electronic devices.

The research team, led by the University of Bath and including researchers from the Universities of Bristol, Zurich and Auckland, describe the artificial neurons in a study published in *Nature Communications*.

Designing artificial neurons that respond to electrical signals from the nervous system like real neurons has been a major goal in medicine for decades, as it opens up the possibility of curing conditions where neurons are not working properly, have had their processes severed as in spinal cord injury, or have died. Artificial neurons could repair diseased bio-circuits by replicating their healthy function and responding adequately to biological

feedback to restore bodily function.

In heart failure for example, neurons in the base of the brain do not respond properly to nervous system feedback, they in turn do not send the right signals to the heart, which then does not pump as hard as it should.

However, developing artificial neurons has been an immense challenge because of the challenges of complex biology and hard-to-predict neuronal responses.

The researchers successfully modelled and derived equations to explain how neurons respond to electrical stimuli from other nerves. This is incredibly complicated as responses are 'non-linear' – in other words if a signal becomes twice as strong it shouldn't necessarily elicit twice as big a reaction – it might be thrice bigger or something else.

They then designed silicon chips that accurately modelled biological ion channels, before proving that their silicon neurons precisely mimicked real, living neurons responding to a range of stimulations.

The researchers accurately replicated the complete dynamics of hippocampal neurons and respiratory neurons from rats, under a wide range of stimuli.

"Until now neurons have been like black boxes, but we have managed to

open the black box and peer inside," said Professor Alain Nogaret, from the University of Bath Department of Physics who led the study. "Our work is paradigm changing because it provides a robust method to reproduce the electrical properties of real neurons in minute detail."

He adds, "Our neurons only need 140 nanoWatts of power. That's a billionth the power requirement of a microprocessor, which other attempts to make synthetic neurons have used. This makes the neurons well suited for bio-electronic implants to treat chronic diseases."

"Our approach combines several breakthroughs. We can very accurately estimate the precise parameters that control any neuron's behaviour with high certainty. We have created physical models of the hardware and demonstrated its ability to successfully mimic the behaviour of real living neurons. Our third breakthrough is the versatility of our model which allows for the inclusion of different types and functions of a range of complex mammalian neurons," said Nogaret.

Professor Giacomo Indiveri, a co-author on the study, from the University of Zurich and ETH Zurich, added: "This work opens new horizons for neuromorphic chip design thanks to its unique approach to identifying crucial analog circuit parameters."

Another co-author, Professor Julian Paton, a physiologist at the University of Auckland and the University of Bristol, said: "Replicating the response of respiratory neurons in bioelectronics that can be miniaturised and implanted is very exciting and opens up enormous opportunities for smarter medical devices that drive towards personalised medicine approaches to a range of diseases and disabilities." +



Species-specific Liver-Chip identifies distinct drug toxicities in human, rat, and dog models; Could improve success rate of drug candidates in clinical trials.

Liver-Chip

**avoids animal testing,
makes drug research
easier, faster**

Among the numerous micro engineered Organ-on-a-Chip (Organ Chip) models developed at Harvard's Wyss Institute, the Liver-Chip is of special interest to a number of industries because the real-time analysis of complex biochemical interactions could greatly enhance the liver toxicity testing that is ubiquitous in the development of drugs, foods, and other consumer products. The Wyss Institute's unique innovation model has brought together a multidisciplinary team of collaborators

from academia, government agencies, and biopharmaceutical companies to support the translation of Organ Chips from an academic project to a platform that is commercially available to advance research and development.

Emulate, Inc., a company spun out from the Wyss Institute to commercialise the Organ Chip technology, announced a new study based on work begun at the Wyss Institute and advanced at the company with biopharmaceutical industry partners showing that its Liver-

Chip model recreates species-specific toxicity responses that known tool and drug compounds induce in human, dog, and rat livers. The data indicate that the Liver-Chip could potentially be used alongside animal models in preclinical testing to improve safety predictions in humans, with the aim of better clinical trial outcomes and safer drugs. The research is published in *Science Translational Medicine*.

"This is an important milestone in the effort to improve the drug discovery and

development process that was achieved by leveraging the Wyss Institute's unique translational model, which allowed us to evaluate the promise of Organ-Chips both technically and commercially early on in the development of the technology," said corresponding author Geraldine A. Hamilton, Ph.D., President and Chief Scientific Officer of Emulate, who previously worked with Wyss Institute Founding Director Donald Ingber, to oversee the development of the Organ Chip technology. "We are excited to see what advances our customers will be able to achieve using this Liver-Chip, and we are grateful for the opportunity to impact the drug discovery and development process and make a difference in the lives of patients."

The Liver-Chip research team, which included scientists from AstraZeneca, Emulate, Janssen Research & Development, LLC, and the Wyss Institute, engineered a species-specific Liver-Chip with up to four different cell types found in the livers of rats, dogs, and humans to approximate the liver's smallest functional unit. The team first exposed the Liver-Chip to FIAU, a compound known to cause liver toxicity in humans, and observed much lower and varying degrees of toxicity in the dog and rat chips than in the human chips, recreating what had been observed in previous animal studies. When the researchers tested the Liver Chip's responses to different drug candidate molecules contributed by Janssen, they saw differences in the drugs' impact on the function of human versus animal liver cells that recapitulated those seen in vivo. They were also able to test underlying mechanisms of action for the different drugs and gain insights that were not possible to observe with conventional cell-based systems or animal models.

From the benchtop to the marketplace

Most drugs that enter clinical trials are first

tested in animals to ensure they are safe before being administered to humans. Testing for liver toxicity in rats and dogs is standard for the majority of drug candidates in preclinical studies, but these tests can produce results that conflict with each other and with the responses later seen in humans. Human liver toxicity is one of the primary reasons why drugs fail in clinical trials.

The research with the Liver-Chip demonstrates how this platform could help ensure that safe and effective therapeutics are identified sooner, and ineffective or toxic ones are rejected early in the development process. As a result, the quality and quantity of new drugs moving successfully through the pipeline and into the clinic may be increased, regulatory decision-making could be better informed, and patient outcomes could be improved. Advancing the assessment of drug safety and efficacy is a goal shared by collaborators who were initially brought together by the Wyss Institute. Through numerous collaborations with industry and with grant support from the Defense Advanced Research Projects Agency (DARPA), Food and Drug Administration (FDA) and National Institutes of Health (NIH), the Wyss Institute has played a central role in refining Organ Chip technology and evaluating it for market applications.

The Liver-Chip is based on technology developed in Ingber's lab and consists of a clear, flexible polymer about the size of a USB drive with parallel internal channels that are lined with living cells. The spatial arrangement of the channels and cell types accurately recreates the tissue microenvironment of human organs in vivo, and exhibits

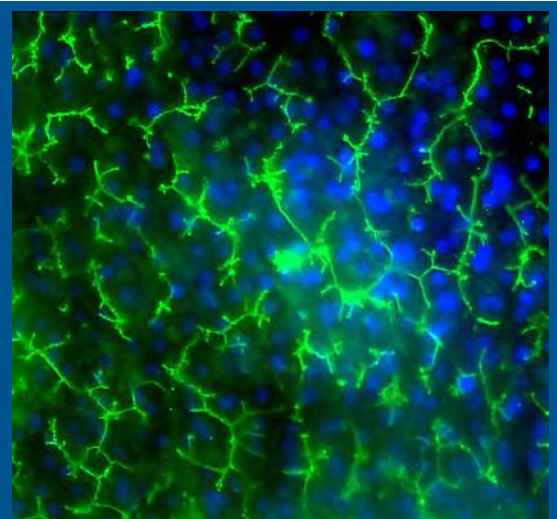


Image of Emulate's human Liver-Chip showing multidrug resistance-associated protein 2 (MRP2 in green and DAPI in blue) efflux transporter in hepatocytes after 14 days in culture. Credit: Emulate, Inc.

physiological responses and disease states that are similar to those that occur in humans. A wide variety of Organ Chips, including lung, intestine, brain, kidney, bone marrow, and liver were developed at the Wyss Institute before commercialisation efforts moved to Emulate, which extended and refined the work into Organ-Chips that they commercialised and continue to develop.

Emulate is now marketing its Organ-Chips as predictive human-relevant models to investigators across the research, pharmaceutical, biotechnology, and cosmetics industries, and plans to expand their offerings into disease modelling in the future.

"This work represents a major achievement for the Organ Chip field because it shows the power of this technology to provide insight into human-relevant responses where current preclinical animal models often fail. This needs to be evaluated and confirmed by others, but if it is, then this could change the way drugs are developed around the world and help begin to reduce the numbers of animals that are used in drug development efforts worldwide," added study co-author and Harvard professor Don Ingber.





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Chasing Technological Advancement – Medicall 2019

Medicall 2019, held in Mumbai had much to contribute to the medical equipment sector – industry representatives assert...

**- By Ranjana Konatt,
Editor – Brand Positioning**



Medicall – An expo dedicated to the Medical Equipment sector in India was held from December 13th to the 15th at the Bombay Convention Exhibition Centre, Goregaon. The expo hosted exhibitors showcasing the latest in the hospital equipment, its technologies, integrated systems and services. The event also saw the display of approximately 6000 products spread across 400 exhibitors who have represented in around 20 countries. While there has been much advancement in technology, the event was home to several interactive sessions. Both industry players and representatives benefited from the showcase while also gaining insight into the technical and technological innovations being pursued across a wide client base. To name a few products being exhibited, the event showcased several medical solutions, such as implants, infusion pumps, lab equipment, monitoring equipment, medical gas, calibration services, OT lighting systems, pharmacy storage solutions, ventilators and much more. With a broad showcase across the medical equipment and the health sector, the event was visited by medical practitioners, dealers, purchase managers and healthcare professionals. Here are some excerpts on what industry representatives had to say.

Keshav Singhal, Head of Sales, Ventek India

“We manufacture LED lighting solutions for OT. These are OT lights used for major OT surgeries. The lights come with variable colour temperature and with laminar flow compatibility and doctors very often perform cardiovascular procedures using our lighting technologies. The system is equipped with feather touch controls and it also has a variable colour temperature with which one can use the yellow or the white lights separately. A key feature with our product is the endo-mode wherein you can adjust the lighting depending on the memory of any previous lighting system that was used. Having



proper lighting in terms of brightness and the mix of colours is essential especially during OT procedures. We aim to capture distributors across the country and our product is made for a client-base interested in turn-key solutions; hence we are hoping to build a strong distributor base. From the technology point of view, in the past five years, the medical industry has grown and so has our lighting technology. Designs have improved and there is technical stability, energy efficiency and many other factors that have improved overall which also has contributed to the growth of the industry. A key factor is that initially, halogens were used and operated at 150 watts, and now we use LED technology that operates at 50 watts.”

Satheesh Kumar, Technical Director, New Gen Imaging Solutions

“We deal with re-furbished imaging equipment, and we focus on the cardiology side of things. Our products and equipment are used in labs and are sold to those customers who cannot afford new equipment. Our focus is tier one and tier two cities where we have medium level hospitals using our products. Our equipment is pre-owned; however, we ensure that after the equipment is re-furbished it is up to the mark concerning standards and OEM requirements. As a company working in the medical equipment space, we see ourselves filling in the gap and the requirement of the industry. A piece of equipment which would otherwise cost 60 lakhs can now be availed for 15lakhs. We are now planning to align with ISO 13485 which



is specifically for medical equipment. Overall, we comply with regulatory requirements laid out by the Government of India. So far, our equipment has been installed in 60 labs and we have 20 plus MRI and CT customers across India. From the industry point of view, we need a government-based regulatory body as many players are compromising on the quality and on industry regulation. As a result of this, we see genuine players getting affected. So far, we have a good response from our clients in Maharashtra and we have a large install base.”

Pradeep S, Chief Executive, IMC Corporation

“We are a hospital furniture manufacturing company based out of Chennai. We usually concentrate on South India, but now we are looking at expanding north. A key product we focus on is our electric examination table – with head



and height functions, the electric examination table has a complete touch LCD panel that has six functions –the head, leg, front and the reverse tilt; along with this we also have a key function where the length of the bed can be adjusted electrically to accommodate a taller patient. We also have a weight monitoring system that has sensors; and with this system, if the patient gets up from the bed there will be an alarm that sets off intimating the nurse at the station. We see a growing demand for our products and now with the number of new models entering the market, we have a few porsche customers who can have this bed in their hospital. We also have a facility where the bed can be connected to Bluetooth and to Wi-Fi through the hospital network and the ERP system. Over the years, we have been investing in technology, and we are planning to have infotainment – something that will add up to the patient’s entertainment experience.”

Reema Roy, Marketing Manager, Forbo

“Forbo is a European brand, and we are a swiss-based organisation. We manufacture end-to-end indoor floorings that are used in hospitals. Right from the entrance mats to the operation theatre; our floorings are made of Marmoleum, a

Post Event



product that can inhibit the growth of bacteria stems. The anti-bacterial quality of Marmoleum does not diminish over time, giving peace of mind. We also have another kind of flooring called Colourex SD – a product that enables safe electrostatic discharge through the thickness of the tile. The product is a formed dense network of tiny carbon black veins that finds use in laboratories, clean rooms, pharmaceutical labs, production sites and operation theatres. We have certificates for all our products and they are all manufactured in Europe. Concerning the market - the market is changing and India is also matching up to international standards. India has a long way to go and must catch-up but again it would be wrong to say that we are not progressing.”

Milan Shah, CEO, Simtek

“We have been a medical equipment manufacturer since the past 25years, and we manufacture medical equipment for gynaecology. We focus on maternity homes, foetal dopplers,



monitors, and we have also been functioning in the areas of syringes, infusion pumps, volumetric infusion for the past 15 to 17 years. Our products have new tech-savvy upgrades – they have a high accuracy level and are trackable and are Wi-Fi-enabled. Our machines (monitors) can detect blockages very fast. The market demand for our equipment has been growing by five to seven per cent each year and the machine is made for the Indian market. Unfortunately, the medical equipment

market in India seems to be headed more towards sales rather than quality manufacturing and more an increasing number of players prefer just purchasing products from China.”

R. Vijayraghavan, Site Medical

“We distribute for the company – AgVa ventilators. It is a revolutionary product and is manufactured in India. A key feature is that our product is low-cost and can be very



useful for nursing homes and ambulances just because of its affordability factor. The price of our product is around 1.7 lakhs which is affordable for most customers, and especially for those patients in need of home care. The ventilator is equipped with a volume control mode, pressure control mode and can even be used in the non-invasive mode.”



SL Raheja Hospital, Mahim-A Fortis Associate and IDL Care organise SYNERGY 2020

The three-day EUS-ERCP-PTBD convergence from 24th-26th January drew participation from over 400 young doctors from across the globe reports Neha Wagle.

The three-day 'SYNERGY 2020' convergence hosted by SL Raheja Hospital, Mahim and Institute of Digestive and Liver Care was inaugurated on 24th January. It is aimed at engaging young doctors from across the globe about the relevance of Endoscopic Retrograde Cholangio-Pancreatography techniques (ERCP), Endoscopic Ultrasound (EUS), Percutaneous Trans-Hepatic Biliary Drainage (PTBD) in the management of Biliary and Pancreatic diseases. The convergence was spearheaded by Dr Vinay Dhir, Executive Director, Institute of Digestive and Liver Care and supported by Thailand's Prof. Rungsun Reknimitr, Australia's Prof. Arthur Kaffes and Spain's Prof. Manuel Perez Miranda.

The journey of endoscopy from a simple diagnostic tool to an advanced therapeutic tool has evolved over the last few decades. The convergence drew focus to this evolution; it witnessed participation from 24 experts across 09 countries, who shared insights, discussed and debated about newer techniques, medical advancements and management of disorders like Gall Stones, Bile Duct stone, Biliary Tumors, Pancreatic Tumors, treatment of Jaundice, etc. Over 400 freshly graduated doctors from across 11 countries attended the session. Experts hosted hands-on training sessions for doctors as a part of the conference in three important areas of advanced endoscopy i.e. ERCP, EUS module and third space.



Live demonstration helped explain:

- The ERCP module which is a procedure that involves the entry of the bile and pancreatic duct using accessories to treat stones, tumors and the pancreatic system
- The EUS module which is a combination of endoscopy and ultrasound is used to detect abnormalities including lumps or lesions
- Third Space which is a relatively new technique where endoscopic work is performed between the layers of the intestinal wall, also useful for non-surgical removal of tumors in the intestine

Speaking at SYNERGY 2020, Dr Vinay Dhir, Executive Director, Institute of Digestive and Liver Care, SL Raheja Hospital, Mahim-A Fortis Associate, said,

"This year we celebrate five decades of ERCP, a procedure which transformed the management of Biliary and Pancreatic disease. Like ERCP, EUS also remained a pure diagnostic procedure for a long time. PTBD, the first non-surgical technique for biliary drainage is now seven decades old has given excellent results in patients with failed ERCP and complex hilar structure. Our aim at the IDL Care is to bring experts from across the globe on a single platform to share their knowledge and expertise, helping provide a bountiful learning experience for young doctors."

Speaking about SYNERGY 2020, Dr Hiren Ambegaokar, CEO, SL Raheja Hospital, Mahim-A Fortis Associate, said, "I thank all the experts who have shared their experience-based learnings at this conference, and encourage young doctors to come forth and learn from these stalwarts."

Dr. Priyanka Udawat, Pediatric Gastroenterologist and Hepatologist, SL Raheja Hospital, Mahim-A Fortis Associate, said "SYNERGY 2020 is about EUS, ERCP and PTBD convergence. The journey of endoscopy from a simple diagnostic tool to an Advanced Therapeutic tool is nothing short of amazing. Like ERCP, EUS also remained a pure diagnostic procedure for a long time. However that situation changed at the term of this century and EUS started getting utilised for drainage of bile duct, pancreatic duct and gall bladder. The evolution of EUS guided Therapy continues with availability of lumen apposing metal stents amongst other technologies. There were live demonstration by renowned International and National experts and a hands-on course for learning ERCP and EUS procedures."



CII Awards Motherhood Hospitals for Customer Obsession 2019



Motherhood Hospital won award for “Active Customer Engagement” by the ‘Confederation of Indian Industry (CII) Award for Customer Obsession, 2019. The results were announced at the Le Meridien, New Delhi. The award was distributed by B.N. Satpathy, Former Senior Advisor, NITI Aayog. The award

was conferred upon the hospital for its ability to adapt to the CII IQ Excellence Framework for Managing Customer experience and Baldrige Excellence Framework and get evaluated as per the global highest standard of evaluation.

Customer experience is the outcome of an interface between the customer and an organisation that tends to include extended arms of its value chain at all stages of the customer life cycle. The experience in the process can be emotional, rational or physical. Hence, customer-focused excellence is a value, embedded in the beliefs and behaviour of high-performing organisations. In order to promote customer-centric culture among Indian Industry, Confederation of Indian Industry (CII) developed a framework and instituted the ‘CII Award for Customer Obsession’ in the Year 2016.

The aim of CII Award is to recognise Customer-Centric organisations where Customer is at the Centre of all that they do. It also helps organisations to understand various elements that are critical for delivering superior customer experience across the value chain. The award is given to promote customer-centric culture across the value chain, recognize customer-centric organisations and promote the “Customer First” approach. +

Atlas Copco inaugurates on-site oxygen plant at Vrindavan hospital

Atlas Copco, recently inaugurated an onsite oxygen plant at Ramakrishna Mission Hospital, Vrindavan. This is a CSR initiative from Atlas Copco, and is a part of their community engagement and social outreach projects. The project has been undertaken through Beacon MedæS, a leader in medical gas and laboratory gas systems. The oxygen plant launch was part of the Sarada Block inauguration at the hospital. The occasion was graced by the honorable President of India Ram Nath Kovind.

The onsite oxygen generation plant would lead to a more reliable source of oxygen supply, lowering the risk of interruption of supply amongst patients, which is a huge challenge in remote locations. The project includes medical gas pipeline system, including pipes, zone valve boxes, area alarms, master alarms, outlets and bed heads as per international standards; medical air system and medical vacuum system. The system has a manifold back-up of 60 oxygen cylinders in case of a major maintenance activity taking place for the oxygen generation plant.

Atlas Copco, as part of its CSR program, also plans to provide on-site oxygen plants to more hospitals across Maharashtra in locations like Sangli, Nagpur and Mumbai. +

HCG Bangalore becomes first hospital in India to completely digitise histopathology diagnosis



Health Care Global Enterprise Ltd. (HCG) becomes the first hospital in the country to completely digitise histopathology workflow for primary diagnosis at the HCG-Strand Laboratory at KR Road, Bangalore. The hospital had introduced a US FDA approved digital pathology solution from Philips Intellisite Pathology Solutions and now the laboratory at HCG has successfully transformed to a 100 per cent digital lab for Histopathology and Computational Pathology. The lab is also now accredited by College of American Pathologists (CAP) and NABL, India, for its Digital Pathology facility in the fields of Histopathology, Cytopathology, Frozen section facility as well as the AI based Breast Algorithm.

Digital diagnosis is now the default diagnosis of the lab for surgical pathology and 100 per cent of FFPE slides (formalin-fixed paraffin-embedded) are digitally scanned into high-resolution digital images. These are then viewed, analysed, annotated and shared with other pathologists in the network in real time. Majority of the pathologists in the laboratory are now working digitally. +

Pune's Sahyadri Hospitals conducts 13 liver transplants in 21 days

Sahyadri Hospitals recently conducted 13 transplants in 21 days including 10 liver and three kidney transplants across its units. Dr Bipin Vibhute, Head of Liver and Multi-organ Transplant department at Sahyadri Hospitals, said "Out of the 10 liver transplants, three patients were suffering from non-alcoholic fatty liver diseases, two from liver cancer and three from alcohol related conditions and two were suffering with other hepatobiliary conditions."

He added "With increasing awareness on organ donation and transplants and state-of-art facilities, Pune is emerging as a major center for living donor transplants. Patients are coming not only from Maharashtra, but also from all across India."

Dr Sheetal Mahajani, Director – Hepatology, Transplant Hepatology, Gastroenterology and GI Endoscopy Department at Sahyadri Hospitals, said "Liver diseases have become very common in India which is a serious concern. The primary reason for this is the changing lifestyle, wrong eating habits and addiction. Early detection of liver problems and the right treatment can help save many lives and awareness about this is important. Understanding this, Sahyadri hospitals has been organising free liver check-up camps in various cities and undertook a unique campaign of liver champions which got an overwhelming response."

Dr Ketan Apte, Unit Head Sahyadri Hospitals, said that Sahyadri Hospitals recently clocked an important milestone of more than 160 liver transplants in just three years. State-of-art and ultra-modern facilities, dedicated transplant team, trained staff and comprehensive liver care has made this possible. +

24 Doctors participated in 'The Champions Trophy 2020' held by Wockhardt Hospital

Wockhardt Hospital, Mumbai Central organised a Cricket Tournament Champions Trophy 2020 with participants of 350 enthusiast doctors from 24 teams. Enthusiast doctors participated in the match, and encouraged people to stay hale and hearty. Team Mahindra marvel won Cricket Treatment Trophy 2020, team Worli wolves was runner up. Doctors face their set of challenges, have to work for extra hours, and also suffer from physical and mental stress, like others. Even doctors have a tight schedule owing to emergencies, and hence it becomes difficult for them to strike a work-life balance. Doctors are busy healing but often tend to forget what's ailing them. Thus, to help doctors relax and rejuvenate, Wockhardt Hospital, Mumbai Central conducted a cricket tournament. Dr. Parag Rindani, Centre Head at Wockhardt Hospital, South Bombay, says "This is 2nd year of crickets trophy among Doctors. Doctors are always on the go. They have demanding schedules and have to attend each and every patient with the same level of attention and focus that can become stressful at times. The long working hours, high level of stress and irregular eating habits can take a toll on their health. This cricket tournament was a stress-buster and fun event for the doctors." +

NephroPlus set to expand services in West Asia and South East Asia



Setting sights on expanding their services in dialysis care, NephroPlus is foraying into international markets beginning with West Asia and South East Asia. The centre that is focused at redefining dialysis treatment, received an investment of \$45 million (Rs 323 crore) from Investcorp, a Bahrain-based, global alternative asset management company.

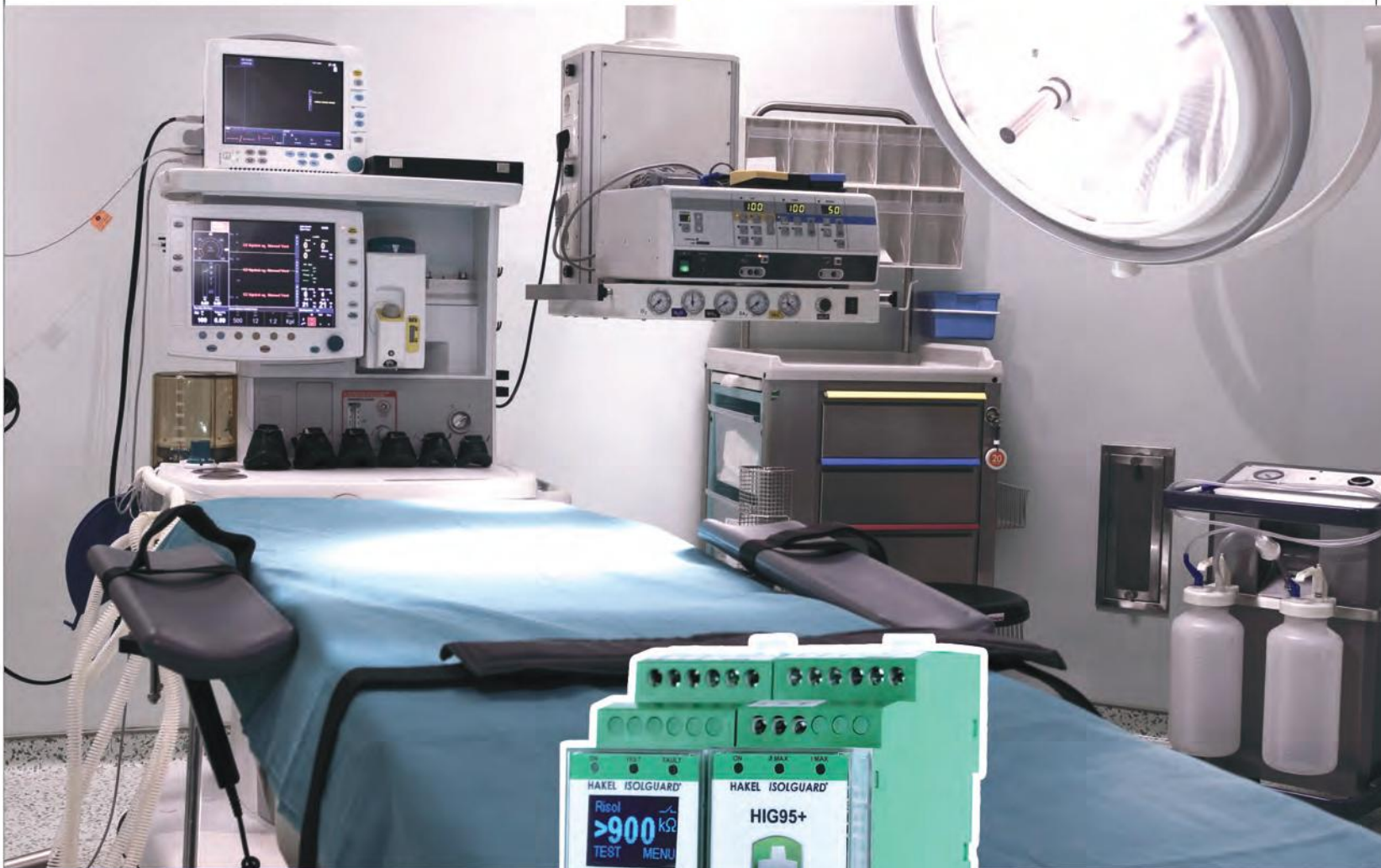
With a footprint of a notable dialysis network in the country with over 200 centres, NephroPlus has been providing cost-effective treatments to over 14,000 dialysis patients. With the latest investment, the company is looking at expanding beyond their current presence in 20 states of India. The funds will further be for acquisitions and partnerships commencing with Indonesia, Philippines, Vietnam, Saudi Arabia and Bahrain. A contract with Vietnam is currently underway and will be effective within the next two-three months.

The focus for the Indian market will continue to develop through the dialysis programmes currently on track at 180 hospitals and will subsequently continue through select acquisitions and expansion of centres; joint ventures and new operation and maintenance contracts will also be set in motion. +



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FORTHCOMING EVENTS

Location: National Convention & Exhibition Center, Shanghai, China
Date: 09th - 12th April 2020

Product Launch



India Medtronic, wholly-owned subsidiary of Medtronic USA, announced the launch of the Mazor X Stealth Edition that offers a fully-integrated procedural solution for surgical planning, workflow, execution and confirmation of spine surgeries. Surgeons at Indian Spinal

Injuries Centre, New Delhi, have successfully performed the first minimally invasive spine surgery in

India using the Mazor X Stealth Edition Robotic-Assisted Spine Surgery System.

The global surgical robotics market has a vast potential, and it is expected to grow to \$9.3 billion by 2025 from

\$4.9 billion back in 2016 with a CAGR of 11.4 per cent. In India, with a rapidly growing senior population, the spine surgery rate is expected to rise. The Surgical Robotics Market in India is predicted to witness a remarkable increase from \$129.9 million in 2016 to \$372.5 million in 2025, growing at a CAGR of 19.2 per cent.

Co-developed between Medtronic and the recently acquired Mazor Robotics, the Mazor X Stealth Edition seamlessly incorporates Stealth software technology into the Mazor X robotic-assisted surgery platform.

India Medtronic launches Mazor X Stealth Edition

It is a revolutionary new technology that uses cutting-edge software to plan the surgical procedure, and then uses a robotic arm to guide implants and instruments through the steps of the surgical process with precision, while simultaneously using real-time imaging feedback to ensure the plan is being carried out as desired. +

AptarGroup, has announced that the FDA recently approved a medication (NAYZILAM (midazolam)) for treatment of acute repetitive epileptic seizures and that the company's Unidose Liquid System was chosen as the delivery mechanism for this rescue drug.

The Unidose Liquid System doesn't require priming and can be used with one hand, from any direction, to deliver the medicine directly into the nose. To help train patients and caretakers on how to administer the drug, Aptar had its new subsidiary, Noble International, design a trainer device that mimics the real deal. In reality, the system can be easily used by a bystander with little training, but it certainly helps to be familiar



Aptar's Nasal Unidose Device Helps Stop Epileptic Seizures

with the product ahead of an emergency. "The launch of our Unidose System on the first and only U.S. FDA approved nasal rescue treatment for seizure activity once again demonstrates Aptar Pharma's ability to help our customers develop and launch complex treatments," stated Gael Touya, President, Aptar Pharma, in a press release. +



FDA Clears Two New Radiotherapy Planning CTs from Siemens

Two newly FDA-cleared radiation therapy planning CT scanners from Siemens Healthineers will be launched soon. The SOMATOM go.Sim and SOMATOM go.Open Pro are part of the company's SOMATOM go platform, designed to achieve the best possible clinical results and to help quicken planning procedures.

Somatom go.Sim is a 64-slice scanner, while the SOMATOM go.Open Pro produces images faster and/or sharper, since it generates 128 imaging slices per gantry rotation. Both of the systems feature an 85 cm bore that can accommodate large patients and any accessories that may be required.

The systems navigate radiation therapists through the setup process via the accompanying touchscreen tablets. This can be performed at the patient bedside and for safety the clinicians can retreat behind leaded glass during scanning.

To improve imaging that may be compromised by motion artifacts arising from breathing, the SOMATOM go.Open Pro has something called Direct Intelligent 4D (Direct i4D) that compensates for patient breathing in real time to generate sharper images. +

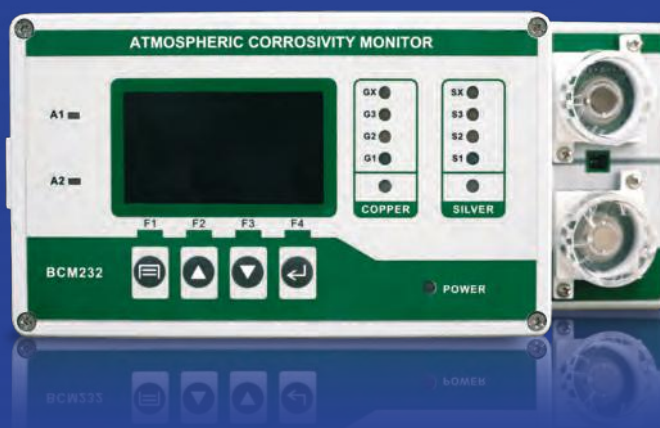
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