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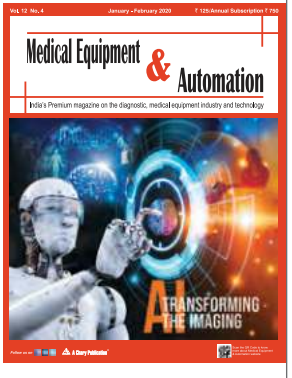

"A step in the right direction

India is the 4th largest market for medical devices in Asia. According to the national investment promotion and facilitation agency, Invest India, orthopaedic prosthetics and patient aids segments are expected to grow at a CAGR of 9.6% and 8.8%, respectively whereas diagnostic imaging, dental products, and consumables are expected to grow at a CAGR of 7.1%, 7.4% and 7.1%, respectively during 2015-20.

Minister of Chemicals and Fertilisers D V Sadananda Gowda recently informed that the Indian medical devices sector can reach $50 billion by 2025. "Indian pharmaceuticals and medical devices sector has the potential to become the world leader and government will provide all necessary support," he added.

However, more than 80% of the country's requirement of medical devices is met through imports. Though the new government under the aegis of Narendra Modi is pushing for its "Make in India" agenda to promote domestic manufacturing, the initiative is yet to yield tangible results at least in the field of medical devices manufacturing. Thus, to ensure requisite quality of the medical devices imported, produced and sold in India, a stricter law was need of the hour. Accordingly, the Union health ministry issued a notification announcing all medical equipment used on humans or animals has been notified as "drugs". This move is primarily aimed at bringing all medical devices including disposable syringes, needles, cardiac stents, catheters, heart valves, X-ray and ultrasound machines, under the ambit of regulation in a phased manner and will come into effect from April 1.

The Medical Device Rules, 2020 is an amendment to the Medical Device Rules, 2017 requiring the registration of all non-Notified medical devices over an 18-month period with the Central Drugs Standard Control Organization (CDSCO). In a nutshell, once notified, the manufacture, import and sale of all medical devices will need to be certified by the CDSCO. Experts believe that such regulation will ensure quality and safety for patients.

We hope to hear from you soon, and we welcome your feedback! Please write to me at **pravita@charypublications.in**

Pravita Iyer
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Editorial

Need coordinated plan to combat coronavirus

The coronavirus COVID-19 outbreak has turned into a global crisis. The highly infectious-disease has affected 109 countries and territories around the world and one international conveyance – the Diamond Princess cruise ship harboured in Yokohama, Japan. According to Johns Hopkins University, more than 3,300 people have died globally from COVID-19 while more than 101,000 infections have been confirmed so far. The World Health Organization (WHO) has declared this deadly outbreak as a "Public Health Emergency of International Concern (PHEIC)" on 30th January and raised the level of global risk to "very high" on 28th February.

> According to Johns Hopkins University, more than 3,300 people have died globally from COVID-19 while more than 101,000 infections have been confirmed so far.

WHO suggests that clinical care of patients with COVID-19 focuses on early recognition, immediate isolation and implementation of appropriate infection prevention and control (IPC) measures; provision of symptomatic care for those with mild illness; and optimised supportive care for those with severe disease.

Accordingly, authorities across the world are adopting drastic measures to try and stamp out the infection and India is no exception. With more than 30 confirmed cases of Covid-19 having been reported so far, the government is preparing a 'containment plan' for states to arrest its spread.

"The need of this hour is to take a more strategic approach like a cluster containment strategy, making the district collectors more accountable, contact tracing and strengthening state and district surveillance teams to avoid widespread community transmission and also break the chain of transmission, if found," Health Minister Harsh Vardhan recently told the Parliament.

Meanwhile, the Department of Biotechnology (DBT) under Ministry of Science and Technology, has announced partnership with the Norway-based Coalition of Epidemic Preparedness and Innovations (CEPI) to fund development of vaccines for COVID-19.

However, as there is no vaccine to protect against COVID-19 and no medications approved to treat it, concerted efforts should be initiated by the governments across the globe to arrest the ever-increasing magnitude of this outbreak before it becomes a "pandemic".

Subhajit Roy
Group Editor

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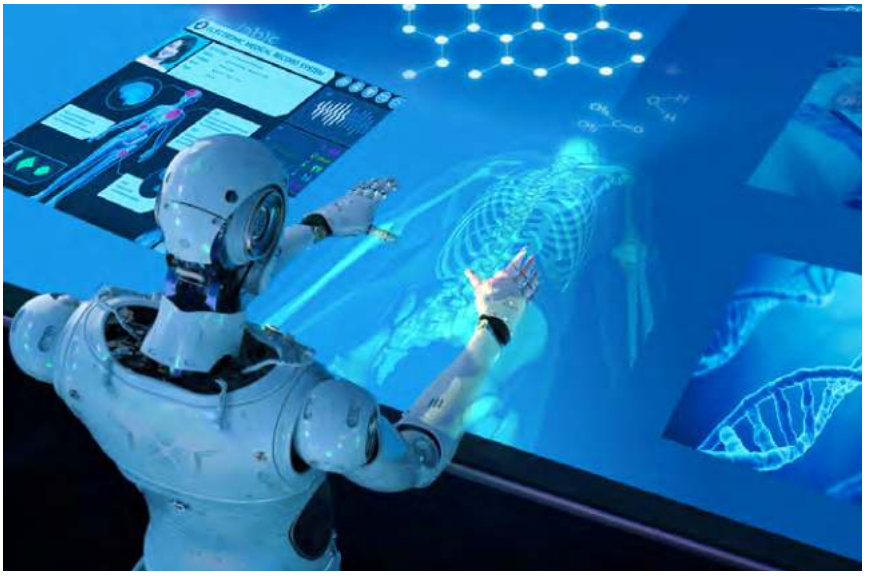

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DEPARTMENTS

CII signs MoU with Health Ministry to reduce TB prevalance significantly by 2025

The Confederation of Indian Industry (CII) and the Central TB Division, Ministry of Health and Family Welfare (MoHFW) recently signed a MoU on catalysing the private sector in a pan-India movement on TB-free workplaces. It is a three-year long campaign that involves multiple stakeholders engaged across awareness and sensitisation, screening and treatment. As part of this campaign, CII will aggregate various initiatives, innovations and linkages necessary to give a fillip to the national mandate of reducing TB prevalence significantly by 2025.

The scope under this MoU includes awareness building/sensitisation of Indian industry – it will include awareness building for a diverse cohort that includes employees, employers and medical practitioners and other specialists involved in managing and caring for TB; screening – CII will develop Public-Private Partnership (PPP) models that address challenges related to local infrastructure and finances and provide referral linkages that can enable timely screening as well as treatments and treatment – these will include activities that focus more on strategic use of existing workforce, MRs, available at pharmaceutical companies to bridge the gap between standard treatment guidelines by the Government of India and the World Health Organization (WHO) and private practitioners who are major stakeholders in treating a large pool of patients.

CII will be organising a mini walkathon which will announce several launches and a formal 'Call to Action' to catalyse the private sector on 22nd, March, 2020 in the run up to the national celebrations on 24th March, 2020 in conjunction with the World TB Day.

IIT Hyd Researchers develop Essential Oils-based drug to treat fungal infections

IIT- Hyderabad Researchers have developed an essential-oil-based drug delivery systems to treat fungal infections without running the risk of inducing drug resistance. This medication can even counter fungi that have developed resistance to conventional antifungal drugs.

The research was led by Dr. Mudrika Khandelwal, Associate Professor, Department of Materials Science and Metallurgical Engineering, IIT Hyderabad, and supported with funds by the Science and Engineering Research Board, Department of Science and Technology (DST), Government of India, and CSR Grants from the American multinational conglomerate AT&T.

The Research Paper, co-authored with her Ph.D. Student Ms. Shivakalyani Adepu, was published in the international peer-reviewed journal Materialia. With the results of this work, the researchers are developing prototype antifungal hygiene products with the financial support from the Biotechnology Industry Research Assistance Council (BIRAC), set up by

the Department of Biotechnology (DBT), Government of India, as an Interface Agency to strengthen and empower emerging Biotech enterprises.

Highlighting the need for developing alternate, non-resistance inducing treatment options for fungal diseases, Dr. Mudrika Khandelwal, Associate Professor, Department of Materials Science and Metallurgical Engineering, IIT Hyderabad, said, "Given the prevalence of fungal infections such as vaginal infections, diaper rash, athlete's foot, and nail fungus, caused by the Candida family of fungi, drug resistance can become life-threatening."

TSC donates label printers to fight coronavirus outbreak in China

TSC Auto ID Technology Co., Ltd. (TSC), an innovator in the design and manufacturing of thermal barcode printer technologies, announced that it donated 300 pcs of barcode printers to nearly 20 hospitals among different cities in China to fight Novel Coronavirus (2019-nCoV) outbreak in association with its China partner.

TSC barcode printers will support healthcare frontline for varied application including patients ID tracking, hospital admission, hospital nursery, specimen/ blood labeling, medication tracking, Staff ID & Access Control and healthcare materials management to enhance healthcare workforce's medical treatment efficiency.

On this occasion, Sam Wang, TSC president said "We should all join hands to fight this epidemic and help

the people in China suffering from this severe outbreak in whatever possible way we can. And we really hope this small gesture of lending a helping hand to the hospitals can help the authorities to facilitate the treatment facilities in a better and efficient way."

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Boston Scientific held workshops for promoting innovative treatments in interventional cardiology

With its continued commitment towards advance therapy adoption in intervention cardiology for treating Complex and High-risk Coronary Intervention (CHIP) patients, Boston Scientific has collaborated with Dr Masahisa Yamane, Director of Cardiovascular Division, Sekishinkai Saitama Hospital, Saitama, Japan to proctor workshops in five cities in India — Delhi, Lucknow, Hyderabad, Ahmedabad, and Patna from 3rd to 7th February, 2020. Dr Yamane will be working collaboratively with leading Indian physicians for effective usage of latest innovative technologies for optimal treatment of extremely complex and high-risk angioplasties to ensure better patient outcomes.

The company has therapies available in India which enable medical imaging using ultrasound waves to view inside the target blood vessels in the heart. This can provide the physician with critical information about the diseased area and may aid in selection of optimal treatment plan and stent implantation. Drug Eluting Stents which have extensive clinical evidence in human populations across geographies and globally acknowledged accreditations with optimum drug eluting regimen of three to four months may also provide better outcomes in highly complex angioplasties in the long term for the patients, thereby improving the quality of life.

Manoj Madhavan, Managing Director, Boston Scientific, said, "We at Boston Scientific are dedicated to transforming lives through innovative medical solutions that improve the health of patients around the world. Collaborative workshops like these conducted on latest technological advancements in the interventional cardiological space would enable a platform for our doctors in India to discuss how technology has aided the journey of CVD treatments, with next generation stents and therapies like Intravascular Ultrasound and Rotational Atherectomy as frontrunners that may aid in treatment of artery blockages and other coronary complexities." ✚

Gandhinagar hosts 73rd Annual Conference of IRIA and Asian Radiology Forum

The 73rd Annual Conference of Indian Radiological and Imaging Association and Asian Radiology Forum, held in Gandhinagar, was inaugurated by Vijaybhai Rupani, Chief Minister, Gujarat. Also present during the ceremony was Nitinbhai Patel, Deputy Chief Minister and Health Minister, Gujarat.

Top leaders and experts from the national and international radiology fraternity present to grace the occasion were Dr Hemant Patel, National President – IRIA and Organising Secretary IRIA 2020; Dr Harshad Shah, Organising Chairman IRIA 2020; Dr Dinesh Patel, Organising Chairman IRIA 2020; Dr Mohan K; Dr Asutosh Dave, Organising Secretary IRIA 2020; Dr C Amarnath, Organising Secretary IRIA 2020; Dr Rajeev Singh, Secretary-General IRIA; Dr Ankur Shah, Chairman Scientific Committee IRIA 2020; and Dr Deepak Mehta, Chairman Scientific Committee IRIA 2020.

IRIA 2020 kick-started its sessions with the inauguration of the ICRI, IRIA's academic body. The focus of IRIA in the last few years

has been improving radiological education and encouraging budding radiologists. After the auspicious lamp lighting ceremony, the new office bearers for the year 2020 were introduced and felicitated.

Dr Hemant Patel, President, IRIA felicitated Dr Lalendra Upreti, Elected Chairman, ICRI and Dr Shailesh Lunawat as Secretary ICRI who further introduced the other office-bearers.

Dr Upreti from ICRI spoke about the vision for the current year and how the team would ensure improved education this year. He also spoke about the success of their budding radiologist training programmes that were organised last year to inspire and buy young and aspiring radiologists in the country. ✚

FOGSI joins hands with Maharashtra Government for private maternity sercives

FOGSI has announced its partnership with Public Health Department, Government of Maharashtra to improve quality of care in private maternity services in Maharashtra. The initiative aims to establish a uniform mechanism for care in every private maternity care hospital, nursing home and clinic, and expects to cover all districts and municipal corporations in the state.

The initiative has been named LaQshya-Manyata and both the custodians will be jointly promoting and implementing 26 clinical and facility standards in private hospitals (maternity care) in the state. This will entail training and aligning hospitals with labour room and maternity operation theatre layout and workflow basis 'Labour Room Standardisation Guidelines' and 'Maternal & Newborn Health Toolkit' issued by the Ministry of Health & Family Welfare, Government of India. The initiative aims to strengthen competencies and knowledge required for life-saving critical care as well as ensure strict adherence to clinical protocols for management and stabilisation

of the complications before referral. In doing so, it is committed to build simple and effective practices and processes, which can help reduce preventable maternal mortality and enrich the experience of every mother in the state.

The components of the programme have been carefully identified by renowned private sector Obgyn specialists and partners covering vital areas for delivering quality care. Key approach under this initiative is quality improvement using PDCA (Plan-Do-Check-Act) cycle. This would require reorganisation of labour room structure (infrastructure, HR, drugs and equipment) and processes. ✚

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Cloudnine Hospital, Vashi trains APMC police officials basic life support skills

Cloudnine Group of Hospitals, in collaboration with APMC Police station, Navi Mumbai recently organised a basic life support training for the police officials. The training, coordinated by Dr Manish Ramteke, Consultant — Pediatrics and Neonatology, and instructed by Winsy Joseph, Assistant Manager – Nursing, Cloudnine Hospital, Vashi, aimed at raising awareness and standard of care for handling all types of adult, infant, gynaec and cardiac emergencies.

More than 40 participants received training in "Basic Life Support and First Aid" with support from Cloudnine doctors and para medical staff. The training in APMC, police station was conducted by a team of Life-Support Instructors from the Department of Emergency Medicine at Cloudnine Hospital, Vashi. Follow-up health check-up was conducted at the sidelines of the training comprising of random blood sugar, ECG evaluation, blood pressure check and consultations with doctors

Dr Manish Ramteke, Consultant, Cloudnine Group of Hospitals, Vashi, said, "In an emergency, situation, be it for adults or infants, it is our duty to provide first-aid and quickly get the victim to the hospital. If anyone hesitates or delays the transportation, then it can prove fatal with life-threatening circumstances. Every family should have at one person trained in Basic Life Support and First-Aid skills." Adding further, Dr Ramteke said, "Training officials with life support skills will help stabilise patients till medical aid is provided, thereby significantly improving the medical outcomes when the patient finally arrives at the hospital."

Impelsys Inc brings iPC Health in India

Impelsys Inc has entered India with iPC Health, an end-to-end mobile learning and upskilling solution for the healthcare sector. The mobile-first platform brings a much-awaited solution to impart 'on-the-go' training and education for hospital staff and in turn deliver better outcomes and save lives. Those present during the unveilling included CN Ashwath Narayan, Deputy Chief Minister, Karnataka; Sameer Shariff, CEO, Impelsys and Phil Smithers, Global Sales and Marketing Head, Royal College of Nursing (RCNi), among other dignitaries from the healthcare industry, who collectively acknowledged and stressed upon the need of a systematic multi-level learning approach that can improve the way healthcare is delivered in the country today.

iPC Health is a first-ever advanced and comprehensive learning interface that will offer certified 'anytime anywhere' education programmes rendering upskilling, advanced learning and compliance training for healthcare professionals in India. The solution hosts multiple digitised courses curated by knowledge partners and noted

domain experts from across the world such as RCNi, American Heart Association, Wolters Kluwer and many other leading medical education publishers.

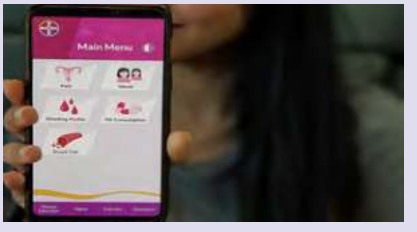
Introducing iPC Health, Impelsys CEO Sameer Shariff said, "In India, skill development and access to quality healthcare clearly are the two areas of improvement. iPC Health is curated to bridge the skill gap and ensure standardisation across the healthcare sector in the country. Our aim is to enhance learning and professional expertise of healthcare personnel and help hospitals manage their greatest assets-their people effectively. This will in turn create an impact by improving the quality standards of healthcare services in the country."

Bayer's digital health solutions provide women with accessible advice

Bayer Zydus Pharma has launched 'Bare Your Pain', an application to help women better manage their endometriosis, as well as 'Ask Tanu', a chatbot, which is the first of its kind in India to provide a reliable resource for advice on contraception and reproductive health.

The 'Bare Your Pain' application targets a chronic and painful disease like endometriosis, which is known to affect ten per cent of women of childbearing age. About 176 million women suffer from it globally, and, of these, 26 million belong to India alone. The application will enable endometriosis patients to better manage and monitor this chronic health condition. This app would help empower women with the information to manage their disease at home, and also monitor the progression, which would, in turn, help them have better discussions and outcomes whenever they visit the doctor.

"Disease management plays a very important role in Endometriosis. The



condition can be managed well when the patient is better aware and is able to monitor the symptoms. In many cases, the patients are unable to provide a clear description of their present condition. Digital interventions in healthcare like the Bare Your Pain application will advance awareness levels and allow us to provide better quality of life to patients," said Dr Narendra Malhotra, Gynecologist and Obstetrician practising in Agra.

With half of the country's population younger than 25 years of age, there is also a need to raise awareness on the use of contraception among the youth, and better family planning among young couples.

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Cordis to launch Railway Sheathless Access System in India

Cordis, a Cardinal Health company, will begin marketing the technologically advanced Railway Sheathless Access System in India this year. Cordis' Railway System is indicated for use in radial artery procedures requiring percutaneous introduction of intravascular devices.

A percutaneous procedure is a method that allows doctors to insert a medical device into a patient's blood vessel by using a needle, a guidewire, an introducer sheath and a catheter. The catheter is used to deliver medication or implant a stent into the blood vessel.

The innovative Railway System is designed to enable direct access to the radial artery in the wrist with a guiding catheter without the use of an introducer sheath. This reduces the size of the arterial puncture site by up to 2F compared to a conventional sheath system. The Railway System will be available in India later this year.

"In our experience the Cordis Railway sheathless access system minimises the radial artery trauma and disruption, by reducing artery puncture size up to 2F (33 per cent) while allowing larger bore guide catheter use during transradial coronary procedures. In our study the Railway system reduced the incidence of spasms, radial trauma and improved the transradial access success rate for complex coronary procedures. This resulted in reduced vascular complications, leading to early ambulation and discharge from the hospital," said Dr Kintur Sanghvi, Associate Medical Director of Interventional Cardiology and Endovascular Medicine at Deborah Heart & Lung Center in Browns Mills, New Jersey, the inventor of the Railway System.

Agilent, IIT Delhi to set up incubator site for bioanalytical science

Agilent and IIT Delhi signed a memorandum of understanding under which, Agilent is contributing funds to support the incubator at IIT New Delhi to support researchers at the institute establish global best practices for identifying and characterising biopharmaceuticals. The research conducted by IIT Delhi examines and reports on the quality of biotherapeutic products for the Indian market.

Agilent will be contributing funds to the IIT Delhi incubator site, as a part of its corporate social responsibility initiative, with the goal of enhancing the quality and safety of biotherapeutics. The aim is to offer world-class training to researchers from academia and industry on protein characterisation.

The setup will be under the DBT Center of Excellence for Biopharmaceutical Technology (CBT) and will support incubated startups at IIT Delhi performing protein analysis, which results will provide critical information to policy makers for ensuring safe and efficacious biotherapeutic products in India.

"We are happy to be associated with Agilent," said Prof. Anurag S. Rathore (IIT Delhi), Coordinator of the CBT. "Agilent's

broad range of technologies will further boost our efforts at the Centre of Excellence for Biopharmaceutical Technology. This mutually constructive and productive partnership will hopefully lead to promising results for the entire biotherapeutics ecosystem."

"We are excited to embark on this initiative with IIT Delhi, an institute with the country's brightest minds engaged in research and technology," said Bharat Bhardwaj, Country General Manager, Agilent India. "Agilent's relationship with IIT Delhi goes back decades. The new memorandum of understanding that we have signed will further strengthen our relationship and will enhance the ability to do cutting-edge research, which can be used to improve the quality of life for the community at large, through the application of new innovations."

Dr LH Hiranandani Hospital bags 'Quality Beyond Accreditation' award

Mumbai-based Dr LH Hiranandani Hospital was recently conferred with 'Quality Beyond Accreditation' Award at AHPI Global Conclave 2020 organised by the Association of Health Care Providers of India (AHPI). Dr Shashikant Pawar, General Manager – Operations & Projects, Dr LH Hiranandani Hospital received the award.

Dr Pawar said, "The day-to-day functioning and quality go hand-in-hand, where the quality systems are the measures of the process efficiency. We keep updating our hospital standard operating procedures periodically to have the process efficiency with involvement from each stake holder. The hospital fosters the quality culture and patient-centric approach. The key metrics being the patient satisfaction index score constantly keeping at around 4.4 out of 5, which is remarkable in the service industry."

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BI-PAP

BABY WARMER & LED PHOTO THERAPY

USA FDA APPROVE

BISTOS FETAL MONITOR

Healthcare data storage market to reach $48.2 Bn at 13.9% CAGR by 2025

The global healthcare data storage market is projected to touch US$ 48.2 billion at a 13.9 per cent CAGR during 2019-2025, as per the recent Market Research Future (MRFR) report. Healthcare data storage are software solutions that are utilised by diagnostic centres, clinics, and hospitals for storing patient data that can be used in the future. These solutions are used by healthcare companies to store data about manufacturing products and their processes.

The growth of the global healthcare data storage market is determined by numerous factors such as an increasing patient database due to the increasing number of surgeries, increasing clinical trials, and research activities to develop innovative products. Also, the decreasing paper use to maintain patient information increases the demand for healthcare data storage solutions. However, the key factors such as data infringement, cyberattacks and high cost of healthcare data storage solution hamper the market growth.

Regional Analysis

The market has been divided, by region, into the Americas, Europe, Asia-Pacific, and the Middle East and Africa.

Americas has been segmented into North America and Latin America, with the North American market being divided into the US and Canada. The Americas is projected to hold the largest market share owing to the increasing burden of clinical data, which is challenging to handle drives the market growth during the forecasted period.

The European healthcare data storage market has been categorized as Western Europe and Eastern Europe. The Western European market has further been classified as Italy, Germany, Spain, France, the UK, and the rest of Western Europe. The healthcare data storage market in Asia-Pacific has been segmented into Japan, India, China, Australia, South Korea, and the rest of Asia-Pacific. Due to the rising geriatric population and the presence of a large patient pool, the market in Asia-Pacific is expected to be the fastest-growing. The healthcare data storage market in the Middle East and Africa has been divided into the Middle East and Africa.

Segmentation

The global healthcare data storage market has been segmented based on solution, application, architecture, type, storage system, and end user.

The market, based on solution, has been divided into on-premise, cloud, and hybrid data storage. On-premise is likely to hold the maximum market share in the global healthcare data storage market.

The global healthcare data storage market on the basis of application has been segregated into the clinical analysis, financial analysis, and operational analysis. The clinical analysis segment is expected to hold a larger share of the market share owing to the rising number of hospitals, clinics, and diagnostic centres. Clinical analysis is further sub-segmented into clinical decision support, quality control, reporting and compliance, population health management, and precision health. The financial analysis is further segmented into revenue cycle management, claim processing, risk adjustment and assessment, and others.

On the basis of architecture is segmented into file storage, object storage, and block storage.

Based on type, the market is segmented into flash and solid-state storage and magnetic storage. The magnetic storage is further sub-segmented into magnetic disks and magnetic tapes. On the basis of storage system, the market is segmented into storage area network and network-attached storage direct-attached storage.

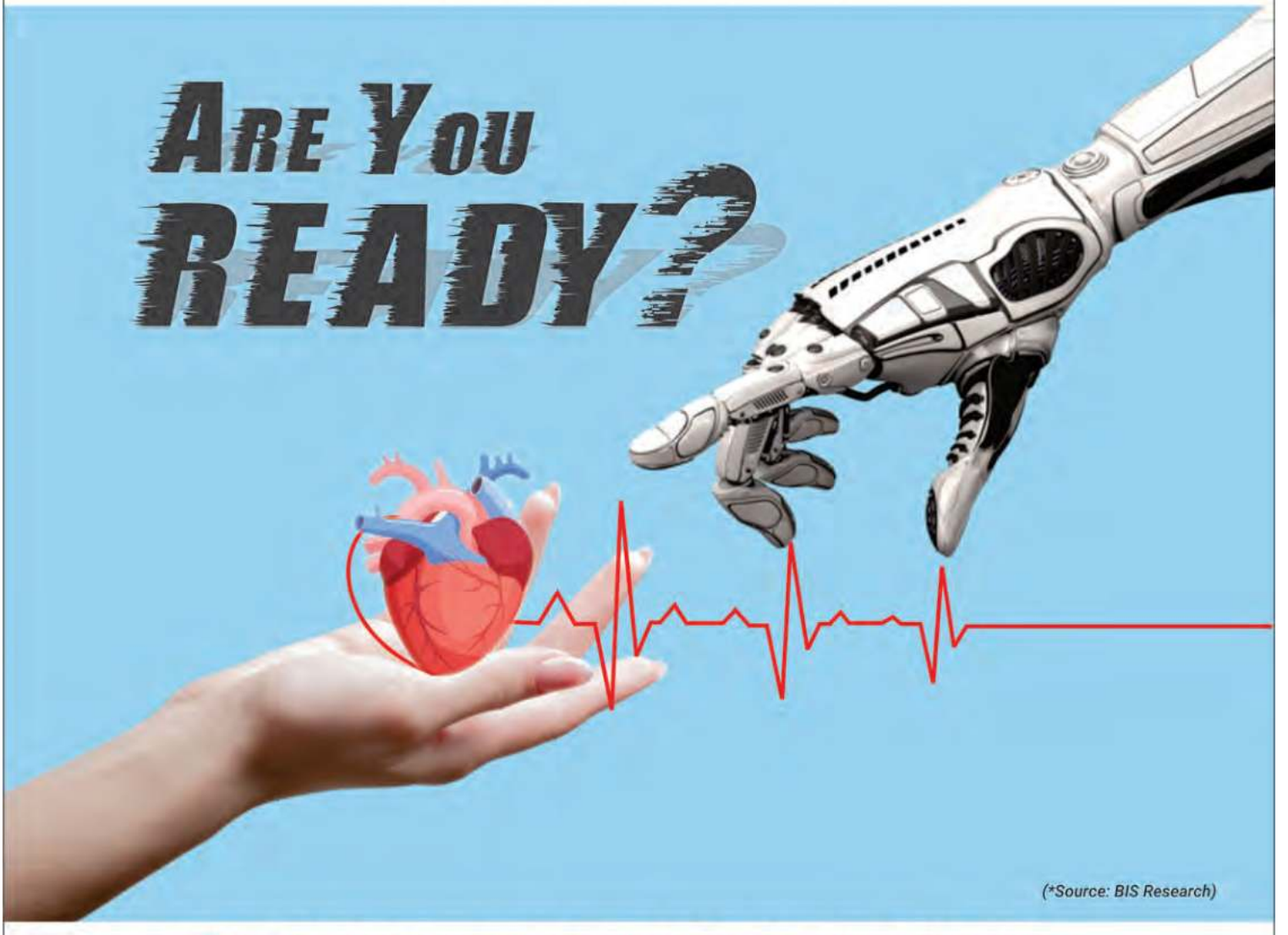
The end-user segment of the market consists of hospitals and clinics, pharmaceutical and biotechnology companies, clinical/contract research organisations (CROs), and contract manufacturing organisations (CMOs), and others.

Key Players

According to the research report, some of the key players in the global healthcare data storage market are DataCore Software (US), Dell Inc. (US), IBM Corporation (US), NetApp (US), Hewlett Packard Enterprise (HPE)(US), Pure Storage (US), Hitachi (Japan), Western Digital (US), Nuance Communications, Inc (US), and Carestream Corporation (US).

GLOBAL HEALTHCARE ROBOTICS MARKET

TO REACH $11.44 BN BY 2023*



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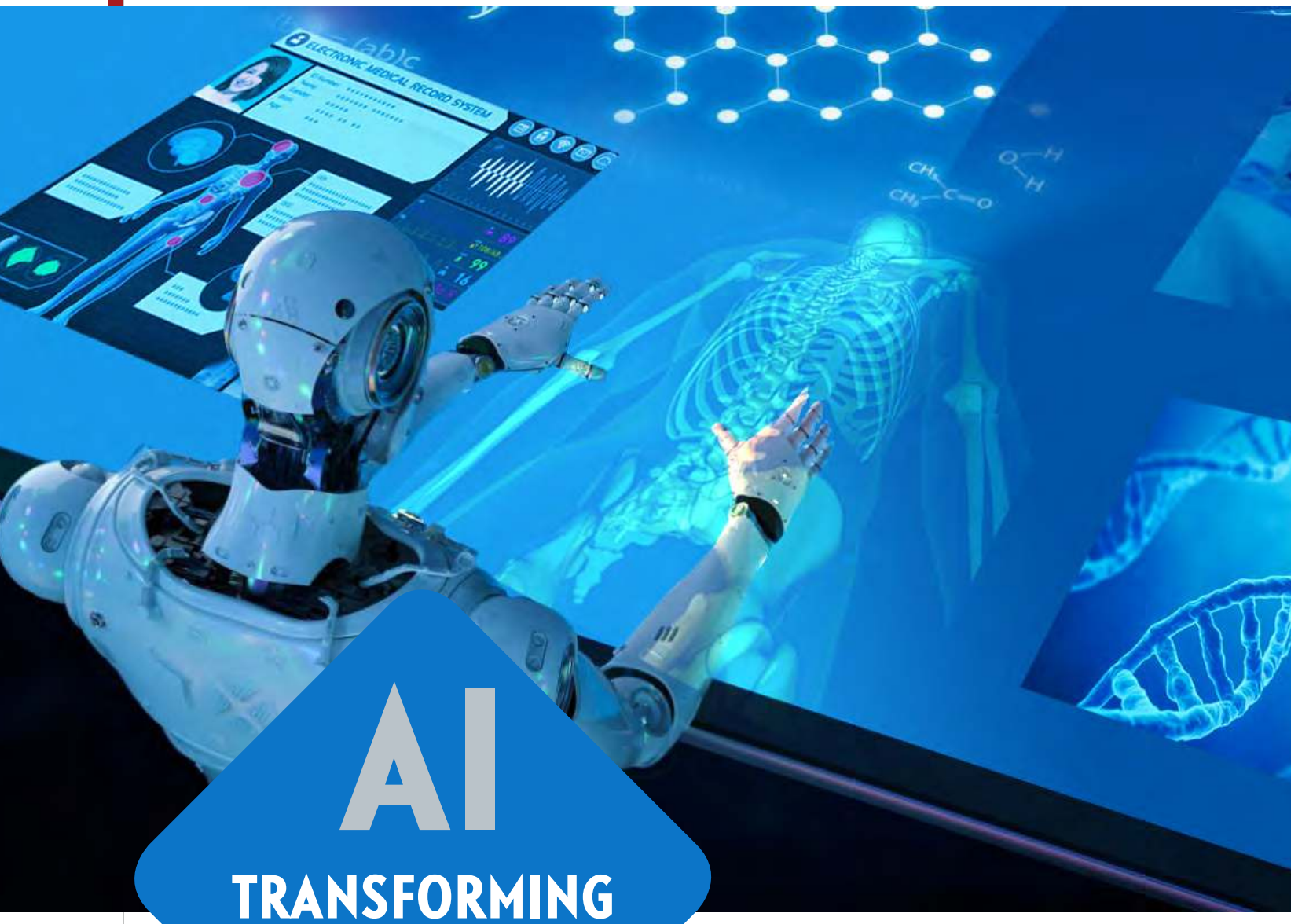

AI TRANSFORMING THE IMAGING

Artificial Intelligence has the potential of transforming healthcare delivery like never before. Reports Neha Wagle

AI can potentially leapfrog another technology, except for AI to be used at any scale, digitalisation may be a pre-requisite. Considering that, in many Indian health centres, medical records are still paper, and radiology uses films (although this is often changing rapidly). The pace of this alteration is rapid, but statistics on digitalisation of records, prescriptions, and radiology are hard to return by.

Healthcare systems everywhere are slower to adopt change than their counterparts in other industries, often with good reason. But in India, it's not only regulation which stifles

innovation. Most healthcare services are provided by the private sector and purchased out-of-pocket. This suggests that to be broadly adopted, technology has got to provide a transparent short-to-medium term incentive to the private sector, instead of directly aligning with health outcomes. The shortage of state spending on healthcare means public health programmes are still largely funded from outside the country. This sometimes leads to importing technology instead of fostering the event of indigenously developed locally appropriate inventions. Medical education in India doesn't place enough

AI-powered solutions have potential to handle major challenges that the aid sector faces these days. Currently, the demand for diagnostic services exceeds the provision of specialists within the manpower.
SurajKumar Chandrasekharan, Head of Diagnostic Imaging, Siemens Healtineers, India

emphasis on research and on maintaining with new developments. Combined with an overburdened system, this leads to generations of practicing clinicians with little motivation to innovate or to know and adopt technology.

"In the future, AI will be available in every field which is able to be vastly benefitted with conversion. AI-powered solutions have potential to handle major challenges that the aid sector faces these days. Currently, the demand for diagnostic services exceeds the provision of specialists within the manpower. Whereas this gap is growing apace, nosology and treatment also are changing into a lot of uncomplicated things," SurajKumar Chandrasekharan, Head of Diagnostic Imaging, Siemens Healtineers, India shared.

Siemens in Healthcare

Siemens Healthineers has been one of the pioneers in AI development for over 20 years and therefore the new deep learning technologies change The United States to change complicated diagnosing and support optimum treatment. Chandrasekharan said, "One such example is that the majority up-to-date introduction of Siemens Healthineers' intelligent computer code assistant for radiology - AI-Rad Companion Chest CT. A computer code assistant that brings Alto computerised tomography (CT) and helps radiologists by dashing up workflows, increasing exactitude, reducing the time for interpretation and reportage, all this by integration with the imaging interpretation advancement. In an exceedingly shell, AI-Rad Companion could be a vendor-neutral, multi-organ increased reading resolution that mechanically prepares clinical input to be understood by radiologists, pathologists and/or clinicians. Through automation, this resolution aims to require away the burden of basic, repetitive tasks, so full-fledged employees will concentrate on delivering value-based care."

AI-based algorithms could soon establish themselves as virtual 'second readers' thereby advancing radiology. With established AI expertise, future-oriented staff, vast medical data sets, and therefore the exceptional computing power needed for creating algorithm-supported healthcare solutions; Siemens is enabling healthcare organisations in their journey towards digital transformation and transforming care delivery.

BPL cementing position with connected devices

The healthcare opportunity in India while most closed corporation people would have sold the business after red, BPL rallied on, after seeing the booming healthcare opportunity in India. When Goldman Sachs invested $60 million for a majority stake within the company in 2013, the BPL family too invested an undisclosed amount to revive the business. A focus on connected medical devices and smaller towns became a

serious driver of business. But first, Sunil Khurana, CEO and MD of BPL Medical Technologies had to set the house in order. Sunil began meeting with distributors to make sure that they stayed with the brand. He says, “From our investors, I realised that we had an excellent brand story and our factory was strong. I met all 97 distributors and told them about our vision. They all stuck by us and that we now have quite 150 distributors who cover two to 3 districts in India, and have reached close 160,000 medical centres.”

To cement its specialise in medical devices, BPL Medical Technologies in 2015 acquired UK-based Penlon Systems, which makes anaesthesia machines and vaporisers. In the last two years, the corporate has partnered with several global players to spruce up its medical devices. These include German-based Lowenstein, which builds ICU ventilators; Japanese company Atom Medical Corporation to sell infant care systems; and South Korea-based Alpinion Medical Systems for ultrasound. These partnerships helped the corporate get an edge within the critical care segment. Today, critical care and imaging (X-rays) forms 55 per cent of the company's revenue. However, BPL Medical Technologies is depending on home care, which remains just 5 per cent of its business. The company continues to be big in cardiology and manufactures on the brink of 10,000 units of ECG machines per annum . This division alone contributes to 40 per cent of its revenue.

AI: The focus in healthcare

The last 5 years in India have seen consumer-facing ‘health tech’ being talked about and embraced by investors, by the government and gradually by the general public. Existing methods also are getting used to reinvent health care delivery within the sort of online consults or chat-based basic healthcare service apps.

More recently, physician-facing digital healthcare tech has begun to make its appearance - like technology that performs or assists with core healthcare or medical tasks like analysing radiology, pathology or ophthalmology images.

In this new storm of developing deep learning algorithms and artificial neural networks, along with the explosion of big data and the acceleration of processing power, experts have witnessed the start of a replacement world of AI. Chandrasekharan adds, “There has been an increasing focus of AI in radiology even to the purpose that some experts within the field are saying that someday AI might even replace radiology experts.” These suggestions are very thought provoking and will give motivation to seem more closely at this technology so people can better understand its potential, understand the drivers, and begin to understand where and the way one can employ the exciting technology to get new ways to enhance the care of patients. AI in radiology will likely emerge in stages. The first stage is already happening and involves AI systems performing automatic segmentation of varied structures on digital CT or MR images. Segmentation of structures is that the opening in any effort to isolate and analyze organs or pathologic lesions for analysis. Although segmentation of structures appears simple and at once apparent to human operators, it'll take huge amounts (hours) of some time to perform by humans.

For BPL Medical Technologies, this suggests inclusive healthcare because people in rural areas need to attend district headquarters for treatment.
Sunil Khurana,
CEO and MD, BPL Medical Technologies

Khurana shared, “The Indian government is pushing Ayushman Bharat and needs to cover 500 million under-insured citizens with Rs 5 lakh as coverage for people in remote areas. For BPL Medical Technologies, this suggests inclusive healthcare because people in rural areas need to attend district headquarters for treatment.” Khurana believes that district-level medical entrepreneurs will create inclusive healthcare, buy healthcare equipment, and increase the reach and affordability of care. Khurana claims that BPL Medical Technologies is well on its thanks to becoming a Rs 1,000 crore company by 2022. Over subsequent 18 months, it'll specialise in selling ventilators. “The company also will work with its 42-member R&D team to form its devices connected and convey affordable products to Indians,” shared Khurana.

According to PWC, the worldwide medical technology market are going to be worth $495 billion within the next three years. India's market size is $9.5 billion, 75 per cent of which is imported. “BPL Medical Technologies wants to extend its presence in India as a ‘local for global’ company. Its imports currently stand at Rs 10 crore and it wants to extend this a minimum of five-fold within the next five years,” Khurana added.

Conclusion

Technology advancements in medical devices with incorporation of AI has brought transitions in the healthcare sector, thus, delivering value-based care.

Wearable Biosensor for Arrhythmia Detection

Arrhythmia detection to further expand monitoring options in cardiology community

VitalConnect, Inc., a leader in wearable biosensor technology, announced the introduction of arrhythmia detection to its remote monitoring portfolio. In partnership with CorVitals, Inc., VitalConnect now offers physicians the ability to monitor, diagnose and treat patients suffering from various heart conditions and diseases.

With arrhythmia detection, clinicians have the ability to remotely monitor patients who may have, or develop, an arrhythmia. This proprietary software can identify 22 unique arrhythmias, from atrial fibrillation (AFib) to left bundle branch block (LBBB). Cardiac monitoring may be introduced after patient symptoms or following a cardiac procedure, all in an effort to improve patient outcomes through this innovative technology. For example, LBBB is a common complication following a transcatheter aortic valve replacement (TAVR) procedure, occurring in 25% - 30% of cases. Additional monitoring following discharge from the hospital may improve patient outcomes following this common procedure.

"We are pleased to now offer arrhythmia detection as part of our ongoing efforts to improve patient outcomes for those suffering from various heart conditions," said Peter Van Haur, CEO, VitalConnect. "Continuous, real-time remote monitoring enables next-level care and efficiency in the hospital and in post-discharge settings."

In addition to offering arrhythmia detection, VitalConnect offers Vista Solution 2.0 which provides clinicians with access to 11 vital sign measurements as monitored by the VitalPatch biosensor and external third-party devices. Vista Solution 2.0 provides information about patients' conditions around the clock with clinically proven predictive analytics via the integrated National Early Warning Score (NEWS) standard.

"At VitalConnect, we are focused on providing technology that takes patient care to the next level and with a growing number of heart-related illnesses worldwide, there is a pressing need for innovative solutions," said Nersi Nazari, PhD, and founder of VitalConnect.

With arrhythmia detection and Vista Solution 2.0, VitalConnect has two technology solutions using the VitalPatch to advance patient care. Additionally, the VitalPatch biosensor allows patients to be independent of wires or bulky devices, providing real-time monitoring while ensuring patient comfort in the process.

"This is the kind of digital health technology that physicians and patients can benefit from," said Dr. John Wang, chief of the Cardiac Catheterization Laboratory at Medstar Union Memorial. "Monitoring patients following TAVR procedures has the potential to further improve patient outcomes and minimise complications which may develop after the patient is discharged from the hospital." ✚

A CLOSER LOOK AT HYPERTHERMIA

Hyperthermia is used as an effective tool along with radiation or chemotherapy to treat cancer. **Dr Nagraj G. Huilgol, Chief Radiation Oncologist, Nanavati Superspeciality Hospital & Centre for Hyperthermic Oncology and Medicine** speaks to **Neha Wagle** about advances in Hyperthermia and the future of it. Excerpts:

Top Radiation Oncologists across the world gathered to impart and share knowledge and expertise at International Conference on Hyperthermia hosted by Nanavati Super Specialty Hospital (NSSH), Vile Parle from 15th February to 16th February. The 11th Biennial Conference Indian Association of Hyperthermia Oncology and Medicine is aimed at bringing in advanced treatment regimens and Hyperthermia awareness to India.

The two-day conference, which began on 15th February, witnessed extensive discussions on interesting themes such as integration of proton therapy and Hyperthermia, role of Hyperthermia in breast, head and neck and cervical cancer and economics of setting up Hyperthermia centre in India.

Dr Nagraj, could you let us know more about Hyperthermia?

The definition of Hyperthermia is heating temperature, the exact term for Hyper is 'to raise' and therme is 'heat'. Hyperthermia is to raise the temperature of the tumor in the cancer; cancer becomes very susceptible for death. So when we add them with a very conventional treatment like radiation therapy, immunotherapy or Chemotherapy, the effects of this

treatment go up. If one can effectively heat the tumor to 45C, there is also a chance that heat alone can also be lethal to cancer. Heat as a treatment for cancer is not new to India in the sense even before Ayurveda there is a mention of heat being used for the treatment of 'Arboda', it means cancer. But sadly we missed Renaissance of Hyperthermia in the 80's. With the help of a Japanese professor, we bought a machine here for radio frequency reading. But very few of us are propagating the idea for Hyperthermia. There is reasonable number of brand maestros which says, "When you combine Hyperthermia with radiation therapy, Immunotherapy or Chemotherapy, the effects go up. There is a scientific method of doing it." We have very sophisticated machines based on radio frequency; micro-wave and it can be integrated in MRI machines. So the whole idea is to add to whatever standard treatment we have. We have a large Head & Neck data and we have also published in international journals about the treatment of Hyperthermia with Chemotherapy, without Chemotherapy, with radiation so far.

At the core of it, what we understand is that heat as a modality of treatment is a primary force; it is the first to harness for treatment. When the present government talks about ancient heritage they should justify and talk about Hyperthermia than anything else. There is more scientific rationale for that. And as I said we have a radiation machine, it is imported from Japan, by a company called Thermatron. We have treated 3,000 patients till now since the year 2000. It is combined with Radiotherapy and Chemotherapy. The advantages of Hyperthermia are that it is not toxic until there is an occasional wound or a discomfort. If at all there is a discomfort, we don't give it. It does not act to the side effects of radiation or Chemotherapy or Immunotherapy, it has its own side effect which is marginal. When we combine, it is very beneficial. We get 8-12 per cent increase in survival. And in Oncology anything around 8-12 per cent is a big number. This is more than a baby step.

What are the advances in Hyperthermia?

Addition of Hyperthermia enhances the effect of Radiation, Chemotherapy or combination of both by 8-12 per cent. In the clinical application of Hyperthermia, three methods can be distinguished: local, regional and whole-body Hyperthermia. Hyperthermia is under study in clinical trials and is not widely available. So further technological improvements will need to contribute to an easier and better controlled adequate application of Hyperthermia.

What are the challenges you faced in treating with Hyperthermia in Indian settings?

In India, this has not yet gone till the mainstream as most of the vendors will not venture into India as the people who did were not happy. Biggest challenge in Hyperthermia is it takes one hour at this propation. So here one can treat 10 patients maximum, and that is a big challenge. When a hospital invest money in a radio therapy machine, you have 40-60 patients which can 10 minutes for check-up and then turn it off, the incentives are more to the hospital to invest where they aren't making any money. So Hyperthermia becomes a little difficult as it is not a primary treatment, it is an add-on treatment awareness of which is little limited. Anything which is different takes a little more time.

Can you talk about the future of Hyperthermia?

Hyperthermia has been here for a last 2 decades, it is popular in Japan, Germany, USA took a long time as the insurance did not recognise it for a while. Medical practices also driven by market forces so may be doctors find it easy to make money in some other way than spend an hour with the patient. Hyperthermia is a useful adjunct to Radiotherapy and Chemotherapy. Hyperthermia is an option to explore now instead of waiting for an exotic treatment to arrive to increase survival. A number of challenges must be overcome before Hyperthermia can be considered a standard treatment for cancer. Many clinical trials are being conducted to evaluate the effectiveness of Hyperthermia. Some trials continue to research Hyperthermia in combination with other therapies for the treatment of different cancers. Other studies focus on improving Hyperthermia techniques. ✚

AI smartens up cancer care

Are we headed for Artificial Intelligence (AI) or Virtual doctors? We order grocery through Alexa, write an email with Siri, AI is revolutionising many aspects of our life. The debate is whether AI is impacting our health by providing better medical diagnosis or treatment?

AI is a mental ability used in solving -problems, learning the concepts and integrating functions, memory, attention, focus, planning and language. AI has greatly evolved over the past few years and the potential of benefits are huge.

AI Impact

Accenture predicts - AI health market will grow to an estimated $6.6 billion by 2021. The compound annual growth rate

has increased to 40 per cent. 96 per cent of the hospitals in US have implemented a certified AI system

Accuracy of Database

Database plays an important role in the healthcare delivery process and AI is reducing the burden of managing health records. It can implement the proactive and predictive strategy while managing the patient data.

EMR has been a major step forward. It has promoted and galvanised the meaningful use of health information technology, which has resulted in a positive and notable shift from paper to computer-based health records.

Quality of Healthcare Delivery

Human intelligence is a product of years of learning and fine-tuning. Courtesy to cognitive skills and abilities he can perform multi-tasking, respond to new circumstances, providing patient-oriented care, adapt to a new environment and handle abstracts and complicated tasks.

AI being the replicated version of human intelligence requires several more R&D to respond to new circumstances, instructions and investments to beat human intelligence. With the help of AI and machine, clinicians can unearth the hidden patterns, trends, and correlations. However, once you teach the machines, they can perform far better than humans.

Clinical Productivity

Predictive models specifically trained on large amounts of data are more efficient in predicting patient outcomes though they lack human sense.

AI- Transforming medical care

While predicting the future of AI in medicine is not an easy task, it can certainly be said that it has a role to play in medicine as a partner. In combination with a human physician AI methods and systems can advance the delivery of care in a way that outperforms what either can do alone.

Step into the era of precision medicine which seeks to tailor medical treatment to the individual characteristics of a patient. This is likely to transform the delivery of medical care by enabling physicians to identify which genetic mutations drive certain cancers, and sequence our microbiome. Central to making precision medicine possible is AI which can make sense of massive amounts of clinical, genomic, and imaging data, thus helping to improve physician efficiency, increase diagnostic accuracy, and personalise treatment.

It can assist in assessing cancer risk. The clinician can pre-empt their patients with the results and chalk out a long-term plan of patient care. AI-based systems are poised to increase diagnostic efficiency in other areas of medicines as well. It will have a positive impact on radiology (CT, MRI and mammography interpretation), pathology (microscopic and cytological diagnoses) dermatology (lesion evaluation for potential melanoma). The field of pathology depends on the trained eye of the clinician to render a diagnosis of a bio-specimen. Given the many different types and subtypes of a disease and the avalanche of new data in the form of different biomarkers and genomics data, this is becoming an increasingly difficult task for the pathologist. The AI-based systems have the potential to augment clinical decision. One of the remarkable achievements is cognitive assisted robotics- da Vinci Surgical System.

Role of AI in breast cancer detection

Digital mammography has a sensitivity of 84 per cent for early BC detection. It can miss an early cancer or can have a false positive result. To safeguard, additional imaging in the form of double reading and more frequent screens are done which increases resource expenditure. AI can increase efficiency by using large complex datasets and image interpretation. It can overcome the inability of radiologists to decipher subtle changes on images.

It can combine these pixel-level variables and associations with patient clinical data, including any known patient risk factors, to develop predictive algorithms that may someday provide equal or better accuracy than human screening mammography. AI can provide clinical decision support to radiologists and improve the delivery of care and cost to patients.

Indian scenario

As of 2018 there were nearly 1.2 million new cancer cases diagnosed in a year in the country and this is expected to rise. India has only one oncologist for 1,600 patients, compared to one for 100 patients in the US, and hence faces an acute shortage of expertise.

Given the increasing number of cancer patients, fewer oncologists to treat them, the broad geographic footprint and the rapid increase in scientific and clinical knowledge about care, physicians in India face a challenging time in staying up-to-date about best practices in treatment and care management.

AI based systems IBM's Watson can search through millions of pages of data, read countless medical articles, and far exceed the capacity of any human physician in its breadth and scale of knowledge. A study published by Manipal Hospitals in 2018, Watson for Oncology was concordant with the hospital's MDT in 93 per cent of breast cancer treatment decisions (Somashekhar et al). IBM Watson agrees with the doctors only shows that it is competent in applying existing methods of care, not that it can improve them.

Assessing the Impact of AI on Physicians

AI replacing the clinicians

In terms of predictive analytics and image recognition, AI may soon become more effective than physicians, in handling millions of images in any reasonable time frame and interpreting even the most complex clinical images as accurately as today's most experienced radiologists.

The doctor–patient relationship

AI - cannot engage in high-level conversation or interaction with patients to gain their trust, reassure them, or express empathy. Physicians are still needed for traditional physical exams, high-level patient-physician interaction, critical thinking and interpretation in ambiguous and challenging cases. AI-based systems are based on precedence and they can underperform in novel or unusual cases where there is no prior example to build on

Way forward

AI-based systems will support the skills of physicians and are unlikely to replace the traditional physician–patient relationship. AI will become a routine part of clinician's daily lives, making their work more efficient, accurate, and valuable

Conclusions

AI will support the future needs of medicine by analysing the vast and various forms of data with a high level of accuracy. It would enhance clinical productivity due to its ability to handle a large capacity of tasks that are well suited for automation without any fatigue or burnout. It is likely to support and augment physicians by taking away the routine parts of a physician's work, hopefully enabling the physician to spend more precious time with their patients, improving the human touch. AI is unlikely to replace physicians in the foreseeable future, maintaining human expertise in the interpretation of data and recommendations. It is incumbent on medical professionals to learn both the fundamentals of AI technology as well as how AI-based solutions can help them at work in providing better outcomes to their patients. Or the time may come; the physicians who use AI might replace physicians who are unable to do so. ✚

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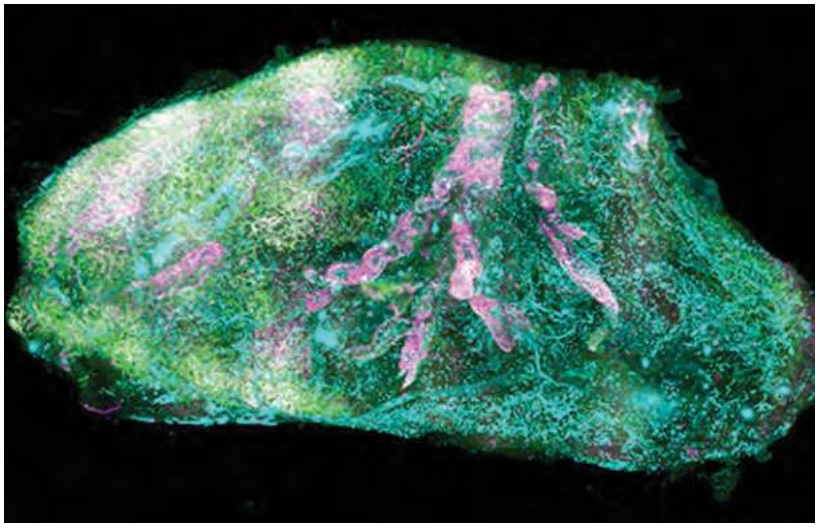
Scientists Make Transparent Human Organs



Vascular and glomeruli details of the human kidney. ©Helmholtz Zentrum München / Ertürk lab

For the first time, researchers managed to make intact human organs transparent. Using microscopic imaging, researchers from Helmholtz Zentrum München, Ludwig Maximilians University Munich (LMU), and Technical University of Munich (TUM) could reveal underlying complex structures of the see-through organs at the cellular level. Resulting organ maps can serve as templates for 3D-bioprinting technologies. In the future, this could lead to the creation of on demand artificial organs for many patients in need.

In biomedical research, seeing is believing. Deciphering the structural complexity of human organs has always been a major challenge due to the lack of technologies to image them at the cellular level. Recent developments in tissue clearing allowed researchers to obtain first cellular views of intact transparent mouse organs in 3D. These methods, however, were not applicable to human organs.

"We had to change our approach completely"

Human organs are particularly stiff due to accumulation of insoluble molecules including collagen in tissues that have grown for years or even decades. Thus, traditional detergents that are used for making mouse organs transparent do not work on human organs, particularly adult ones. "We had to change our approach completely and start from scratch to find new chemicals which can make human organs transparent," says Shan Zhao, PhD student at Helmholtz Zentrum München and first author of the study. After exhausting trials, the team discovered that a detergent called CHAPS could make small holes throughout the entire stiff human organs. CHAPS allows additional solutions to travel deep into centimeters-thick human organs and convert them into a transparent structure.

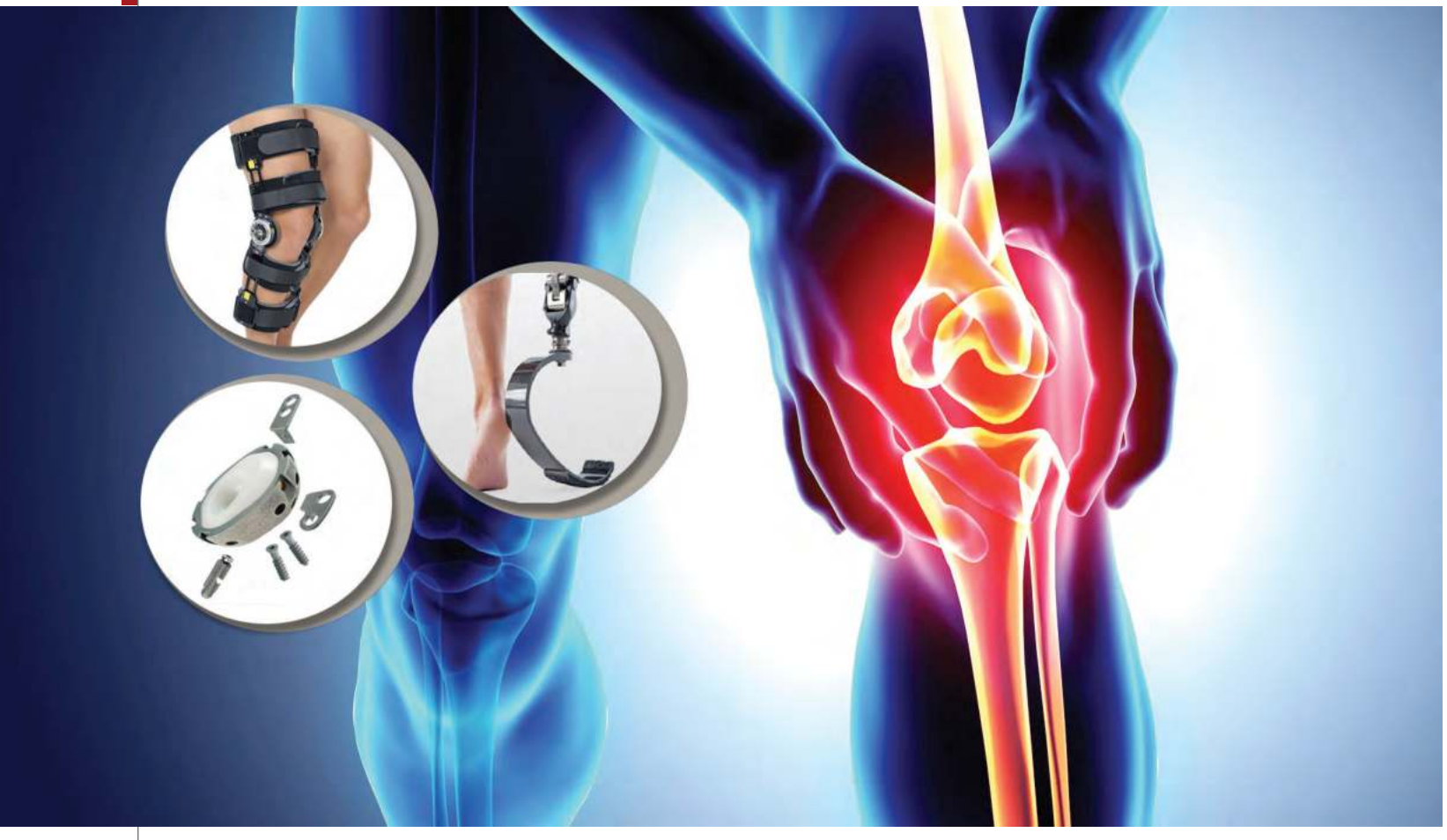
After making the human organs transparent, which were obtained post mortem from Prof. Ingo Bechmann's lab at the University of Leipzig, the team had to tackle additional challenges for both organ imaging and the analysis of the large amount of resulting data. First, they developed a new laser-scanning microscope with a large sample holding capacity called "Ultramicroscope Blaze" in collaboration with Miltenyi Biotec. This microscope enabled imaging of human organs as large as the kidney. Next, together with Prof. Bjoern Menze from TUM, the team developed deep learning algorithms to be able to analyse hundreds of millions of cells in 3D.

The researchers named this new technology SHANEL (Small-micelle-mediated Human orgAN Efficient clearing and Labeling). "SHANEL can develop into a key technology for mapping intact human organs in the near future. This would dramatically accelerate our understanding of organs such as the brain, their development and function in health and disease," explains Dr. Ali Ertürk, Director of the Institute for Tissue Engineering and Regenerative Medicine at Helmholtz Zentrum München and also Principal Investigator at the Institute for Stroke and Dementia Research at the hospital of LMU.

Final goal: 3D-bioprinting of artificial organs

Cellular maps of human organs could be used to engineer large scale human tissues and organs with emerging 3D-bioprinting technologies. Towards this goal, Ertürk and his team are currently working on mapping major human organs, starting with the pancreas, heart and kidney.

"There is a huge shortage of organ donors for hundreds of thousands of people," says Ertürk. "The waiting time for patients and the transplantation costs are a real burden. Detailed knowledge about the cellular structure of human organs brings us an important step closer to creating functional organs artificially on demand." ✚



Advanced Technologies in Orthopaedic Equipment

The orthopaedic devices industry will continue to be a promising area in the global medical technology space, and is expected to rank third in sales after cardiology and in-vitro diagnostics by 2020.

The emergence of advanced technologies and the rise in orthopaedic disorders will drive industry growth. Rising incidence and prevalence of orthopaedic disorders, and growing geriatric population are some of the major driving factors driving the growth of the global orthopaedic surgery equipment market. However, the high cost of treatment and challenges in reimbursement are hindering the growth of this market to a certain extent. Continuous innovations and development in the field of orthopaedic surgery helped the

orthopaedic industry to maintain a steady growth over the last decade and this trend is expected to continue in the years to come. Currently available trauma management techniques are incapable of restoring body parts successfully due to the lack of efficient surgical tools. As a result, manufacturers are investing significantly in R&D to develop innovative and efficient devices. Increased R&D activities are anticipated to ensure high market growth in near future.

Technological advancements and integration of digital technologies has also triggered the changes in demand pattern as far as the patients and healthcare professional are concerned. Maintaining qualified team of professionals is becoming increasingly vital for the healthcare institutes owing to the rapid technological advancements. It is essential for the manufacturers to keep in mind the safety, comfort, and convenience of the consumers. Affordability is another factor that plays a key role in the overall growth of the market for orthopedic devices. Incorporation of cutting-edge trends have revolutionised the field of orthopedics over the last few years. For instance, medical fabrics and wearable medical devices.

Severe competition in the healthcare has forced healthcare providers to look for modern technology, equipment and devices to provide superior healthcare facility. Medical device industry is a multi-billion dollar industry whose outlook is supposed to rise in years ahead. These devices diagnose and treat a multitude of patient infirmity and work much better than drugs. Hospital care is rising and the medical device industry is being looked to provide low cost technology for home healthcare. Now, the industry seeks Healthcare medical devices that can be used by individuals with unskilled healthcare experience. Need for modern technology, equipment and devices can be leveraged through Medical device equipment, medical equipment manufacturers to afford better-quality healthcare solutions.

Manufacturers in this field must focus on factors that determine the demand trends and consumer preference for orthopaedic devices. As per the researchers, rising consumer awareness regarding the availability of the range of innovative products is something that influences the demand. Hospitals around the world are constantly on the lookout for the implementation of innovative products. Increased upgrades in terms of devices and instruments will bode well for the manufacturers of these devices.

As per the researchers, minimally invasive surgeries are gaining prominence as they cause less pain, blood loss, scarring, OT time and hospital stay. The increased accuracy rate of these surgeries is a revelation for the instrument manufacturers who want to incorporate this technique while developing orthopaedic devices. Apart from that, advanced techniques like computer-aided surgeries, robotics, and 3D printing are being adopted for better patient outcome and precision. High demand for these surgical procedures and latest technologies reflects on the changing manufacturing trends in the market for orthopaedic devices. The orthopaedic supply chain is in constant need for devices that can reduce the impact and improve accuracy while cutting into the bones, small or large.

Healthcare sector is adopting 3D printing at an astonishing pace. Irrespective of ethical and technological changes, major manufacturers are adopting 3D printing in regenerative medicine, tissue engineering, bio-printing, and other advanced processes. Inclusion of personalised prosthetics and metallic implants with the use of stainless steel, cobalt-chromium alloy, and alpha-beta titanium alloy (Ti-6Al-4V) are the most noteworthy trends in 3D printed orthopaedic devices market.

On the basis of products, the market is categorised into accessories and surgical devices. The surgical device segment is further divided into drill guide, custom clamps, guide tubes, screw drivers, and distracters, among others. The accessories segment covers products such as braces, arthroscops, and other consumables. This segment also includes other devices such as sutures, plaster materials, and screws. Accessories segment is expected to expand at the fastest CAGR over the forecast period. Advancements in these devices and tools are anticipated to further propel the demand in near future. Technologies and types of implants used in surgical procedures are expected to further impel the market growth over the forecast period. Reduced prices of older versions owing to rapid pace of innovation and upgrades are anticipated to create business opportunities, especially in emerging regions.

Innovations in diagnostic and surgical imaging are helping surgeons to better evaluate, plan and execute surgeries. 3-D imaging for 3-D evaluation before, during and after surgery could improve implant positioning; software is used for an accurate and reproducible 3-D standing reconstruction of the musculoskeletal system. In the future, full automation of 3-D imaging will be possible. Surgical navigation and imaging systems help surgeons make data-driven decisions by integrating surgical planning software, instrument tracking technologies and intraoperative imaging to accurately track instruments in relation to a patient's anatomy during a procedure. Smart implants have embedded sensors that provide real-time information to surgeons for positioning and post-operative evaluation for better patient care throughout the treatment pathway. These implants have the potential to reduce pre prosthetic infection, which is a growing problem in orthopaedic practice. Sensor-enabled technologies have given health care providers a choice of unique, cost-

effective products.Spinal devices are also expected to witness a steady growth rate during the forecast period, owing to the introduction of new technologies and products and rise in prevalence of spine-related disorders. The trauma fixation orthopaedic devices are also anticipated to witness substantial revenue by the end of 2024.

North America is expected to dominate the market, due to the increasing awareness of the minimally-invasive procedures for orthopaedic surgeries, continuous innovation in the implant technologies, and advanced healthcare facilities. High adoption rates of advanced technologies are also the factors driving the growth of the market in this region. Asia Pacific is expected to exhibit the fastest CAGR during the forecast period. China and India are expected to account for the largest geriatric population pool in the world. Hence, the demand from these countries is expected to grow tremendously in near future. In addition, booming medical tourism industry owing to the availability of advanced healthcare treatments at cost-efficient rates is expected to attract target patient population. Japan has a large number of implant manufacturers coupled with high healthcare expenditure compared to other regional countries. Moreover, high adaption of new technology is expected to further fuel regional market growth.

Arthroscopic devices, Joint Reconstruction, Regenerative Ortho, Trauma Fixation Devices, and Spinal Devices are few of the major orthopaedic devices. Joint reconstruction devices, which accounted for more than 40 per cent of orthopaedic devices industry revenue in 2016, are set to grow at a rate of 3 per cent over the coming seven years. Increase in the number of road and sports injuries will boost the product demand. Orthopaedic devices market revenue from orthobiologics is predicted to surpass USD 4 billion by 2024, driven by its immense usage as substitutes and bone grafts. Spinal devices are projected to observe notable gains of 3.5 per cent during the period from 2017 to 2024, owing to high occurrence of degenerative disc disorders among the aging people plus product innovation for treating disorders of spine. Trauma fixation devices are likely to collect revenue of USD 7 billion by 2024, subject to its high need in developing regions and product differentiation in the comparatively matured markets of developed regions.

Global Orthopaedic Device Market is anticipated to grow at a CAGR of 3.55 per cent from 2019 to 2027 and Reach US$ 58,400 Million by 2027, owing to cutting-edge Technological Advancements in booming the Orthopaedic Market across the Globe, says Absolute Markets Insights

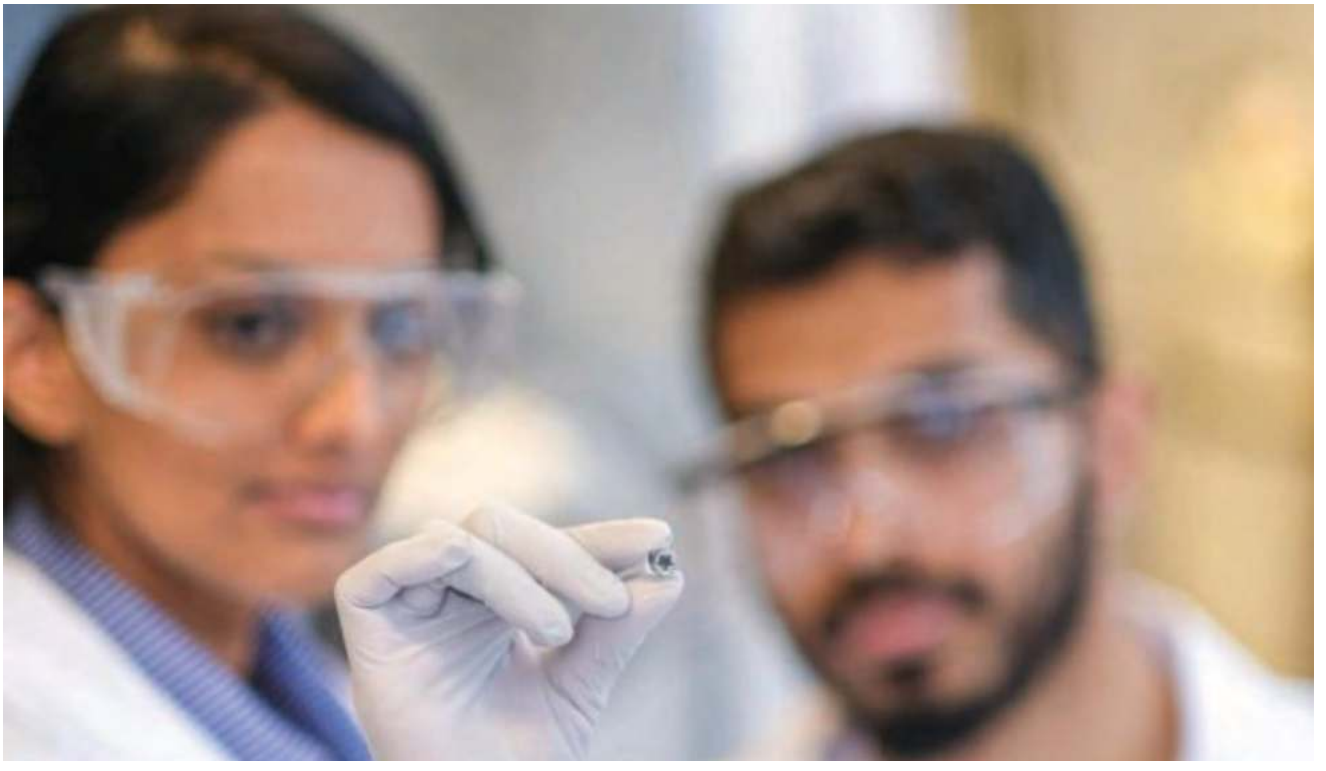
According to the market research report published by Grand View Research, the worldwide orthopaedic devices market is anticipated to witness steady growth. By the year 2024, the market is poised to reach past around USD 43.1 billion, growing at a steady CAGR. Unavailability of effective surgical tools and ineffective trauma management tools are also anticipated to impel the demand for improved orthopaedic devices. Consumers from around the world, especially from the emerging markets are aware about the availability of innovative products. This factor is anticipated to play a crucial role in the growth of the market over the next four to five years. The high demand for knee orthopaedic devices is attributed to growth in aging population, obesity, and high prevalence of musculoskeletal conditions.

The global orthopaedic devices market is highly fragmented. Market players focus on continuous product development and offering orthopaedic devices at competitive prices, especially in the developing countries. Minimally invasive orthopaedic devices, which do not require repeat procedures, are expected to boost the number of procedures in the developed and developing regions.

Therapies and procedures that reduce time and costs and provide optimised and personalised outcomes are expected to increase as innovative technologies continue to shape the industry. Intelligent orthopaedics - a combination of traditional techniques and high-end technology—will be the future of the industry

Dr. Anindansu Basu
Consultant – Orthopaedics/
Bone and Joint Surgery
Fortis Hospital,
Anandapur, Kolkata.

Pill-sized chemical heater for point-of-care diagnostic tests



Researchers at the University of Toronto have developed a 'heater' — about the size of a pill tablet — that regulates the temperature of biological samples through the different stages of diagnostic testing. This technology could enable resource-limited regions around the world to test for infectious diseases without the need for specialised training or costly lab equipment.

"The lack of electricity adds a layer of complexity," said Buddhisha Udugama, a researcher involved in the study. "Our miniature heater addresses that. It can be used in various settings to detect viruses without the need for electricity. If we were to summarise the benefits of our technology, it would be accessibility, portability and precision."

Udugama adds, "The precision and flexibility of our heater opens the door to a future of do-it-yourself diagnostic kits."

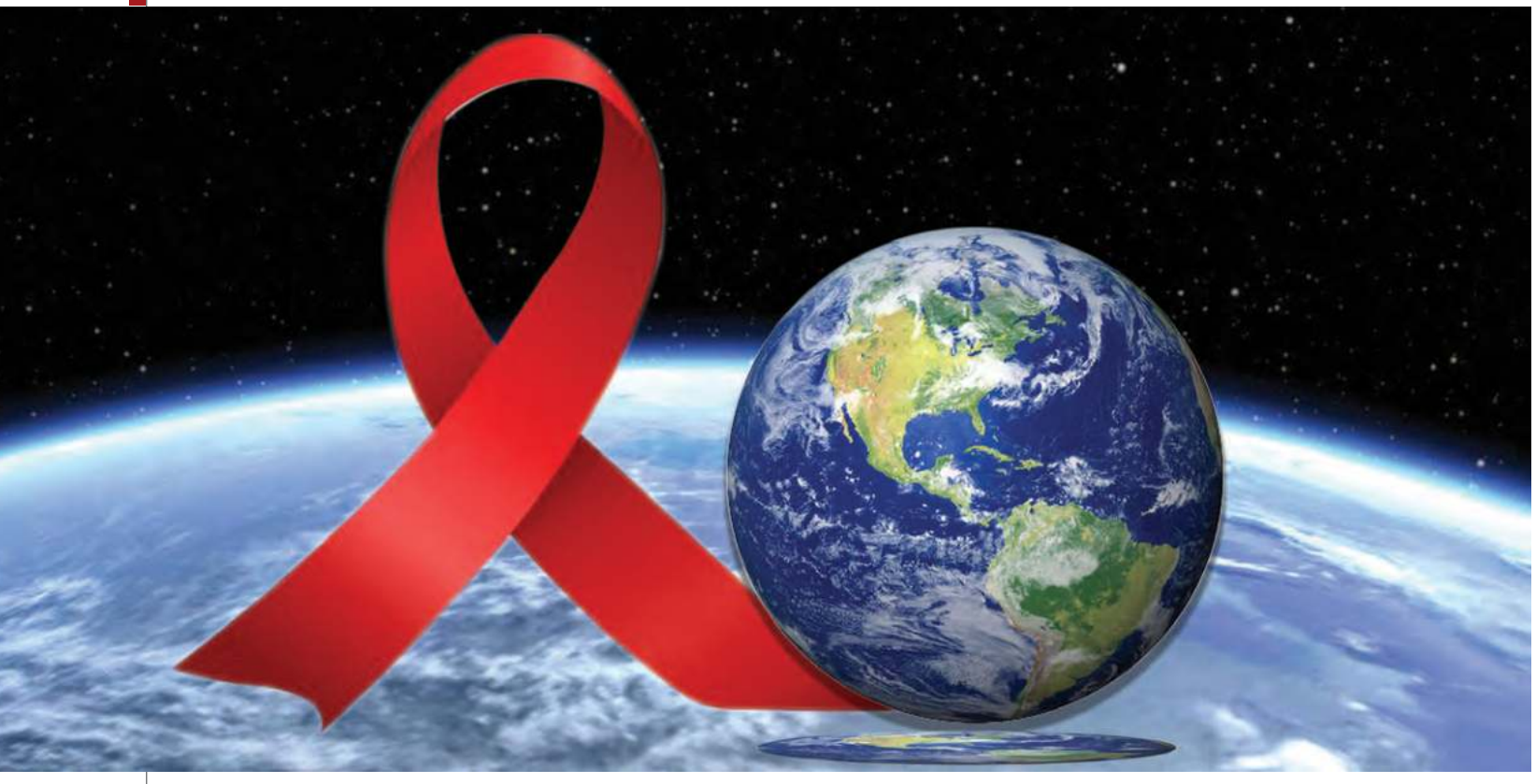
In a typical diagnostic test for infectious pathogens, multiple temperature-regulation steps are involved. The ability to control temperature is crucial to the accuracy of the test results, and is especially important in areas where access to large research facilities are limited.

The outside of the heater tablet is composed of a non-reactive acrylic mould that encapsulates lithium, a reactive element that is commonly found in battery cells. When dissolved in water, the reactive lithium interacts with the solution to release heat and hydrogen gas. This results in an increase of temperature for an extended period of time.

The researchers observed that the reproducibility of the temperature profile is controlled by constant gas release, which is dictated by the shape of the lithium mould. After testing multiple shapes of the lithium mould – from circles to triangles – they found the star shape, measuring just 8 millimetres in diameter, to be the most ideal for precise heating.

Consolidating multiple steps into a single tablet also means specialised training is not required to operate any diagnostic testing, reducing the chance of human error and making the device accessible to the public.

"Tablets are conventionally used for medications such as aspirins. But we have now developed a series of tablets and pills that can diagnose diseases," said Warren Chan, principal investigator on this research and director of IBBME. "Combined with smartphone technology, everyone would have a portable system that can track, monitor and diagnose infections. This is critical for preventing the spread of diseases." ✚



Put end to Cancer

On the world cancer day which is observed on 4th February every year with this year theme 'I Am and I Will' the experts from medical industry share their insights and awareness about the cancer. 2020 marks the halfway point of the 3-year 'I Am and I Will' campaign.

February 4th known as World Cancer Day, when organisations and people around the world unite to raise awareness about cancer and work to make it a global health priority. Projected 9.5 million people worldwide were expected to die from cancer in 2018 – about 26,000 cancer deaths a day - and that number is predicted to grow.

Around the world, communities' present seminars, walks, hold public information campaigns and other events to raise awareness and educate people on how to fight cancer through screening and early detection, through healthy eating and physical activity, by quitting smoking, and by urging public officials to make cancer issues a priority.

'I Am and I Will' is a call-to-action influencing for personal commitment and represents the power of individual action taken now to impact the future. World Cancer Day is a campaign built to boom, motivate change and mobilise action long after the day has passed. A multi-year campaign offers a chance to create long-lasting impact by increasing public-facing contact and engagement, more opportunities to build global awareness and impact-driven action.

Understanding the connection between chronic inactivity and heightened risk of most type of Cancers

Dr Boman Dhabhar, HOD & Senior Consultant - Medical Oncology, Fortis Hospital, Mulund says, "Diet, physical inactivity and weight are all interlinked, ultimately leading to obesity, which is defined as Body Mass Index more than 30 kg/m2. In Breast Cancer, Colorectal Carcinoma, Prostate Carcinoma and Endometrial Carcinoma, obesity at the time of diagnosis is linked to poor outcomes."

The American Cancer Society and the American College of Sports Medicine for Cancer Survivors recommend that maintaining a healthy weight and then opting of physically active lifestyle, i.e. at least 30 minutes of moderate to vigorous physical activity for five or more days of the week, and eating a healthy diet, positively benefit the quality of life of Cancer survivors. Growing evidence also suggests that sedentary behavior, time spent engaged in activities such as TV watching and computer use, maybe independent risk factors for developing Cancer as well as a poor prognosis in Cancer survivors, which has been shown in a few meta-analysis also. "As regards to patients who are already diagnosed with Cancer, for example Breast Cancer, who are on Hormonal Therapy like Aromatase Inhibitors and are obese, have higher incidence of recurrence. Patients on Chemotherapy who engage in moderate physical activity are known to have a better quality of life by reducing Cancer-associated fatigue and lethargy. Endometrial Cancer patients who are Obese and Diabetic are known to have poor outcome as compared to their non-diabetic non-obese counterparts," Dr Dhabhar shared.

Cancer mortality is higher among men than it is among women, yet awareness about cancer is low in men

Dr Donald Babu, Surgical Oncologist, Hiranandani Hospital Vashi-A Fortis Network Hospital, says, "Studies conducted worldwide show that men are 40 per cent more likely to die from Cancer, it was also observed that men are 16 per cent more likely to get the disease than women. However, there is no substantial biological reason as to why men should be more susceptible." Let's look at two possible explanations for this phenomenon. Lifestyle factors include unrestrained smoking, drinking, rapidly increasing weight, and no exercise; all of these are noted risk factors for several types of Cancer. Secondly, men also tend to hide their symptoms, or simply don't understand the symptoms, which means by the time they are diagnosed with Cancer, it is in advanced stages. Also, women tend to be in frequent contact with health professionals, as against males, which means their health related queries are never answered or at a much later time.

"Men need to take charge of their health too, six-monthly or yearly check-ups are important, speaking to your doctor about unusual symptoms is important, and lastly, being aware of risks associated with Cancer is important," Dr Babu shared.

Ms. Pranjal Dange, psycho oncologist Dr. Rajiv Yadav, COO, ACI, Varun Deshpande, Director, Hopscotch HealthDr Sanjay Sharma, Director, ACI Ms. Avanti, Dr. Deepak Parikh, Director, Asian Cancer Foundation & Dr. Arun

Men need to take charge of their health too, six-monthly or yearly check-ups are important, speaking to your doctor about unusual symptoms is important
Dr Donald Babu, Surgical Oncologist, Hiranandani Hospital Vashi-A Fortis Network Hospital

Data Collected

To raise awareness of cancer and to encourage its prevention, detection, and treatment, World Cancer Day is led by the Union for International Cancer Control (UICC) to support the goals of the World Cancer Declaration, written in 2008. Ahead of the World Cancer Day, Metropolis Healthcare Ltd has collated a data of cancer tests that it conducted in Mumbai in the year 2019.

Number of 80105 samples tested for cancer at Metropolis Healthcare Ltd's Global Reference Laboratory			
Total Number of registered cases	**Total Number of Positive cases**	**Total Number of Male Cases**	**Total Number of Female Cases**
57052	5151	2191	2952
Percentage %	9%	3.84%	5.17%
		The tests were done at Metropolis' Global Reference Laboratory in Mumbai	

Metropolis Healthcare Ltd, tested 57,052 samples for cancer in 2019 in Mumbai. The data of given samples indicates that about 9 per cent (5151) of these samples were diagnosed with cancer. Out of these 9 per cent (5151), 3.84 per cent (2191) were tested positive male cases whereas 5.17 per cent (2952) were positive female cases. Amongst females, breast cancer (1008 females) was reported maximum number of times followed by cancer of the cervix (302 females), GI Tract (342 females) and hematolymphoid cancer (296 females).

Amongst males, Cancer of the GI tract (399 males) was reported maximum number of times followed by Head & Neck (366 males) and Hematolymphoid (489 males). Prostate Cancer also contributed to a considerable percentage amongst males (293 males).

An age-group wise segregation revealed that a bulk of the positive cases were reported positive amongst the 51-60 and 61-70 age group followed by 41-50 age group.

Commenting on the data, Dr. Kirti Chaddha, Sr. Vice President – GRL Operations & Medical Affairs and Sr. Consultant Oncopathologist, MD, PDCC (Oncopath & Oncohemat), Metropolis Healthcare Ltd said, "In Maharashtra, we have seen the age-groups of 51-60 and 61-70 are more prone to cancer than others. In females, the incidences of breast cancer are rising. The exact cause of rising breast cancer is not known. However, there are benefits for women who exercise regularly, maintain a healthy weight, do not smoke and have a low intake of alcohol."

She added, "Breast cancer cannot be prevented, but if it is diagnosed early then it becomes easier to treat. Under doctor's supervision, or through home-screening, the regular breast screening from the age of 30 onwards would be beneficial."

Tech-based solution

While tobacco use has fallen significantly in countries like the United States over the last decades, tobacco dependency persists in India at alarming levels. According to the Global Adult Tobacco Survey (2016-17), nearly 30 per cent of all Indian adults use tobacco - Cigarettes, beedis, and pipe tobacco, along with smokeless tobacco like snuff, snus, and dissolvable tobacco

Cancer speciality amongst female and male							
Cancer specialty	**Female**	**Male**	**Total Cases**	**Cancer specialty**	**Female**	**Male**	**Total Cases**
Bone tumour	1	6	7	Male genital tract	0	8	8
Brain	49	71	120	Multiple myeloma	12	15	27
Breast	1008	28	1036	Ovary	159	3	162
Cervix	302	0	302	Pancreatic and billiary	49	32	81
CNS	22	20	42	Penis	0	6	6
Endometrium	180	0	180	Prostate	0	271	271
Eye	5	2	7	Skin	43	38	81
Genito urinary tract	8	15	23	Soft tissue tumour	119	123	242
GI tract	342	399	741	Testicular	0	19	19
Head and Neck	148	366	514	Thyroid	106	33	139
Heamatolympoid	162	293	455	Urinary bladder	29	139	168
Kidney	25	45	70	Vagina	5	0	5
Liver	47	81	128	Vault	0	1	1
Lung	132	181	313	Vulva	2	0	2
Grand Total	2952	2198	5150	Grand Total	2952	2198	5150

Age group wise segregation		
Age Group	**Positive Cases**	**In %**
0 - 10	55	1.07
11 - 20	113	2.19
21 - 30	323	6.27
31 - 40	599	11.63
41 - 50	963	18.70
51 - 60	1102	21.40
61 - 70	1113	21.61
71 - 80	636	12.35
81 - 90	147	2.85
90 +	17	0.33
NA	82	1.59
Grand Total	**5150**	**NA**

products are widely prevalent. This addiction persists despite a majority of Indians' being fully aware that tobacco use is harmful. Half of all smoking and smokeless tobacco users are planning to quit tobacco - but few are equipped with the tools to do so successfully. It's a dire predicament, with the resulting diseases such as lung, oral and esophageal cancers claiming the lives of lakhs of Indians.

To address this challenge, Mumbai-based ACI Cumballa Hill Hospital and Asian Cancer Foundation has joined hands with health tech startup Hopscotch Health to design a structured program called 'Tobacco Minus', for tobacco users for over a period of 6 months. The tailor-made program consists of monitoring via a smartphone app, consultations, and counseling sessions.

Diet, physical inactivity and weight are all interlinked, ultimately leading to obesity, which is defined as Body Mass Index more than 30 kg/m2
Dr Boman Dhabhar,
HOD & Senior Consultant - Medical Oncology, Fortis Hospital, Mulund

Padmashri Awardee Dr. Ramakant Deshpande, Onco Surgeon & Chairman of Asian Cancer Institute, highlighted, "According to the World Health Organisation, (WHO), tobacco kills more than 8 million people each year. Over 7 million deaths are a result of direct consumption, whereas 1.2million is the result of passive smoking. It is the need of the hour to help people overcome tobacco addiction via cessation programs. Tobacco dependency invites a plethora of health problems such as lung and oral cancer, tooth and gum diseases, Chronic Obstructive Pulmonary Disease (COPD, asthma, heart disease, oral infections, bronchitis, and even gastrointestinal issues."

He added, "The 'Tobacco Minus' program will make it easy for doctors and counselors to keep track of the health of the patients. Stopping nicotine usage can cause withdrawal symptoms and that also can be managed through this program."

Varun Deshpande, Director at Hopscotch Health said, "The 'Tobacco Minus' program is a 6-week quit plan, that will guide a tobacco user towards quitting tobacco through in-person consultations with psycho-oncologist and a smartphone app that monitors the user's craving and moods. The app can perform daily check-ins; provide daily inspiration or information on coping strategies, and request information from the user to personalise their experience further. The user can notify the app if they're feeling a craving, in order to receive a mitigation strategy based on established coping strategies."

"The app has been designed using insights from the forefront of behavior change and technology development. It is a testament to the power of technology to help people lead healthy lives, more effortlessly. We're proud to partner with ACI Cumballa Hill Hospital to reduce the burden of tobacco-related deaths, and improve the quality of life of the patients," concluded Varun.

In Maharashtra, we have seen the age-groups of 51-60 and 61-70 are more prone to cancer than others.
Dr. Kirti Chaddha,
Sr. Vice President – GRL Operations & Medical Affairs and Sr. Consultant Oncopathologist, MD, PDCC (Oncopath & Oncohemat), Metropolis Healthcare Ltd

Conclusion

World Cancer Day is a powerful single event that extends its consequences throughout the whole year. The 'I Am and I Will' campaign has a strong message that empowers people, engaging them in an amazing level of commitment, raising collective awareness concerning cancer prevention. ✚

AI is the world's first AI-guided ultrasound software, which is embedded onto a compatible ultrasound system to help users acquire and interpret ultrasound images with confidence.

First AI-Guided Ultrasound

Gets Green Light from FDA

FDA Grants Caption Health Landmark Authorisation for First AI-Guided Image Acquisition System Caption Guidance uses artificial intelligence to empower medical professionals without specialised training to perform cardiac ultrasound.

Caption Health, a leading medical AI company, announced today that the U.S. Food and Drug Administration (FDA) authorised marketing of Caption Guidance, software that assists medical professionals in the acquisition of cardiac ultrasound images. Caption Guidance uses Artificial Intelligence to provide real-time guidance and diagnostic quality assessment of images, empowering healthcare providers—even those without prior ultrasound experience—with the ability to capture diagnostic quality images. Empowering more clinicians with ultrasound image acquisition capability will bring the benefits

of ultrasound to more patients, help standardise the quality of care, and help institutions realise valuable cost and time savings.

Caption Guidance was authorised via the De Novo pathway, a regulatory pathway reserved for novel technologies. The granting of this De Novo is ground-breaking, as Caption Guidance is the first medical software authorised by the FDA that provides real-time AI guidance for medical imaging acquisition. Caption Guidance is equipped with numerous features that together act as a co-pilot for clinicians when performing an ultrasound exam. The software emulates the guidance that an expert sonographer would provide to optimise the image, including providing real-time guidance on how to manipulate the transducer, and automated feedback on diagnostic image quality.

"No patient should have to forgo a potentially life-saving cardiac ultrasound," said Andy Page, chief executive officer of Caption Health. "Through the power of artificial intelligence, Caption Guidance will provide patients with unprecedented access to ultrasound when and where they need it most."

FDA's authorisation of Caption Guidance comes at a time when democratisation of ultrasound is touted as the future of healthcare due to portable form factors and increasing hardware affordability. Ultrasound is a safe, non-invasive, and powerful diagnostic tool, and its benefits to patients have been demonstrated in a variety of clinical settings, from the emergency department to the operating room. However, performing ultrasound is challenging and requires specialised training to master, which prevents its adoption and can compromise quality and care.

"We founded Caption Health to tackle head-on some of the most challenging, intractable problems in medicine," said Charles Cadieu, co-founder and president. "This FDA authorisation confirms our unique ability to couple breakthrough technology with robust clinical validation. And we're just getting started."

Caption Guidance will initially be deployed in acute point-of-care settings, including emergency and anaesthesiology departments and critical care units, with plans to expand to additional departments. These settings serve a high volume of patients; emergency rooms alone are visited by one in five U.S. adults at least once per year. In these environments, ultrasound can be used to triage, monitor, and assess patients who have chest pain, shortness of breath, cardiac arrest, and many other conditions, as well as for the detection of heart disease.

"Point-of-care ultrasound has been demonstrated to expedite time to diagnosis, reduce the need for more costly testing, and decrease complications from invasive procedures," said Dr. John Bailitz, System Point of Care Ultrasound Education Director, Northwestern Medicine. "Caption Guidance can unlock these benefits by addressing one of the largest barriers to ultrasound adoption: the ability to acquire diagnostic quality images quickly."

Marketing authorisation was granted after the FDA reviewed extensive performance testing, including data from a pivotal multi-center prospective clinical trial conducted by Northwestern Medicine and Minneapolis Heart Institute at Allina Health, evaluating the use of Caption Guidance by registered nurses (RNs) with no prior ultrasound experience. Caption Guidance successfully met its primary endpoints, meeting the pre-specified criteria for study success.

In this study, eight RNs with no prior ultrasound experience used Caption Guidance to perform ultrasound exams on 240 patients, following a short training course. Patients were stratified to include a wide range of body-mass index and cardiac pathologies. The RNs acquired limited echo exams of 10 views each. Each exam was assessed by a panel of 5 expert cardiologists to determine if the exam was of sufficient quality to make a set of specific qualitative visual assessments.

Caption Guidance successfully met all four primary endpoints, meeting the pre-specified criteria for study success by acquiring images of sufficient quality for specific clinical assessments. Namely, the RNs successfully acquired limited echo exams for qualitative visual assessments of left ventricular size: 98.8%, 95% CI [96.7, 100]; left ventricular function: 98.8% [96.7, 100]; right ventricular size: 92.5% [88.1, 96.9]; and pericardial effusion: 98.8% [96.7, 100].

In 2018, the FDA granted Breakthrough Device designation to Caption Guidance. To qualify for such designation, a device must provide for more effective treatment or diagnosis of a life-threatening or irreversibly debilitating disease or condition, and meet additional criteria including being a breakthrough technology with no approved alternatives and offers significant advantages over existing alternatives.

"Throughout the process, the FDA demonstrated a sophisticated understanding of AI and its unique regulatory considerations," said Sam Surette, Head of RA & QA at Caption Health. "It has been a privilege to collaborate with the Agency on the development of a new regulatory paradigm for AI-guided image acquisition."

In addition to Caption Guidance, Caption Health's full software suite includes automated interpretation and quality assessment capabilities, to assist clinicians throughout their workflow. Caption Guidance software can be integrated onto compatible ultrasound devices. It will be paired with Caption Health's automated ejection fraction interpretation capability and will be offered to the market as Caption AI. ✚

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3 YEARS	18	2000.00	2900.00	3500.00	2000.00	3900.00	4500.00
5 YEARS	30	3000.00	4500.00	5500.00	3000.00	6000.00	7000.00
AUTOMATION & ROBOTICS WORLD							
1 YEAR	6	1200.00	1500.00	1700.00	1200.00	1875.00	2075.00
2 YEARS	12	2160.00	2760.00	3160.00	2160.00	3435.00	3835.00
3 YEARS	18	3200.00	4100.00	4700.00	3200.00	5100.00	5700.00
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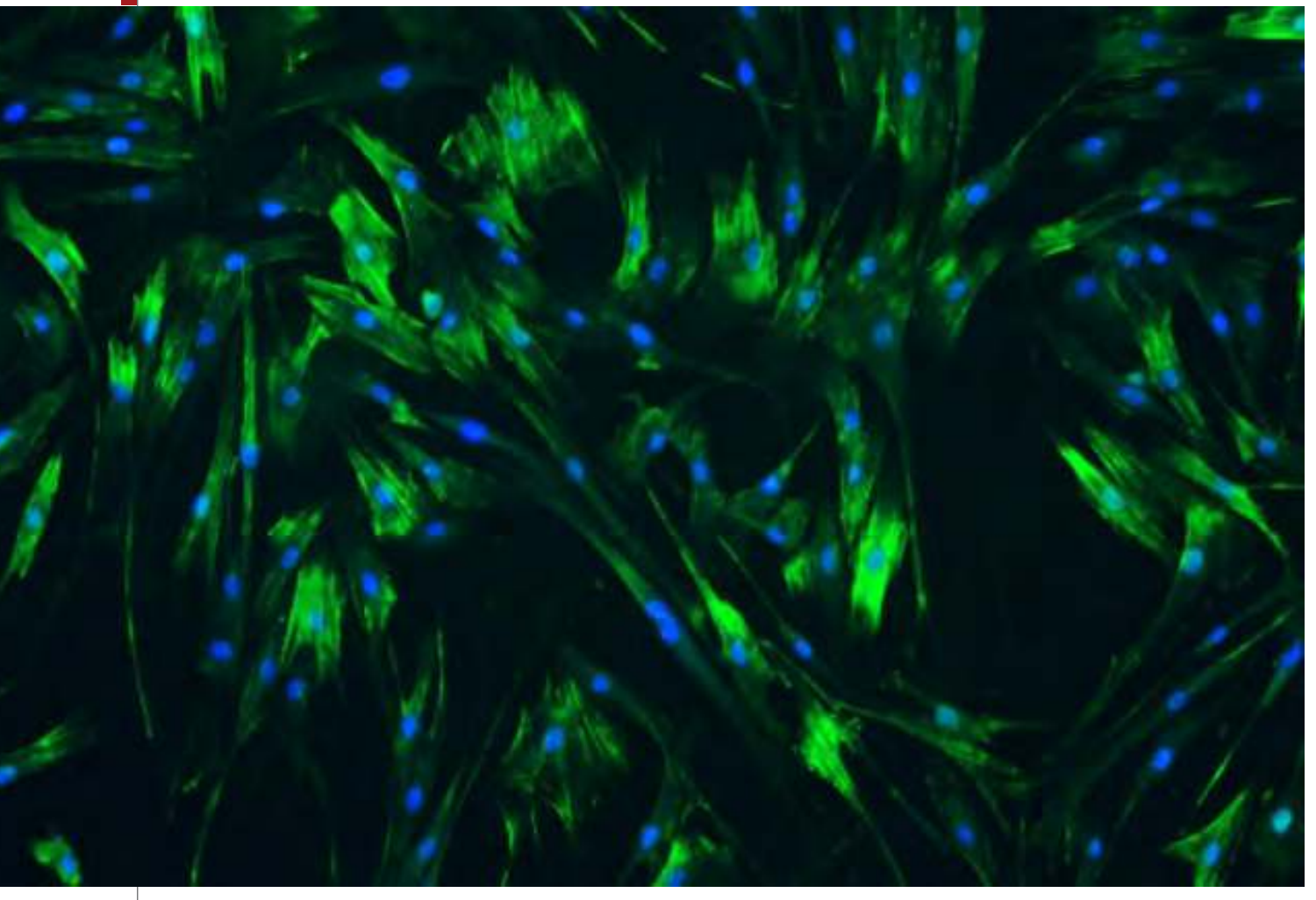

MIT engineers used human ureteral smooth muscle cells grown in a lab dish to identify drugs that would help to relax the muscle cells.

Image: Christopher Lee and Michael Cima

New treatment could make passing kidney stones less painful

Muscle relaxants delivered to the ureter can reduce contractions that cause pain when passing a stone.

Kidney stones are made from hard crystals that accumulate in the kidneys when there is too much solid waste in the urine and not enough liquid to wash it out. It is estimated that about one in 10 people will have a kidney stone at some point in their lives.

Every year, more than half a million Americans visit the emergency room for kidney stone problems. In most cases, the stones eventually pass out of the body on their own, but the process can be excruciatingly painful.

Researchers at MIT and Massachusetts General Hospital have now devised a potential treatment that could make passing kidney stones faster and less painful. They have identified a combination of two drugs that relax the walls of the ureter — the tube that connects the kidneys to the bladder — and can be delivered directly to the ureter with a catheter-like instrument.

Relaxing the ureter could help stones move through the tube more easily, the researchers say.

"We think this could significantly impact kidney stone disease, which affects millions of people," says Michael Cima, the David H. Koch Professor of Engineering in MIT's Department of Materials Science and Engineering, a member of MIT's Koch Institute for Integrative Cancer Research, and the senior author of the study.

This kind of treatment could also make it easier and less painful to insert stents into the ureter, which is sometimes done after a kidney stone is passed, to prevent the tube from becoming blocked or collapsing.

Christopher Lee, a recent PhD recipient in the Harvard-MIT Division of Health Sciences and Technology, is the lead author of the study, which appears in Nature Biomedical Engineering.

Local drug delivery

Several years ago, Cima and Brian Eisner, who co-directs the Kidney Stone Program at MGH and is also an author of the paper, began thinking about ways to improve the treatment of kidney stones. While some larger stones require surgery, the usual treatment plan is simply to wait for the stones to pass, which takes an average of 10 days. Patients are given painkillers as well as an oral medication that is meant to help relax the ureter, but studies have offered conflicting evidence on whether this drug actually helps. (There are no FDA-approved oral therapies for kidney stones and ureteral dilation.)

Cima and Eisner thought that delivering a muscle relaxant directly to the ureter might offer a better alternative. Most of the pain from passing a kidney stone arises from cramps and inflammation in the ureter as the stones pass through the narrow tube, so relaxing the muscles surrounding the tube could help ease this passage.

Around this time, Lee, then a new student in MIT's Health Sciences and Technology program, met with Cima to discuss possible thesis projects and became interested in pursuing a kidney stone treatment.

"If you look at how kidney stones are treated today, it hasn't really changed since about 1980, and there's a pretty substantial amount of evidence that the drugs given don't work very well," Lee says. "The volume of how many people this could potentially help is really exciting."

The researchers first set out to identify drugs that might work well when delivered directly to the ureter. They selected 18 drugs used to treat conditions such as high blood pressure or glaucoma and exposed them to human ureteral cells grown in a lab dish, where they could measure how much the drugs relaxed the smooth muscle cells. They hypothesized that if they delivered such drugs directly to the ureter, they could get a much bigger relaxation effect than by delivering such drugs orally, while minimizing possible harm to the rest of the body.

"We found several drugs that had the effect that we expected, and in every case we found that the concentrations required to be effective were more than would be safe if given systemically," Cima says.

Next, the researchers used intensive computational processing to individually analyze the relaxation responses of nearly 1 billion cells after drug exposure. They identified two drugs that worked especially well, and found that they worked even better when given together. One of these is nifedipine, a calcium channel blocker used to treat high blood pressure, and the other is a type of drug known as a ROCK (rho kinase) inhibitor, which is used to treat glaucoma.

The researchers tested various doses of this combination of drugs in ureters removed from pigs, and showed that they could dramatically reduce the frequency and length of contractions of the ureter. Tests in live pigs also showed that the treatment nearly eliminated ureteral contractions.

For these experiments, the researchers delivered the drugs using a cystoscope, which is very similar to a catheter but has a small fiber optic channel that can connect to a camera or lens. They found that with this type of delivery, the drugs were not detectable in the animals' bloodstream, suggesting that the drugs remained in the lining of the ureter and did not go elsewhere in the body, which would lessen the risk of potential side effects.

Ureteral relaxation

More studies are needed to determine how long the muscle relaxing effect lasts and how much relaxation would be needed to expedite stone passage, the researchers say. They are now launching a start-up company, Fluidity Medicine, to continue developing the technology for possible testing in human patients.

In addition to treating kidney stones, this approach could also be useful for relaxing the ureter to help doctors insert a ureteral stent. It could also help when placing any other kind of instrument, such as an endoscope, in the ureter.

"The platform pairs drug delivery to the ureter. We are eager to first target muscle relaxation, and as offshoots of that, we have kidney stones, ureteral stents, and endoscopic surgery," Lee says. "We have a bunch of other urological indications that would go through different developmental pathways but can all be hit and all have meaningful patient populations." ✚

26th edition of Medical Fair India hosted in Mumbai

The 26th edition of Medical Fair India 2020 held on 05-07 March at Bombay Convention and Exhibition Centre in Mumbai. A part of the "MEDICAlliance" family of trade fairs, was organised by Messe Düsseldorf India in cooperation with MEDICA.

Together with MEDICAlliance and in association with Association of Healthcare Providers, India (AHPI), Association of Indian Manufacturers of Medical Devices (AIMED), Association of Diagnostic Manufacturers of India (ADMI), Quality & Accreditation Institute (QAI), Practicing Pathologists Society, The Association of Practicing Pathologists (APP), and Maharashtra Association Of Practising Pathologist & Microbiologists (MAPPM), this edition promised to bring together all the stakeholders from all facets of medical and healthcare industry.

Veena Kohli, President, Association of Diagnostics Manufacturers of India continues to lead the Clinlab conference. The conference coverd topics on in-vitro diagnostic, laboratory medicine, point of care testing, molecular medical diagnostics and clinical chemistry.

'Make in India' pavilion formed by AIMED at Medical Fair India has always been a centre of attraction at MFI exhibition under the pioneering vision of Rajiv Nath, Founder, AIMED, who is the voice representing the interest of over 700 manufacturers of medical devices to promote global harmonisation and respect for the Indian devices industry.

"Medical Fair India is well-known for its ability to detect trends and respond to new innovations. Therefore, each edition is unique as it explores new sub-segments and opportunities for diversification" said Thomas Schlitt, Managing Director, Messe Düsseldorf India.

Additionally, the future for Health (FTR4H) conference this year at Medical Fair India focused on how Digital Transformation reconstructs Healthcare. NASSCOM – Center of Excellence – IoT & AI joins this year as its Digital Transformation Partner and jointly with FTR4H organised the Start-up Awards. This year attractions include participation from start-ups showcased their solution in the healthcare domain.

The VOH 5th International Healthcare Conference at Medical Fair India is an important date on the national healthcare calendar. This year, the theme was 'Synergy, Idea, Collaboration: Unlocking the potential of Indian healthcare'. The overarching objective is to mobilise key stakeholders from both public and private sectors – along with their strengths and innovations – on a common platform that can highlight best-ways forward for everyone who holds a stake in the space. rehaindia, powered by Rehacare continued to feature alongside Medical Fair India. This segment was dedicated to the rehabilitation sector in India. The three-day event attracted all the categories of stakeholders in this segment.

The "Smart Hospitals" platform was created as a new entity this year. The objective is to help the Small and Mid-sized Hospital Owners to rethink their business models, create new opportunities by evolving newer smart ways of delivering healthcare. The intent was to bridge an existing gap as medical conferences hardly ever touch the business side of healthcare.

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Mitsubishi Electric to supply elevators to AIIMS in Himachal Pradesh

Mitsubishi Elevator India Private Limited recently announced that it has secured a major order from the 'All India Institute of Medical Science (AIIMS), Bilaspur, Himachal Pradesh.' The order consists of a total of 64 elevators, including 48 of a model that is exclusive to the Indian market, at this Indian government-owned medical facility, which houses a hospital and a national medical institute. By means of these high quality elevators and services, Mitsubishi Elevator India aims to provide the safe and reliable vertical transportation required by medical facilities. This order is a big boost to Mitsubishi Elevator India's "Make in India" program under which the company started Manufacturing in India in 2016 and has been expanding production and portfolio for the Indian market. Of the 64 elevators, 48 are "NEXIEZ-LITE MRL," models designed exclusively for the Indian market which were released in April 2019 and are manufactured by IMEC. They are equipped with specific functionality required in India such as automatic emergency landing devices, which operate in the case of a power failure, as standard. The model uses a gearless traction machine with a permanent magnet motor, leading to reduced power consumption. The use of locally produced products contributes to the reduction of CO2 emissions during transportation.

Legrand India introduces 'Legrand Telemedicine Health Center'

Legrand India has kickstarted its medical health centre for the people in Haridwar and Jalgaon. As a part of its India CSR initiative, Legrand has collaborated with Nanavati Super Speciality Hospital, Mumbai to set up this telemedicine centre, which will aid in free super-speciality tele-consulting for patients for whom specialist healthcare is difficult to reach.

A synergy between the best in medical and telecommunication technology, this CSR project is designed to be sustainable and scalable, considering it can be replicated in other locations for Legrand. The facility will enable patients to connect with the doctors real-time through audio/video technology. Patients can diagnose and submit their health data such as BP, blood test, X-Ray, etc. online which will be remotely made available to the doctor sitting at Nanavati Hospital with the help of paramedical staff available at the centre. Doctor and patient can then be connected real-time through audio-video. This technology also enables doctors to use a digital stethoscope to listen to the heart and lungs, similar to a physical examination and subsequently prescribe relevant medicine.

Kauvery Hospital launches Hybrid Cath Lab Operating Room

Kauvery Hospital recently launched a Hybrid Cath Lab Operating Room (OR). The flex arm Hybrid OR was inaugurated by Banwarilal Purohit, Governor of Tamil Nadu in the presence of Dr S Chandrakumar, Executive Chairman, Dr Manivannan Selvaraj, Managing Director and Dr Aravindan Selvaraj, Executive Director, Kauvery Hospital.

With the launch of the flex arm Hybrid Cath Lab OR, Kauvery Hospital will now be setting a new benchmark in adoption of high-end technology in healthcare where the patient can be assured of safe and advanced cardiac procedures under one roof and in the best possible manner. This facility ensures minimum hospitalisation time, faster procedures, reduced risk of complications, optimised cost and better outcomes overall.

Speaking on the occasion, Purohit said, "It gives me immense pleasure to inaugurate India's First Flex Arm Hybrid Cath Lab at Kauvery Hospital. The new facility will help in delivering quality and safe cardiovascular and neurovascular treatments for patients and is a great addition to our country's health infrastructure. The progress of Kauvery Hospital has been remarkable over the past few years and their contribution to India's growth in cardiac healthcare is noteworthy. I extend my hearty wishes to the entire management and team.".

HCG Bengaluru completely digitises histopathology diagnosis

Health Care Global became the first hospital in the country to completely digitise histopathology workflow for primary diagnosis at the HCG-Strand Laboratory at KR Road, Bengaluru. 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 National Accreditation Board for Testing and Calibration Laboratories (NABL), India, for its digital pathology facility in the fields of histopathology, cytopathology, frozen section facility as well as artificial intelligence- 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.

100 per cent of digital histopathology labs help patients by providing more accurate results and ease of access to expert opinions. It significantly improves the turnaround time for reports as well as cost-saving in terms of glass logistics of slides and blocks. Digitisation also means there is no longer worry about the risk of losing or damaging specimens in the transit.

BLK Centre for BMT completes fastest 1,000 transplants in northern India

BLK Super Speciality Hospital achieved another milestone by crossing 1,000 bone marrow transplants. BLK Centre for BMT has emerged as Asia's largest BMT unit and has completed the fastest 1,000 bone marrow transplants in northern India. Few patients who were part of this decade long journey marked their presence on the occasion. Credited for performing hundreds of high risks transplants, Dr Dharma Choudhary, Senior Consultant and Director, Centre for Hemato-oncology & Bone Marrow Transplant, BLK Super Speciality Hospital said, "With bone marrow transplants, we are successfully curing incurable diseases like leukaemia, myeloma, thalassemia and also improving the quality of life for the patients. It has emerged as an innovative option to fight critical and life-threatening diseases. Performing a large number of transplants provides us with an edge to make the life-saving medical procedure safer and more effective for patients."

Achieving a milestone by performing over 1,000 bone marrow transplants during the last decade, BLK Super Specialty Hospital's Centre for Bone Marrow Transplant has also released the data related to types of transplant procedures and treatment of critical diseases such as leukaemia, thalassemia and myeloma. Data shows the majority of patients who underwent BMT were suffering from leukaemia, thalassemia and myeloma.

Jupiter Hospital becomes the first in Western India to host MRCP UK PACES examination

Jupiter Hospital, Thane, has become the first hospital in Mumbai and Western India to have hosted the prestigious MRCP UK Pathfinder Practical Assessment of Clinical Examination Skills (PACES) exam in collaboration with the Royal College of Physicians, United Kingdom. Thirty doctors from across India and South East Asia undertook the examination held recently. On successfully concluding the examination, Jupiter Hospital has now become a recognised PACES centre, the first in the whole of western India.

The examination was conducted under strict vigilance as per the guidelines laid down by the Federation of the Royal College of Physicians, United Kingdom. There were five stations through which the candidates had to go through where they were assessed for clinical skills, history taking and communication. There were 11 examiners for each cycle (five from the UK and six from India). The hospital boasts of having three renowned doctors – Dr Amit Saraf, Dr Navin Davda and Dr Snehal Tanna – as certified MRCP PACES examiners for Federation of the Royal Colleges of Physicians, United Kingdom.

Dr Peter Newman, Chair of Examiners, Federation of the Royal Colleges of Physicians, United Kingdom said, "I am delighted that the Pathfinder went off without a single glitch. We have to thank the management of Jupiter Hospital for having the vision to support and drive through this important development in postgraduate medical education."

Biography

John J. Wild
(1914-2009)

John J. Wild known as "Father of medical ultrasound" was an English American Physician born on 11th August 1914 in Kent, England. He received his early education in London. He was part of the first group to use ultrasound for body imaging, mostly for diagnosing cancer. He received his degrees in Natural Sciences (with honours) from Cambridge University in 1936 and 1940. He received his M.B.B in Medicine from Cambridge University. He was then elected as a member of the Royal Society of Medicine in 1944 and later joined Royal Army Medical Corps.

John moved to the US after World War II taking a position at the University of Minnesota. In 1949, John was supported by a U.S. Public Health Service surgical fellowship, he started working on bowel failure. John had previously interested in treating bowel distention or bloating at the Miller General Hospital. Working in Minneapolis with similar surgical bloating conditions John needed to measure the changes in thickness of the bowel wall. Pulse-reflective ultrasound was considered a possibility for this purpose. By 1951 John and Dr John Reid had gained access to equipment that operated at the 15 MHz range, providing the detail needed to scan internally and to distinguish between healthy and cancerous tissue. Wild gained access to this equipment and with the help of Donald Neal, in technical charge, quickly confirmed the possibility of measurement of living bowel wall thickness at 15 m/c frequency. Further experimenting with a surgical specimen of cancer of the stomach wall brought forth the then completely novel concept, by John, of using pulse-echo ultrasound for tumours diagnosis and detection.

A rectal scanner was developed by John in 1956. For the study of heart, he also constructed a double transducer scanner. In 1971, John received his PhD degree from Cambridge University. He continued to serve as the Director of the Medico-Technological Research Institute in Minneapolis till 1999. John was held as the largest defamation award in Guinness Book of World Records till the early 1990s. For his pioneering work in ultrasonography, John was presented the prestigious "Japan Prize" by Science and Technology Foundation of Japan in 1991.

John was elected an honorary member of the Japan Society for Ultrasound in Medicine, in 1991 for becoming the second foreigner to be so honoured. Britain had issued a set of stamps to commemorate Wild's pioneer work in ultrasonography. He received the Frank Annunzio Award by Christopher Columbus Fellowship in 1998. John was recognised by the University of Minnesota's School of Medicine for Lifetime Achievements in Research, innovation and medicine. The Ian Donald Technical Achievement Award from the International Society of Ultrasound was presented in 2000.

He was recognised in 1991 for his pioneering contributions to the development of ultrasound. He is also an honorary member (1989) of the British Institute of Radiology, a Fellow of the American Institute of Ultrasound in Medicine (AIUM) and is the recipient of the AIUM's 1978 Pioneer Award. In 1997, John was recognised by the World Federation of Ultrasound in Medicine and Biology for his contribution of advancing ultrasound throughout the world. John died on September 18, 2009, at the age of 95 from complications of a stroke at N.C. Little Memorial Hospice in Edina, Minnesota. +

Source: Wikipedia

Index to Advertisers

FORTHCOMING EVENTS

Medicall
Location: Hitex Exhibition Center, Hyderabad
Date: 03rd - 05th April 2020

Eastern Medical Healthcare Expo
Location: Eco Park, Kolkata
Date: 3rd - 5th April 2020

International Dental Lab Expo & Conference (IDLEC)
Location: International Trade Expo Centre Limited, New Delhi
Date: 11th - 12th April 2020

PharmaTech Expo
Location: Parade Ground, Sector- 17, Chandigarh
Date: 17th - 19th April 2020

India Med Expo
Location: Chennai Trade Centre, Chennai
24th - 26th April 2020

India Medical Show (IMS)
Location: Parade Ground, Sector- 17, Chandigarh
Date: 01st - 03rd May 2020

Product Launch

Siemens Healthineers India launches ACUSON Redwood Ultrasound System

At the 73rd Annual Conference of Indian Radiological & Imaging Association (IRIA) 2020, Gandhinagar, Siemens Healthineers launched the ACUSON Redwood Ultrasound System. The system is built on the company's new platform architecture and features advanced applications for greater clinical confidence, AI-powered tools for smart workflows and has shared services cardiology features used by different hospital departments. These features, along with a portable and lightweight design, offer clinicians an affordable and efficient high-performing imaging solution.

"We are seeing an increased demand for premium medical imaging services being driven by the growing healthcare needs of a population with varied requirements, particularly in regard to chronic diseases," says Vivek Kanade, Executive Director, Siemens Healthineers India. We worked together with inputs from users to transform care delivery with the ACUSON Redwood and meet these challenges."

The ACUSON Redwood's advanced applications, including Contrast Enhanced Ultrasound (CEUS) and Shear wave Elastography, are available for the first time from the company in this segment and support precise lesion detection and characterisation as well as potentially reduces the need for invasive procedures. +

Fujifilm displayed DR systems at IRIA 2020

Fujifilm India recently displayed its latest medical systems at the 73rd National Conference of the Indian Radiological and Imaging Association (IRIA) in Gandhinagar, Ahmedabad. As part of the event, Fujifilm displayed its latest medical devices like FDR – Smart F, FDR – D-EVO II, FDR – SE Lite, FCR – Prima T, Full Field Digital Mammography (FFDM) – Amulet Innovality and Synapse PACS.

In DR systems, the company displayed the FDR Smart F–Fujifilm's latest high-quality, cost-effective digital X-ray system that can be easily installed in limited spaces and is easy to use. This product was especially designed for emerging countries like India. Whereas in the FDR D-EVO series, the company showcased FDR – D-EVO II detector that allows smart image processing and dose efficiency for the patients.

In CR systems, Fujifilm displayed the Prima TM – an affordable high-speed image processing tabletop FCR (Fuji Computed Radiography) with mammography compatibility. The machine supports a space-saving design and provides superior image quality of 50 micron resolutions. +

Allengers in association with Canon launch 32 slice CT

Allengers became the first Indian company to manufacture a CT scanner within the country. The CT scanner was launched at IRIA 2020 by Dr Hemant Patel, Past President, IRIA. The 32 slice 'Made in India' CT scanner is manufactured in collaboration with Canon Medical Systems.

Dr Hemant Patel, "We always wondered that despite having a large quantum of radiology equipment in the country why can't we have a machine that is manufactured here. Companies such as Allengers took up this challenge and today they have launched the first CT scanner that made in India. It is a proud moment for us and has a lot of expectations for this CT scanner machine. This CT is going to cost us less and hopes that this will help us reduce the cost of CT scans significantly."

Just as Dr Patel pointed out, Allengers's CT will provide a cost difference of at least 10-15 per cent and promises to provide better ROI in the long run. Speaking about the newly launched CT scanner, R S Kanwar, executive Director, Allengers said that the new CT is a high quality, cost-effective technology. The company intends to further increase the cost difference to about 30-35 per cent. +

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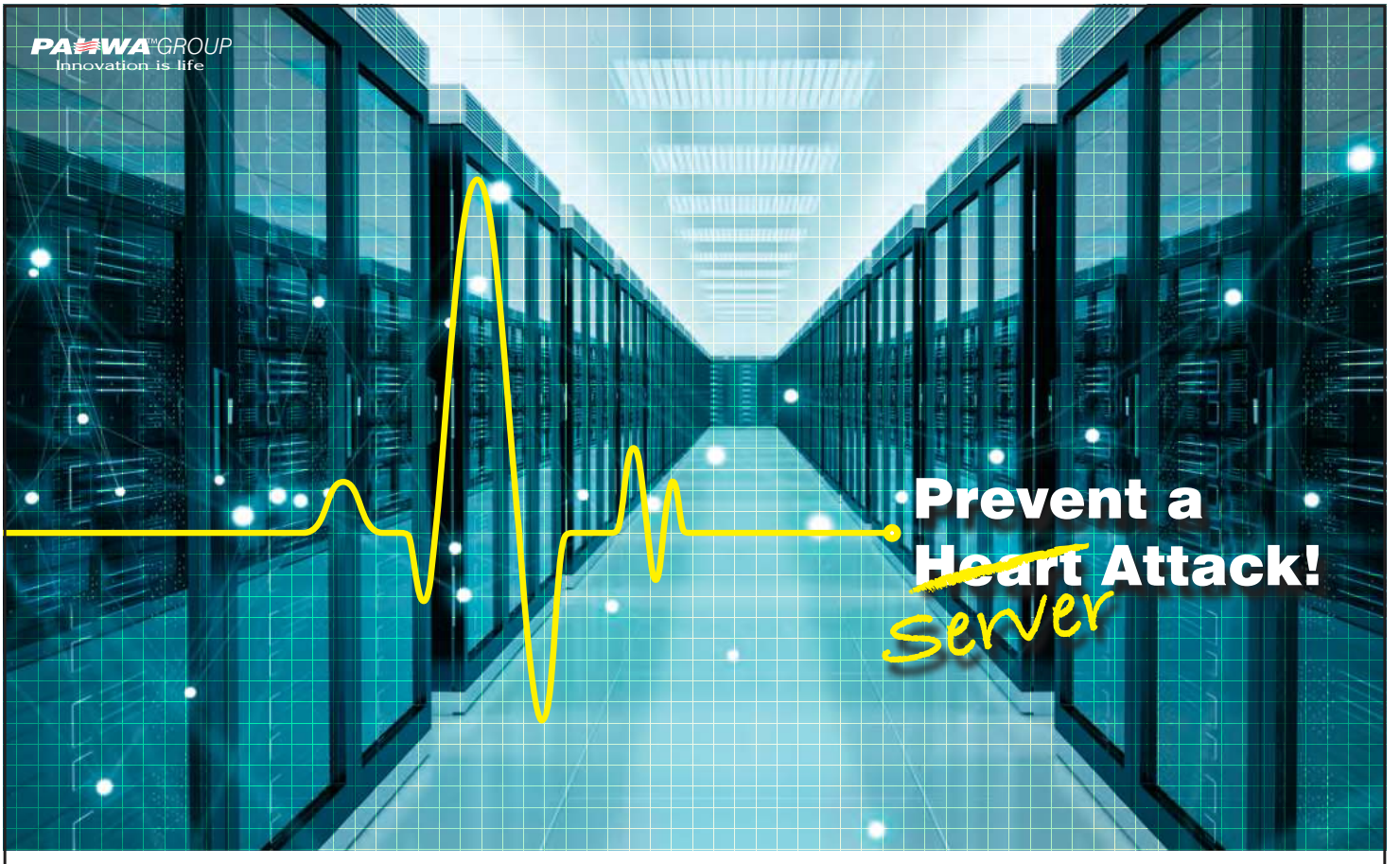

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