VOL.13 NO 4 PAGES 64

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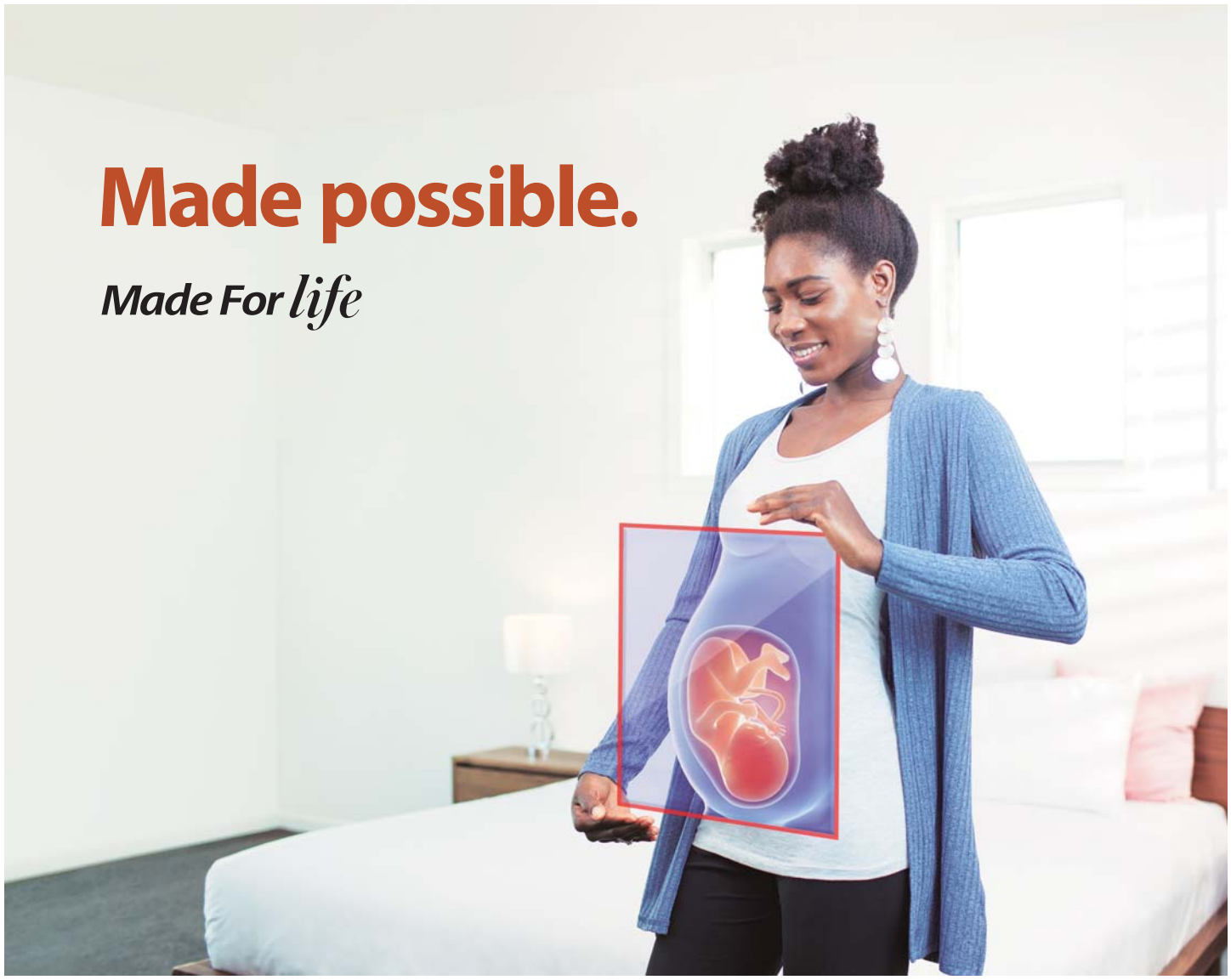

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DELHI-NCR / CHENNAI / KOCHI / COIMBATORE: Sunil Kumar - +919810718050, sunil.kumar@expressindia.com
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BENGALURU: Douglas Menezes - +919821580403, douglas.menezes@expressindia.com

FOR DELEGATE REGISTRATIONS

Vinita Hassija
+91 9820590053,
vinita.hassija@expressindia.com
Madhuri Kudapkar
+91 9664297646,
madhuri.kudapkar@expressindia.com

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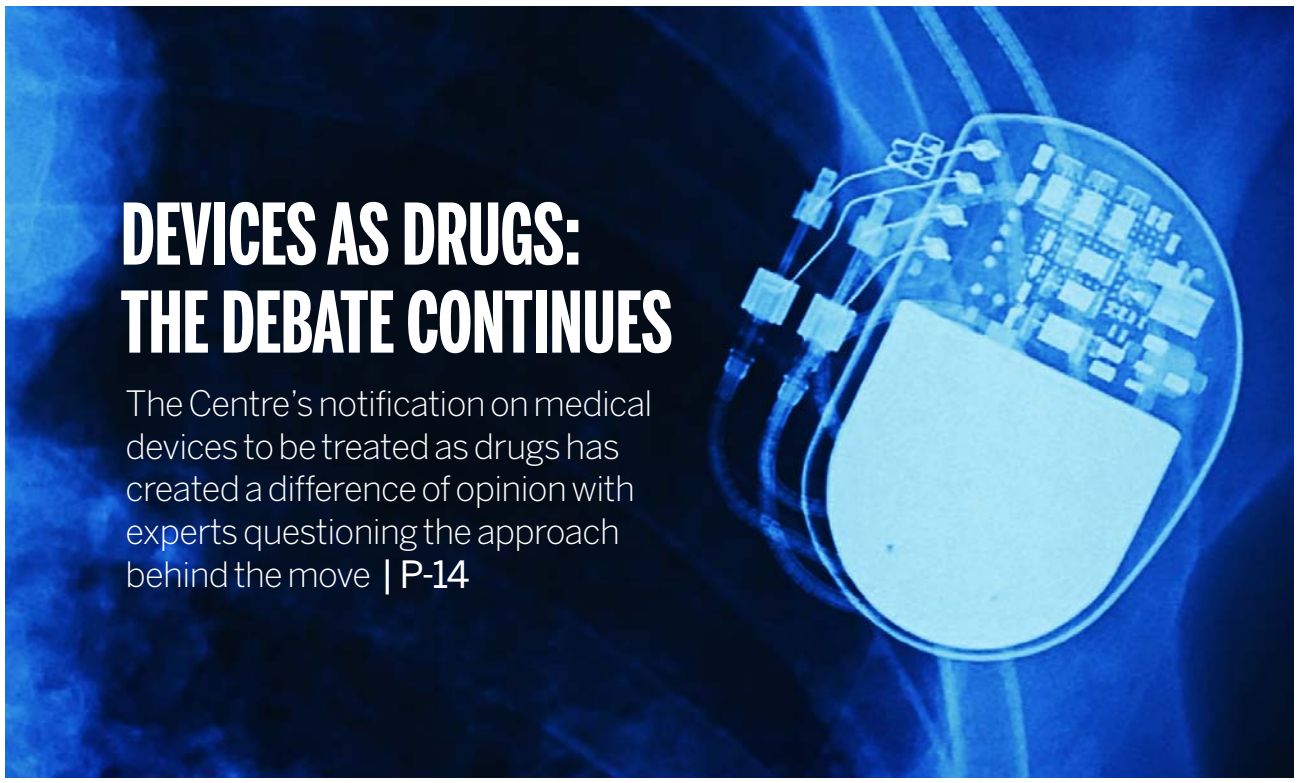

DEVICES AS DRUGS: THE DEBATE CONTINUES

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NPPA revises stent prices

The prices of coronary stents are set to increase by 4.2 per cent from April 1 with the National Pharmaceutical Pricing Authority (NPPA) revising them in line with the Wholesale Price Index (WPI) for the year 2018 over 2017. This continues the calibration efforts of the price watch dog which started in 2017, when it cut prices of stents by as much as 85 per cent in some cases. While prices of stents ranged from Rs 25000 per unit sold to a couple of lakhs per unit in some of the more advanced stents, the 2017 price cap reduced prices between Rs 2500 to Rs 31,000.

After more interventions last year in February and April, the latest order notification dated March 29, states that the ceiling price of bare metal stents (BMS) will now be Rs 8,261 while the price cap on drug eluting stents (DES) including metallic DES and bioresorbable vascular scaffold (BVS)/biodegradable stents will be Rs 30,080. These prices are exclusive of Goods and Services Tax (GST) where applicable.

The order also allows manufacturers/ importers of coronary stents with MRPs lower than these ceiling prices (plus GST as applicable, if any) to increase the existing MRP to this price cap. While this order offers some respite to stent manufacturers, the industry would probably argue that these prices are still not viable and sustainable enough to encourage investments in further innovation and research. There was also a demand that the government introduce more price slabs and differentiate stents based on the technologies used. The government has so far refrained from this step.

The government's focus on reducing the trade margins between manufacturers, distributors and hospitals is no doubt laudable. But, the medical device segment is still smarting at being regulated along with drugs under the Drugs and Cosmetic Act, the Drugs (Prices Control) Order, 2013 read along with the Essential Commodities Act, 1955. While manufacturers concede that regulations are necessary to provide checks and balances and provide a road map for the development of any sector, they argue that a one-size-fits-all approach is severely flawed.

With the Medical Device Rules 2017, the Central Drugs Standard Control Organization (CDSCO) has taken a huge step towards addressing the specific requirements of medical devices. Our cover story in the April issue, titled Regulating devices as drugs: The debate continues, analyses different view points of this contentious issue.

Regulation is both intention as well as implementation. The former remains an empty promise if the latter cannot keep up with the pace of growth of the industry

But this is just the first step. Industry associations are urging regulators to further fine tune the Medical Device Rules 2017, as it needs separate provisions to address the requirement of high-end medical devices with regards to maintenance, testing, stock, post release changes, import of parts post-sales, etc. Medical device associations also point out that there is an urgent need for more approved test houses to support during design development.

Hopefully, regulators are listening and will address these issues in consultation with industry. The bottom line is that there is no doubt that patients have benefited from these price monitoring initiatives, thanks to increased access. The fact that NPPA has announced this latest revision is a sign that the regulator will consider reasonable increases in line with inflation.

But, will increased access due to moderating of prices, lead to indiscriminate use of medical devices, even when not required? Thus, on the government's side, regulators must keep in mind that the cost of medicines and medical devices is only a part of the overall cost of the procedure, or for that matter, medical treatment of any nature. Continuous monitoring to plug leakages and frauds will be crucial to see true long-term benefit of these policy changes.

There are some early signs that the government seems to be serious about cracking down and preventing the loss of resources. At least when it comes to its flagship healthcare scheme. For e.g, the National Health Authority, the implementing arm of *Ayushman Bharat*, has suspended the licenses of two hospitals in Jharkhand (Nagarmal Modi Seva Sadan in Ranchi and PVTG Hospital in Ramgarh) when audits showed that the hospitals had admitted more patients than the number of beds and also charged money for diagnostics from beneficiaries. Hopefully, monitoring of the scheme will get more stringent rather than slacken as more hospitals get impaneled and beneficiaries increase. With elections around the corner, let us hope poll promises will translate into intelligent policies after the heat and dust has settled.

As always, regulation is both intention as well as implementation. The former remains an empty promise if the latter cannot keep up with the pace of growth of the industry.

VIVEKA ROYCHOWDHURY *Editor*
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MUMBAI/AHMEDABAD: Douglas Menezes - +919821580403, douglas.menezes@expressindia.com, Nirav Mistry - +919586424033, nirav.mistry@expressindia.com
DELHI-NCR / CHENNAI / KOCHI / COIMBATORE: Sunil Kumar - +919810718050, sunil.kumar@expressindia.com
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BENGALURU: Douglas Menezes - +919821580403, douglas.menezes@expressindia.com

FOR DELEGATE REGISTRATIONS

Vinita Hassija
+91 9820590053,
vinita.hassija@expressindia.com
Madhuri Kudapkar
+91 9664297646,
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POST EVENTS

IIMK, IIHMR organise international conference on Global Health and Medical Tourism

Discussions were held on how India can be destined to become a global destination for medical tourism

Indian Institute of Management, Kozhikode in association with Institute of Health Management Research (IIHMR) Jaipur, recently organised an international conference on Global Health and Medical Tourism (GloHMT). The chairperson of the conference was Prof Deepa Sethi, GloHMT and also present were Prof Federico Lega, SDA Bocconi School of Management, University of Milan, Italy and Robin Nunkoo, Associate Professor, University of Mauritius. The event was attended by 150 delegates and paper presenters.

A plenary keynote address by Jagdish Sheth, Charles H Kellstadt Professor of Marketing, Emory University Goizueta Business School, US and Dr Angappa Gunasekaran, Dean and Professor, The School of Business and Public Administration, California State University. Prof Sheth, in his keynote address, highlighted about how India is destined to become a global destination for medical tourism whereas Dr. Gunasekaran enlightened the participants about systematic perspective on the applications of big data analytics in healthcare management.

At the inaugural ceremony Prof. Debashis Chatterjee, Director, IIM Kozhikode gave a welcome speech where he spoke about the pains of organising a conference on a light note. He elaborated about the overall scenario of healthcare in India wherein he stated that more hospitals don't promote good health. He also mentioned that 48000 infants in India don't live to see their fifth birthday. He emphasised on how US spends $475 per capita on healthcare as compared to just $75 in India.

Dr. MR Rajagopal, Chairman Pallium India, Director, Trivandrum Institute Of Palliative Sciences stated that a personal touch is very important during the course of a treatment. It just shouldn't be about protocols procedures and treatments. Human touch is a very important aspect in healthcare and cannot be replaced with technology. He concluded his speech by saying that responsible healthcare is a must. Change is a must. The responsibility lies with the people.

Dr Naseer Yusuf Vice President; Cardiology Club, Calicut emphasised on India's importance in the global healthcare scenario since India is a very important medical tourism destination. Dr Yusuf said, India offers state-of-the-art healthcare at low costs as compared to the rest of the world. However he threw some light on the problems that patients travelling to the country for medical needs encounter as well. He emphasised on the importance of staying relevant and staying ahead of the learning curve. He urged the media to be more responsible and help promote India as a MVT destination. He signed off by saying that if we work together we can achieve results and be the number one destination in the world.

Prof Federico Lega, SDA Bocconi School of Management, University of Milan, Italy said, people travel for better quality, privacy and availability of medical treatments. However, with increasing regulations and changing patient demands, the industry is becoming more and more complicated by the day and service providers need to be more

sophisticated with their business models to gain competitive advantages. He further elucidated on the need to build new capabilities and leadership development in healthcare and medical tourism. He suggested glocal alliances to provide healthcare solutions with the help of disruptive technologies which can be accessible to all. He concluded by saying that in the healthcare industry one has to either adapt or die.

Dr Narayankutty Warrier, Medical Director and Sr Consultant Medical Oncology, MVR Cancer Centre and Research Institute stressed on the importance of healthy living for a better life. He explained how lifestyle diseases are on the rise and early detection can help prevent the onslaught of disease. He detailed how tobacco is the root cause of 50 per cent of cancers and stated that out of every two children in the Indian sub-continent are or would be exposed to passive smoking. Talking on the importance of a healthy and balanced diet, Dr Warrier said that red and processed meats cause cancer and should avoided or consumed in very low quantities.

Dr Robin Nunkoo, Associate Professor, Faculty of Law and Management, University of Mauritius spoke about the demand and supply in healthcare sector. People not only travel for entertainment but also for healthtainment. As a result there has been a rise in the number of people travelling for medical treatments and procedures. This has also lead to market expansion and rise in competition at a rapid pace. He also advised that healthcare providers should consider cultural compatibility as caring is very culturalcentric. He topped it off by by saying that there shouldn't be a healthcare divide. As MVT improves healthcare standards it is important to ensure that the same standard of care is provided to all patients. Dr Tanuja Nesari, Director, All India Institute of Ayurveda, Ministry of Ayush firstly spoke on the impact that women have had in every field and then she went on to say that new India isn't about women development, new India is about women led development. She then spoke about the impact that Ayurveda and other alternate methods of treatments have made in the last few years. Speaking about Ayush and its achievements, how it is helping India in wellness tourism. She compared it to the rest of the world and said that India is the best and very cost effective.

The conference concluded with a valedictory ceremony where the guest of honours, Sreeram Sambasiva, IAS, District Collector, Kozhikode and Dr Sheila Balakrishnan, Professor, Head, Fertility Centre, Trivandrum Medical College, Trivandrum graced the event with their presence. Sambasiva spoke about the importance of medical tourism and how institutes can contribute in the wide spread awareness of the concept at a national level.

Some faculty members of IIM Kozhikode also attended the event and shared their insights on the topic of medical tourism. Prof Rudra Sensarma, Dean, Research, Innovation, Internationalisation, IIM Kozhikode during his address to the participants of the conference said, “Medical tourism is gaining popularity due to a number of factors such as ageing population in the western countries, and high costs of treatments. These factors act as an opportunity for countries like India because an average individual who travels for medical tourism spends twelve times more than a normal tourist. This, in turn, acts as a value addition to India’s foreign earnings.

PRE EVENT

4th edition of Healthcare Senate to be held in New Delhi from July 11-12, 2019

The theme for the summit is 'India Healthcare Inc: Financially Fit, Tech Empowered'

THE 4TH edition of Healthcare Senate, India's largest private sector Healthcare Business Summit, will be held from July 11-12, 2019 in New Delhi. Healthcare Senate 2019 invites CXOs of hospital chains, owners/promoters of hospitals, CEOs, CFOs, CIOs, COOs, supply chain heads, thought leaders, industry stalwarts and domain experts to congregate at India’s largest private sector business summit to ideate new strategies, techniques and business models to ensure a steady transition of technology in various business processes to achieve financial sustainability.

The first three editions of Healthcare Senate served as an excellent platform for thought leaders, key decision makers, investors and budget holders to share and exchange strategies. Retaining relevance in the fast changing healthcare environment took centre stage, as did running sustainable, responsible and profitable businesses.

All stakeholders came together to share their insights on business models that will work for India. The first edition focussed on 'Value-based healthcare delivery’, the second edition highlighted 'Building a future ready healthcare sector for India’ while the third edition focussed on 'Strengthening Values for Sustainable Growth'.

The fourth edition takes forward this theme, analysing strategies to make 'India Healthcare Inc: Financially Fit, Tech Empowered'.

This year’s edition will examine the rapid advancements that technologies such as AI, cloud computing, block chain, IOT and more have ushered in healthcare by automating most of the complex businessprocesses within healthcare organisations.

It will also drive home the point that we need to adopt strategies and approaches to derive real value by turning the initial support which healthcare businesses receive today through PE, VC, IPO funding etc., into long-term growth -- transforming a spark into a sustainable fire.

Thus, this year’s Healthcare Senate will establish how financial stability and technological empowerment is pivotal for healthcare organisations to tackle key business endeavours like evolving healthcare product/service lines, expanding geographic footpints or investing in new areas that enhance patient care and experience.

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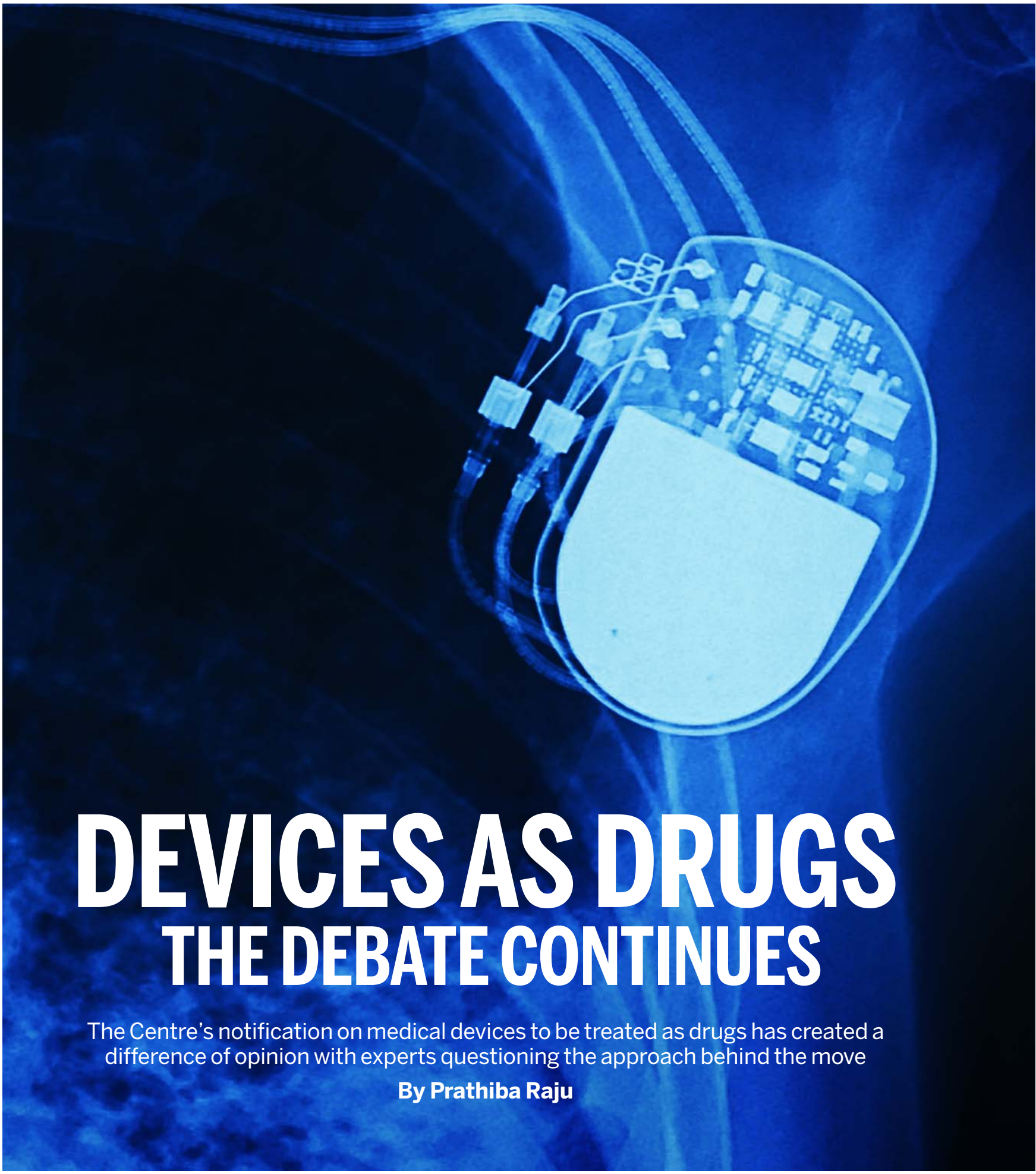


DEVICES AS DRUGS
THE DEBATE CONTINUES

The Centre's notification on medical devices to be treated as drugs has created a difference of opinion with experts questioning the approach behind the move

By Prathiba Raju

The government's recent notification on categories of medical devices including an entire range of implantable devices as drugs, to ensure the supply of safe devices, and monitoring the introduction, has perturbed the medical devices community. Informing that the government's intentions are good, yet these could have some far reaching impact. Experts in the medical devices segment also argue that the decision is half-baked and has left them questioning the approach taken.

The Union Health Ministry recently notified that eight more categories of medical devices including the entire range of implantable devices will be known as drugs — MRI equipment, PET, bone marrow separators, dialysis machines, CT scan and defibrillators — which is set to come into effect from April 2020.

Elucidating the background of how medical devices are regulated in India, Sumit Goel, Partner, Healthcare Advisory, KPMG in India, informed that till 2017, there were very limited regulations and in a bid to regulate the medical devices, the Government of India in February 2017 notified the new Medical Device Rules 2017, by exercise of powers conferred by the Drugs and Cosmetics Act.

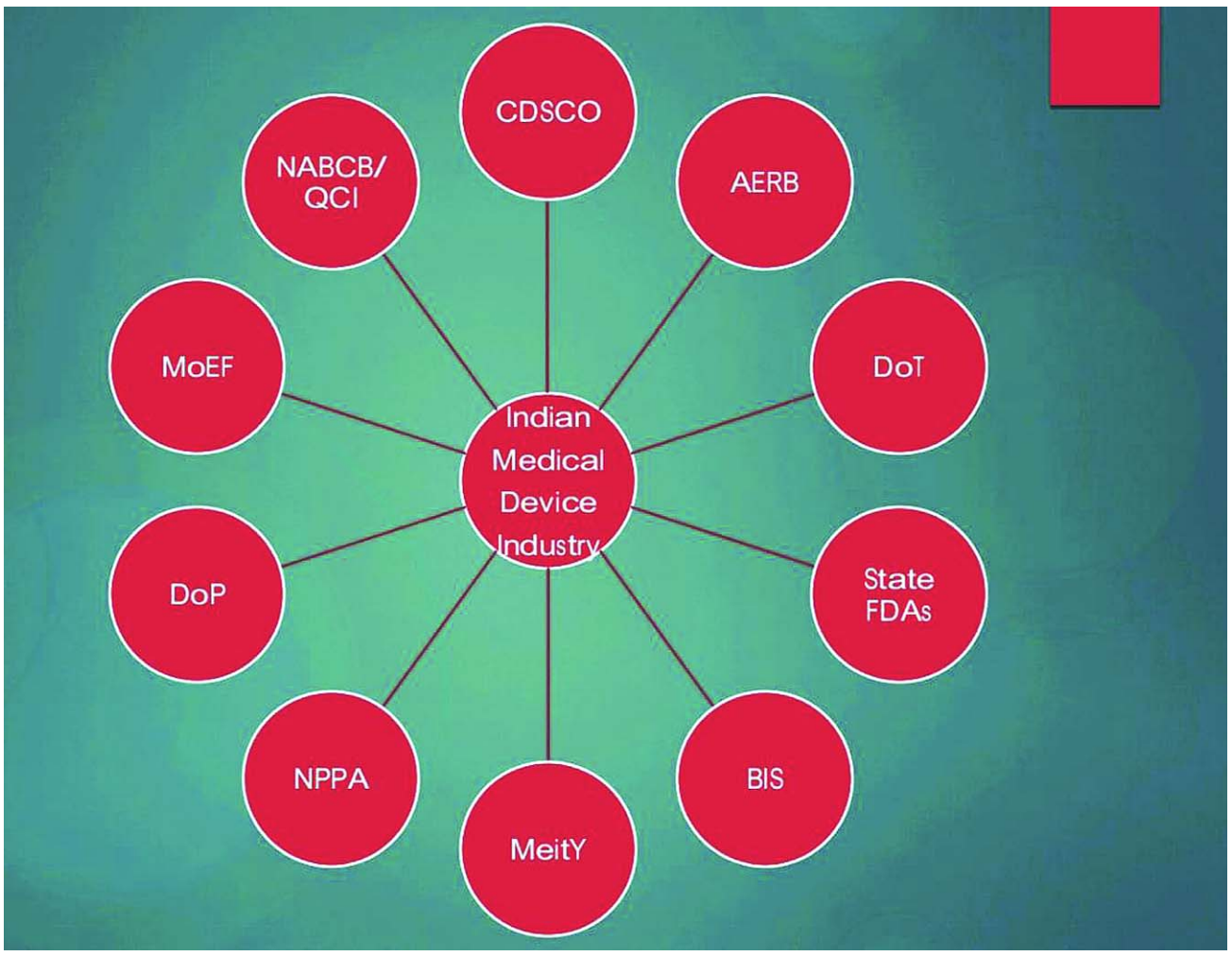
For the medical devices to be regulated under the Medical Device Rules 2017, a medical device has to be notified under the said Act as 'drugs' by the Central Drugs Standard Control Organization (CDSCO). Initially, only 15 categories of medical devices were notified under the said Act and hence, covered under the Medical Device Rules.

Hence, classifying these medical devices as drugs is more of a legal technicality rather than an attempt by the government to regulate these devices along the line of drugs. However, different set of rules apply to medical devices under the Medical Device Rules-2017.

Goel further emphasised that it was a positive step by the government to ensure that devices available in the market will meet certain quality standards. These devices play an important role in diagnosis, treatment, mitigation or prevention of diseases or disorder in patients and a sub-standard quality can adversely impact patient safety.

Talking about the move, Pavan Choudary, Chairman, Medical Technology Association of India (MTaI), said, "A device is an electro-mechanical unit. Drugs are chemical or biological entities. The beginning made in 2005 to regulate drugs as devices, in our view, was a mistake. However, a lot has been done in the last few years to correct this mistake. And, we feel that the government is finding its path again."

Experts inform that the medical devices segment is a vital cogwheel of the healthcare sector and it has a unique functionality. They contend that these devices cannot be treated the same as a drug. They raise questions on the new notification.



Can devices be categorised as drugs?

Experts question how can a regulatory mechanism for drugs 'also' be the yardstick for the safety and efficacy of medical devices?

Usage of drugs and equipment is completely different, informed Dr Tejinder Kataria, Chairperson, Radiation Oncology, Cancer Institute Medanta, The Medicity. She added that medical devices and pharmaceuticals vary in their development, evolution, manufacturing, method of delivery, and impact on patients. "You cannot have both under the same banner. This will not help patients but risk their lives even more," she said.

Informing that when we call a medical device a drug, the approval on its use and regulation becomes complicated. Mohammad Ameel, Senior Consultant, Healthcare Technologies, WHO CC for Priority Medical Devices & Health Technology Policy, National Health Systems Resource Centre, Ministry of Health & Family Welfare, Government of India, said, "Let's not forget that India imports a major share of its medical devices. We use regulations on these devices as per international standards, or as instructed. They cannot be under the same roof."

Asserting that it is a challenge, Himanshu Baid, Chairman CII Medical Technology Division and Managing Director, Polymedicure, said, "Regulation of medical devices along the lines of drugs under Drugs and Cosmetic Act with desired intervention will help address various challenges as the act does not provide requisite provisions to control and monitor all the medical devices."

Highlighting that the medical devices and drugs are two core elements of health treatment, yet the two are different in application and function, Choudary, said, "The two sectors cannot be treated as one. CDSCO recognised this distinctiveness of medical devices and has come with Medical Device Rules 2017, specifically for this

sector. These regulations will surely help in the development of quality management systems in the country because these regulations lay custom-made regulatory foundation for medical devices which was required."

Stating that regulating medical devices is a knowledge-and experience-intensive work, Choudary also mentioned, "Keeping the historical development of medical devices regulation in mind, CDSCO has the maximum expertise in this area because since 2005, it is the organisation which has been regulating medical devices. To try to duplicate this expertise in any other body would be a herculean task and will lead to duplication. We can also consider another agency for India-specific standards. The essential principle guidelines which the CDSCO implements and makes sure the industry follows are standards which finally confirm whether the product is safe and effective for patient."

Demanding a separate regulatory act for devices, Dr BB Chanana, Head of Department Interventional Cardiologist, Maharaja Agrasen Super Specialty Hospital, said, "As a healthcare community, we were expecting a separate regulatory act for devices. We need a scientific approach to regulatory issues, particularly for devices which are engineering-driven products and not chemical entities like drugs. You cannot ensure patient safety by putting drugs and devices under the same regulations? The notice lacks clarity. Is an implantable device the same as a medicine?"

Taking the manufacturer perspective, Baid opined that including high-end medical devices and all implantables under Medical Device Rules 2017 has and will ensure access to quality medical device for all stake holders.

"The latest notification in February 6, 2019 technically includes majority of Class III medical devices which are under implantable category and high-end medical devices encompass major portion of Class II/III medical devices. Manufacturers need to get multi-ministerial approvals in initial stage, followed by commitment to maintain the equipment's running as per specification over a decade which involves import of several parts/replacement of critical portion of equipment. All this requires import of parts post-sales and required to be serviced at users premises. These high-end medical devices undergo stringent evaluation, thereby undergoing minor to major changes depending on the market response post release, hence requires regulatory approvals . All these challenges will be difficult to handle under current provisions of Medical Device Rules. It is advisable that regulators should consider to bring desired changes in Act for medical devices to control and monitor all the medical devices under regulations. Also, there is an urgent need to review requirements of high-end medical devices with respect to maintenance, testing, stock and sale. It may be appropriate that regulators provide separate provisions under Medical Device Rules 2017 to address separate needs of said products," he stated.

Informing that medical devices are nowadays a pervasive part of contemporary medical care, Dr Gaurav Laroia, General Manager, Roche Diabetes Care India said,"At Roche we believe that MDR 2017 rules will help in bringing up the QMS standards across the board. With the escalating use of medical devices, stringent regulatory standards are necessary to certify that the devices are safe, well studied and have minimum adverse reactions."

"It is the prerogative of the government to safeguard the interests of patients and the country. The public also expects that medical devices are of the highest safety standards. Regulations that are in the best interest of patients will only help the industry. Risk Based Classification Systems, QMS requirements, Concept of Notified body assessments etc. will all support the quality objective,"he added.

He further added, "Quality assurance programmes need to be familiar with frequent problems with medical devices and how to approach them."

Explaining the government's stand, a Union Health Ministry official said, "Many medical devices are not yet regulated and are available in the market without any certification or regulatory control. Till now 23 medical devices are regulated and nearly 5000 more devices needs regulation. We have picked up the Singapore model after systems in the US, Canada, Australia and Japan were also examined at a high-level meeting with officials from health ministry, CDSCO and associations, representatives from industry. Our concern is patient safety, medical device can have serious adverse events

It is a positive step by the government to ensure that devices available in the market would meet certain quality standards. These devices play an important role in diagnosis, treatment, mitigation or prevention of diseases or disorder in patients and a sub-standard quality can adversely impact patient safety

Sumit Goel
Partner,
Healthcare Advisory, KPMG in India

The beginning made in 2005 to regulate drugs as devices, in our view, was a mistake. However, a lot has been done in the last few years to correct this mistake. And we feel that government is finding its path again

Pavan Choudary
Chairman,
Medical Technology Association of India (Mtal)

You cannot have both under the same banner. This will not help patients but risk their lives even more

Dr Tejinder Kataria
Chairperson,
Radiation Oncology,
Cancer Institute Medanta,
The Medicity

so we are bringing in adequate regulatory interventions as far as medical device regulatory system is concerned."

Reinstating that as a manufacturer, regulations are always welcome, as it provides a basic structure for development to market access Baid said, "CDSCO's recent proposal to bring in

It is the prerogative of the government to safeguard the interests of patients and the country. The public also expects that medical devices are of the highest safety standards. Regulations that are in the best interest of patients will only help the industry

Dr Gaurav Laroia
General Manager,
Roche Diabetes Care India

simple regulations to include all medical devices by simple regulatory process similar to models followed by few major Asian countries like Singapore is a welcome step. At the outset bringing Class III Medical devices under regulation will definitely provide requisite check and balance for manufacturers, users and end beneficiary patients. There is an urgent need for more approved test houses to support during design development."

"Industry is waiting for proposed road map by CDSCO for regulating all the medical devices which will provide innovators , manufacturers clarity on upcoming regulations under existing Medical Device Rules next three to five years. Current provision needs a notification for regulating medical device," he added.

The medical devices fraternity also informs that the biggest relief which the industry requires to function efficiently is to get rid of the multiple controlling bodies. Today, the Indian medical devices industry is controlled by CDSCO, Atomic energy Regulatory board (AERB), Department of Telecommunications (DoT), State Food and Drug Administration (FDAs) and Bureau of Indian

Standards (BIS), among others.

Call for a single window regulatory exercise

The medical devices industry is controlled in various aspects by ten bodies. This leads to interdepartmental delays, duplication and sometimes even turf issues. The Medical Device Rules is the first coherent and comprehensive move from the government which is tailor made for medical devices.

"We hope that this regulatory exercise will be taken to its logical conclusion, and there would hopefully be just one regulator for the medical devices sector. MTaI believes that a single-window regulatory regime for medical devices will enable the industry to serve the patients better and keep this sector attractive for all serious players irrespective of their domiciliary origins. Wider consultation on all matters plaguing the healthcare sector will highlight the necessity of having a single window where all the compliance requirements converge," Choudary added.

Reiterating on the positive step taken by the government, Goel informs that the regulated medical devices play an important role in diagnosis, treatment, mitigation or prevention of diseases or disorder in patients and a sub-standard quality can adversely impact patient safety. For example, digital thermometers being regulated, will ensure only quality products which provide correct readings are available in the market. Wrong readings can result in adverse impact on a patient.

Informing that there will be significant impact on domestic and international market post implementation of regulation and future action of bringing all medical devices under MDR 2017, industry doyens say that 70-75 per cent products available in market will get impacted in terms of availability, quality to healthcare providers and end beneficiary.

CDSCO's recent proposal to bring in simple regulations to include all medical devices by simple regulatory process similar to models followed by few major Asian countries like Singapore is a welcome step

Himanshu Baid
Chairman, CII Medical Technology Division and Managing Director, Polymedicure

As a healthcare community, we were expecting a separate regulatory act for devices. We need a scientific approach to regulatory issues, particularly for devices which are engineering-driven products and not chemical entities like drugs

Dr BB Chanana
Head of Department Interventional Cardiologist, Maharaja Agrasen Super Specialty Hospital

Let's not forget that India imports a major share of its medical devices. We use regulations on these devices as per international standards, or as instructed. They cannot be under the same roof

Mohammad Ameel
Senior Consultant,
Healthcare Technologies,
WHO CC for Priority Medical Devices & Health Technology Policy,
NHSRC, MoH&FW

"The increase in prices of stents indicates that NPPA is mindful of the operational pressures in the medical device industry. We continue to be hopeful that in the interest of Indian patients and quality of Indian healthcare, the Government will bring in a policy to differentially price the innovative generations of medical devices. We are also engaged with the NPPA to find a way to offset the exchange value depreciation and thus mitigate the economic threats in the system to the medical device industry," Choudary said.

Pointing out that robust implementation of these regulations would ensure that quality and patient safety stay in the foreground, Choudhary added that stressing on quality would eventually improve the reimbursement levels for devices and give a share of this pie to the quality supplier too. Internationally, the reputation of Made in India products would go up.

"Sanitising the sector was important. We must not over-regulate and sterilise it," he concludes. Demanding patients' protection, stronger regulation and price capping to make devices and quality treatment accessible, the Association of Indian Medical Device Industry (AiMED) has recommended political parties to include concerns regarding medical devices in their manifestos.

"The key points of their recommendations demand regulation of all medical devices under a patients' safety medical devices law, protect consumers from exploitatively high pricing in medical devices through rational price controls, to encourage employment and Make in India, ensuring public procurement of quality medical devices at affordable price, shift from L1 (lowest cost) to Q1 (best quality at reasonable price) so best price and best quality can be factored for public procurement in public health institutions," AiMED proposal for election manifesto read.

Experts question how can a regulatory mechanism for drugs can 'also' be the yardstick for the safety and efficacy of medical devices

Meanwhile, public health advocates inform that the new regulations will increase transparency. Still with one year for implementation, we need to wait and watch on the on the outcomes of the new regulations and its impact on the medical device manufacturers and device companies functioning in India.

prathiba.raju@expressindia.com

INTERVIEW

Our focus is to ensure that poor are able to access curative care across hospitals

In a freewheeling and an exclusive interview, **Dr Indu Bhushan**, CEO, NHA, AB-PMJAY, who has been spearheading Ayushman Bharat Pradhan Mantri Jan Arogya Yojna, a healthcare programme of huge magnitude and complexity, talks to **Prathiba Raju** about rolling out the initial phase of the scheme, the challenges and achievements

What was the major achievements and challenges according to you in the first 157 days of implementation of PMJAY?
We have been able to issue more than two crore e-cards to beneficiaries in less than six months into the scheme's implementation. In the same time, more than 16 lakh beneficiaries across the country have availed free treatment worth Rs 2,000 crores for serious illnesses.

Our biggest challenge and focus so far has been, and continues to be beneficiary empowerment through awareness generation. While we have issued more than 2.6 crore e-cards to beneficiaries, we still have to reach out to more than 10 crore households in the country. We need to empower them by making them aware of the features, benefits and their rights as beneficiaries under the scheme and we are doing that by various kinds of Information, Education and Communication (IEC) campaigns.

Can you let us know which procedures patients mostly use under PMJAY? Any disease pattern tracked till date.
In general, India is seeing an upward trend in the incidence of NCDs (non-communicable diseases) as lifestyle-related diseases are on the rise and the state of preventive healthcare and level of nutrition is becoming relatively better. This is also getting reflected in the data coming from the scheme though we need to analyse it further and deeply.

> At present, NHA is holding discussions with NPPA on how to take up this initiative of negotiating special rates for implants or other devices that are used under PMJAY. The detailed methodology for the same will have to be worked out and after that field studies will have to be done. Only then some scientific conclusions which are acceptable to the stakeholders can be made

So far, how many private hospitals have been empanelled in PMJAY? The private hospitals are not happy with the packages. Your comments.
So far, 14,876 hospitals have been empanelled under PM-JAY. Private hospitals will always want more. We will never give them the rack rates and are working and trying to move them from low volume to high margin to large volume to low margin. They are not happy. We understand that there are some issues and we are working on them. The main objective and focus of Ayushman Bharat is to bring quality in secondary and tertiary care to 50 crore poor and vulnerable individuals comprising the bottom 40 per cent population of the country. It is to ensure that the poor are able to access curative care at both public and private hospitals for treatment of serious illnesses.

Many private hospitals have been in news for rising billing costs, unethical practices as well. How do you keep a tab on them when it comes to implementation of the scheme?
Our focus of the scheme is to ensure quality of care for the beneficiaries through a large network of public and private empanelled hospitals, while at the same time controlling any fraud and abuse. Various mechanisms and measures were undertaken to build the very design of the scheme. Even before the scheme's launch, we have launched policy guidelines for hospital empanelment, claims processing, beneficiary identification, and anti-fraud, where there can be potential to defraud the system. We have also put in place a technology-led fraud and abuse control cell to prevent fraud and to look into triggers that can lead to fraudulent practices and dishonest dealings.

What measures have been taken to prevent frauds and make sure that the scheme is

reaching the beneficiaries? Any examples.
For a programme of such scale, magnitude and complexity as that of Ayushman Bharat Pradhan Mantri Jan Arogya Yojna, it is critical to put in place a strong anti-fraud mechanism not only from financial perspective, but also to safeguard people's health from unethical practices. National Health Authority (NHA), the nodal agency for implementation and oversight of the scheme, has taken a number of steps to safeguard the programme from the inception. Some of the key actions taken in this regard are listed below.

Policy and design level

- Transparent tendering process implemented for empanelment of insurance company, implementing service agency and service providers.
- Tightly worded legal contracts for service delivery as per pre-defined SLAs have been developed with penalty clauses and punitive action to deal with fraudulent activities on the part of any agency involved in delivering services under PMJAY.
- Hospital empanelment process has been developed with two-tiered structure approach involving district level and state level committees, having due representation of senior officials – civil surgeon, chief medical officer and nodal officers of the district.
- The entire process is web-enabled wherein a hospital can track the status of its empanelment from application to approval stage.
- IT system and processes have been designed with checks and balances along with defined roles and responsibilities, role-based logins and audit trails for all processes – beneficiary identification, transaction management system, funds flow, claims payment etc.
- Further, all pre-authorisation and claims transactions are carried out online for efficiency and complete transparency.
- The process of pre-authorisation has been designed to ensure maximum efficiency while avoiding abuse and fraud.
- Minimum requirements for claims investigation and medical audit have been laid down.
- The tendency of healthcare providers to overcharge, bill extra and other related issues has been taken care by introducing all-inclusive package rates. However, sufficient flexibility has been given to treat patients requiring medical management and the list for procedures shall be enhanced as more experience and insights are gained.
- Comprehensive anti-fraud guidelines were released by Minister of Health & Family Welfare on August 27, 2018 for laying down detailed strategy, processes, systems and manpower for anti-fraud both at the national and state level
- Whistle Blower Policy adopted at NHA level in December 2018, shared with the states for adoption on similar pattern.

Operational and system level

- NHA had issued anti-fraud advisory notes requesting states to expedite the creation of their anti-fraud unit to identify and investigate suspect cases in December 2018.
- Capacity building workshop for fraud control and medical audit organised for SHAs, ISAs and insurance partners on December 14 to 15, 2018 in New Delhi
- Fraud investigation and medical audit manual released in December 2018
- Monitoring and analysis of utilisation trends done through regular MIS and dashboards, watch over abuse prone packages, suspect transactions/hospitals watchlist being prepared for sharing with SHAs on regular basis from January 2019. Cases were shared with Jharkhand, UP and Chhattisgarh so far.
- Medical Audit Capacity Building Training and Field Audits conducted in Jharkhand on January 21-23, and feedback shared with SHA. Show-cause notices were issued by SHA to – Nagarmal Seva Sadan and PVTG Hospital on February 7, 2019.
- Top analytics firms- Fraud Analytics- Proof of Concept initiated with top analytics firms — SAS, MFX, Lexis Nexis, Optum and Greenojo on January 7 for triggering suspect transactions and entities through rule engines and artificial intelligence layer. The teams have started creating triggers and results being shared with the states on a regular basis from February 28, 2019.
- Mobile App – Kaizala by Microsoft has been customised for field investigations and medical audit, test deployment done in January 2019. It will be rolled out soon.
- Procedure-specific documentation and checklist being developed for controlling abuse and leakages, integration with IT is under progress.
- Adjudication guidelines and capacity building workshop for SHAs/ISAs processing teams — scheduled for UP, Bihar, Haryana, J&K, Uttarakhand, Himachal Pradesh on February 21-22. Rest of the states will be covered soon and such workshops are being conducted round the year.

Since the announcement of the scheme, there has been criticism by many state governments, but as of now out of 33 states, you have successfully implemented it in 31. How are you handling politics over smooth implementation?
The objective and focus of Ayushman Bharat is to bring quality secondary and tertiary care to 50 crore poor and vulnerable individuals comprising the bottom 40 per cent population of the country. Our focus is to ensure that the poor are able to access curative care at both public and private hospitals for treatment of serious illnesses, which they have not been able to do since they are unable to afford expensive hospital care. In the absence of such capability, the poor either accepted their fate and procrastinated treatment or were forced to sell off their assets or undertake huge debt that pushes six crore people into poverty every year.

The objective of Ayushman Bharat is to help change this healthcare, seeking behaviour among the poor regardless of region, state or politics and that is how we have been able to get most of the states, especially led by opposition parties, and UTs on board. The scheme by its very nature and design rises above politics and ideologies to appeal to all administrations and regimes.

As far as IT implementation in states is concerned, it is provided in a hosted manner. States like Jharkhand, which did not even have a health insurance scheme, have managed to empanel 600 hospitals and treat 95,000 patients for free within six months of launch. It also provided the flexibility — for example Jharkhand offers PM-JAY coverage to anyone with a BPL ration card in the state. The open API approach ensured states could rapidly integrate and configure the IT system to meet the states' needs. Existing states that converged the scheme with PM-JAY like Tamil Nadu and Karnataka have managed to integrate in a couple of months. Portability has also been a big benefit brought out by the scheme. Technology has helped people with cancer, cardiac and other tertiary care diseases to seek care outside their state in some of the top medical institutions in the country. This was not possible prior to PM-JAY.

How will the scheme benefit through the tie up between IRDAI and Insurance Information Bureau of India (IIBI)? What would be the outcome of the joint working group? What kind of SOPs will be brought in?
To support the implementation of AB-PMJAY with the active involvement of various stakeholders and to further strengthen the health insurance ecosystem, a working group with IRDAI and NHA has been constituted to work on key areas of mutual interest and cooperation. These areas will include, among others, network hospitals management, comparative study of packages and their rates and mapping to uniform codes, defining standards and indicators for safe and quality healthcare, data standardisation and exchange, fraud and abuse control, common IT infrastructure for health insurance claims management.

The working group may consult experts from insurance industry, healthcare providers, NABH, IT, third party administrators etc. in the course of their deliberations.

Any update on the integration of Health and Wellness Centres (HWC) and PMJAY and how will IT be used to create this seamless integration?
To ensure the envisioned paradigm shift from illness to wellness of beneficiaries, we at NHA believe that healthcare should be well-integrated and there should be continuum of care from primary (preventive) care to secondary and tertiary (curative) care. This continuum of care is not only imperative for streamlining access to care for beneficiaries, but also pivotal in providing timely, quality care to beneficiaries by creating a digital feedback system across different levels of care.

It is important that there is a good coordination between tertiary hospitals and HWCs. We can help MoH&FW integrate HWCs with PM-JAY so that appropriate beneficiary follow-ups backed by IT are done, so patients can get continuum of care. We have written to the ministry about this and are currently waiting for their response.

Do you think states have enough awareness on the scheme? How do you ensure the same? Can you give us a feedback on how states are performing in imbibing the scheme?
As mentioned before, one of our main focus areas is currently beneficiary empowerment through awareness generation. While we have issued more than 2.6 crore e-cards to beneficiaries, we still have to reach out to more than 10 crore households

in the country. We need to empower them by making them aware of the features, benefits and their rights as beneficiaries under the scheme and we are doing that by various kinds of campaigns.

The first round of Additional Data Collection Drive covered rural areas and was successfully implemented in 22 states with its initiation on April 30 as 'Ayushman Bharat Diwas'. Similar exercise was also organised in urban areas in the month of May to verify the eligible families and collect additional information from them. The objectives of the drive were two-fold — to inform the eligible beneficiaries about the programme, its benefits; and to validate the existing beneficiary list and collect additional information wherever necessary, from each beneficiary family. 94 per cent of all targeted families reached across 25 participating states/UTs.

NHA has signed MoU with Common Service Centres (CSCs) for beneficiary identification and is utilising over three lakh village level entrepreneurs for identifying beneficiaries. So far, more than 2.6 crore beneficiary e—cards have been generated through the CSCs, and by Pradhan Mantri Arogya Mitras at empanelled hospitals.

Personalised beneficiary identification letters signed by the Prime Minister with family card have been sent to all the identified families in the villages and towns across the country. So far more than 7.7 crore letters have been delivered to the beneficiaries' doorsteps. This will drive awareness among the beneficiaries and further ease the identification process when they visit points of care or CSC centres.

We have also launched a mobile app 'Ayushman Bharat (PMJAY)' for citizens to get access to information on PM-JAY, check the eligibility and find hospitals nearby and get assisted help. The app is available for download on Google Play Store. It has crossed more than 2.25 lakh installations with a rating of 4.3.

Will there be trimming of existing packages, which is currently 1393?

NHA is going to undertake a Health Benefit Package (HBP) revision exercise. This will include rationalisation of the package list also. It will be the job of specialist committees to examine the packages offered under their specialty. Depending upon their recommendations, the number of packages may go up or down.

You had discussions with National Pharmaceutical Pricing Authority (NPPA) to negotiate special rates for implants or other devices that are used under PMJAY to further bring down the cost. What would be the new cost if they accept?

It is too early to predict anything on this front. At present, NHA is holding discussions with NPPA on how to take up this initiative, the detailed methodology for the same will have to be worked out and after that field studies can be done. Only then some scientific conclusions which are acceptable to the stakeholders can be made. To say anything on this subject at present will be speculative.

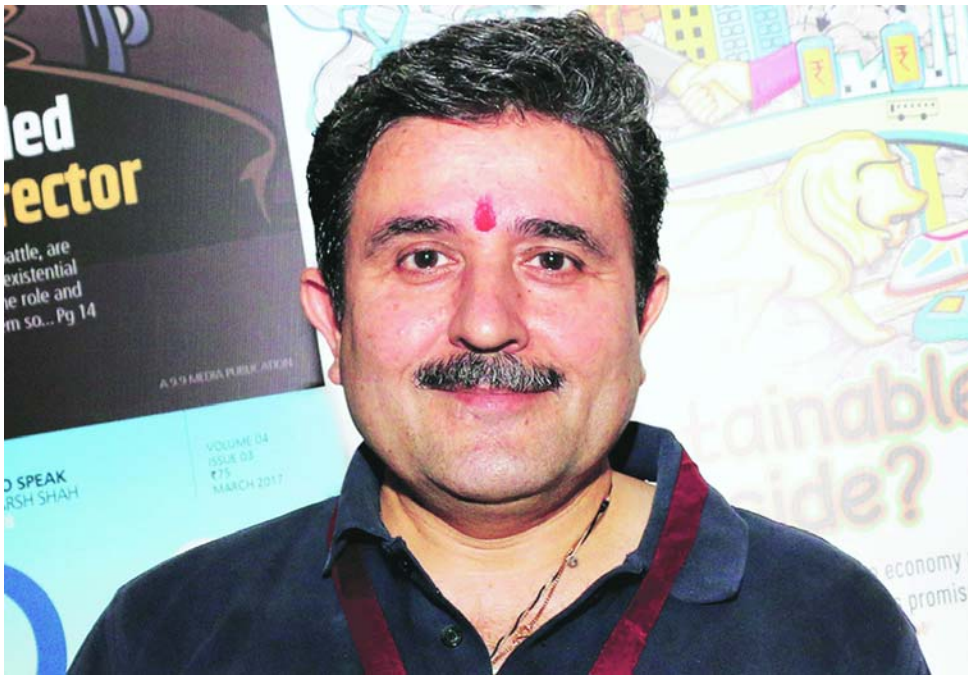
prathiba.raju@expressindia.com

INSIGHTS

Indian healthcare: Compromises and compulsions

To achieve Universal Health Coverage, Indian healthcare sector needs a viable business model for higher investment and should integrate innovations into its delivery systems, states **Rajiv Kapahi**, Director, Boston Scientific India (BSCI)

The Indian healthcare sector is witnessing a great transformation with new policies and programmes in place. The new healthcare ecosystem will define the healthcare delivery and products space with cost-effective hospitals, specialty clinics and medical technology which address the needs of quality and affordable services for all. To achieve the goal of 'Healthy India' or Universal Health Coverage, the two critical areas which need to be on our top priority are higher investment and innovations. For inviting investments and integrating innovations, the Indian healthcare sector certainly needs to adopt viable business models.



It is promising to note that the government has recently unveiled its long-term vision for 'Healthy India,' however, every vision needs execution and in absence of operational plans, the vision will remain on paper. Unfortunately, in the last 70 years, emphasis on higher investment in the sector went unnoticed and the government spending still remains very low. Lack of adequate investment in healthcare infrastructure resulted in poor healthcare delivery to a very large section of people.

Now, we have a mega health insurance scheme, Ayushman Bharat, in place and it aims to provide hassle and distress free healthcare service to over 50 crore needy people. As a welfare state, India needs to take care of healthcare needs of its people especially coming from poor and weaker sections. For successful and effective implementation of the Ayushman Bharat and other healthcare schemes, bigger participation of private sector is required and that would not be up to the desired level unless a favourable business climate is created for them.

It is fundamental to have a viable business model which can drive enough money into the sector in the form of enough taxes for the government to take care of subsidies and financing of Ayushman Bharat.

Rational pricing mechanism

New healthcare economy calls for a rational pricing mechanism. Along with affordability, focus also needs to be on innovations. Commercial viability, quality parameters, clinical backup and medical rectitude demand a well-informed group of experts to regulate the price based on consensus. For different segments, there has to be a different approach towards pricing. For example, medtech segment has several sub segments and each sub segment needs separate attention in terms of pricing and other policy push.

The growth of medical devices segment is very critical for the development of healthcare sector which faces several challenges in this space. Medical technology cost in setting up a tertiary care hospital amounts to 30-40 per cent. Cost of medical technology /equipment/devices is 20-25 per cent of total healthcare cost for a patient.

Medtech segment is a strategic driver for the sector and barriers are not duties/taxes or preferential market access. The main barrier is lack of a sizeable local market. Efficiency and innovations are key drivers to expand market for the medtech sector. But, unfortunately, India's healthcare spend is far lower than other emerging markets. Therefore, to attract investment in complex medical devices, the first priority will have to be market expansion. That requires a robust business model supported by promotional and rational regulations.

Similarly, regulators must establish a sustainable mechanism using which medical institutions like hospitals can obtain commercial and operational viability. If hospitals cannot attain viability then the entire healthcare ecosystem would face imbalance in terms of care delivery. So, there is a need of rational regulation for better outcomes. Whole mechanism needs to be comprehensively understood and assessed before putting it in place.

Integrating innovations

Innovation, quality and clinical research are interlinked. The technology companies are investing in the training of the doctors because our medical colleges and medical institutes have limited resources. Those who are investing in the training of doctors, other healthcare professional, technicians need to be supported because then only the latest technology can come to the sector. The government needs to encourage such partnerships and can hope to build required capacities to adopt innovations. Success of schemes like Ayushman Bharat would largely depend on such partnerships. We need to train our doctors, technicians and paramedics to adopt newer technologies.

India has only 1.1 beds per 1,000 populations in India compared to the world average of 2.7. Out of pocket expenditure (OOPE) constitutes more than 60 per cent of all health expenses, a major drawback in a country like India where a large segment of the population is below poverty line. Reducing cost of healthcare services needs to be given top priority by all stakeholders, if the country aspires to achieve UHC by 2030.

By attracting investments and integrating innovations, the Indian healthcare sector can overcome its challenges and there will be no compromise on quality, access and affordability.

Along with higher investment in the sector, India needs a holistic and balanced approach to bring down the cost of healthcare services through rational policies, health schemes, innovations and solutions. Apart from price control measures, India needs to explore other, and possibly more effective, mechanisms to ensure affordable services through overall asset management, by taking innovative 'Digital Health' initiatives and systematically focusing on 'Prevention and Wellness.'

Trends in medical imaging technology

Dr Rashmi Badhe - Consultant Radiology, Global Hospital, gives an insight on how technology can streamline workflows and improve productivity in medical imaging

MEDICAL IMAGING is one of the most innovative and dynamic fields in the healthcare industry. It is crucial for disease diagnosis and has advanced remarkably over the last few years with widespread adoption of imaging systems like MRI, CT & USG and various modifications of these technologies.

Some of the new trends in the medical imaging field include continued growth of various technologies such as:

Computed tomography (CT)

It is the workhorse of modern medical imaging. Today's CT scanners include technological developments that enable us to better manage patient care, including high quality images, dose guidance and regulation, spectral and multi-energy imaging, and expansion of cardiac and brain imaging.

Technology in CT has evolved from single slice scanner to ultra fast multidetector CT scanners reducing the acquisition time significantly, increasing the spatial resolution along with modifications to reduce patient radiation dose.

An exciting development that offers great promise to further increase the modality's potential is dual energy CT (DECT), also known as 'spectral imaging.' It utilises two separate energy sets to examine the different attenuation properties of matter, having a significant advantage over traditional single energy CT. It can create virtual non-contrast images from contrast-enhanced imaging, eliminating the need of non-enhanced scan and thus reducing the radiation exposure to the patient. It can also delineate the composition of renal calculi and arterial plaques for appropriate management. It improves lesion detection and characterisation in sub-centimeter sized lesions in liver. DECT can enhance CT angiography protocols obt aining exquisite image quality

and implementing calcium subtraction techniques at post-processing in case of significant wall calcifications, which can interfere with lumen assessment.

Perfusion blood volume maps acquired with DECT can be used to identify the segmental or sub-segmental areas of lung affected by a pulmonary thromboembolism and to detect areas of ischemia in the myocardium. It also allows to acquire better quality images in patients with metallic implants reducing the implants related artifacts.

Some of the newest CT scanners move fast enough to capture images that freeze cardiac motion and prevent motion blur or the need to stitch images from several heartbeats to reconstruct a complete cardiac image, also reducing the radiation exposure.

TAVR/structural heart planning software gives the clinicians the detailed and crucial information required for planning for transcatheter aortic valve replacement (TAVR) or other structural heart surgeries with the help of the CT scan acquired images. Similarly, extensive angiographic applications in the neuro-imaging including CT cerebral angiography, perfusion imaging, angiographic applications in body imaging have majorly revolutionised the patient care.

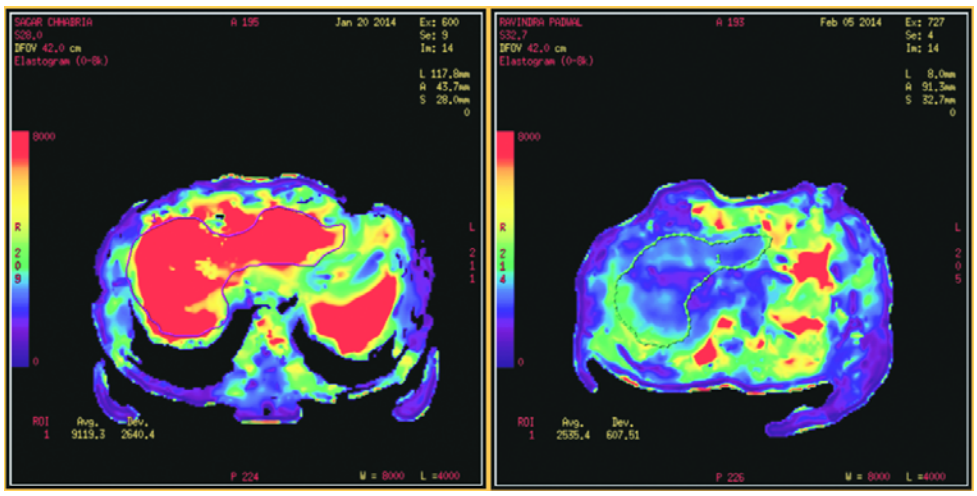
Tomosynthesis or 3D mammography

This cancer detection technology allows three-dimensional (3D) reconstruction of the breast tissue, which can then be viewed as sequential slices through the breast. This new technique reduces error and allows thorough examination of even dense tissue. Tomosynthesis facilitates detection of minute lung nodules and chest pathologies that can go undetected with conventional methods. This 3D imaging helps outline cancer morphology in patients and determine the stage of the disease with greater accuracy.

MRI

The most recent big advances in magnetic resonance imaging (MRI) technology have been on the software side.

MR Elastography is a rapidly developing non-invasive technology for quantitatively assessing the mechanical properties of tissue and tissue stiffness. It works by combining MRI imaging with sound waves to create a visual map (Elastogram) showing the stiffness of body tissues.



Elastogram in patient with liver cirrhosis

Its applications are widely in use for assessment of hepatic stiffness and the stage of fibrosis in patients with liver disease. It can serve as a safer, less expensive, and potentially more accurate alternative to invasive liver biopsy which is currently the gold standard for diagnosis and staging of liver fibrosis.

Magnetic resonance-guided focussed ultrasound

This non-invasive, incisionless MRI-based therapeutic technique uses ultrasonic pulses to ablate the target tissue. It uses an MRI thermal imaging system to continuously measure temperature changes inside the body, pinpointing and guiding the treatment. It is gaining popularity as an alternative to medical and surgical interventions in the management of symptomatic uterine fibroids; other applications being treatments of adenomyosis, facetal arthropathy, bone tumours (both benign and malignant) for pain relief. Recently its applications in neurosurgery are also being explored for treatment of essential tremors and Parkinson's disease.

Multimodality fusion or hybrid imaging

Anatomic imaging technologies like magnetic resonance imaging (MRI) and computed tomography (CT) clearly show morphologic features, such as size and shape, but not information on proliferation or inflammation. Functional imaging technologies, such as positron emission tomo-graphy (PET) or single-photon emission computed tomography (SPECT), use radiolabelled glucose or monoclonal antibodies to provide critical information on cellular activity, but cannot provide the anatomic detail needed for precise localisation. Physicians need both anatomic and functional data to make the definitive diagnosis that is so important to the patient. Bringing together anatomic and functional information with sensitivity and specificity is the true value of multimodal fusion imaging, examples are PET-CT, SPECT-CT imaging.

Fused images can be used to plan surgical procedures, guide invasive or noninvasive therapeutic interventions, and monitor individual response to therapy.

Intra-operative CT/MRI

Intraoperative imaging is a rapidly expanding field encompassing many applications that use a multitude of technologies. Some of these applications have been in use for many years and are firmly embedded in, and indispensable to, clinical practice (e.g. the use of X-ray to locate foreign bodies during surgery or oocyte retrieval under ultrasound guidance or intra-operative ultrasound for the lesion localisation and treatment.

Most spine surgeries today are done using minimally invasive techniques to spare muscle and healthy tissues. To do this as effectively as possible, some form of intraoperative imaging is typically used to verify surgical accuracy. The intraoperative images help make sure that a spinal implant is placed in the desired place or that a tumour is dissected to the desired outcome. While providing excellent imaging resolution and navigation to guide an operation, the mobile CT scanner also permits the surgeon to obtain immediate CT images at the completion of surgery. This allows for immediate intraoperative intervention if necessary before surgical closure.

Intraoperative MRIs or iMRIs, can move into the or during surgery, providing real-time images while the patient lies stationary on the table. These images are transferred to the frameless navigation system and allow up-to-date assessment of the brain's position and shift, the degree of tumour resection and residual tumour. This enables the surgeon to maximally resect tumour while preserving normal structures and brain tissue. Though it has its own limitations in terms of cost and the technical difficulties, but it has wide applications in brain tumour surgery, epilepsy surgery and also for verification of electrode placement in surgeries for Parkinson's disease and other disorders treated with deep brain stimulation.

3D printing and computer aided design

A 3D-printing technique allows clinicians to produce highly detailed models of human anatomy for better planning of complex surgical cases using the data acquired from CT images.

While use of advanced visualisation in radiology is instrumental in diagnosis and communication with referring clinicians, this technology can render Digital Imaging and Communications in Medicine (DICOM) images as three-dimensional (3D) printed models capable of providing both tactile feedback and tangible depth information about anatomic and pathologic states.

The main applications are:

- Surgery preparation assisted by the use of 3D printed models
- 3D printing of surgical instruments.
- Custom-made prosthetics using 3D printing

Artificial intelligence (AI)

As AI technology is further developed, the possibility of a complete digitalised radiologist is a tangible reality. Although AI is being explored as an extra eye on imaging analysis, it is not likely to replace the human factor. The radiologists do much more than even the most advanced algorithm can because they don't just look at images! Their scope includes communication, image quality assessment, image optimisation, education, procedures, policy making, and more.

Recently, Korean researchers proposed through a study that although AI was faster on its own in lesion detection than radiologist, the best results came from teamwork – humans utilising the AI algorithm as a second look.

AI can support radiologists and radiographers by streamlining workflows and improving productivity.

Precision and efficiency: What tomotherapy is all about?

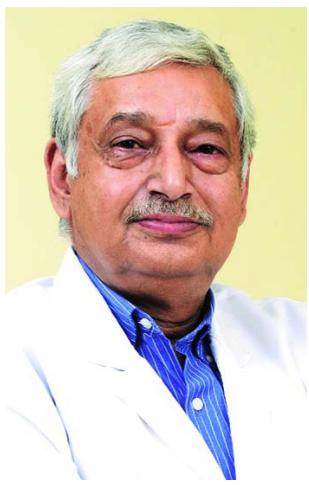
With tomotherapy, specialists can adjust the size, shape and intensity of the radiation beam to accurately target the size, shape and location of the patient's tumour, informs **Dr S Hukku**, Sr Consultant and Chairman, Radiation Oncology, BLK Super Speciality Hospital

ADVANCEMENT IN radiation therapy has transformed the entire procedures which are deployed to treat patients suffering from critical life-threatening diseases like cancer. Oncologists, surgeons and radiation experts, after first-hand experience with tomotherapy, have been convinced with its efficacy and outcomes. Precision and speed are two key features which make tomotherapy, the most sought-after advanced radiation machine.

Patients reeling from diagnoses need precise and effective treatment to get their lives back. Treatment teams need next-level precision, speed and efficiency to improve patient outcomes. Clinical practices need to treat a broad range of indications with superior outcomes. Tomotherapy's latest version - The Radixact Treatment Delivery System- enables all of this with a fully integrated platform for intelligent treatment planning, data management and treatment delivery.

Using a refined X-ray beamline and next-generation imaging technology, the system delivers scalable and highly reliable treatments for patients with a variety of individual treatment needs. Tomotherapy has come as a boon to cancer patients. It is now used as a curative treatment for cancer, the second leading cause of death across the world. With the most recent introduction of Tomotherapy, the radiation oncology has touched an all new high in the race of effective curative treatment for serious illnesses. In India, a very few health institutions are equipped with tomotherapy. BLK Super Specialty Hospital has now acquired the latest version of the machine for tomotherapy- Radixact.

Cancer patients require radiation therapy as part of their treatment plan. Tomotherapy is marked as the latest and the smartest radiation therapy to trick and treat the most complicated of cancers. What makes doctors so confident in this technology is the fact that unlike the former techniques of radiation for cancer, tomotherapy works in a much unique way. This system combines imaging and radiation delivery to target cancer



more precisely.

Efficiency of the tomotherapy can be gauged with the fact that it is a systematic process that combines treatment planning, CT image-guided patient positioning and treatment delivery into one integrated system. It helps in calculating the shrinkage of the cancer caused after each cycle, allowing the doctors to plan the next steps as per requirements.

Although it has been in use since the beginning of this century, but the introduction of this treatment process in India is regarded as a ground-breaking development in the healthcare space of the country. The procedure begins with treatment planning. With the use of 3D images and special software, the precise contour for each tumour is defined. How much radiation the tumour should receive, as well as acceptable radiation levels for surrounding tissue and organs are also some of the matters that get decided in the stage of planning. From there, the technology calculates the appropriate pattern, position and intensity of the radiation to be delivered.

Next in line is the CT image-guided patient positioning. Precision in patient positioning is crucial for effective radiation treatment. With Radixact 9, a special CT scan is taken just before each treatment to verify the tumour's location and adjust the positioning, if necessary. This is useful since with every session the position may change slightly and certain types of tumours, such as prostate cancers, can change shape or shift from day-to-day. With this technology, physicians can make sure that the radiation is directed precisely from one session to the next.

With tomotherapy, physicians can adjust the size, shape and intensity of the radiation beam to accurately target the size, shape and location of the patient's tumour.The equipment used for tomotherapy looks much like a computed tomography (CT) system. During treatment, the patient lies on a couch that moves continuously through a rotating ring. Radiation is delivered from all angles as the ring turns and the couch moves through the gantry.

Overall, tomotherapy is an all-in-one advanced form of treatment that combines Intensity Modulated Radiation Therapy (IMRT) with the accuracy of Computed Tomography (CT) scanning technology (IGRT- Image Guided Radiotherapy). The procedure in its final stage combines IMRT with a spiral delivery pattern which means radiation can be delivered from all around the body, which helps ensure the treatment is confined to the tumour.

Second edition of Radiology and Imaging Conclave to be held on July 12 and 13, 2019

The conclave aims to disseminate information and knowledge that can help radiologists to turn challenges into opportunities and ensure a sustainable growth

AFTER THE success of the first edition of Radiology and Imaging Conclave in July 2018, *Express Healthcare* and the Radiology and Education Foundation (REF) is all set launch its second edition. The conclave will be held on July 12 and 13, 2019 in New Delhi. The theme of Radiology and Imaging Conclave 2019 will be Radiology 2024, that delves into understanding the future challenges and opportunities in the next five years. The conclave aims to disseminate information and knowledge that can help radiologists to turn challenges into opportunities and ensure a sustainable growth.

Discussions will be held on the following topics:

- AI and clinical decision support
- Adding 'Value' in Radiology and enhancing patient experience
- Managing a radiology dept/centre efficiently
- Cut Practice: Can it be phased out?
- Managing emergencies (both medical and patient-created)
- Planning the finances of a radiology centre
- Fellowship and sub-specialisation programmes: Can we do better?
- Creating moonshots for the future: What is our wish list?

The first edition of the conclave saw experts and veterans of the diagnostic sector congregate to discuss on vital trends, innovations and business models shaping the future of radiology in India. These experts also prepared a blueprint for progress based on various skill development activities that will make radiology organisations successful, both in terms of profitability and goodwill. The second edition will expand the discussions further and bring in a new flavour to this conclave.

EH News Bureau

Creating accessible and quality healthcare

Dr Philip Payne, Director of the Institute of Informatics and Robert J Terry Professor in the Division of General Medicine and Professor of Computer Science and Engineering at the School of Engineering and Applied Science, Washington University in St Louis, sheds light on how precision medicine can help provide best healthcare through AI, machine learning and data collection

Much has been written about the promise of precision or personalised medicine. This approach to healthcare utilises all the data we can collect about individuals to measure their characteristics, including lifestyle, genes, the biological basis for their health and wellness, and how they present during an office visit.

The biggest challenge facing us in delivering precision medicine is turning data into action. We have massive advances underway in artificial intelligence, machine learning, and the use of mobile computing and sensors, as well as any number of other data sources to help providers better understand our patients and our communities. There is a lot of information coming at us at an astonishing cadence. Now is the time when we have to turn that data into actionable insights for as many patients as possible.

To turn data into action, we must understand all levels of data, from individual behaviours and lifestyle to environmental factors, and the clinical presentation of health as well as disease. As we use these data to make better decisions for individuals, we can often improve the quality, safety, and cost of the care they receive.

Ultimately, if we can process all of this information and translate it into action, we have an opportunity to treat people when they are sick, and also to take care of them and ensure that they don't get sick in the first place. However, there is much work to be done to ensure this information is inclusive of all people.

Studies have shown us that disease risk, as well as response to drug therapy, varies greatly across different populations. Starting in 2009, a series of studies identified the fact that more than 96 per cent of the data that we were using to understand the genomic basis of disease was derived from individuals of western European ancestry. Of course, the patients that we see in our clinics and hospitals are not just from western European ancestry, they come from across the globe, from a variety of races and ethnicities. It's critical that the data we collect to inform precision medicine reflects that diversity, and that we engage partners from all over the world in this undertaking.

Studies have shown us that disease risk, as well as response to drug therapy, varies greatly across different populations

India is making some interesting moves to implement broader access to health insurance and healthcare for all parts of their population. Given the size of India's population and the complexity of delivering care at that scale, in many ways, a country like India could leapfrog the US in terms of thinking about data-driven approaches to improve wellness in the population. Their goal of creating more accessible, better quality healthcare for all of their citizens will only work if they can manage demand, and the only way to manage demand is to keep that population healthier in the first place. You can think about that from a couple of different perspectives.

For example, India has some of the highest penetrance of mobile devices of any country in the world. Such devices open up all kinds of interesting ways of intervening and working with patients to understand their health status, and to maintain that status, through their devices that are personal and consumer-oriented.

Additionally, if broader access to healthcare insurance and care expands in India via Ayushman Bharat, if you have a population where the vast majority of individuals have access to healthcare, and if there is an increasing use of electronic health records, which is also happening in India, you have a scenario in which you can build very large cohorts of patients. From those cohorts, you could build their genomic signature alongside clinical data. Using both clinical and genomic data will allow researchers to ask and answer questions at a scale that we can't readily ask in our siloed healthcare system in the US.

I also think India has an opportunity to rethink how to train healthcare providers to deliver that care. They are going to need many more healthcare providers. Those healthcare providers are perhaps going to have to see and manage much larger patient cohorts than we deal with in the United States. That's where digital health becomes really interesting. It could augment human capabilities to make those providers more effective and allow them to practice at the maximum capacity they can to ensure that important access to high-quality healthcare.

We also need to think about the ethical, legal, and social implications of doing so. Increasingly, we've come to understand that we need laws and ethical standards that allow us to not only collect the data that we need to understand how people respond to therapy or what their risks of disease are, but also to make sure that understanding is not used to discriminate against individuals.

These are just few of the issues that my colleagues and I at Washington University in St Louis recently had the opportunity to discuss with healthcare experts and practitioners in India. During our Forum for India, held in Mumbai, we talked over opportunities, challenges and best practices with friends from a variety of corporate, academic and clinical backgrounds. During these face-to-face sessions, we were able to connect, collaborate, and further strengthen partnerships.

Ultimately, the most beneficial approach to delivering healthcare is not treating people while they are sick, but actually promoting health and wellness. This is an opportunity to take an individual's unique risk of developing a disease and intervene before they become sick, so that both patients and providers alike can be focussed more on well-care as opposed to sick-care. It is something we must work toward on a global scale, and I look forward to further engagement with my colleagues in India to do just that.

Need collaborative approach to manage drug resistance TB

The need of the hour is a more streamlined and aggressive approach to access the government CAP and DOTS offering to end TB epidemic by 2030. **Dr Vikas Oswal**, Chest Consultant, Mumbai, Chairperson, DRTB Site, Shatabdi Municipal Hospital National Trainer, reveals more

INDIA NEEDS an urgent collaborative, multi-stakeholder approach in order to accelerate progress towards the goal of ending the tuberculosis epidemic as per the Sustainable Development Goals (SDGs) deadline of 2030. In 2018, at the launch of the TB Free India Campaign at 'Delhi End TB Summit', Prime Minister Narendra Modi said that the government is implementing a national strategic plan (NSP) to end TB by 2025 and ensure that every TB patient has access to quality diagnosis, treatment and support. The recent years have seen a leap in medical advancements in the challenging area of drug resistant TB. It is now a matter of joining hands and putting together a concerted effort to ensure improved monitoring and diagnosis, access to treatment options, education, awareness around prevention, and adherence to end the perils of drug resistance.

Tuberculosis continues to be one of the top 10 causes of death worldwide and the leading infectious killer disease. Central to the problem is the fact that Mycobacterium tuberculosis, the causative bacteria can mutate and develop resistance to the anti-microbial drugs used to cure the disease (referred to as drug resistant TB). This bacterial resistance poses the biggest challenge to eradicate the disease as the bacteria then becomes far more virulent and warrants a more aggressive bactericidal approach.

Multi drug-resistant TB (MDR TB) is the form of TB that does not respond to at least isoniazid and rifampicin, the two most powerful anti-TB drugs. Extensively drug resistant TB (XDR TB) is TB which is resistant to at least four of the core anti TB drugs. XDR TB involves resistance to the two most powerful anti-TB drugs, isoniazid and rifampicin, in addition to resistance to any of the fluoroquinolones (second-line treatment drugs) and to at least one of the three injectable second-line drugs. Drug susceptibility and resistance can be detected using special laboratory tests which assess the bacteria for sensitivity to the drugs or detect resistance patterns. These tests can be molecular in type (such as the Xpert MTB/RIF and Line Probe Assay (LPA)) or else culture-based (such as the Mycobacteria growth indicator tube (MGIT) test).

Evidently, drug-resistant TB is a major public health crisis due to mismanagement of TB treatment and person-to-person transmission. Inappropriate or incorrect use of anti-TB drugs, or use of ineffective formulations of drugs (such as use of single drugs, poor quality medicines or bad storage conditions), and premature treatment interruption (due to unpleasant side effects such as nausea, vomiting and rashes; or due to the long duration of treatment) leading to poor adherence can cause drug resistance, which can then be transmitted, especially in crowded populations with poor immunity.

A new priority ranking of available medicines for MDR TB based on a careful balance between expected benefits and side effects is now available. These treatment options have been outlined in World Health Organisation's evidence-based guidelines based on drug susceptibility testing (DST). The management of patients with MDR TB has dramatically transformed for the better, as a result of these new, more potent drugs which are proven to be safe in clinical practice. Recent years have seen the entry of two new breakthrough drugs Bedaquiline and Delamanid that directly combat the enduring scourge of MDR TB. Since 2016, the MoH&FW's Central Tuberculosis Division (CTD) has made these drugs available through a Conditional Access programme (CAP), implemented by state governments, in a phased manner across the country. The treatment duration for MDR is two years including six months of injectables as against six months for drug susceptible TB.

The principles of MDR TB treatment include appropriate counselling to enable informed and participatory decision-making ahead of enrollment on treatment, dissemination of patient information material so that patients are appropriately informed about their treatment options, social support and physician confidence to enable adherence to treatment, access to safe and effective medication, and active drug safety monitoring and management (aDSM) for all patients enrolled on MDR TB treatment. In addition to radiology-based tests such as X rays and CT scans, it is important to conduct follow up microbial checks to monitor for relapse and effectiveness of the treatment.

The MoH&FW's conditional access plan (CAP) is a systematic and cost-effective approach designed for the use of new generation MDR TB drugs across India based on the balance between benefit and side effects. In addition, since 2005, as part of the Revised National TB Control Programme (RNTCP), Directly Observed Treatment Short-course (DOTS) strategy, the government provides free of cost treatment and diagnosis for all variants of TB including the new generation MDR TB drugs and susceptibility tests. The need of the hour is a more streamlined and aggressive approach to access the government CAP and DOTS offering. In addition, India urgently needs more trained and motivated medical experts to educate patients and caregivers about the various treatment options, the need for drug compliance, to provide effective counselling and to prescribe drugs based on the patient's drug resistance and tolerance. Finally, regular monitoring is required to ensure treatment adherence and efficacy and prevent relapse. Public Private Partnerships (PPPs) provide a feasible solution to bring all these elements of TB management together effectively. A collaborative, multi-stakeholder approach is therefore the only solution to meet the SDGs for TB by 2030.

INTERVIEW

One of the highly challenging aspect of hospital is to manage the revenue cycle

Prof M Mariappan, Chairperson, Centre for Hospital Management, School of Health Systems Studies, Tata Institute of Social Sciences, in interaction with **Sanjiv Das,** chalks down strategies for hospital management

Hospital management is one of the most recent concepts in the field of management courses. How has this stream of study evolved over the years?
Hospital management or administration as a discipline has been existing for more than six decades India. It is evolving slowly and has reached to some level during the last five years. Hospital administration was introduced in All India Institute of Medical Sciences (AIIMS) and Indian Army Hospitals and Tata Institute of Social Sciences, Mumbai had started this programme over five decades ago. At present, hospital administration has been viewed in many ways on the clinical ground – some of the institutions offering MD in Hospital Administration, which are mostly focussing on management of clinical services and enhance the clinical quality. Such institutions offer this programme only to medical graduates. Other institutions are looking at hospital administration as a management programme. These type of institutions offer hospital administration to all graduates. It is seen that both are serving the need of modern hospitals.

In the past, hospitals were managed by medical officers who use to do administrative work along with clinical activities. But this scenario is getting changed due to development of professionalism in hospital management. Further, Indian healthcare is strongly oriented towards curative care. Therefore, a large number of hospitals are created with huge infrastructure, facilities, human resources, system and process.

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Today, it is seen that modern hospitals cannot be managed without trained person in hospital management. Hospital management programme is offered by nearly 40 institutions and

approximately 3000 graduates are released every year across the country. Students are trained and are procuring academic degrees like certificates, diplomas, post graduate diplomas, executive programmes, master degrees, MPhil and PhD. Hospital administration is continuously growing and is an emerging field in India.

School of Health Systems Studies (SHSS), Tata Institute of Social Sciences (TISS) has been offering Master of Hospital Administration programme for over two and a half decades along with MPhil and PhD programme in Hospital Administration. Apart from these, Centre for Hospital Management under the SHSS offers Executive and Post Graduate Diploma Programmes for working persons. This includes Executive Post Graduate in Hospital Administration (EPGDHA) for Indian students, Executive Post Graduate in Hospital Administration (EPGDHA) for Afghanistan students, Post Graduate Diploma in Healthcare Quality Management (collaboration with NHSRC) for government and private sector candidates exclusively to promote quality improvement in public and private sector, and Management Development programmes.

What strategies would you recommend for those hospitals who need to revisit their revenue cycles?

One of the highly challenging aspect of a hospital is to manage the revenue cycle. Basically, revenue cycle means the hospital provides input in form of resources which include equipment, infrastructure, human resources and materials. These are converted through appropriate process including work methods, practices, standards and quality improvement tools towards healthcare delivery or services (output). The hospital shall be charging for the services rendered to the patients. This will become the revenue for the hospital. Again, this revenue is used for purchasing resources and used through the process and create services for generating revenue. This is called revenue cycle and is an ongoing process.

It is seen that generating revenue in a hospital is a highest challenge within a structured condition. Healthcare services are the outcome of various financial measures: for example, huge capital investments, number of operational and non-operational expenses. A majority of the hospitals fail to understand the implication of huge investment and operational aspects in the strategic point of view. Further, there has been a lack of understanding with regards to operational efficiency, cost structure, technological pressure, workforce inefficiency, market condition and competition, etc.

There are certain common practices in which hospitals can ensure their revenue cycles maintained properly.

- Hospitals have to improve the operational efficiency, patient satisfaction, application of cost reduction and cost control technique and quality improvement.
- Make sure that every patient shall appreciate your service and carry great experience while leaving the hospital. They should be your ambassador.
- Work with community closely, understand their requirement and modify the services as per their need
- Work with corporate clients, insurance and TPS and ensure that there is no accumulation of accounts receivables.
- Practice best methods of management of resources including utilisation of HR, materials, energy services and other sources
- Regularly monitor the cost and revenue by implementing performance and quality indicators
- Try to collaborate with like-minded organisations towards learning, sharing services and exchanging ideas

It is important to note that the hospital should be best patient-centred care centre rather than highly advanced technical centre.

What are the challenges faced by hospitals in managing cost efficiencies?

> Over the years, hospitals have become complex organisations where exclusive knowledge and skills are needed to manage them well. Further, modern hospitals have become highly investment-oriented institutions

Over the years, hospitals have become complex organisations where exclusive knowledge and skills are needed to manage them well. Further, modern hospitals have become highly investment-oriented institutions. It is to be noted whether it is private, public or charitable hospitals, financial management becomes a major issue. Public hospitals need to take cost-effective measures and offer services to a large number of population. Also, they should ensure that adequate revenue is achieved by recovering cost from the customer. Further, hospitals are facing huge challenges due to environmental issues which include internal (within the hospital) and external (outside the hospitals – nationally and globally). Within the organisation, the hospital is expected to satisfy the patient, improve its strategic position, constantly focus on growing demand of hospital patients, ensuring productivity, maximising the profit or better cost recovery mechanism. With respect to external environment meeting the community demands, shareholders demand, facing national and global competition, technology advancement and other factors, hospitals need to have the ability to achieve cost, increase the value to patients or customer, revenue cycle and risk management.

- If the hospital fails to understand and is unable to manage, it may loose the patient/clients. Therefore, it is important to focus on managing the cost.
- In this regard, the basic challenges are understanding the cost structure e.g. Variable cost versus Fixed cost or Direct Cost versus Indirect Cost through an appropriate costing information system.
- Secondly, the hospital management should be able to develop strategic cost data that should be used to ascertain the profitability of hospital revenue centres and regularly identify the scope cost reduction and cost control projects.

Some of the cost reduction and cost control projects are

- Work force analysis: Time and motion work study, method study, process improvement, full time equivalent studies.
- Resource utilisation: Productivity analysis, process reengineering, multiskilling and multitasking, benchmarking and standardisation, quality improvement exercises, application of quality and performance indicators, activity-based costing, budgeting, value analysis and other tools.

There is a huge gap between private and public hospital infra. What is the reason behind this and what will be your recommendations to minimise this gap?

It is true that there is a huge gap between the public and private sector infrastructure. This is because the private sector has to meet the customer demand, face the competition with other hospitals and try to gain competitive advantage.

On the other hand, public sector hospitals are managed through tax payers money. Tax payers money is not just meant for only healthcare. Healthcare is one of the number of essential projects of the government. Therefore, there is always a limitation in terms of building resources to the government or public health facilities.

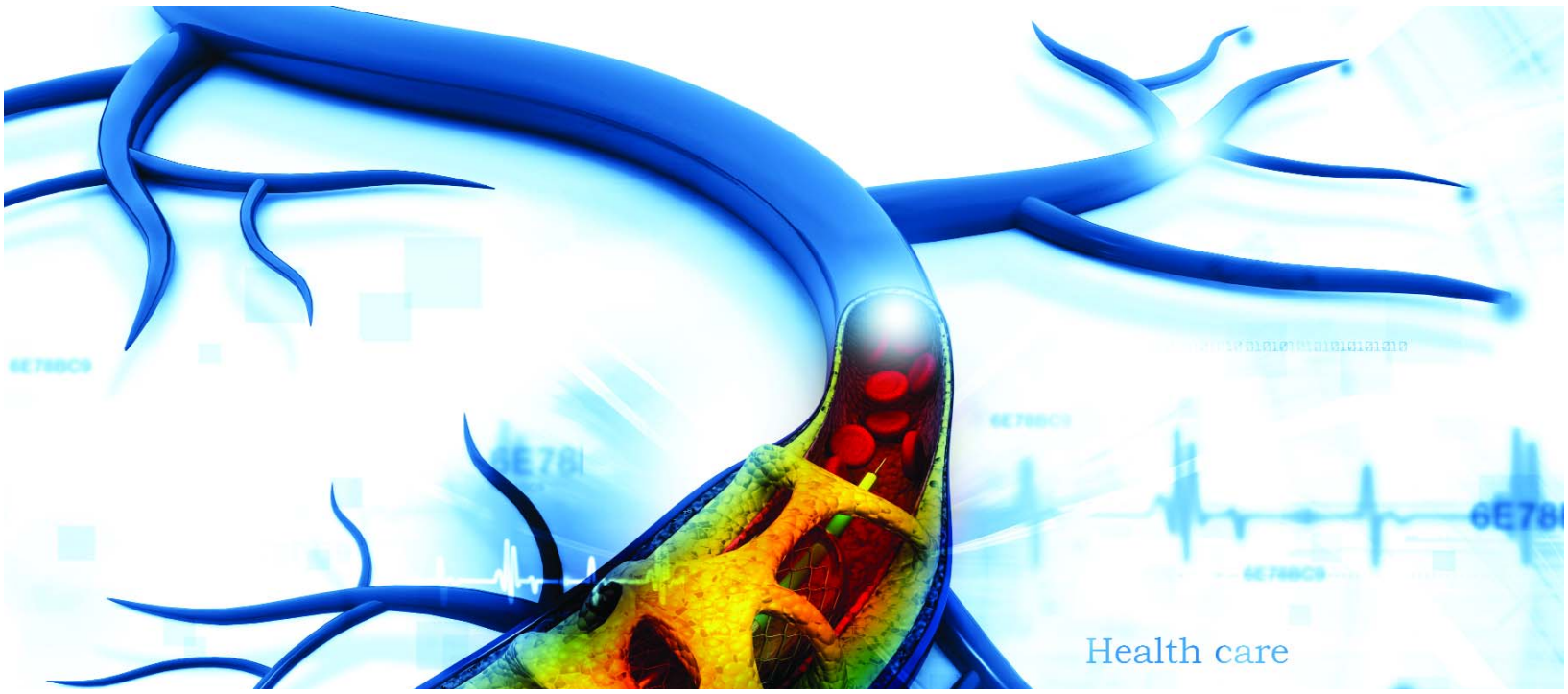
These gaps can be reduced by utilising the resources optimally by collaborative effort between the government and the private sector. It is found that nearly 50 per cent of their infrastructure is not adequately utilised by private sector. On the other hand, the public sector is always having shortage of resources equally and therefore the government can identify the unutilised resources of private sector or encourage private sector to participate in various government projects which would reduce the gap.

Unfortunately, the public sector/private sector is unable to move together due to goal differentiation. The private sector is expected to generate profit and the public sector has to work on the basis of non-profit motive. As a result, huge resources are getting wasted without being used optimally.

sanjiv.das@expressindia.com

Indian stent makers: No more on the fringes of business

In India's price sensitive market, domestic stent manufacturers have fared well and are now capturing global markets



Raelene Kambli

THE GOVERNMENT'S move to regulate stent prices in order to bring in equilibrium and ensure affordability for patients has disrupted the entire market dynamics. Multi-national stent companies which sold their products at prices ranging between Rs 75,000 and more threatened the government to withdraw their high-end stents from the market. At the same time, Indian stent manufacturers took this as an opportunity to increase market share. Two years down the line, even with the government increasing the prices by about four per cent, this move has proved to be extremely beneficial for the sector in two crucial ways— made the market more competitive with increased accessibility of high quality stents and pushed Indian manufacturers to start investing in clinical research in order to improve quality.

With this backdrop, *Express Healthcare* conducted a series of interactive video interviews with leading national and international research experts and interventional cardiologists who had gathered in Mumbai for an important cardiovascular meeting to understand this impact better. This is also part of the our new web series initiative which *Express Healthcare* will soon be launching.

The interactions were based on the latest developments in clinical research within cardiovascular sciences in India, CVD management and cardiovascular stenting..

During these discussions, experts revealed that the Indian government is preparing a blueprint to tackle CVDs-which is proving to be one of the most insidious health ailment that Indians are dealing with. Also, post NPPA's move to regulate stent prices *(Check Box 1)*, domestic stent manufacturers are no more on the fringes of the business and are finally proving their worth not only in the domestic market but the European markets too.

Latest notification on stent prices with effect from April 1, 2019

- NPPA has recently approved hike in prices of cardiac stents by 4.2 per cent in-line with the wholesale price index (WPI) of the previous calender year, as per an official statement.
- As per the new prices notified by the National Pharmaceutical Pricing Authority (NPPA), a bare metal stent (BMS) would now cost Rs 8,261, while the drug eluting stent (DES) will cost ?30,080.
- According to the NPPA, after considering the WPI at 4.26 per cent for the year 2018 over 2017, it has been decided to revise the ceiling prices of coronary stents with effect from April 1, 2019.
- The drug pricing authority had earlier revised the prices of stents in February last year. It had increased the prices of bare metal stents from Rs 7,400 to Rs 7,660. On the other hand, it had reduced the price of DES to Rs 27,890 from Rs 30,180.
- The government had for the first time cut prices of life-saving coronary stents by up to 85 per cent in February 2017.

Increased market competitiveness

Speaking of the market competitiveness, Sumit Goel, Partner-Healthcare Advisory at KPMG, informed,"In 2017, the stent market was around 9 lakh pieces with Indian stents comprising 60 per cent of the market, US MNCs 35 per cent with balance being from Chinese players and non-US MNCs. A significant shift in the market came with NPPA regulating the prices in stents in 2017, which reduced the prices by 80-85 per cent. Before the price control, MNC stents used to provide significantly higher margins to hospitals as compared to Indian stents and hence were promoted by the hospitals. However, after the price controls, the scenario changed, and Indian stents became

commercially as attractive as the MNC stents for the hospitals. With lower costs and better margins, Indian stent companies have invested in promoting their products. As a result, Indian stent companies have increasingly gained market share. In response, MNC companies have also modified their strategies. They offer a wider set of products that are used in a cardiac procedure and most of these products are not in the purview of price control. So by using a portfolio approach to sell their products, they have been able to partially offset the margin impact and promote their stents."

Similarly, Dr Nirod Kumar, Director and Piyush Kumar, Senior Consultant, Transformational Health (Healthcare) Practice, Frost & Sullivan, share, "New generation drug-eluting stent (DES) with thinner stent struts, biodegradable polymer coating, and new limus proliferative agents have improved the safety and efficacy profile over the early generation DES. Once dominated by global players, Indian stent industry now has presence of both Indian and multinational companies. The leading Indian stent manufacturers are Sahajanand Medical Technologies (SMT), Merril and Translumina, while there are many MNC stent makers like Abbott, Medtronic, Umbra Medical Products, B Braun Medical etc. They are also growing at a fast pace in the more competitive western markets. Indian stent manufacturers have fared well in this competitive market widely trusted and captured by the global players. There was a time when patients and medical fraternity did not trust stents made by Indian companies, but today, Indian stent manufactures have expanded beyond boundaries and are serving the international market as well. In the recent years, use of Indian stents has grown significantly. In 2017, the share of Indian stent manufacturers grew to 61 per cent (5.4 lakh stents) of total stent sales in India (8,92,358 stents), from 57 per cent (5.1 lakh) in 2016."

Changing mindset

While the market grew more ambitious, this move also brought the much needed mindset change within manufacturers and providers. Today, most domestic players are looking to invest in clinical research and ensure improved quality of stents. With the availability for a variety of stents in a similar price range, has also opened the minds of providers. Says Dr Antonio Colombo, Director, University of Colombo, Italy, informed, "Last few years, lot of scientific papers have come out of India to build evidence-based medicine." Refering to the recently published Talent Trail in the *Lancet*, he said that the TALENT (a study conducted by Sahajanand Medical Technologies (SMT) that compared their Supraflex stents to Abbott's Xcience) is a real life study, findings are positive because stent made in India is totally non-inferior, not marginally but clearly to the benchmark of Xience. "Now there is evidence that India can make very reliable products. Moreover, in Italy we do use Indian manufactured stents for our patients and they are really doing good." Adding his view on the Indian government's contribution in furthering more research work he stated, "The government also needs to help to conduct studies that can be sponsored by both the government and the industry."

Likewise, Dr Alexandra Azmus, interventional cardiologist, Brazil also mentioned about the Talent Trail and how Indian stents are now at par with the multinationals. He said, "Stents make it possible to treat more and more complex surgeries and avoid surgery. The recent interest of Indian companies investing in clinical research such as the Talent Trail will give confidence to providers in India and abroad to use Indian stents. This will help stent prices to be more competitive and reach more patients."

Dr Patrick Serruys, Lead researcher in the Talent Trail pointed out that Indian manufacturers have great opportunity in the European and US markets. India will certainly benefit with progress.

While international experts are very upbeat about the quality and reliability of Indian stents, Indian cardiologists are also turning their heads towards good quality Indian stents, but emphasise on the need for building more clinical evidence.

Dr Atul Abhyankar, Clinical Director for Interventional Cardiology, Mahavir Heart Institute, Surat says, "Research needs to be modified for country, important aspect is cost. We need inter-disciplinary approach towards training, meticulous data for research and evidence as well a efficient regulatory framework. India needs a system that is capable of identifying fallacies and training for scrutiny."

Interventional cardiologists, Dr Nimit Shah, Dr Sanjay Porwal and Dr Sen Devadathan also pointed out that India needs a strong clinical research regulation that can ensure quality of medcial devices for pateints. Dr Devadathan recommended, "Educate patients for stents. There is a need to project better success stories from India. When it comes to clinical research, there needs to be structural practice and a lot of investment is required both from the government and industry. Moreover, we need additional focus on encouraging education in research at medical schools."

Worry of public institutes being a dumping ground

While there are some Indian experts who have started to recommend Indian stents to their patients, there are concerns on how Indian stents are being dumped in government hospitals.

Throwing light on this aspect, Dr Tabassum Khan, Interventional Cardiologist, BSES Hospital, Aarogyanidhi Hospital, SRV Hospital, and K J Somaiya Medical College revealed that alot of Indian stents are being used under the government's national health schemes at public hospitals. She pointed out that although there is a change in mindset among doctors about Indian stents, there is still some level of skepticism that exist. Government schemes and public hospitals have therefore, become a dumping ground for Indian stents. While she clearifies that she totally believes that the new domestic stents available in the market are of high quality and she very well recommends them to even her private hospital patients.

Goel adds , "I think there are three aspects to consider – commercial reasons, quality of stents and category of stents used.Since the prices and distributor margins on stents are same for Indian and MNC stents of same category (bare metal or drug eluting stent), commercially it will not matter to the government hospitals, if Indian or an MNC stent is used. Now if the quality of Indian stents is not inferior (as the study mentioned above highlights for a particular stent), then again, use of Indian stents should also not be a concern. On the third aspect about category of stent being used – bare metal or drug eluting stent – the decision has to be driven by clinical need as assessed by the intervention cardiologist."

Expounding further and urging the industry to look at this situtation a little differently, Dr Kumar asserts, "This move is obviously in favour of ensuring care for the lower section of the society who is hitherto unable to access care in private healthcare system. This would provide a competitive boost to the care segmentation and capabilities in both the private and public care system. Over the next 2-3 years a clear view should emerge on how some of the transformative technologies and innovation are being applied in this segment. This would normalise the pricing equation with primary focus on quality and safety of these stents."

Going forward

In future, regulatory pressures on medical devices and implants and their quality will be mounting. Quality is and will continue to be a significant component for stent manufacturers, providers and patients. Both Indian and MNC companies will need to maintain highest quality and patient safety standards. Just as the Talent Trail that indicated Indian stents can be non-inferior to their competitors, there are reports that have pulled up MNC players for their non-compliance of qulaity standards. The focus in future should and will be patient safety and care.

raelene.kambli@expressindia.com

Market Attractions

Competitive advantage for domestic players: Regional production of stents helped domestic players meet the existing price caps while maintaining healthy operating margins. This has resulted in the share of domestic manufacturers to grow from 57 per cent in 2016 to 61 per cent in 2017

Entry of Chinese players: China's medical device manufacturing market is much bigger than India's. They are able to manufacture stents at a similar cost as Indian manufacturers. Until 2016, Chinese players had no presence in the Indian stent market. In 2017, they captured 1 per cent market share, with 7,656 stents in sales

Funding by PE investors in Indian market: PE investors have shown interest in investing in stent manufacturing companies due to growing sales. Companies plan to leverage such funding to start global manufacturing facilities to avail local incentives and acquire newer technologies

Reduction in usage of BMS (Bare metal stents): With significant reduction in prices of stents, the price difference between bare metal and a drug eluting stent has considerably reduced, thereby resulting in a 30 per cent reduction in the usage of BMS.

(Source: KPMG)

IUIH intends to use AI and robotics for transforming healthcare in India

AI and robotics have myriad applications and immense potential in healthcare space. Some of the ways they can be put to use include ensuring healthy lifestyle; detecting diseases at an early stage; diagnosis; decision making and treatment including end of life care; besides training

Here's a look at how AI and robotics can help modern-day healthcare ecosystems:

Healthy lifestyle: In fact, the use of AI and Internet of Medical Things (IoMT) in consumer health applications is helping people already. Lately, what we have observed is technology applications and apps are encouraging healthier behavior and are aiding in proactive management of healthy lifestyle. This puts people in control of their health and wellness. From the healthcare professional's point of view, AI enhances their ability to understand the daily patterns and needs of people. With this understanding, they are able to provide better feedback, guidance and support.

Early detection of diseases and diagnosis: In some of the leading healthcare environments across the world, AI has already been put to use to detect cancer. We all know how important it is to detect this disease in its early stage. According to the American Cancer Society, a high proportion of mammograms yield false results. Use of AI is now enabling review and translation of mammograms 30 times faster with 99% accuracy. This has brought down the need for unnecessary biopsies. Consumer wearables have proliferated rapidly, these along with other medical devices when combined with AI are being applied to oversee early-stage heart disease. This enables doctors and other caregivers to better monitor and detect potentially life-threatening episodes at earlier (more treatable) stages.

Enabling decision making and medical treatment including end of life care:
Predictive analytics can enable clinical decision-making along with prioritizing administrative tasks. Another area wherein AI is beginning to make its mark in healthcare is using pattern recognition to identify patients vulnerable of developing a condition or seeing it deteriorate further due to lifestyle, environmental, genomic, or other factors.

AI has the potential to help doctors take a more comprehensive approach for disease management, better coordinate care plans and help patients to better manage and comply with their long-term treatment programs. Besides, it's been three decades now that we have been using robots of all kinds in the healthcare domain – be it the simple laboratory robots or the highly complex surgical robots that can aid a surgeon or conduct the entire surgery all by themselves. Not just surgery, robots are used in hospitals and labs for repetitive tasks, in rehabilitation, physical therapy and in support of those with long-term ailments.

Thanks to all the advancements in healthcare, we are living longer than our previous generations. Often, old age is associated with conditions like dementia, heart failure and osteoporosis. Not to forget the loneliness. Robots are now being put to use to change the end of life care for good. They help people remain independent for longer, reducing the need for hospitalization. AI combined with the advancements in humanoid design is enabling robots to have conversations and other social interactions with people to keep aging minds sharp.

Training:
AI makes way for trainees to go through naturalistic simulations in a way that simple computer-driven algorithms cannot. With the advent of natural speech and the ability of an AI computer to draw instantly on a large database of scenarios, trainees have a lot to benefit from. The training can be done anywhere – be it the power of AI embedded on a smartphone, after a tricky case in a clinic or while travelling.

DR AJAY RAJAN GUPTA,
Managing Director & Group CEO, Indo UK Institute of Health

Artificial intelligence (AI) and robotics are getting evolved by the day to do what humans do but more efficiently, more quickly and more cost effectively. We at Indo UK Institute of Health (IUIH) are exploring tie-ups with leading medical technology companies to ensure that the best amidst the latest is put to use for the benefit of patients in India as and when our world-class hospitals and clinics are ready to serve the nation in the near future

MATTHEW LEMASONRY,
Director of Information Technology and Programme Management Office at Indo UK Institute of Health

AI and robotics have myriad applications and immense potential in healthcare space. Some of the ways they can be put to use include ensuring healthy lifestyle; detecting diseases at an early stage; diagnosis; decision making and treatment including end of life care; besides training. IUIH intends to put AI to effective use in all of these spheres

INTERVIEW

Enabling healthcare startups to grow

Siraj Dhanani, Founder CEO, InnAccel, elaborates on the changing landscape for healthcare start-ups, the novel technologies they are bringing to the market and strategies to tackle challenges of scale, in an interaction with **Prathiba Raju**

What made InnAccel, India's first medical technology incubator, to become a product innovation company? What led to this transformation?
InnAccel started with a vision of enabling medical technology innovation that effectively, and profitably, resolves the challenges in the Indian healthcare segment. We initially felt that an incubation model that provides comprehensive support to selected medtech startups, would be the right way to realise our vision. However, we saw that most startups were creating versions of existing medical devices (more affordable, portable, etc), rather than solving specific healthcare challenges from the ground up. For us, this is a fundamental different value proposition than, say, creating another patient monitoring system. In this, our thinking was shaped by the Biodesign methodology, developed and taught by Stanford University.

As a result, we started working on identifying critical unmet needs and setting up teams to create novel technologies to solve those needs. Eventually, we realised that we were much more excited to identify problems that hadn't been addressed before, and create new technologies to solve them. So, we decided to focus on in-house innovation instead of the incubation model. Today, InnAccel has a portfolio of six innovative products in three different areas that will be in the market this year- products that address gaps which result in over 700,000 deaths annually in India alone. Our long-term goal of launching 20 innovative technologies by 2025 and transforming Indian healthcare, still stands- we have just changed the model for achieving it.

> Medtech start-ups is focused on re-engineering, which is not healthy. There is a big opportunity for firms to create novel technologies and first-in-world products that specifically target Indian needs

Do you think grant funding ecosystem to start ups in India is thriving, particularly for the healthcare segment?
The grant funding ecosystem has seen tremendous improvement over the past five to six years. A large part of the credit for this goes to the Department of Biotechnology, and its funding arm, BIRAC. Under Dr Renu Swarup's leadership, BIRAC has been the leader in funding MedTech and Biotech projects, at all stages. Several projects at InnAccel have received grant funding from BIRAC. Other grant-making organisations, such as foundations, are also very active in India and funding many healthcare projects. So, the grant funding ecosystem is definitely thriving in India for the healthcare segment.

Start ups in the medical devices segment are focusing on re-engineering. Do you think it is correct or what should be the focus?
The needs and gaps in the Indian healthcare sector are so many; there is a need for all kinds of medical technology innovation. Firms focusing on re-engineering will hopefully make critical technologies more usable and affordable for the Indian setting. However, it appears to me, that the vast majority of medtech startups are focused on re-engineering, which is not healthy. There is a big opportunity for firms to create novel technologies and first-in-world products that specifically target Indian needs. As we saw earlier, there are several gaps that are seen in the Indian healthcare system- these provide the opportunity to create new technologies and products, which in some cases, may have global markets. I believe this is where the real value of indigenous innovation will be tapped, and can make India the medtech innovation hub for global emerging markets.

What are the risk factors applicable to healthcare start-ups and what kills them in few years of its existence?
Most start-ups significantly underestimate the time it takes to develop a truly market-ready product. This becomes a significant issue as the start-up requires more capital to complete development than previously estimated and can lead to a funding crunch. Another risk factor for start-ups is misunderstanding the product-market fit, especially for new, innovative, products. Too often, we believe that if a product provides a healthcare benefit, there must be a market for this. This belief is often erroneous, and a start-up should rigorously evaluate its target markets' ability and incentive to buy its product.

Few must-do things for a healthcare start up to survive, sustain and scale up?
Be conservative in your timelines, and be ready to expect significant delays. If possible, raise more capital than you think you need to develop and launch a product, things never work out the way you plan. Leverage grant funding to the maximum- there are many good sources of grant funding today, and these can supplement investor's capital during product development.

prathiba.raju@expressindia.com

HEALTHCARE@EAST
WEST BENGAL

There is a visibly renewed commitment towards providing affordable, quality service to patients, hospitals and healthcare providers in the Eastern part of the country

According to a report in The National Commission on Macroeconomics and Health, a few years ago, the Eastern region faced a serious shortage of healthcare resources. Now, things are changing for the better, especially in West Bengal. Gone are those days when a chunk of the population used to travel to the far West and South to get the best of treatment.

Committed to provide affordable, quality service to patients, hospitals and healthcare providers in West Bengal and around Kolkata have revolutionised health when it comes to provide healthcare facilities. Private healthcare players have been setting up facilities in various parts of West Bengal over the past decade to deliver world-class healthcare service to patients in this part of the country.

Even patients from Bangladesh are travelling in large numbers to the state to get the best of treatment. Therefore, in this issue of Healthcare@East, with a special focus on West Bengal, we have covered four major private healthcare providers, i.e. Apollo Gleneagles Hospitals Kolkata, Peerless Hospital, AMRI and Mercy Hospital. These are some of the set ups which have been able to bring in a revolution in healthcare in this region.

These players have been investing in West Bengal's healthcare sector and intend to do so in times to come. Moreover, with renewed focus from the government on public health and more PPPs in the health sector, the state has a road map to transform its healthcare sector.

Express Healthcare, in this Special Edition, analyses how West Bengal is emerging as a hub for healthcare in Eastern India and surrounding areas.

INTERVIEW

'We strive to transform healthcare with technology and make quality care affordable'

Rana Dasgupta, CEO, Apollo Gleneagles Hospital, Kolkata, in a exclusive interview with **Sanjiv Das,** talks about the future goals of the hospital and its initiatives to revolutionise healthcare in Eastern India

What role would Eastern India play in furthering the progress of the healthcare industry?
Healthcare sector is maturing in Eastern India both in public and private sectors to handle super speciality treatment and care like heart transplant, liver transplant, reconstructive surgeries etc so that these patients need not travel to other parts of India. The region is also playing a leading role in deceased donor transplant programme spearheaded by the efforts of the Department of Health and ROTTO. The state-of-the-art medical technology is also available now in this region.

What strategies are being adopted by your group to tap the growing opportunities in the healthcare sector?
In terms of the overall healthcare sector in India, an industry report valued the sector at around $ 100 billion in 2015 and is expected to touch $ 280 billion by 2020, at a compound annual growth rate of 22.9 per cent. Nearly 65 per cent of overall sector includes hospitals, nursing homes, diagnostics centres and pharmaceuticals.

The major drivers of healthcare growth are:
◗ Awareness and acceptability due to rapid urbanisation and consumerism
◗ Affordability coming from rising incomes and insurance coverage
◗ Access in terms of number of facilities, investment through private, PE and VC sources and Innovations – telemedicine, e-consultations etc
◗ Rise in demand through rising non-communicable diseases such as diabetes, heart disease, chronic respiratory disease and cancer and of course increasing population

> Apollo Gleneagles Hospital is thinking out of the box and coming up with path breaking innovations in clinical and technological

The life expectancy in 2014 was 66 years The target is to make it 80 by 2030
◗ To provide that through traditional healthcare delivery models we need: – additional 3.5 million hospital beds, and 2.5 doctors, five nurses per 1000 population
◗ We in turn will need more nursing and medical colleges to provide additional three million doctors and six million nurses.

Apollo Gleneagles Hospital is thinking out of the box and coming up with path breaking innovations Clinical and Technological
◗ Clinical pathways are defined treatment plans based on international standards for procedures like transplant, knee replacement which are aimed to maintain the timelines, ensure early interventions in case of deviations thereby ensuring timely discharge and good clinical outcomes.
◗ Minimally invasive techniques in cardiac surgery, orthopaedics, general surgery, ENT , oncology are ensuring reduced length of stay and early recovery .
◗ Technological innovations like robot aids surgeon to reach regions where hand cannot reach thereby reducing incision length ensuring reduced length of stay and early recovery
◗ Stringent monitoring and surveillance of infection control practices through dedicated teams leading to reduced infection rates *vis-a-vis* rational use of antibiotics.
◗ With use of interventional radiology (both technology and skill) less invasive procedures are being performed with targeted precision and equal efficacy
◗ Use of Cell Vizio and other advanced endoscopic techniques have revolutionised the treatment in gastro sciences by enabling minimally invasive biopsies and other procedures
◗ Following the tenet that prevention is not only better but cheaper preventive health packages including specialised packages like healthy heart, sugar packages, cancer screening packages have been introduced with extensive awareness campaigns and community activities.
◗ Mobile medical units for

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screening cancer in rural areas is a major project where till 3.5 lakhs people have been screened till date

◗ Genetic screening to determining malignancies with genetic predisposition like breast, colon and ovarian cancers to name a few

◗ Foetal diagnostics and counselling to determine abnormalities in the womb itself

Healthcare is increasingly moving towards a tech-driven future. How is your group investing in technology to become future-ready?

In the last five years, mobile penetration has increased by 3 per cent; smartphones by 27 per cent; Internet usage by 22 per cent, which has opened new avenues for access , prevention , monitoring and revolutionised the clinical data management process.

At Apollo Gleneagles, we strive to transform healthcare with technology and make quality care affordable. In current scenarios of highly fluid environment of both healthcare and technology, we have set our priorities on two things.

◗ Becoming Customer – Obsessed (Personalised Care)

◗ Digital Transformation and Productivity (Increasing productivity efficiently through digital transformation).

Some of our digital initiatives are:

◗ eHIS (ERP for Hospital operations which has more than 30 modules like LAB, bloodbank, emergency , WARD, doctor, OP, MRD, etc.)

◗ Pharmacy application is integrated for quick dispatch of drugs with improved accuracy along with in built protection for allergy and drug-reaction

◗ PACS – This transmits radiological images instantly which expedites diagnosis and start o treatment

◗ eDoc is the digital gateway which is being converged with Ask Apollo for netizens to avail the services through online booking

◗ CME on Cloud where continuing medical education is being conducted through digital platforms. Live workshops are done where there is a two way connection between the theatre and the conference hall. Demonstrations can be given and questions asked both ways enhancing the education and knowledge development process.

◗ Telemedicine - Further value addition to age old telemedicine through partnering with corporates and government

◗ Mobile telemedicine medical units

◗ Apollo Prism – Patient controlled E Health Record

◗ Ask Apollo – Website where patient can connect to doctor and also upload medical reports and records

◗ Apps for access of medical records

◗ Tele ECG facilities

Artificial Intelligence and Big Data – IBM Watson for Cancer second opinion and predictive analysis and collaboration with Microsoft for cardiology risk assessment to develop India-specific patterns for disease detection and cure.

What are your goals for the upcoming fiscal and what are your action plans for it?

◗ Enhancing access through digital applications

◗ Qualitative change in patient experience through a culture of excellence and ensuring personalised service

◗ Focus on digitalisation of OP and IP processes to ensure seamless patient experience and management of records and health data

◗ Management of NCDs through preventive measures such as health check ups, disease-specific diagnostic packages, awareness campaigns , in house support groups and community connect

sanjiv.das@expressindia.com

INTERVIEW

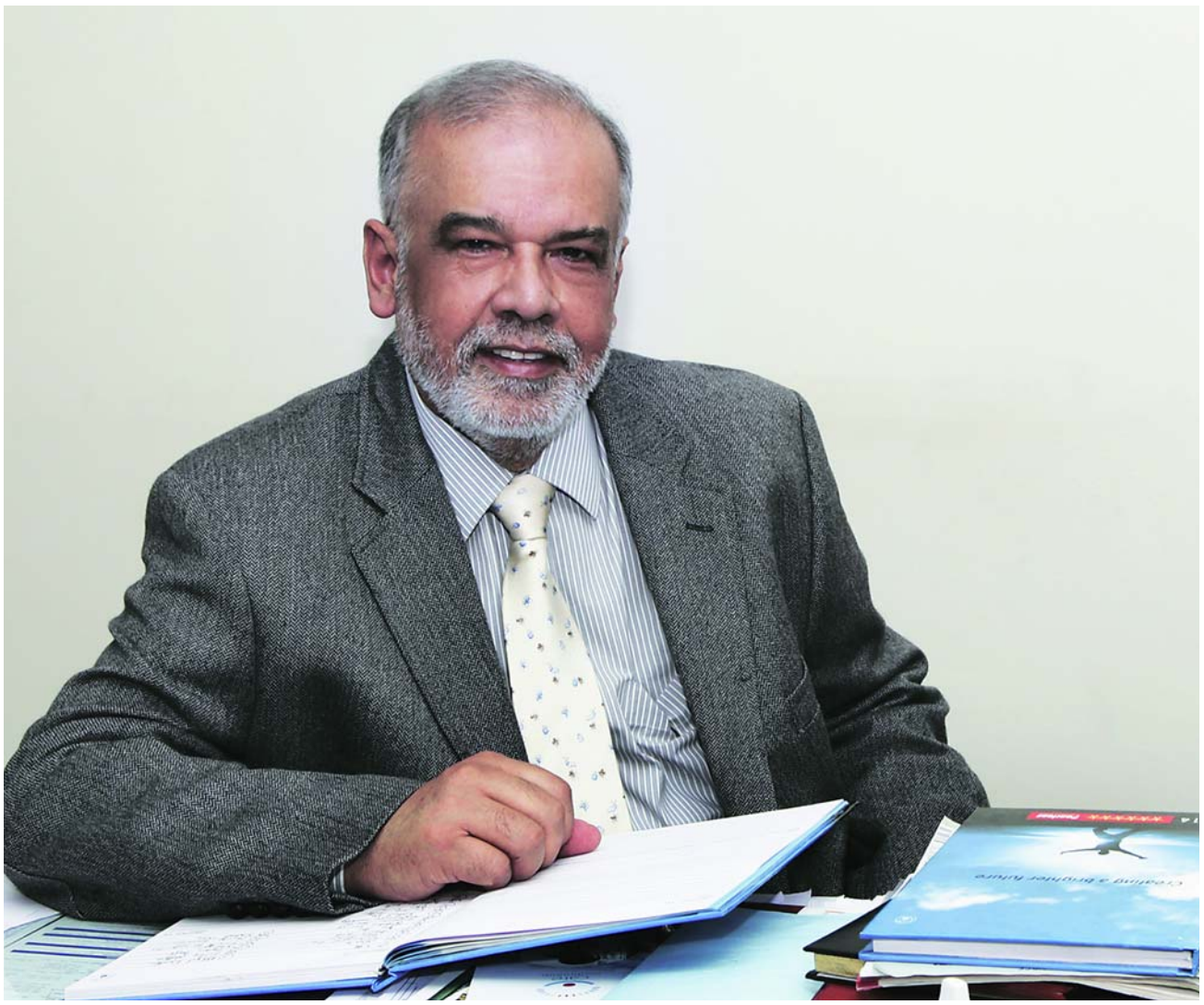
'We take a lot of pride in projecting our hospital as a highly responsible organisation'

Peerless Hospital, one of the oldest and most trusted hospitals of Eastern India, has been a major provider of tertiary care services to a large number of patients. **Dr Sujit Kar Purkayastha**, Managing Director, Consultant Gastroenterologist, Peerless Hospital And B K Roy Research Centre, in an interaction with **Sanjiv Das**, elaborates more on the group's future development plans and how it has transformed healthcare scenario in Eastern India

Tell us about the outlook for Indian healthcare industry by 2020. What learnings can India adopt from international healthcare systems?

Healthcare industry is growing at an unprecedented rate and market size has gone up to trillions of rupees. The industry is growing at a rate of about 15-16 per cent every year and is expected to sustain this pattern of growth.

It may be pertinent here to make a distinction between healthcare and healthcare industry particularly in the context of our country. International healthcare system, developed in the west, initially concentrated on improvement of basic hygiene, provision of clean water, improved sewerage system and major infrastructural developments. As a result, the disease burden in those countries became very different to ours. We have the highest number of multi-drug resistant tuberculosis, large number of cases with malaria, HIV, hepatitis B etc many of which are largely preventable. While we are still struggling with communicable diseases because of lack of basic facilities, we have also slowly



acquired health problems, traditionally considered to be the diseases of the west. In the last few years, we have witnessed some efforts from the government like Swachh Bharat Abhiyan which has been long overdue. We must concentrate on public health issues much more aggressively if we seriously wish to improve our healthcare.

There is one other issue which does not always attract much attention. We lose a lot of skilled doctors to affluent countries. This profession is highly respected in countries like the UK with opportunities for professionals to constantly update their knowledge. It also provides an ideal work life balance. In contrast, in India, medical profession is going through a turbulent period and doctors are put in a very difficult situation by emotionally overcharged public and some sections of media, which result in verbal and sometimes physical abuse. If the outcome is not what is desired, doctors are presumed guilty without proper investigation. The public do not tend to realise that doctors can not cure all illnesses and there is a distinction between error and negligence. If right working environment is created, professional honesty is encouraged and the profession is appropriately rewarded then there will be a spontaneous reversal of movement from the west to the east. It is important for the government to ensure that healthcare is delivered to the neediest at the desired level which is only possible if we have a sufficient number of trained professionals. Growth of the healthcare industry is clearly important for the economy of the country but it should be at the supporting role in provision of healthcare.

What role would eastern India play in furthering the progress of the healthcare industry?

There has been a great deal of improvement in healthcare delivery in West Bengal both in private and public sectors. Many new hospitals for acute care have been established in tier 2/3 cities. The government has opened a good number of super specialty hospitals. A few new medical colleges have started functioning. Eastern India was behind south and western part of the country in the area of organ transplantation. West Bengal has now taken a positive step in that field and both heart and liver transplantations have been performed successfully. Kidney transplantation has been going on for a long time. New cancer care hospitals have come up with all the modern technology and expertise. All these are positive developments and will most certainly be able to provide excellent services not only to the state but also to neighbouring states and countries. There are plans to open All India Institute of Medical Sciences in West Bengal and other eastern states which are bound to improve healthcare quite substantially. Healthcare industry will be well placed to grow with expansion of healthcare services.

Tell us about the strategies adopted by your group to tap the growing opportunities in the healthcare sector.

Our hospital is one of the oldest and most trusted hospitals of Eastern India. We have been providing most of the tertiary care services to a large number of patients. However, even though we have excellent diagnostic facilities for cancer detection including a digital mammography machine, we were unable to offer the full range of treatment to our patients. The group has decided to fill in that void and plans are being made to open up a fully comprehensive, state-of-the-art cancer care wing within the next two to three years. Our hospital has started kidney transplantation and we are in the process of applying for the license to perform liver transplantation. Our strategy is not only to be a service provider but also a responsible trainer of future doctors. We are associated with a prestigious and internationally reputed organisation like the Royal College of Physicians in promoting medical education. Our core functional area is to give good medical care to our users and if we can provide that with complete trust and ethics, we will consider that we have done our job well. That will give us more opportunities to grow further and in the right direction.

Healthcare is increasingly moving towards a tech-driven future. What type of investments are happening in the technology sector to become future ready?

We are living in a technology-driven world and we use some kind of technology everyday of our lives. While this has changed the world, technology needs to be used in healthcare setting more discretely and appropriately. Use of technology can be very expensive and there may be some conflicts of interest. Its improper use may adversely affect socio-economic balance of a society. In western countries, healthcare and use of technology is either free to the patient or heavily subsidised through insurance. In India, even though insurance schemes are being taken up by many, there are lots of restrictions imposed on patients. It is not difficult to buy technology but we should be more careful of its implementation and our workforce need to be trained in using them. In today's world, training is widely available and simply "on the job learning" for use of sophisticated technology may not be the right way forward.

We examine each technology as it comes, carefully and adopt them as per our need. Our latest acquisition has been PACS (Picture Archiving and Communication System) which enables to read X rays in different locations, report them quickly and allows easy access to the clinicians. It is possible to connect the system to remote satellite centres which benefits patients unable to visit the hospital. We are one of the very few hospitals in Eastern India to have acquired the digital mammogram. We all know that incidence of breast cancer in our country is rising and affecting younger women. This machine is able to detect early suspicious lesions more accurately. We have invested in a very experienced consultant breast radiologist who is spearheading our one stop breast clinic programme and is able to perform stereotactic biopsy. We have plans to complement the equipment with tomosynthesis and a very advanced ultrasound machine just for breast diseases.

In conclusion, we take a lot of pride in projecting our hospital as a highly responsible organisation which is keen to act in the best interests of our patients and not blindly follow any particular model. We are keen to mobilise perception of the society that modern treatment is very expensive and the best way forward for the masses is prevention of illness as we all know now that most of the non-communicable diseases including some cancers are preventable. The government has its role in improving public health to minimise incidence of communicable diseases. Healthcare should not be a gimmick but honest and affordable.

sanjiv.das@expressindia.com

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INSIGHT

Government schemes will go a long way to make healthcare more accessible

Rupak Barua, Group CEO, AMRI Hospitals, Kolkata and Chairman, Health Subcommittee, CII (Eastern Region), gives an insight on how proper implementation of Ayushman Bharat could have a positive impact on reducing direct payout for patients and their families

For those who have been in the healthcare industry for many years, they all must have often come across the question as to how one can make quality healthcare more accessible and affordable. A lot of formulae have been shared on various platforms but no answer has seemed satisfactory to the wider audience, or has been accepted as a manageable template.

While the public healthcare delivery system has worked on its own model for decades but has often been plagued with the weight of having to serve a country of 130 crore, private healthcare service providers have also tried to work their way around in providing the best care at acceptable rates. For the latter group, however, the fact that a large percentage of the capital expenditure gets invested into new technologies and equipment, besides as payout for quality doctors and staff, sometimes makes it difficult to keep a low price mark.

This is where ambitious schemes like Ayushman Bharat, along with others introduced by state governments, like Sishu Saathi and Swasthya Saathi in West Bengal, come into the picture. As the Ayushman Bharat policy started being implemented since September 2018, the healthcare sector in India was seeing the beginning of a paradigm shift. The health insurance launched by the government has the potential to positively affect lives of nearly 10 million families, or in other words, around 50 million poor and vulnerable people.

The ambitious scheme offers an annual health cover of Rs 5 lakh per family from economically weaker sections of society, as determined by the Socio-Economic Caste Census database. Under the scheme, enrolled families will receive cashless treatment, from more than 1,350 packages of various surgeries and procedures, including treatment for knee replacement, coronary bypass, and stent implants, at rates almost 20 per cent lower than under the Central Government Health Scheme.

A primary benefit of Ayushman Bharat is the absence of any cap on the size of the enrolled family or the age of its members, besides the added advantage that the benefits of the scheme can be accessed anywhere across the country at any healthcare service provider empanelled under the scheme. Once properly in place, the policy could bring about a sea change, ensuring smooth movement and a standardised regulation, involving the government, insurance companies and TPAs.

The scheme, however, is not without its challenges. The primary challenge here, particularly for private healthcare service providers, is the pre-determined rate of packages available under the scheme, decided by the Central government. The primary concern here is that since the private healthcare sector has much higher capital investment in manpower and infrastructure, fixed low rates, particularly for high-end surgeries and procedures will prevent them from spending more on infrastructure or getting suitably qualified doctors. A 2018 report on Ayushman Bharat, formulated jointly by CII and leading consultancy firm PWC, found that a key element in smooth implementation of the scheme will be a need for the right infrastructure.

This is where private healthcare service providers have a major role to play, given that infrastructure development will not be as easy under the government-run healthcare system. Private hospitals will have to come forward and meet demands of the increased bed capacity, along with access to better and advanced technological and technical support. While it will take some time for the policy to be implemented, almost all private healthcare service providers will have to get empanelled under the scheme because of its wide-ranging nature.

Once properly implemented, the Ayushman Bharat scheme could have a positive impact on reducing direct payout for patients. Not only will the economically vulnerable get access to health coverage, the scheme could have a positive snowballing effect, leading to better and timely treatment protocols, higher clinical excellence, and hence, higher patient satisfaction.

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Mercy Hospital: Compassion with excellence

Mercy Hospital has aligned itself with the responsibility of improving access to healthcare in India and it is in the process of making healthcare affordable

Mercy Hospital strikes a perfect balance in expanding its exemplary work in changing the healthcare industry, etched with a strong value system to serve the needy.

Since 1977, Mercy Hospital is one of the leading healthcare organisation with its presence not only in Kolkata but also in the rural areas of West Bengal. It has aligned itself in the process to spread healthcare to the remote areas of the state. The NABH-accredited organisation has a dedicated team of doctors, nurses, partners with long standing well wishers and education based institutions from across the globe.

Sanjay Prasad who is at the helm of affairs of Mercy Hospital as its President and CEO for over a decade, took up the challenge of creating a turn around by sustaining and growing the organisation. Sanjay has a Masters in Healthcare Administration and Healthcare Delivery Management from Harvard Business School.

On its journey from a small clinic to a 173-bed facility, Mercy Hospital provides a 'marked to market' price treatment model for sustainability and most importantly to serve the underprivileged of the society.

The hospital is committed to serve people with it's vision 'Compassion with Excellence,' making healthcare affordable to its patients and the innovative leadership combine to make Mercy Hospital a model healthcare network.

Set up by visionaries, Mercy Hospital over the last four decades offers a variety of services including a complete surgical facility (General surgery, orthopaedic, obstetrics, gynaecology and neuro-surgery), three critical care units (ICCU, ITU, NICU), a mother and child centre, an emergency centre followed by a medical and general centres.

Mercy Hospital not only caters to the city's population but the entire state. Patients from districts like Malda, Midnapore, Burdwan, Birbhum, Bongaon, Asansol, Purulia and North Bengal access the services of Mercy Hospital. Patients from neighbouring states like Odisha and Jharkhand and neighbouring countries like Bangladesh also visit the hospital.

Since 1979, Mercy Hospital operates a School of Nursing, which is affiliated to West Bengal Nursing Council and recognised by The Indian Nursing Council. West Bengal Government empanelled Mercy Hospital as a Class- I Medical Service Provider in the year 2011.

Mercy Hospital is Accredited by NABH and also certified by NABH Nursing Excellence.

There is a wave of opportunity in the Indian healthcare sector. Existing delivery models are being reinvented by providers to bring healthcare closer to the patient. The industry which has seen a massive growth will in the next five years grow to new heights.

Mercy Hospital is optimistic that the initiatives taken up by

Mercy Healthcare

Mission of Mercy Hospital & Research Centre

NABH Accredited

NABH Nursing Excellence

41 Years of Care | Trust 1977 - 2018

Compassion with Excellence

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- Intensive Therapy (ITU)
- Neonatal Intensive Care
- Oncology
- Ophthalmology
- Pediatrics
- Cardiology
- Cardiothoracic and Vascular Surgery
- Cardiothoracic and Vascular Surgery
- Pediatric Surgery
- Physiotherapy
- Plastic Surgery
- Psychiatry
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- Urology
- Neonatology
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- Neurology
- Neurosurgery

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the government at the Centre like National Rural Health Mission (NRHM), Rashtriya Swasthya Bima Yojana (RSBY), Ayushman Bharat and others would help in spreading basic health services to under-privileged section of the society and help in upgrading the basic healthcare and make medical services more affordable for the poor in the coming five years.

Hence, factors like these frugal innovations in healthcare technology will catalyse the growth of the healthcare sector in the coming years.

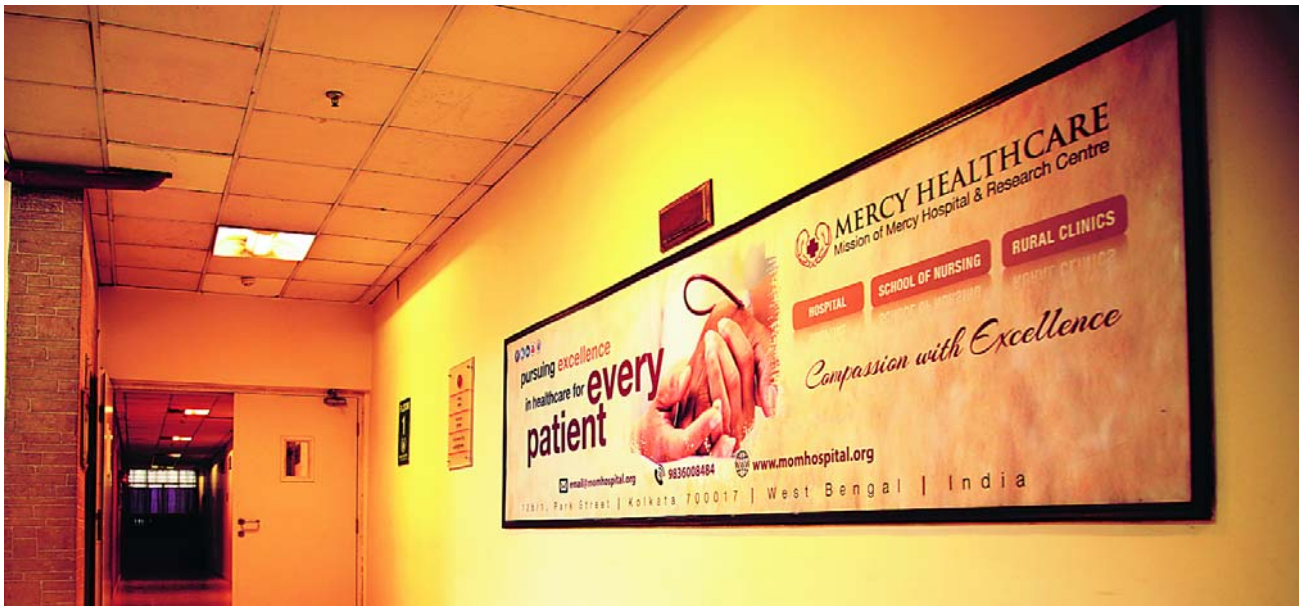
The road ahead

As India's healthcare industry continues to evolve, it is clear that opportunities exist for all be it entrepreneurs, investors and experts.

The coming years will see a great out-of-the-box thinking by the strategists in the field of healthcare, beginning with the way healthcare is delivered. To begin with, a rise in retail clinics, single speciality, secondary and tertiary care centres are seen coming to the fore.

The tier II and III cities will become attractive to the healthcare players, especially because of tax sops and increasing disposable incomes among Indian families across the country and dearth of quality healthcare infrastructure in these locations.

The shift will be towards brown fields and JVs rather than on greenfield expansions, for an easier and quick entry into the targeted locations. Technology in the last two decades has transformed the way healthcare is delivered. It will continue to play a decisive role in bringing quality in healthcare, be it better nursing communication systems, patient monitoring devices, imaging or telemedicine to provide low cost diagnosis to remote patients. Facilities like 128-slice CT Scan, MRI with in-bore experience, pneumatic chutes, PACS, automated laboratories, health related software and management tools, Android & Apple mobile apps will soon become very popular in both public and private healthcare institutions.



Serving the community

As a part of its social responsibility, Mercy Hospital has initiated 'Project Rhino' which provides disadvantaged children with basic education, nutrition and healthcare. In 2014, the initiative covered 700 children in Kolkata and its surrounding areas, in the age group of 3 to 16 years.

Mercy Hospital collaborated with Smile Train (a US-based organisation providing corrective surgery for children with cleft lip and palates), which was started in 2004 as a specialised programme. The hospital has successfully operated on over 1300 children needing a cleft lip and palate repair. The plastic surgery team has become a champion of this initiative and their commitment has transformed many a child's life. Keeping in mind the need to provide comprehensive care to these children, work in undertaken with children and their families to provide speech therapy and dental work, when necessary.

Over the years, Mercy Hospital has also provided care to children suffering with Thalassemia. Every month there are close to 125 children who are receiving consultation at the highest clinical.

Mercy Hospital has collaborated with Christian Medical College, Vellore. The hospital is successfully running the Post Graduate Diploma in Family Medicine (PGDFM) programme for doctors since 2008. The ongoing efforts has also culminated in Mercy Hospital running the Certified Course on Gestational Diabetes Mellitus (CCGDM) in collaboration with Public Health Foundation of India (PHFI) and Dr Mohan's Diabetes Education Academy.

INTERVIEW

‘Diseases can be prevented through creating and maintaining healthy ecosystems’

Grammy Award winner **Ricky Kej**, in an interview with **Akanki Sharma**, shares how music can make citizens aware about climate change, in turn leading to the prevention of diseases

When was the first time you decided to associate yourself with the cause of saving environment? Any particular incident that inspired you to be an eco-warrior?
Music and conservation have always been two pillars that dictate my life. Ever since I remember, I have been a musician. I would learn about different cultures and people through music. It was through my music that I fell in love with our natural world. I found a deep connection within music and nature, I also realised that I loved hanging around with animals and within nature than I did with humans and I would see a personality in every single animal I saw, including insects and reptiles.

After I won the Grammy Award for my album ‘Winds of Samsara’, our prime minister Narendra Modi invited my wife and me for a private meeting to his office. The meeting turned out to be an hour-long philosophical discussion. The Prime Minister knew that I was a strong conservationist and inspired me to dedicate my life and my music to the sole cause of environmental consciousness. This was the push I needed, and ever since then all of my music has been about the environment and raising awareness on climate change.

How can music help and inspire people to save environment and be more aware of health issues?
I am a very strong advocate of the Sustainable Development Goals of the UN. I have always believed that only when people start acknowledging an issue and start a dialogue to solve it, a solution will come. My aim is to inspire this dialogue through my music as music has the power to retain a message deep in the consciousness of a listener. Our audience will sing our songs, and keep humming them many times a day. One goal will catch their attention, followed by another, and another, becoming a topic for conversation that will build into a cause for action. I have performed to audiences consisting of world – leaders, decision makers and prominent dignitaries to urge them to create stronger policies to tackle environmental issues and health issues and I have performed to hundreds of thousands of the general public to raise awareness about these issues.

What preventive measures should the government and citizens take to improve and preserve the environment, so that we can prevent or lessen the disease burden?
We have to realise that we are all a part of the same ecosystem. We only get what we give and any damage that we cause to our environment by polluting our water, air, land etc. will definitely end up affecting our own health. Diseases can be prevented through creating and maintaining healthy ecosystems. We as humans only protect what we love. As an artist, I have made it my mission to make everyone fall in love with our natural world and hopefully through that love, we will find it within ourselves to clean, protect and conserve the environment. We cannot rely on others to do it for us and we have to take the necessary steps to make this happen.

Music composer, environmentalist and professor – how do you manage all the three roles?
The titles of these roles might be different but they are all interlinked and serve the same purpose. I have dedicated my life and my music towards various causes. I do all I can to create awareness about environment and positive social impact through my music. If we are speaking about creating a more environmentally-conscious society, then we need to start with the children and hence, I also focus my messages to the younger generation. Through this, I hope to inspire them to follow their passion and to make a positive difference to our planet no matter what career they choose.

Conferred with the title ‘Youth Icon of India’, what is

your message for the youngsters of India? How can they help in making the environment healthier and safer?
India has over 600 million people under the age of 25 and population of youngsters in India is higher than anywhere else in the world. Youngsters today are more in tune with environment and are aware of the effects of global warming. They are more technologically connected than any of the previous generations. They have to understand that sustainability and development can go hand in hand. They have to make better choices in their lives with the products they consume and the resources they utilise. I urge them to come up with better alternatives to fossil fuels, to plastic, to environmental degradation, to marine and air pollution etc. We need greener technology to sustain our planet and I believe the youngsters of our country can lead the way. The future of India and our planet is in their hands.

Last year, you were appointed as UNICEF's celebrity supporter for Andhra Pradesh, Karnataka, and Telangana. In line with this, what have been your roles and responsibilities?
With my role as an official celebrity supporter for UNICEF for Andhra Pradesh, Karnataka and Telangana, I hope to uphold the vision and values which guide UNICEF's work for children, by being their representative, interacting with policymakers and high-level government officials, participating in conferences, summits, advocacy and other such events. Also, I wish to creatively and artistically communicate data and key messages to the relevant authorities/ governments and general public so that it will be understood and retained in their consciousness rather than it just being an academic information. And also make known the exemplary work done by UNICEF in these states and India in general. Through this communication, I hope to inspire my audience and fans to move to action - for realising our common vision towards ensuring every child is in school, safe from harm and be able to fulfil their potential.

Have you worked with state governments? If yes, what all projects have you worked on?
I have worked with multiple state governments. For eg, I worked with the Government of Andhra Pradesh to promote 'Zero Budget Natural Farming' by making several trips to the remotest parts of the state to observe and learn first-hand from the tribal farmers about the Zero Budget Natural Farming (ZBNF) technique being followed there. This technique does not use any pesticides or chemicals, and is 100 per cent natural. I noticed the massive difference that this technique is making to the lives of the natives. I tasted the freshest produce. I also musically collaborated with the tribal farmers to create a music video called *One with Earth* to showcase this technique to the world. I launched this song along with the chief minister of Andhra Pradesh, Chandrababu Naidu, at the UN Headquarters in New York. I was recently invited back to the state to address a gathering of over 9,500 farmers.

Recently, I completed work on an original score for India's first blue-chip natural history film called *Wild Karnataka* that was made by some of India's finest film makers and is narrated by the legendary Sir David Attenborough. This film is presented by the Karnataka Forest Department. Just last month, I went to Australia as a part of a delegation for the Australia – India Youth Dialogue to foster better relations between our two countries. I am always collaborating with various government bodies within India and in other countries as well. It's absolutely necessary because governments represent the people. They have the power to make a massive difference in our lives.

akanki.sharma@expressindia.com

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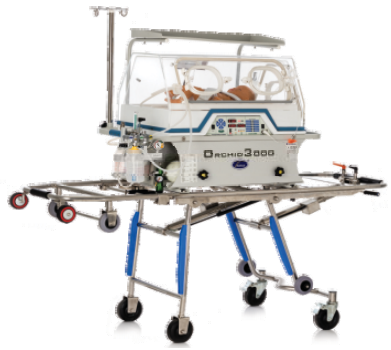
nice 3010 H

Infant Incubator

nice 5000 RP

Infant Radiant Warmer



nice 3000

Infant Transport Incubator

nice 4000 LED

High Bright LED Phototerapy

High Flow Oxygen Therapy

Types Of Cannulas

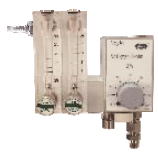
Hiflex Cannula for ventilator breathing Circuits

Maxflow Nasal Cannula For High flow Breathing Circuit (BC 580)

Types Of Air Oxygen Blender

OPTION –1
nice 5005 - 15 LPM

OPTION –2
nice 5010 - 30 LPM



OPTION –3
nice 5010 - 60 LPM

(nice 8050 & nice 5010 / nice 5005)

Looking for National & International strategic partnership!

M/s. **nice Neotech Medical Systems Pvt. Ltd.**, was established in the year 1997. **'nice'** stands for **'Neonatal Intensive Care Equipment'** which aptly amplifies the objectives of the organization.

nice Neotech design the product as per world standard which symbolizes excellence in form, function, quality, safety, sustainability and innovation, and communicate that the product is usable, durable, aesthetically, appealing and socially responsible & most user-friendly.

Our product range include Infant Incubator, Infant Transport Incubator, Infant Radiant Warmer with T – Piece Resuscitator & Infant Phototherapy, Infant Radiant Warmer, Infant CFL Phototherapy, Infant LED Phototherapy, Bubble CPAP System, Heated(Respiratory) Humidifier, Infant T – Piece Resuscitator, Infant/Neonatal Fiber Optic Transilluminator, Oxygen Analyser, Infant/Neonatal Respiration Monitor, Infant Observation Trolley, Infant Weighing Scale, Oxygen Hood, Air Oxygen Blender, Medical Air Compressor, Reusable/ Disposable Breathing Chamber, Reusable/Disposable Breathing Circuit, Nasal Mask, Nasal Prongs, Head Bonnet, and Eye Mask etc.

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Changing the future of respiratory patient care

John Power, CEO and Founder, Aerogen shares insights with **Prathiba Raju** about the respiratory medicine market in India and how Aerogen products are making a difference in the Indian market

How do you intend to change the future of respiratory patient care? How does your product profile compliment Indian conditions?
India has 18 per cent of the world's population but 32 per cent of the global burden of respiratory disease. This is the second highest cause of death in India in 2017. Till date, over seven million acute care patients around the globe have benefitted from treatment utilising Aerogen products. Our ambition is to bring this benefit to more patients in India.

How has the Aerogen's aerosol drug delivery technology transformed the emergency medicine in hospitals, worldwide and particularly in India?
I would like to refer to a recent study conducted in St John Hospital and Medical Centre, Detroit, where it showcased that by using Aerogen nebuliser, there was 32 per cent reduction in hospital admissions and a 75 per cent reduction in required medication when compared to a standard jet nebuliser. This data extolls the benefits of Aerogen Ultra, a new product which helps in treating ER patients faster and more effectively.

As per the US-based 'Transparency Market Research', India's nebuliser market is to reach Rs 4,703.4 million in 2023 from Rs 575.6 million in 2014. Amidst this, what opportunities are you looking at for Aerogen? Currently, where does the company stand in the market? What scope do you see for your company in the nebuliser market of India?

Aerogen aerosol drug delivery technology is clearly differentiated from the traditional nebulisers that are in used in many hospitals. Multiple clinical and scientific studies clearly demonstrate that Aerogen is more effective at delivering treatment to patients through greater deposition in the lung that the current nebulisers used in the treatment of patients with respiratory disease. Patient's outcomes are better. The use of Aerogen can result in reducing the need for escalation in care in specific instances and getting patients home faster. It is Aerogen's patented Vibronic technology that allows the aerosolised drug to be so impactful.

> Our team is focussing on specific market segments, initially to ensure that we are meeting our customers' demand for clinically superior products

As Aerogen meets our customers' demand for clinically superior products that provide a clear economic argument for hospital buyers combined with a better experience for our patients, we believe that we will have significant growth and market penetration in the next five years.

Our team is focussing on specific market segments, initially to ensure that we are meeting our customers' demand for clinically superior products that provide a clear economic argument for hospital buyers combined with a better experience for our patients. As we increase our market penetration, we will be seeking to increase our investment in the marketplace.

What is vibronic technology and how does it help in the drug delivery system?
Aerogen's patented vibrating mesh technology turns liquid medication into a fine particle mist and gently and effectively delivers drugs to the lungs of patients, enhancing outcomes and giving healthcare professionals a higher level of confidence and control.

How much importance is given to R&D by Aerogen and how many new projects are currently underway?
Aerogen invests a vast majority of profits back into Research & Development, as we want to continue to drive technological advancement across all areas of acute care aerosol drug delivery. R&D helps us to have the market leadership position and invest in the development of new ground-breaking technologies.

Can you give us an update on the two products that you were working on? What are those two drugs for and its current status? When will it be out in the market globally?
Aerogen's sister company Aerogen Pharms is also a part of the Stamford Devices Limited Group. The group is intensively investing in the development of a "super-generic" device drug combination. The device is based on the Aerogen's Vibronics technology. One of the drugs under development will be used in the treatment of Neonatal Respiratory Distress Syndrome. If successful, Aerogen will revolutionise Surfactant Replacement Therapy. The projected market launch is 2022.

In what ways has collaboration with Singapore-based Temasek Investment benefited Aerogen?
Temasek, a global investment company headquartered in Singapore, has acquired a minority stake in Aerogen. We are excited to realise the growth opportunities this collaboration will bring. Temasek, our partner of choice, has deep global and sector expertise. It is with this that we will together accelerate our market penetration. With Aerogen's technology already in use in over 75 countries, the partnership of a developmental and commercial stage medtech and pharma companies, will be significant in accelerating the company's ambition to be the standard of care for acute care aerosol drug delivery and, in the launch of the drug device solution in development by Aerogen Pharma (subsidiary).

prathiba.raju@expressindia.com

Value beyond pricing

Association of Healthcare Providers India (AHPI) recently signed a Value Procurement Organisation (VPO) deal with Medikabazaar, a B2B online platform for medical supplies and equipment. The key objective of the agreement is to standardise the medical amenities across all AHPI hospitals

The 2500 hospitals under AHPI will have professionally managed, centralised, cost-effective procurement of medical devices and utilities from hundred's of suppliers, manufacturers and distributors from multiple brands, all under one roof with this partnership.

Speaking about the partnership, Dr Girdhar Gyaani, Director, AHPI said, "It is important for hospitals and medical facilities to focus on their core duty, which is treating patients and saving lives. The partnership helps as Medikabazaar will be taking care of the procurement needs of the hospitals. The hospitals are able to focus on their core duty of patient care. We also envisage significant savings for all our member hospitals, which in turn will lead to lower cost to patients.Our main aim of signing the VPO is to bring in economies of scale and better management of resources."

Medikabazaar which sells products in the form needle, glove to ventilator, CT & MRI with different categories with this VPO is expected to bring savings of upto 30 per cent or more for hospitals. The VPO agreement, will empower hospitals to provide better medical services to the patients, across the network while still keeping economies of scale. The partnership will benefit AHPI member hospitals with various value-added services from Medikabazaar - warranty service, same day delivery, flexi finance options, artificial intelligence-based inventory prediction software tools, tier II and III cities coverage, warehouse support and inventory management.

Talking about the partnership, Vivek Tiwari, CEO, Medikabazaar said, "We are addressing a major challenge of hospitals having to deal with hundreds of vendors and will function as a single point contact for them. Being an aggregator, it will also help decrease the value loss happening in the form of inefficiencies in procurement and additional margins that come into play when purchasing from different vendors. This will bring immense value for AHPI members by improving the bottom line, and ensuring the cost efficiency required to meet Ayushman Bharat's low reimbursements. While hospitals take care of patients health, Medikabazaar will take care of hospital's health."

He also added that through this partnership, MedikaBazaar looks at an immediate opportunity of business worth Rs 1000 crore pan India with AHPI. This will have a savings for AHPI members in the range of Rs 150 to 300 crores per year.

Philips India expands portfolio in ultrasound

EPIQ Elite offers a range of diagnostic ultrasound solutions tailored to the needs of specific medical specialties, including Philips' first solution for vascular assessment and diagnosis

ENHANCING CLINICAL performance and patient experience, Royal Philips, a global leader in health technology announced the launch of the EPIQ Elite ultrasound system, a new premium ultrasound that combines the latest advances in transducer innovation.

EPIQ Elite offers a range of diagnostic ultrasound solutions tailored to the needs of specific medical specialties, including Philips' first solution for vascular assessment and diagnosis. In addition, EPIQ Elite for Obstetrics & Gynecology delivers extraordinary image quality and lifelike 3D scans to provide advanced fetal assessment during all stages of pregnancy. The ultrasound features an exceptionally high level of clinical performance, workflow and advanced intelligence optimised for the most demanding clinical situations.

Commenting on this innovative technology, Dr Nidhi Bhatnagar, HOD Radiology, Mata Chanan Devi Hospital, said, "The features in EPIQ Elite like FlexVue and MircoFlow imaging will give excellent results to the end users."

Adding to Dr Bhatnagar, Dr TSH Bedi, Director, Bedi Ultrasound, commented, "The New Epiq Elite has a High Resolution HD Max screen which will bring excellent resolution. The new probes XL14-3,mC7-2,eL18-4 will take ultrasound to the next level of clarity. The C (Coronal) axis on real-time scan is amazing; there is no drop of frame rate and resolution."

Through this technology, Philips expects to equip clinicians with detailed information thereby resulting in diagnosis that is more confident. The advanced system combines new display technology (24inch HD Max monitor – 40 per cent brighter than OLED technology) and innovative transducers (XL14-3, V9-2, L12-3 Ergo and mC7-2), enabling accurate outcomes as well as enhancing overall patient's experience. Harnessing the power of advanced technologies with tailored clinical tools, the Elite delivers ultimate ultrasound solutions across clinical applications, especially for liver, breast, small parts and vascular assessments.

With imaging playing an important role within the care delivery spectrum, Philips' latest integrated solutions across MRI, CT and ultrasound are built to enable radiologists in India to transform overall patient experience through faster and more accurate diagnosis.

This new portfolio helps in obstetrics and gynaecology by providing lifelike 3D scans which offer improved detection of birth defects and potential complications during all stages of pregnancy.

The ergonomic, lightweight V9-2 transducer is the first high-frequency PureWave transducer focussed on getting fine detailed images as early as possible to help clinicians easily perform confident assessments of foetal health.

The xMATRIX linear transducer by Philips helps to produce 3D images of patient's vasculature, which allows clinicians to see into a vessel to evaluate plaque location and composition as well as flow data to assess stenotic conditions. The system also allows clinicians to acquire two planes simultaneously, which the company said improves accuracy and can reduce exam time by 20 per cent.

Philips is a leader in ultrasound solutions with a large global installed base and strong record of accomplishment of industry-first innovations. The company's ultrasound portfolio supports the effective and efficient delivery of care across a broad range of clinical specialties including radiology, cardiology, point-of-care and OB/GYN.

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Note: Candidates working in any part of the world can join these Programmes and get formal diploma while working.

Application form and admission: Candidates are required to apply online through the E-application process only, website: www.tiss.edu. The application fees is **Rs. 1,030/-** for online transfer. Please refer application form for payment details. The last date of receiving application is for **EPGDHA, May 31, 2019** and **PGDHQM, June 28, 2019.** Admission will be based on the interview at TISS, Mumbai.

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