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Radiology Special

What keeps women representation low in radiology?

THE COMING OF A PLATFORM REVOLUTION

The healthcare delivery systems of today will increasingly leverage the platform and resources that they have to become a hub for both health and healthcare in the future

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THE COMING OF A PLATFORM REVOLUTION

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AES strikes again

For the past decade, districts in Bihar have seen outbreaks of Acute Encephalitis Syndrome (AES) during the peak summer months. Inspite of this history and almost a year since the roll out of Ayushman Bharat, this year was no different.

The toll had passed 130 by end-June and is likely to increase, even as health officials play the blame game.

State health authorities blamed parents for allowing their hungry children to overeat Bihar's famed Muzaffarpur lychees. The children were severely malnourished and should have been part of the state's nutrition schemes. But, even those children part of the midday meal scheme were getting only part of the meals.

The centre stepped in with Union Health Minister Harsh Vardhan dispatching five teams of senior paediatricians and paramedics to Muzaffarpur.

But how does one attract permanent medical and para medical staff to these areas? In some cases, air conditioned ICUs, vital for treating AES, could not be used as some primary and community health centres lacked competent staff.

Poor sanitation and severe poverty round off the dismal picture. It seems certain that Bihar will be re-visited by AES next summer too.

That is, unless the budget can incentivise states like Bihar to drastically improve its health indicators. The recently released Health Index 2018 is a sorry report card of how states have fared on selected health indicators. The Niti Aayog hopes that the 'Healthy States, Progressive India' report 'will propel states towards undertaking multi-pronged interventions that will bring out the much-desired optimal population health outcomes'.

Among the 21 larger states, Kerala tops the rankings, while Bihar is 19th, with Uttar Pradesh last. But even Kerala cannot get complacent: it is one of six larger states to show a decline in performance from base year (2014-15) to reference year (2015-16). It is understandable that states with high ranks will show less incremental improvement. In fact, maintaining their ranks itself is a tall order.

The June 2019 Health index is the second edition and it is already evident that the index is flawed and does not reflect the individual needs or scenarios of states. Is it fair to compare Kerala with a population of 35 million, with UP which has a population of 200 million? This is not to excuse the poor performance of UP on the NITI Aayog Health Index, but just to put the size of UP's problems into perspective. We need a different approach for larger states. What's works in Kerala may not work in UP.

The Niti Aayog itself admits that the 'learnings that have emerged during the process of development of the Health Index, will guide in refining the Index for the coming year and also address some of the limitations.'

But states had better heed the health index and its rankings. The Ministry of Health & Family Welfare is linking the Index to incentives under the National Health Mission. States showing a potential to improve will presumably get more funding. And specific interventions showing promise will get additional focus.

But the major flaw of the Health Index is the lack of health data systems and without good data, all conclusions could be shaky. Thus, it is even more important the Finance Minister Nirmala Sitharaman hikes health's share of the budget allocations. India's health spending is an abysmal 1.15 per cent of GDP which needs to be increased to at least 2.5 per cent of GDP. If not, we will fall short of the UN's sustainable development goals. Universal Health Coverage will also remain a distant reality.

The Niti Aayog recognises that besides the health ministry, health outcomes are impacted by the private sector and other sectors. For instance, the availability of affordable and quality medical technology. India has been a net importer of medical devices; upto 80 per cent according to some reports. Post GST, medical device imports have reportedly become 11 per cent cheaper. Domestic MSME med-device manufacturers have warned that imports are up 24 per cent, from Rs 31386 crore in 2017-2018 to Rs 38,837 crore in 2018-2019.

Medical technology and devices is one of key target areas of US firms. According to a report of the US Department of Commerce, the expansion of India's super-specialty hospital chains, both in the private as well as government sectors, is an opportunity for overseas organisations to set up hospitals in India through the foreign direct investment. This is besides exporting high-end medical equipment like operation theatre products and training through simulation labs. Midst the US-China trade war, can Prime Minister Modi leverage this interest to infuse better health systems in the areas which need them most? After all, he has won his second term and can take tough decisions. While US President Trump has a year and a half to his poll test. It could be the best opportunity to arrive at a more equal win-win situation for both countries.

VIVEKA ROYCHOWDHURY *Editor*
viveka.r@expressindia.com

> Unless the upcoming Union Budget incentivises states like Bihar to drastically improve its health indicators, it is fairly certain that outbreaks such as AES will become a regular occurrence

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 at Radisson Blu Airport, 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

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

strategies. 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 business processes 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 health-

care 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.

EH News Bureau

2nd edition of Radiology and Imaging Conclave to be held in New Delhi from July 12-13, 2019

The theme of Radiology and Imaging Conclave 2019 will be Radiology 2024

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 theme of Radiology and Imaging Conclave 2019 will be Radiology 2024, that delves into understanding 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.

Key topics that will be discussed are

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AI, CDS, women in radiology - entrepreneurship and leadership, devices as drugs - the fallout (good or bad) of radiology equipment coming under CDSCO, sustainability with responsibility, life cycle management of equipment, bare minimum practice takeaways (CDs, films, etc), Indian moonshots in radiology and what ails radiology education?

Visitor profiles include: Radiologists, Radiology centre owner, Promoters of imaging diagnostic centres and HOD of radiology dept in Hospitals and Medical colleges.

8th International Patient Safety Conference 2019 to be held in Hyderabad

The conference will address critical issues in patient safety that will be highlighted by relevant experts from across the world

THE 8TH International Patient Safety Conference 2019 will be held in Hyderabad on September 13 and 14, 2019. The conference to be organised by Apollo Hospitals will be based on the theme 'Imagine, Innovate, Inspire.' This edition of the conference will address critical issues in patient safety that will be highlighted by relevant experts from across the world.

The main objective of this conference is to discuss how proactive practices and streamlined systems can improve patient safety. The multidisciplinary, invigorating learning sessions will involve participants from all areas of the healthcare continuum, including clinical and administrative leaders, practitioner, healthcare academics, regulators and care givers.

The conference will see around 200 speakers and 2500 delegates participating from 30 countries with 27 breakout sessions, five pre-conference webinars and eight pre-conference workshops. A pre-conference

workshop will be conducted on September 12, 2019.

The conference is also inviting entries for the International Patient Safety Awards. The awards are open to all hospitals, medical devices/ technology companies, diagnostic centres/chains, health insurance companies, NGO's, healthcare start-up's, and other healthcare service providers.

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CONTACT US FOR MORE INFORMATION: Rajesh Bhatkal - +919821313017, rajesh.bhatkal@expressindia.com

FOR SPONSORSHIP & EXHIBITION BOOTH
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
HYDERABAD: E Mujahid - +919849039936, e.mujahid@expressindia.com
KOLKATA: Debnarayan Dutta - +919051150480, debnarayan.dutta@expressindia.com, Ajanta Sen Gupta - +919831182580, ajanta.sengupta@expressindia.com
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
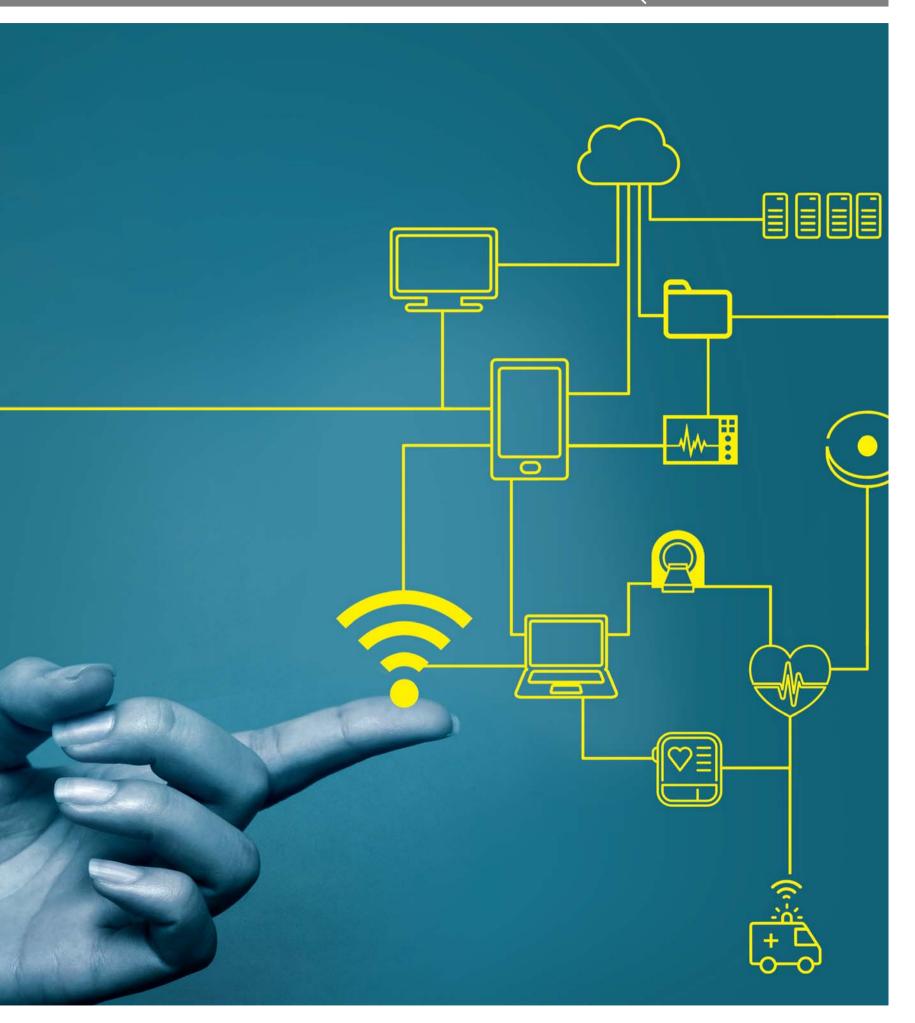
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THE COMING OF A PLATFORM REVOLUTION

The healthcare delivery systems of today will increasingly leverage the platform and resources that they have to become a hub for both health and healthcare in the future

By Raelene Kambli

In November 2018, Forbes published their annual study on the world's most valuable brands. Coming as no surprise, Apple topped the list of branding behemoth for the eighth time, gathering an eye-watering brand value of $182.8 billion—up by 8 per cent from the previous year—followed by Google at $132.1 billion, Microsoft at $104.9 billion, Facebook at $94.8 billion and Amazon at $70.9 billion.

So what's the trump card that allows these tech giants to have such an authoritative presence in the mind of the modern consumer?

Is it because of the perceived value, the high quality products, the fantastic services and more that these companies offer?

Yes, all these factors contribute to their riding success but there is certainly something more to it.

It is called the Platform.
Take Apple for example. Apple's platform has been one of the biggest factor fueling a faster rate of revenue growth for the company than all of its hardware segments combined. Its platform connects the iOS ecosystem to various devices and aims to create the best platform experience for its customers. So each new Apple product you buy improves the experience on all the other Apple products you already own – particularly the iPhone.

For instance, both the iPad and the MacBook get even better connected if you already have an iPhone, since the iOS platform connects these three devices and you get the ability to sync texts and send photos across the devices.

Likewise, companies such as Google, Amazon and Facebook too leverage the new tech paradigm and earn ginormous value through their respective platforms. These tech companies use their platforms to not only dominate the market share for their businesses, but their platforms also gives a new

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> From the patient's perspective, they will get a menu of offerings and options which they can study, understand and then select— making them participate in their own healthcare choices
>
> **Joy Chakraborty**
> COO, P D Hinduja Hospital

> There should be a lot more focus on outside in customer thinking and customer journey workshops in order to derive key pain areas of customers so that the same can be effectively addressed
>
> **Sumit Puri**
> CIO, Max Healthcare

> Overall success of the healthcare platform is to be measured by the value of investment not by the return on the investment. Hence the investment needs to be based on the value that the business is trying to get from the platform, which is not only the topline, EBITDA but customer experience, efficiency, turnaround time and productivity
>
> **Niranjan Ramakrishnan**
> CHCIO Vice President Digital, Leixir

> The Hospital platform element is the exposure of its customer facing components/social graph to external applications which enables a different set of use cases. Customer centric focus needs to be considered now
>
> **Girish Kulkarni**
> Principal IT Consultant, SVP Hospitals

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competitive advantage- a strong reason to build perceived value and boost the immense brand loyalty that drives their success stories.

Today, buoyed by the success of Apple, Amazon, Google and Facebook, thousands of companies of all sizes across industries and around the globe are rethinking their business models. Leveraging the tech paradigms, they are creating vibrant ecosystems and, in the process, reap big rewards.

Now, one might wonder what has these tech giant's platform business models got to do with healthcare companies?

Well, the answer lies in the need for healthcare companies to build brands that can create such perceived value, win patient trust and earn long lasting brand value using digital platforms. Wondering why? We spoke to some healthcare technology and business experts who tell us how companies, especially hospitals, can take advantage of the platform and resources that they have to become a hub for both health and healthcare in the future.

Moving from product strategy to platform strategy
Today, the Indian healthcare sector is at the cusp of a digital revolution. Technology has already touched every aspect of healthcare delivery, therefore, experts feel the need for healthcare organisations to move from being just a healthcare provider to creating a platform for health and healthcare in their community.

On the global front, healthcare companies are already moving from a traditional concept of buying, building hospitals and simply providing care to newer dynamic strategies that focus on leveraging the platform they have in place to create more value and growth via more profitable streams of revenue.For instance, Mayo Clinic is already operating as a platform today. Their

platform includes leveraging research, big data, expert clinic insights and artificial intelligence to create new value for Mayo's clinical practice as well as new opportunities for Mayo's partners.

Seeing that the platform can be a great business enabler in healthcare, Amazon teamed up with Berkshire Hathaway and JP Morgan and Chase to build its own healthcare entity. In addition to the venture, Amazon also has designs on companies already in the space. It acquired an online pharmacy Pill Pack for just under $1 billion, according to US new reports. Then, Amazon announced a slew of HIPAA-eligible services, including a machine learning tool for healthcare developers. These moves clearly indicate that Amazon won't leave an opportunity untapped.
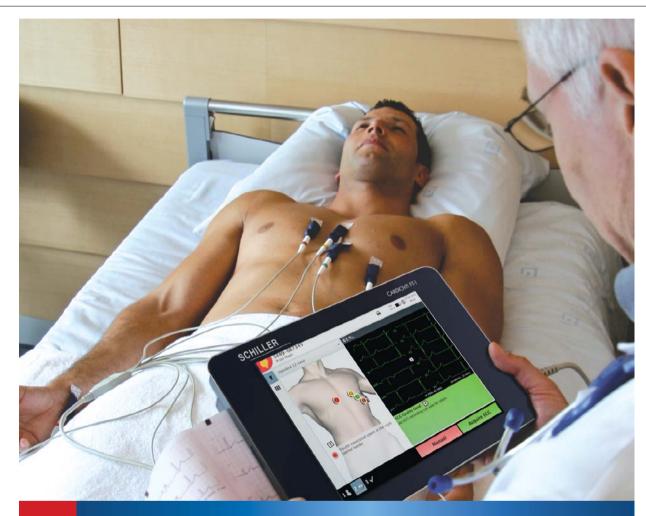
Experts feel that from a company's profitability outlook, there seems to be an enormous upside to those companies who understand this pivot and take advantage of such market changes.

This is one reason why Indian healthcare companies, especially hospitals, need to think beyond a product or service strategy of business to a platform strategy.

Given that the healthcare sector in India is said to be one of the largest employers in the country, there are immense opportunities for companies in this space to become a hub. As per experts, healthcare providers in the past have leveraged that position to simply care for the sick. They are expected to become healthcare hubs for innovation and build new companies to bring the community together. These companies will then tackle large public health issues, strengthen education and training, encourage research and development partnerships, build support groups for specific chronic conditions, create communities for digital and virtual care, and for thoughtful and effective

support for mental and behavioural health.

Opines Joy Chakraborty, COO, P D Hinduja Hospital, "The healthcare ecosystem in India is already a milieu of intertwining facets of technology along with physical and biological aspects of patients, providers and caregivers relying on networks and technologies to carry out and sustain various activities. Therefore, a platform solution is just the next level in this integrated healthcare world wherein the service or healthcare provider can provide comprehensive services on a new interface."

Similarly, Sumit Puri, CIO, Max Healthcare, says, "It's a great strategy and will help the service provider from moving up the value chain and creating a holistic and comprehensive solution for its customers. However, core strengths and current

capabilities of the service provider need to be assessed carefully before moving in this direction. A realistic assessment should entail understanding whether the service provider has the ability to constantly innovate and create newer sources of value for its customers through its healthcare platform. Nevertheless, the benefits are clearly higher stickability and customer retention by providing enhanced customer value which would translate into higher business revenue and growth."

Explaining the difference between this new approach and traditional business models,Girish Kulkarni or GK as he is know with his colleagues - peers - friends, The Principal Consultant - IT, AICPL TM & SVP Hospital, describes, "Product by its mere core competency is all set to solve a set of problems for the intended user, by its unique design and delivery of its features where as a platform can be visualised to leverage multiple set of such-similar products in the ecosystem to aggregate the ability across multiple products and solution sets. Platform what we talk about is set to leverage the existing product lines within its eco-space as well as across such similar products in an enterprise environment. Now to talk about its relevance in healthcare, especially in provider space / hospitals, there is a strong mix of unique products and its services being offered by multiple products and more so from multiple vendors. If platform can be envisaged in this context to leverage each of its product capability without duplication of opponents/design etc, there comes the slogan 'Economy of Scale'.

"Healthcare platform can also be considered as a business framework. By this I mean a framework that allows multiple business models to be built and supported. Examples of HMIS-Patient centric application and its ex-

PRODUCT STRATEGY V/S PLATFORM STRATEGY (COURTESY JOY CHAKRABORTY)

- While a product or service strategy designs for the consumers, the platform is designed keeping both producers and consumers in mind.
- Platform creates an ecosystem value through the interactions between users and third parties, whereas Products create customer value by charging for certain features or items based on customer needs.
- The cost of any product or service is borne by the one who consumes it, whereas on a platform a transaction is done based on usage and may incentivise the producer for participation or monetise consumer attention.
- While product or services have 2 main role players – Producers and Consumers; platforms have 2 role players: Owners who control the intellectual property; Providers who interface with users of the platform; Producers who create offerings and consumers who use these offerings.

tended design on Patient Portal, Mobile app as one side of a triangle, where as organisation wide ERP applications such as SAP / Oracle etc towards asset / resource specific ERP's. Thirdly in the context of connected world, there would be third party - online applications / vendors on a different business models for its optimised use (Such as Travel, Hospitality related applications). When you design a platform for your organisation , if we can identify the common objective / design components across which one can utilise common API's as an example), there could be huge transformational shift for value optimisation as an organisation", he asserts.

What's happening in India
While experts endorse for a platform model, there are some healthcare companies which have already set on this path to create such platforms. Companies such as Cure.fit, Portea, Lybrate, Practo, Live-Health, Murgency, Forus Health, Onco.com and more are taking several strikes in this direction. Equivalently, some hospital chains and technology companies are also working in this direction.

Chakraborty updates on how the Indian healthcare ecosystem experiencing this momentum. "Currently the healthcare scene has a few established platform systems- Philips HealthSuite, Amazon's Alexa and Siemens Healthi-

neers digital ecosystem. Several Doctor Patient Platforms have also risen in India which includes Practo, Lybrate, JustDoc, etc. Philips Health-Suite for example is a digital platform for connected healthcare for patients and providers, in any setting, hospital and home. It's an open, cloud-based platform that collects, compiles and analysis data from a range of devices and sources, and technology brands. It helps bridge care from the hospital to the home and integrates the various care teams. The approach of the above platform solutions is to offer actionable, data-driven insights which enable patients to work together with their care providers including family members. Once inte-

grated, this data and predictive algorithms can find correlations and subtle signs, like health deterioration of the patient can be caught at an early stage. The healthcare business by its inherent properties needs to work in a network, and a platform will provide this streamlined solution. Both the sides are engaged due to a number of benefits created by a platform ecosystem. A customised platform like the 'patient engagement' platform mentioned above will create value for our hospitals in several ways. Engaged patients are happy patients, and are therefore long term patients. From the patient's perspective, they will get a menu of offerings and options which they can study, understand and then select — making them participate in their own healthcare choices. Interactions with different participants will provide support to the patients not only from family and friends but in form of support groups for social and psychological support.Integrated data will help not only patients but even healthcare providers identify the patients' needs early on and plan a precisecourse of treatment. A successful implementation of this business model will in turn boost referrals for services to the hospital and in turn revenue", Joy elaborates.

Similarly, Puri explains how Max Hospital has created a platform and how it functions. "We have already created a self service patient portal where we have several sources of value for our customers and the focus is on continuing to enhance the services offered. Our current services including a digital health locker for patients, which would contain digitised diagnostic and medical reports, e-Prescriptions, discharge summaries etc besides enabling, booking of doctor appointments, Max@Home or in-hospital services including PHP and radiology etc., getting online discounts and waiver of initial registration

charges, consolidated linkage of family members' records, calling emergency services including ambulance etc. What we are hoping to do is offer more personalised content on the patient portal considering his / her individual condition, provide customised care pathways and ease of adherence to patients for vaccinations and lifestyle related diseases to manage a healthier lifestyle outside hospitals", he spells out.

Puri strongly believes that their platform model will deepen their engagement and understanding of customer needs. "We will hopefully, in the future, be offering personalised applications and treatment plans on both web and mobile for various categories of customers both at home and in the hospital so that we can offer a one stop shop for all patients' healthcare needs. Also, we have already integrated complaints and feedback functionality in the portal and our patient mobile app, so that we can carry out any redressal of genuine patient grievances even before the patient has left the hospital", he quickly adds.

So does this new strategic concept of being a platform requires new thinking, new structures and new skill sets? What kind of investment would it demand? And what kind of returns it would fetch?

What it means to be a hub

Platform models work on a collaborative model, which means companies may even need to collaborate with competitors in order to build strong networks. Therefore, a change in the organisation's thought process becomes paramount. Says Puri, "Platform approach requires very high level of customer centric approach and a lot more collaborative mindset where you might also need to sometimes collaborate with your potential competitors. It would require various technological and operational aspects of the organisation to come together

structurally so that siloed department level thinking can be replaced with an integrated enterprise wide customer centric approach where people, processes and power of technology can be married seamlessly. Also, skill sets of data scientists with knowledge of Artificial Intelligence and Machine Learning, and business domain analysts with sound business understanding would be needed in order to gather and glean actionable insights from the structured and unstructured data available in healthcare institutions. The investments needed would be significant but returns would be multiple times the investments made by the organisation, if implemented effectively".

"The platform business model will have to be one of the core components of corporate strategy planning. This

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CONTACT US :

UNITED BIOTECH (P) LIMITED
FC/B-1 (Extn.), Mohan Co-operative Industrial Estate, Mathura Road, New Delhi - 110 044
Tel. : 0091-11- 66611100 / 40651100 / 66607094 / 66607095
Fax : 0091-11- 66605681 / 66607096
E-mail : international@unitedbiotechindia.com, ubpl@vsnl.com
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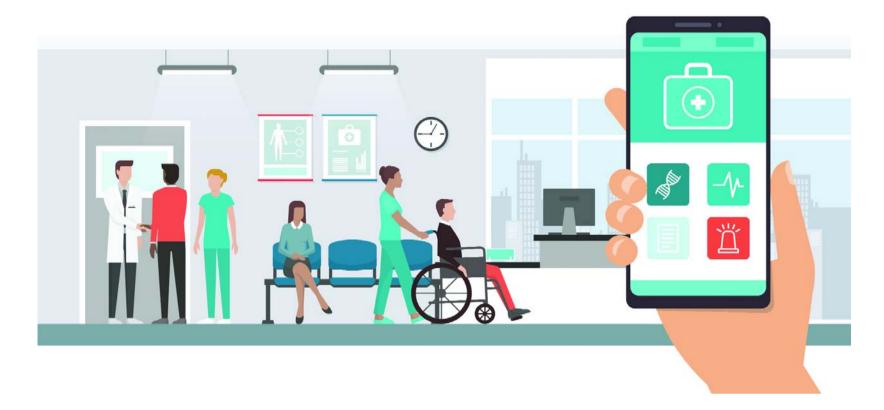
network strategy will have to be aligned with the right choice of platform-enabling technologies, like cloud technologies, big data solutions, modular architecture, IoT, and AI solutions. All of these will require a substantial investment and will also need expertise in terms of manpower to power and implement a successful healthcare platform. However the expected returns will be substantial in terms of both tangible and intangible benefits", chips in Chakraborty.

Adding to this, Niranjan Ramakrishnan, CHCIO Vice President Digital, Leixir, says, "Overall success of the healthcare platform is to be measured by the value of investment not by the return on the investment. Hence the investment needs to be based on the value that the business is trying to get from the platform, which is not only the topline, EBITDA but customer experience, efficiency, turnaround time and productivity as well. Understand the difference between upfront investment over the total cost of ownership and it has to be at least for the period of five calendar years. Also, building a culture

SOME OF THE KEY ADVANTAGES ARE AS FOLLOWS (COURTESY NIRANJAN)

- ◗ Predictability on the IT budget
- ◗ Definable timelines and deliverables.
- ◗ Manage the change by the inhouse team in most controllable manner
- ◗ Mutual growth: Platform grows as the business grows
- ◗ Supported by OPEX instead of heavy CAPEX.

IT TOOLS WHICH HOSPITALS CAN OPT WHILE CREATING THEIR PLATFORM (COURTESY NIRANJAN)

- ◗ SOA and SOAP protocol based
- ◗ Low coding or no coding development framework
- ◗ Capability to build large applications at the quickest possible time
- ◗ Application development with no coding efforts
- ◗ Automation in terms of database creation and normalization
- ◗ Automation in creating the forms, workflow management, widgets and business reports.
- ◗ Deployable across different database servers
- ◗ Ready to use UI templates
- ◗ Integration Engine
- ◗ Multi-tenant database architecture
- ◗ Integrated Analytical reporting
- ◗ Artificial intelligence Ready

of Information Technology within the environment which is totally different from how

healthcare institutions function today."

Having said this, there is a

level of urgency to move quickly. We have started to see a slow-down in business

models already. If hospitals don't expand the role they play in both health and healthcare in their community, someone else will step in.

So, how are IT experts in this space planning this transition?

The action plan

In future, Indian healthcare will witness a significant transformations in business models and digital technologies will play a pivotal role in this metamorphosis. Hence, It expert in this field suggest that orgnaisations, especially hospitals, need to have a serious forethought and strong master plan for building a platform.

"There should be a lot more focus on outside in customer thinking and customer journey workshops in order to derive key pain areas of customers so that the same can be effectively addressed. The change management, training and user socialisation issues need to be understood and key strategies planned to align all aspects of the organisation, including the doctors, customer facing employees and nurses in order to elicit active participate in the action plan

so that ownership and user adoption can be significantly enhanced," suggests Puri.

Sharing his perspective on how the platform can be optimised in a hospItal setting GK delineates, "The Hospital platform element is the exposure of its customer facing components / social graph to external applications which enable a different set of use cases. Customer centric focus to consider now: For e.g, HMIS product on a hospital digital platform can interact with citizen centric patient portal for a seamless interaction between care-providers across hospitals and patients across locations through a single platform. Likewise if you can think from an operational efficacy standpoint, typical ERP analytics alone can't optimise the connected streams with patients, here HMIS which is patient centric can bring out patient specific trends and outcome, through its platform to optimise/maximise the value proposition , both for operations staff within hospitals as well as with connected external vendors outside the hospitals. Another example here is patient App on mobile: a platform could be your smartphone i.e. it has its own device form factor and its own ability to interconnect with other software streams, therefore it's a platform that you can do other things with that were not originally envisaged at the time of its initial design."

Niranjan further lists down some action points which can be considered by hospitals:
◗ Start with the preparation of a detailed business case and get it validated with industry experts
◗ Focus on systematic due diligence on the requirements of healthcare industry as a business organisation, various stakeholders such as hospital administrator, patients, doctors and allied health professionals and business potential.
◗ Ensure the documentation of all the assumptions, identified risks and anticipated challenges well in advance.
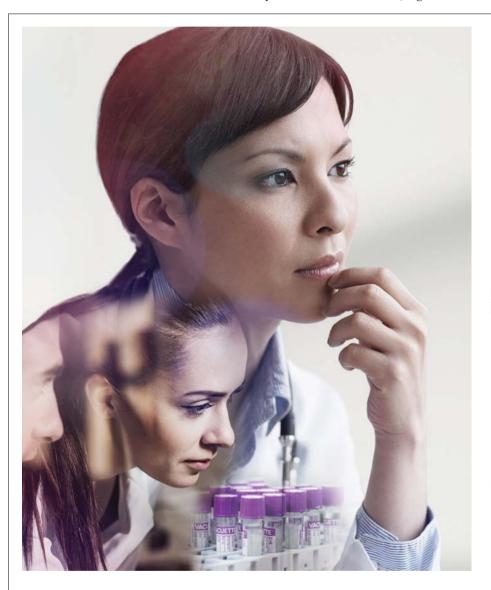
◗ Put together a time bound evaluation process and limit the exercise to specific number of iterations.

Going forward, experts envision the coming of the platform revolution in healthcare.

Picking inferences from the experts, healthcare organisations/ hospitals need to create the digital front door well in time. They will also need to ensure that their platfroms drive affordability and reduce cost, tackle social determinants of health and healthcare delivery and create partnerships for healthcare innovation. In order to enable the effectiveness of the platform in healthcare, organisations will need to also focus on the lifeline for every health and healthcare hub-actionable data. Consequently, leveraging applied analytics will become crucial.

raelene.kambli@expressindia.com

WHAT DOES BEING A LEADER ENTAIL?

From influencing behaviour to developing a vision and realising a goal, leadership is multifaceted role. Top guns from leading hospitals share their views on the major traits required from a leader in the healthcare domain

An organisation flourishes if leaders are able to identify their team's strengths

Healthcare is a multi-disciplinary and complex arena. Our ecosystem is an extremely intricate co-relation of multiple professional groups, departments, and specialties. Establishing a seamless and robust system of coordination and interactions amongst each of these groups is the foundation of a strong entity considering the inter-dependence the groups have upon each other. Alongside, leaders in the healthcare industry have a task of integrating organisational commitment into day-to-day practices at an institution so that we work towards common goals meaningfully.

Any successful entrepreneur with a vision to serve needs to capitalise on the diversity within the organisation to emerge as a piece of effective and efficient machinery. An organisation flourishes if the leaders are able to identify the strengths of its team, leverage them appropriately, and stand-by our people.

My vision is to expand HCG's state-of-the-art treatment across the country and beyond borders making it affordable and accessible to the patients. To bring alive this vision, we consciously invested in our people and ensured that every employee at HCG is aligned to our beliefs and mission to care, concern, and be compassionate yet save lives. I had to take tough calls during this journey, but every single decision made was completely worth it.

With this objective, we started in Mysuru with Bharat Cancer Hospital, at a time when

Dr Ajai Kumar,
CMD, HCG Global

there was no proper treatment available for cancer care and since then have successfully established 26 cancer centres under HCG across the country and overseas providing advanced cancer care to the doorstep of millions of people. This journey wasn't easy, but with a dedicated workforce, we fared well! I firmly believe that when we start from scratch, we need to remain focused on our objectives. Along the way, our approach may fail, but what is essential is to keep challenging ourselves and not lose sight of our objectives.

We constantly need to throw challenges at people and encourage them to push boundaries. 'Doing more' is a mantra we believe in and a culture we foster here at HCG. Our people across levels-doctors, nurses, diagnostics, administration, management are encouraged to do one thing more that can bring value to the institution. We encourage feedback and seriously work on it to improve ourselves.

Another thing I learned in my journey is that we need to work carefully with plan A and B but never give-in to hurdles. I always plan ahead and am certain that there is a way around if one has right people besides us.

While the road to success might be steep, solutions will follow if you persist. Each day is an opportunity to unleash our potential, and leaders have a responsibility to inculcate this in themselves as well as the working partners.. I am living my dream through HCG and everyday aim to make it the global destination for cancer care.

'Effective leadership is required to lead and drive changes at all levels of the health system'

The healthcare industry in India is at crossroads. It is expected to reach $372 billion by 2022 driven by rising incomes, greater health awareness, lifestyle diseases and increasing access to insurance. The world's largest funded government schemes Ayushman Bharat was launched last year along with several other schemes for ensuring 'Healthcare to all' — which is not just equitable but accessible and affordable too. In other words, the constitution of India considers the 'right to life' to be fundamental and obliges the government to ensure the 'right to health' for all. But have we ever imagined, how all of this has been possible. It is leadership - taking responsibility, assuming ownership for success, and doing the right thing in the larger interest of the society.

Years ago, when I was working in Australia, I overheard a nurse talking to another nurse "I don't want to be an Indian" – and my ears became more alert and I asked her what does it mean? And whom was she referring to? She was surprised that I asked her the question, and she asked me if I have not heard the saying. I said NO. In Australia and many other countries people think Indians are good followers and NOT leaders – this is what the British have made us or believe? She was referring to her career, that she wants to progress higher up and not get 'stuck' at one level. Either way, industrialisation required people to 'work like sheep' and not think or ask questions. But the modern world encourages one to think, ask questions, and be curious – so more opportunities for one to develop leadership skills.

Healthcare leaders know about change

The need to adapt as individuals, as organisations, and as an industry—is obvious. What is less apparent are the leadership skills that are most important in today's uncertain and complex environment. For decades, US-based healthcare providers, in-

surance companies, pharma and device firms have been operating in a shifting landscape. Advances in technology and new standards of care, new business models, a growing population, and changing demographics have propelled ongoing change in the healthcare sector. Regulation, access to care, cost pressures, and legal and ethical considerations add to the complexity, as does healthcare reform. In this context, it can be difficult to know if organisations have the leadership talent they need to set direction, create alignment, and gain commitment among employees, partners, and stakeholders as they seek to provide safe, high quality patient care. Leadership is something that has been debated over the years/ decades with the primary question, "Is a leader born or made?" But one thing is for sure, whether they are born or made, one has to have the instinct to become a leader either way.

Healthcare leadership skills

The healthcare sector is experiencing significant and rapid change, with dramatic change yet to come. In an evolving and challenging environment, healthcare organisations must ensure high levels of technical and professional expertise. At the same time, they must develop the leadership capacity needed to adapt and succeed in

Dr Kishore Kumar, Founder Chairman and Neonatologist, Cloudnine Group of Hospitals

For any leader to be successful, the ability to adapt to change and to meet business objectives are strong points

the future. In my view, leadership skills can be taught and can be learnt, only if someone wants too. Harvard Medical School and Harvard Business School among many others have started lot of leadership programmes especially in the last few years – focusing on more medical doctors – because they want leaders in the healthcare sector. Is it only the healthcare sector – that needs leaders? No – even companies like Accenture are heavily investing in leadership programmes. Every company hopes to 'train leaders' and GE has been running their Crotonville Leadership Programme in the US, which is very popular but can be attended only by invitation.

It is essential for everyone to know that a hospital or any healthcare facility is a unique environment and as a highly regulated industry, leaders in healthcare should only know only know and adhere to all regulatory standards, but also lead by example and must ensure that all appropriate training is imparted all levels. To rise as leaders with countless departments working together in healthcare facilities, one must maintain a solid collaborative relationship with each one of those departments to ensure better outcomes. The top priority for leadership development in the healthcare sector is to improve the ability to lead employees and work in teams.

I realise that I have been a leader from childhood. I was leader of my class in the primary school, high school and in college and so on. During my medical schooling, I even became Secretary of the House Surgeons' Association – and

revolutionised the way the medical representatives treat the fresh medical graduates among few things. College life was tough – as I was always in 'confrontational mode' for injustice....which is an indication that leaders don't like to tolerate injustice. These qualities probably played a crucial role in me attaining quickly leadership roles in the UK, Australia too – where I was in-charge of the junior doctors, lead to establishment of protocols, setting up NICUs and so on. leadership trains you in many things as you go" and you become better at it as you go.

Additionally, it is important for any healthcare organisation to create strategies to provide current and future leaders broad, cross organisational experiences, and learning. Healthcare leaders have gaps in several areas that are essential for learning and long-term success: having a broad functional orientation, self-awareness and career management. Organisational training and development, succession planning and individual feedback, coaching, and development efforts should address these gaps. Today, we have completed more than a decade of when Cloudnine was started in 2007 and it required leadership to 'establish' – and make it 'successful'. Leadership roles make you arrogant as you don't tolerate injustice but at the same time if it involves consumers in a hospitality industry – you need to learn to swallow your pride – opposite of your leadership qualities.

For any leader to be successful, the ability to adapt to change and to meet business objectives are strong points.

They need to be resourceful, straightforward and composed. At the same time, they should be fast learners and willing to "do whatever it takes." There are several types of psychological analysis of a person, including the famous type coach – wherein a person is classified into a four letter type of analysis and this is supposed to indicate if one becomes a good leader or not? Leaders are not supposed to be emotional but clearly there are lot of leaders who are emotional and successful, clearly showing that one system cannot judge everyone.

Where are we?

Healthcare being a state subject, healthcare outcomes have remained divergent based on the quality of the state administration. In the book 'Leadership in Health Care', Gunderman suggests that people who have a high need to achieve may not be the best leaders. Success of an organisation rests on responsibility and control at the group level, and the required wider diffusion of responsibility and control may not suit some high achievers. A better leader may be an individual with a high need for power but who thinks in terms of the group and takes responsibility for what happens in it. As a leader, it will be important to understand what really motivates the group of healthcare workers to increase performance of the group and value of what they produce (better results at lower cost). Leadership is something we need to 'learn more' and become think tanks – which the modern world is trying to create. Leadership in healthcare is very much needed in our country, at present there is paucity of the same. Effective leadership is required to lead and drive changes at all levels of the health system to actualise goals of the ongoing reforms in healthcare organisations.

1. https://www.ibef.org/industry/healthcare-india.aspx

Communication is integral for formulating leadership strategies

The healthcare environment faces evolving challenges, which in turn means that the skills required for leadership are constantly changing as well. Whether it's responding to new or modified regulations, bottom-line profitability pressures, new diagnostic or treatment techniques or integrating technological trends to system processes, what makes a person an effective leader of healthcare systems is the ability to balance all of these pressures alongside the needs of patients.

Communication plays an integral base for formulating great leadership strategies. Depending on how many people you have on your team and their specific responsibilities, you may have a maze of connections that you need to handle. Finding out ways to make sure everyone stays on the same page aligned with the organisation's mission and vision is the key. Effective communication also requires that you have a good command over technology. By learning how to use tools that compile and share data, you can contribute to efficiency and efficacy.

Listening is a part of communication, but it deserves its own mention because it is so vital to advancing your team. An "open door" policy can help create an atmosphere where everyone is comfortable speaking up. Making room in your routine for self-education. This would involve reading the latest professional journals or talking to people who are more experienced than you are in your field.

As a leader, you are bound to face curveballs. Have a flexible mind-set and being willing to adapt to new situations, flexibility is particularly important during crisis situations.

One shouldn't be afraid to set ambitious goals. The enthusiasm for excellence will be contagious, and you may be surprised by how much your team can accomplish. A leader's success always lies in managing a successful, empowered and performance oriented team.

Good governance at organisational level not just helps in providing necessary responsibilities and practices to ensure benefits realisation, optimise resources and optimise risks while ensuring an organisation is compliant with local laws and regulations and providing value to stakeholders but also facilitates a high level of trust by patients and consumers of healthcare services which is the most significant considering the healthcare sector requires a higher level of documented control and accountability than is required by any other industry. A good governance model always augments the performance of a good leader.

Effective information and technology governance may seem dauntingly complex, given the regulatory context of the healthcare industry and competing stakeholder goals. Most governance requirements, thus, must originate with logical and straightforward principles.

A post on health care thought leader BE Smith's website says, "Effective leaders have a clear vision of what success will look like in a specific time period. They know how to plan for it, how to communicate and direct it, and how to implement it. They dream big and look forward to overcoming the challenges their vision will face."

Analysing your goals and breaking them down into smaller, measurable goals that can help you and your team stay on track. When one approach or method for reaching goals doesn't work, one must be prepared to make adjustments.

Whether an organisation has recognised room for improvement in its executive governance approach or the need for a more comprehensive overhaul, a few guiding principles for the foundation to transform healthcare at any organisation would include:

Engaging the right stakeholders

Making the call to action: This establishes the point on the horizon to become the destination for all team members.

Dr Tarang Gianchandani, CEO, HN Reliance Hospital

Often, this communication is prompted by some sentinel event, sparking a desire for excellence, a patient harmed, a legal action, a missed benchmark etc. This call to action, or statement of vision, should be established in writing and communicated via one-on-one meetings, leadership huddles, mass communication, and posted announcements. This communication should flow upwards and downwards through the organisation, from the meeting room to the cubicle.

Forming the leadership team: Recruiting the right mix of people (multidisciplinary representation) to serve on the leadership team. Effective executive governance depends on a balance of executive roles.

Establishing shared understanding of objectives

Identifying high level opportunities: This shall prioritise those in a data-driven environment, to a strategic way to target areas for early and meaningful change where the highest value proposition exists. This way, the work is deep and effective in a few areas of greatest opportunity, rather than ineffectively in too many

Assessing organisational capabilities and readiness: Determining capabilities and readiness early so that the work isn't stalled once in progress. Perform a self-assessment or structured interviews with a third-party improvement expert to carefully examine these areas: processes, methodologies, infrastructure, skills, and cultural factors. This audit will identify potential weaknesses and help ensure that the organisation is prepared for improvement work and able to manage risk.

Aligning incentives and rules of engagement

Adopting a consistent improvement methodology: This methodology will include responsibilities from reconciling conflicts of interest among stakeholders to making sure everyone is aligned with and supportive of the organisation's top priorities the framework by which leaders organise teams, assign accountability, and empower individuals in improvement work.

Aligning incentives: Effective executive governance aligns everyone within the organisation around the same vision, goals, and accountabilities. An established compensation or incentive structure shall encourages clinicians, data experts, and business leaders to participate in improvement while keeping balance with their other responsibilities. In the case of clinicians, this means making it possible, and appealing, for clinicians to participate in improvement work while not compromising patient care.

Keeping polarities in balance: Polarity refers to a pair of values that we tend to see in adversarial terms—this VERSUS that—but are, in fact, interdependent and mutually valuable. Keep polarities in the organisation balanced by identifying the ones that could impede improvement and then developing a plan to foster their coexistence.

Practicing disciplined prioritisation

Analysing opportunities and determining priorities - This is time to operationalise the vision by prioritising desired, measurable outcomes within those strategic areas. This will require some deeper analysis to identify specific areas of opportunity. This becomes a fantastic leverage point for engaging front-line stakeholders in shaping and understanding the shared objective.

Allocation of resources: The owners of resources (those who make allocation decisions) throughout the institution need a consistent rubric for making resource allocation decisions. Identify the key resources the health system needs for work improvement, particularly those high-value assets for which supply doesn't meet demand.

Establishing prioritised teams: Improvement teams comprise the innovators and early adopters who drive improvement and inspire others to follow. These team members play critical roles in permeating the vision and protecting priorities. They build strength and create a snowball effect for the organisation's strategic and operational vision

Extending and sustaining improvement: To ensure that improvement work becomes and stays an integral part of the health system, there is a need to put practices and processes in place to operationalise and grow ongoing improvement work. This can be done by establishing standardised ways of reporting among improvement teams, setting times and methods for communicating to the whole organisation, and planning regular re-assessment to monitor ongoing value and accountabilities. And, importantly, they'll create opportunities to share success, such as having team's present positive outcomes and methods to the guidance team, Leadership, and executives.

Healthcare systems are composed of numerous professional groups, departments, and specialties with intricate, nonlinear interactions between them, the complexity of such systems is often unparalleled as a result of constraints relating to different disease areas, multidirectional goals, and

Healthcare leader should be grounded in social realities

In the traditional healthcare space, healthcare delivery organisations were driven by individual doctors as its leaders. The success of the institution depended on the healthcare leader's ability to learn, understand and cater to the demands of the patients. Today, the leader is expected to understand and assess the capacity of the workforce, deal with business partners, stakeholders and be aligned to societal expectations. Imagine a situation where the leader has not defined the expectations, values, ethics for the organisation. This will lead to a situation where the workforce is directionless. Hence, the leader needs to guide the team appropriately. However, there is definitely more to it when it comes to today's dynamic healthcare sector.

Main goal to serve the people

There are various elements that differentiate healthcare leaders from others. Firstly, since the sector deals with human lives every day, it is imperative that an individual at leadership position possesses empathy, sympathy, compassion and at the same time being passionate to cater to the patients through the healthcare services while pursuing business growth. The passion to serve patients remains paramount, as this helps being attached to a strong purpose to serve the society. The term widely used for this quality is servant leadership- which indicates that the main purpose of the healthcare leader is to serve the society. This quality is different and unique to healthcare sector, as a leader is not majorly focussed on competitions and focusing on highest sales. Here, the servant leadership in healthcare indicates attitude and passion to serve, while focusing on business growth.

One of the important requirements for a leader in healthcare is to assure that "Profit is a byproduct and not the aim" – unlike any other business. Moreover, this passion to serve will also help in staying aligned with organisation's vision of serving the patients and working on the hospital's competitive environment and focusing on improving the services for the patients. Parallelly, this quality should be supported by helping people realise their dreams and be a part of preparing future leaders.

The socially aligned leader

The healthcare leader needs to be grounded in social realities and cognizant of the evolving policy environment. The healthcare sector is highly regulated and this also keeps the sector under constant media glare. Across the globe, healthcare remains a key priority for governments. Even in India, there are policy developments – right from medical education to healthcare insurance – and a constantly evolving societal narrative about healthcare. Healthcare organisations are

Dr Azad Moopen, Founder Chairman and MD, Aster DM Healthcare

primarily driven by the core vision of ensuring healthy communities i.e healthy societies. This vision drives the quality of services rendered and health outcomes for individuals and communities, not just tangible inpatient and outpatient numbers. There is a requirement for a healthcare leader to focus on CSR as a major responsibility.

The technology savvy leader

In this era of technological disruption in healthcare, the leadership involves envisioning a strategy and a clear implementation model to ensure a highly-personalised patient care. Unless and until the leader is in the forefront of technology with insight into digital transformation through Big Data Capturing & Analysis, Applying AI on data

etc. they will be thrown out of the business. He also has to capture ways to bring healthcare to the homes of people through various methods like tele-medicine, home monitoring, chronic disease management, e-ICU etc. It becomes important that a leader understands the technological wave entering the healthcare sector and gradually transform to adapt and adopt the technological advancements.

The culturally aware leader

In today's globalised world, a healthcare leader should also possess understanding of the varied markets. This is especially important in GCC and India with its geographical diversities, cultural nuances and religious practices. Each market has its own uniqueness and flavour, hence operating in each market has its own advantages and limitations. The healthcare leaders must be aware of this and employ local population.

Gone are the days when leaders were prepared for certain situations common to all the sectors. With the changing times, every sector is growing and witnessing transformation at its own pace. Similar is the case with the healthcare industry which is witnessing a transformation. Presently, the healthcare sector of India is at an exciting stage of growth and advancement and to be able to play significant role healthcare leaders require a forward thinking vision, supported by fast adaptation to new skills.

multidisciplinary staff. Within large organisations such as healthcare systems, the numerous groups with associated subcultures might support or be in conflict with each other. Thus, leadership needs to capitalise on the diversity within the organisation as a whole and efficiently utilise resources

when designing management processes, while encouraging personnel to work towards common goals.

Leaders at many times are change agents brought in to lead change management. This is probably the hardest role for the leaders in healthcare owing to culture of extensive resistance to change which at times reflects in the nature the

healthcare is imparted. Ironically, healthcare is rapidly changing owing to new technologies and modalities of treatment, however still healthcare culture is most resilient to change. The role of a leader in such instance is to lead the change in mind-sets and cultures by taking the stakeholders along with perseverance, patience yet a focussed direc-

tion. A real leader adjust the sails of the ship to bring the change in direction rather than just expecting a change or complaining about the odd direction of wind. Leaders have to be close enough to understand, together enough to support , distant enough to motivate and ahead enough to steer the direction to walk the path towards the vision.

A leader can be an individual at any level in the organisation

What makes a leader? Is it the years of experience? Is it the number of people one manages? Is it the designation? Through the years, I have come to realise that true leadership emerges from many factors, including skills, results and strength in the face of adversity, all combined with an ability to work with and get the best out of people and also ensuring that the right connect and touch with the team is strengthened time to time. This essentially means that given the right circumstances, a leader can be an individual at any level in the organisation.

Today, we need to look beyond the traditional definition of a leader as someone with a position in charge of a group of people in an organisation. That is something which only a few of us can achieve – after all, there can only be one CEO in a company! What is important is that each one of us finds our area of strength - strength that does not come from our position in an organisation, but from a credible and healthy influence that is built on relationships. In a modern organisation, it is essential for each individual to realise that while each one is a leader in his or her circle of influence, leadership is not about the power one wields on others, but rather it is about inspiring others and helping others and being part of a high impact team that shows results and demonstrates positive outcomes.

In 'We Are All Leaders: Leadership is Not a Position, It's a Mindset', Fredrik Arnander, a Scandinavian entrepreneur and business guru puts it concisely when he says that the new face of leadership is consensual and non-hierarchical. Leadership in a modern organisation is not just for the corner office executives. This is a time of rapid technological change and economic uncertainty and we all need to step up and develop the mind of a leader. Successful organisations are those that empower employees at all levels to take an active role in leading themselves and their organisations to success.

Becoming a leader is a state of mind. Many people mistakenly believe that it is necessary for people to have an innate quality of leadership to be a leader. It may be true that there are some who are naturally good at lead-

Arvind Sivaramkrishna, Group CIO, Apollo Hospitals

ing, who easily take charge. But at the same time, there are also individuals in whom leadership quality comes to the fore in certain situations that fit their strengths and are aligned with their passions. This is where the role of mentoring in today's organisation comes into play, with mentors sharing their wisdom and providing insight and guidance to an individual to find his or her strengths and the right place to display it. This advice is indispensable when people move up in their career, to a different role or a senior leadership role, or where there is a need to quickly assimilate the different skills required to perform effectively and meet strategic and operational challenges in a new role.

Mentoring helps in various aspects such as improved leadership skills and leadership-capacity building and an increased job satisfaction. It reduces the feeling of isolation and aids in professional development of the individual. It is important to realise that development is not a one-time act, but a continuous activity to meet the dynamic nature of roles in an organisation. Mentors can play a vital role in an aspiring or potential leader finding the 'right' situation to become a leader

The argument against everyone being a leader is - who will then follow, how will an organisation function? Once again we need to move away from the traditional definition of leadership. If leadership is finding our area of strength to positively impact the organisation, then we are all leaders and all followers. A leader at a senior position may have greater responsibility, but each of us are leading and influencing in our own areas of strength.

A WW Kellogg Foundation report from 2001 talks about the Collaborative Leadership Paradigm. It describes how an organisation needs to recognise the leadership potential within each person to contribute to the betterment of the organisation. Leaders are those who work with an inclusive approach to achieve constructive benefits for the whole organisation. Peter Senge, founder of the Society for Organisational Learning, puts it succinctly when he says - Leadership has to do with how people are. You don't teach people a different way of being, you create conditions so they can discover where their natural leadership comes from.

Organisations today have to face and overcome a complexity of issues in a rapidly changing business environment, and it is only by adapting and evolving to this new model of leadership will they be able to succeed and grow. So let's all begin by recognising the leader in each one of us!

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Dedication, determination and dynamism are a leader's growth drivers

Leadership in any industry is a challenge in today's fast changing world. As far as healthcare is concerned, leadership has its specific challenges which have to reckon with the new advances in medical sciences and the changing circumstances. This is a sector where human life and well being is directly concerned. We are going through an era where continuous up gradation and induction of new technology is the way to stay ahead.

Requisites of good leadership

In my view, an ideal leader should focus on certain vital parameters like earning trust, create vision, execute strategy, invest with a far sight, nurture potential and empower people. In my healthcare career spanning for nearly three decades I have taken up hardest challenges based on these parameters. I had held several senior positions in major corporate hospitals of the city. My insatiable appetite for new challenges prompted me to take up the charge of a number of private hospitals which needed turn around. I could lead the organisations to the right direction roughing all the turbulent waves to reach its apex. Dedication, determination and dynamism were my growth drivers. Before I joined AMRI Hospitals Group as CEO, I somehow earned an identity as the crisis solver.

My focus as AMRI Group CEO

When I took the charge of AMRI Hospitals after its set back in 2011, it was perhaps the difficult most challenge I accepted in my career in healthcare. This time too I succeeded in re-establishing AMRI to a niche position. It came back to its journey on the fastest growth track with new vigour and expertise. AMRI Hospitals, the largest

Rupak Barua, CEO, AMRI

healthcare brand in Eastern India, plans now to emerge as the 'premier healthcare brand' in the country.

After I took over, I put thrust on factors like quality, transparency, human resource, performance, right evaluation to name a few. Healthcare industry is a very specialised industry that is directly connected to people and obviously in their life's most critical moments. I believe transparency and patient satisfaction are the prime aspects of focus in any healthcare organisation. That's why, I have always endeavoured to focus on clinical excellence and quality. In order to reach the highest level of clinical excellence we are continuously exploring and investing on engaging talented medical professionals.

We have a full fledged department for academic research and development. Clinical research is an ongoing process here. Every case is scrutinised in the light of new research and its far reaching effects. Seminars, workshops, exchange of experience and views are of much significance. We are always updating and upgrading on the new developments in medical science around the world. To offer to

the patients maximum advantages of advanced treatment. I believe investment in academic research in healthcare is a prerequisite to ensure superior quality treatment.

Along with clinical excellence one has to ensure quality standard at every level. I specially emphasise on this aspect and we are committed to implement quality in every simple detail. The clinical excellence will only bear fruit if stringent quality standard is maintained. That is also another golden rule to ensure patient satisfaction. We have already received NABH accreditation, NABH in Nursing for Dhakuria Unit and NABH for Emergency Department at Bhubaneswar Unit and Green OT certificate in support for our quest for quality.

Thrust on the edge

I feel we need to stand apart by adding extra edge to our facilities. We have introduced many firsts in eastern India like 1.5 Tesla Ambient MRI (70cm wide gantry with in bore experience) for accurate image and patient friendliness, Gem Stone technology based 128 Slice Dual energy Spectral CT Scan for high clarity, speed and less radiation, SPECT CT to name a few. We have put a major emphasis on digitalisation to ensure quick access and prompt action.

What's more, I feel investment in technical infrastructure is not complete without dynamic man power at all levels. The main thrust should be on human resource development to ensure quality at-

> **An ideal leader should focus on earning trust, creating vision, executing strategy, nurturing potential and empowering people**

tainment in all areas. The ability of each person in the team has to be unleashed to improve the performance and grow.

Another most important aspect is teamwork which is of untold significance in particularly healthcare sector. Team work is the ability to work together towards a common vision. In my career I always stressed on team work and team spirit and that helped me to achieve my goal to a great extent. There is no substitute for a perfect teamwork, otherwise huge investments on infrastructure will not yield the desired outcome.

The key to excel in leadership

Finally our aim is to ensure quality at affordable cost. We are committed to the society at large to deliver the superior standard of services within the reach of the common people. While the government is expanding and upgrading its facilities and schemes to serve larger number of people, we should also reach out to serve more people even from the remote parts in tune with the government initiatives.

If we have to offer the advanced treatment facilities to the mass, it will require an excellent balancing of cost reduction as well as delivering high standard of services. It will require re-engineering of the process system to manage both the factors - keeping the stake holders happy at one hand and serving the society, on the other hand. There lies the secret of a dynamic leadership.

'The success of any organisation, department or a team is dependent on the ability of the leader'

Leadership is one of the most important functions in the management of any industry, and at the same time, it is not an easy job because a leader is somebody who is looked up to and is expected to know and do the right things. This was aptly put by John C Maxwell as, "A leader is one who knows the way, goes the way, and shows the way." Among all the industries, today's fast-paced modern healthcare setting calls for effective leadership more than ever before. Effective leadership in healthcare is furthermore a challenging task since it asks for an additional competency of clinical skills and knowledge, besides the obvious leadership traits of business competencies and interpersonal or soft skills, and an inherent drive to improve the quality of healthcare provision.

The success of any organisation, department or a team is dependent on the ability of the leader to focus on a vision or idea, to establish a direction and path, motivate the team to take the path, and eventually building the right culture or habit at the workplace.

When Airbnb was founded, CEO Brian Chesky was 27 years old. Steve Jobs was 25 years old when Apple went public. Bill Gates was only 20 when he founded Microsoft. I have realised early on that I need to imbibe and implement the traits that made them achieve amazing things at a young age despite the inexperience. Four mantras that have played a huge role in shaping and influencing my professional life are taking an initiative, decisiveness, perseverance and responsibility.

Focussing on these personality traits in my day-to-day job responsibilities from day one have helped me further my work at Apollo. One other important personality trait that I have focussed early on is judgement. As the popular Chinese philosopher Han Fei Tzu says, "It is not difficult to know a thing; what is difficult is to know how to use what you know". Under the able guidance and mentorship senior leadership at Apollo, I was able to do innovate and implement multiple initiatives at Apollo Hospitals including some of the first evers in the Indian healthcare industry.

Gaurav Loria, Group Head-Quality, Apollo Health & Lifestyle

With a significant shift in the healthcare landscape in India, there is a growing demand for cost-effective quality healthcare services which is what our entire focus has been for the last couple of years at Apollo. I believe through these projects, we have tried to redefine the health system and processes at Apollo and clearly laid out the preferred path for several key aspects, including adherence to treatment and care protocols, regulations, quality models, clinical as well as operational efficiency and patient satisfaction. The critical learnings have been:

Taking initiative: I have learnt to take up initiatives while keeping the patient always at the centre.

Decisiveness: In healthcare I feel decisiveness is very critical at all times. Effective and timely decision making and not sitting over issues was a virtue that I learnt in the initial few years.

Perseverance: Resistance is always a part of every human, especially in organisations that have existed for many years. Keeping the same in mind, I learnt to overcome resistance, difficulties or delays in achieving success.

Responsibility: Owning up initiatives and being responsible is also very important. What we imbibe and emulate is what our team members follow as well.

I adopted multiple strategies to overcome all the challenges that I faced and some of them were:

Using data and real time outcomes to convince people that there's a problem and secure emotional engagement by more interactions.

Team engagement and their buy in for the initiatives, targets, ways to achieve them and sustenance. It is also important to clarify who owns the problem and solution, agree roles and responsibilities at the outset, work to common goals and use a shared language.

Incentivising participation and 'hard edges' - Relying on the intrinsic motivations of staff for quality improvement can take us a long way, especially if 'carrots' in the form of incentives are provided—but they may not always be enough. It is important to have 'harder edges'—sticks— to encourage change but these must be used judiciously and only in dire circumstances.

The key principles are also to be prepared always, think bigger than you actually are, focus on growth and set the goals along the way.

Healthcare industry is a very complex sector, in terms of the constant changes. And that's where the need for good leadership is even more critical. It is the leader's role to handhold and guide the organisations towards effective and efficient healthcare delivery.

An amalgamation of manifold skills and knowledge form an effective healthcare leader

Leadership has always been of utmost significance and shall always be so. Irrespective of the past history, present scenarios or upcoming future; leadership is what often defines an era, creates a movement and manages to let a successful story unfold.

Healthcare is constantly getting more and more complex and challenging for medical professionals to navigate through. This further demands an efficient leader who can adapt to changing dynamics of a hospital business model while successfully evolving the required skill set.

For a healthcare organisation to stay effective and successful, a leader with a unique set of skills is required. Clinical skills, business competencies, and interpersonal skills constitute an effective healthcare leader.

There are various ways in which being a healthcare leader differs from being a leader in any other industry. At the outset, if one looks at the demanding health industry, it has many variables to it.

To begin with, the healthcare industry has a major technical aspect to it comprising the medical and the nurs-

Dr Nandakumar Jairam, CEO, Chairman & Group Medical Director, Columbia Asia Hospitals India

ing part. It has a hospitality aspect which is the front office, billing and the rooms, and a quality aspect as we are dealing with human lives. Therefore, the attributes of a healthcare leader differ from what it takes others to become leaders in diverse industries.

Technical knowledge: Whether it makes a doctor a better leader or not; a thorough knowledge and appreciation of the technical aspects is extremely important. The knowledge of the health industry is crucial and therefore an understanding of the varieties of specialties, their composi-

tion and understanding of the qualifications and capabilities of the doctors, the ability to measure clinical outcomes are all import attributes of a healthcare leader.

Finance: A thorough knowledge of understanding costs is crucial. Costs in healthcare is the bane of the industry and can make or break of a healthy organisation. Managing costs is like walking on an extremely tight rope and this needs to be appreciated, understood and thoroughly digested by all

Leadership is a gift and a privilege

Leadership is a skill. Some acquire it naturally while some have to develop a leadership attributes. Either ways 'a leader' has to be grounded and follow an open door policy to be in sync with the aptitude of the employees and motivate them to achieve the organisational goals.

Today, when we talk about a leader there are two prominent names that come to mind amongst many others – Bill Gates and Steve Jobs (it's not that there are no good Indian leaders but today's generation is well read on these two). Both the founder of Microsoft (Bill Gates) and Apple (Steve Jobs) had one thing in common – they had the ability to look way ahead. While the former envisioned a computer at the hands of every human being; the latter dreamed about a device that would be technically, creatively and design wise be more extra elegant and they both added tremendous value to their end customer.

Above all this, these two believed in their people and that is only the reason why Bill Gates and Steve Jobs could create mammoth companies like Microsoft and Apple. Beyond these two, I am also believers of the teachings of Indian leaders like Narayan Murthy, Azim Premji and enamored by the abilities of new generation entrepreneurs like Sachin Bansal (ex-Flipkart) and Bhavish Agarwal (OLA).

Being the COO i.e. heading the Operations of the hospital

**Joy Chakraborty, COO,
PD Hinduja Hospital**

there are some important lessons that I have learnt enroute my journey. They are:

Your people are your biggest asset. I have always believed a leader cannot work in solo. He or she needs a strong team in support to meet the goals. As important it is spot the hard working team members and further nurture them, it is also important to find the weakened and give them the resources and learnings to scale up.

Strip off the high powered ego (if any). With designation also comes the ego – that you have reached the penultimate position. A true leader should always encourage his subordinates to do better and push them at times to do even better than himself or herself.

Know your people: This is a very important aspect of a

leader. Knowing your people's names and isn't a big thing anymore; getting to know them personally and personal in such a way that its neither an intrusion nor for them an obligation to share their story. Striking a conversation with each and every employee is the key. Nobody would walk up to their bosses (read MD/CEO/COO) and share their personal story but if you instill that confidence in them, one will have lot more conversations than just about projects and deadlines.

Value your people. As a leader it is very much important to value your people's hard work as much as you might reprimand them and who doesn't love a pat on the back. I have always had seniors in career who's appreciated my hard work and probably that is the only reason I am where I am today. So I make it a point too, appreciate/congratulate my people as much I might pull them up for tasks.

Risk-taking ability: Every leader is expected to take risks and at some point have to take some decisions which maybe beyond the market dynamics. The confidence to take that decision comes from the fact that you have a strong deliverable team in order. For e.g. when we bought the –Da Vinci Xi robot – it was the most advanced robotic system in India but we had confidence that our team will deliver numbers. It's been just couple of months that we have got it and we have already done more than

100 robotic surgeries.

Empower and enrich: Undermining the ability of your people to take decisions is seen as one of the most negative and regressive tract in a leader. Being a leader, one should encourage his/her people to take decisions and correct actions if necessary rather than questioning their ability.

Be accountable: In the process of making our facility the best for healthcare delivery, there are a lot of new projects / services / ideas that are taken up the organisation. But, as a leader when one takes a little more accountability to deliver then it boosts the confidence of the team members too and the end result is always impactful.

Decision-making capabilities: While running the operations of delivery of care, one needs to take many decisions that are right, ethical and have a profound impact on care delivery. Hence, I think the correct decision making capabilities are very very important in a leader.

Leadership is not about somebody opening the door for you but about opening the door of opportunities for your people. It's a gift and a privilege. I am a great follower of Nelson Mandela and truly believe in what he said, "It is better to lead from behind and to put others in front, especially when you celebrate victory when nice things occur. You take the front line when there is danger. Then people will appreciate your leadership."

healthcare leaders. In addition, the working and understanding of the P&L, the various aspects on which revenues can be optimised in an industry that deals with sick people is indeed an attribute that would require fine tuning even with the best of B-School's information and knowledge.

Human Resources: Dealing with people is the next attribute that is very important. While arguably this is true for any industry, in healthcare you are dealing

with people who are working in an environment which is in the midst of anger, sorrow, joy and a mixed emotion that is a composite human behaviour exercise. Therefore, the stress levels of healthcare workers being high, understanding of how and what needs to be done for employee engagement, ensuring their comfort levels and keeping the team together, enabling them to flourish in this atmosphere is indeed another attribute.

Administration: There is a need to acquire knowledge and information about engi-

neering and the front desk. While a person may not be an expert, common sense understanding of these areas is indeed very important.

So I would say that a healthcare leader has to be an amalgam of many faces... a physician's face or a clinical face, a hotelier's face which means that he has to understand the importance and efficiencies that are based on customer care but also about food and beverages, rooms upkeep, building upkeep, etc. He should also have technical knowledge to the extent re-

quired of engineering. One also needs to know finance and a thorough understanding of how the healthcare industry and the insurance industry works.

It is wise for a healthcare leader to interact with industry, government officials, statutory bodies and understand the long-term health aspirations of the nation.

Healthcare is indeed a national priority and in keeping with that one has to work irrespective of whether you are in a field of "for profit" or "not for profit".

INTERVIEW

Maintenance of data integrity at the process and product level are of key importance

Validation of medical devices and its corresponding engineering and manufacturing processes form an integral part of the complete product development lifecycle informs, **Suhas Tamras** – Global Head, Medical Devices and Healthcare Practice, Tata Elxsi in conversation with **Raelene Kambli**

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Validation of medical devices and its corresponding engineering and manufacturing processes form an integral part of the complete product development lifecycle

What are the new technologies that you think can change the current healthcare landscape? And what are the policy framework required for them to ensure successful utilisation?

Almost all industries have seen a dramatic shift in the way consumers are adopting new technologies. The new age consumers demand information, goods and services at the place and time of their choosing and as an industry, our job is to enable an ecosystem that fulfils such a demand. It is true that consumer for every industry is different but this trend is horizontal in nature.

Healthcare industry, which consists of a healthcare provider, manufacturers of medical devices and drugs, and medical insurance providers, is witnessing a technology-driven transformation itself. While the healthcare system has always been providing evidence-based care but digital health technologies have opened doors for preventive care, which promises to be more efficient and effective in every way. It is proven through clinical studies that patients who are better informed about their health make better decisions pertaining to their health, which in turn leads to better outcomes. Furthermore, it is not only limited to the patient use case. Healthcare Provider (HCP) and OEMs are increasingly using these technologies to make informed decisions and provide meaningful benefits to the end user.

Some of the key digital health technology trends prevalent in the industry are Artificial Intelligence (AI), Internet of Medical Things (IoMT), Telehealth, Augmented Reality (AR) or Virtual Reality (VR) or Mixed Reality (MR) and Blockchain.

As the industry is embracing these technologies, regulatory bodies are feeling the need to modernise their policies. Although the main objective of the regulatory bodies is to ensure patient safety, they are streamlining their regulatory process to encourage innovation in digital health technologies. For example, the US FDA has been vocal about its intent to improve patient outcomes and hence has taken an inclusive and iterative approach towards digital health technologies. They have rolled out a pilot software pre-certification programme for software as a medical device (SAMD) which would be further refined based on the outcome of the pilot and to also include software in a medical device (SiMD), and other software that could be considered accessories to hardware medical devices in the future.

What role does data integrity and validation play for medical devices?

Maintenance of data integrity at the process and product level are of key importance when OEMs are either transforming internally to adopt digital technologies to optimise their internal processes or providing additional value to their end-customers by leveraging digital health technologies.

From the process point of view, OEMs are increasingly reliant on electronic records to maintain data throughout the product lifecycle. Although handling data in the electronic format provide convenience to the users/stakeholders, it poses a unique set of challenges for the OEM. US FDA through its industry guidance 21 CFR part 11 expects the companies to ensure that the data maintained in their systems is always attributable, legible, contemporaneously recorded, original or a true copy, and accurate (ALCOA). Companies achieve these by implementing controls such as limiting individual access through authorisation, maintaining a secure audit trail, checks for validating the source of data input and enforcing permitted steps, provision for data backup/disaster recovery and importantly the protection of records. Hence, OEMs are required to formulate strategies at the corporate level, implement control for secure data management and validate the system in their entirety.

In the case of product line expansion, OEMs are leaning towards the integration of digital technologies to provide a complete ecosystem of solutions, which not only addresses critical areas in their operating areas but also creates a seamless

experience for the user. For example, IoT is one of the most discussed technology topics in the medical devices industry and so is cybersecurity. Implementing an IoT platform is beneficial for both the end-user, i.e. doctors, clinicians, nurses, etc. as well as the OEM. Users can ensure a better clinical outcome by remotely accessing data for informed clinical decisions while OEMs can access device log data to enable predictive maintenance and ensure minimum device downtime. In all cases, the security of data takes precedence over all other ecosystem development requirements. OEMs are aware that the loss of data integrity can lead to severe consequences in terms of patient safety hence apart from ensuring data security at the device or system level, methodologies are also required to be implemented to ensure secure data transmission.

Validation plays an important role in ensuring compliance with the requirements set forth by the regulatory bodies. The validation of the system is required to establish documented evidence that a process or product will consistently perform accordingly to the predetermined specification and quality attributes. Validation strategies at the companies need to be pragmatic in order to ensure effective and efficient compliance with the objectives of the entire validation programme. One needs to prioritise the systems according to their impact on the quality of the product itself and accordingly carry out the validation activities.

What are the costs that companies have to pay for not maintaining data integrity associated with medical devices?
Regulatory bodies rely on documented proofs of OEMs' compliance claims. If your objectives, plan, protocols and reports are not documented satisfactorily then the system is inadequately controlled for ensuring product quality, which in turn may affect patient safety. Hence, the implication of not maintaining data integrity can be huge in terms of costs. The cessation of sales and product recall may directly affect the company's top line and at the same time, resources may need to be diverted to address the problems, which further affects the operational cost. The problem is much more for the public listed companies as the investor sentiments may turn negative.

What does a successful validation programme bring together - engineering, manufacturing, regulatory compliance and quality assurance and/or more?
Validation of medical devices and its corresponding engineering and manufacturing processes form an integral part of the complete product development lifecycle. At times, validation guidelines have a broad definition and lack specificity. This may lead to inadequate validation, especially in the case of smaller companies that have a comparatively small pool of resources undertaking multiple tasks.

Hence, it of utmost importance that the functions in the organisation work together and successfully execute a validation programme. A validation team must have representation from dependent functions, in-depth and common understanding of what validation consists of, for different processes and device types, and how validation programme must be carried out.

Tell us about the impact or value that Tata Elxsi has created for its client/partner's business?
We at Tata Elxsi house an experienced team of engineers that brings an in-depth understanding of various functions involved in the entire PDLC of medical devices. Its geography-specific regulatory requirements exposure, allows it to work closely with OEMs of all sizes to analyse risks in their various processes and mitigate them to deliver quality products. Our expertise in the validation area covers both the device validation and the process validation including test method validation, computer system validation etc.

One of the key aspects that we help our clients consider or cover is the economics of the validation programme. Since the industry is very competitive and in some cases commoditised, the consideration for cost-benefit plays an important role in planning the entire validation programme. Our turnkey approach and proven methodology have helped customer execute the validation programmes in an optimised, efficient and cost-effective manner.

raelene.kambli@expressindia.com

The future of robotic surgery

Approved by USFDA in 2000, over five million robotic surgeries have been performed using Intuitive Surgical's da Vinci platform, informs **Dr Vivek Venkatesh**, Consultant – Uro-oncologist and Robotic Urologist at Nanavati Super Specialty Hospital

INITIALLY DEVELOPED with a view to perform surgery on the battlefield, robotic surgery has grown by leaps and bounds in the last two decades. Today, it has become one of the most sophisticated tools a surgeon has, allowing for precise, tremor-free surgery with the added benefits of a minimally-invasive approach.

Robotic surgery involves the surgeon sitting at a console and operating on two joysticks. The surgeons' wrist movements are replicated within the patients' body by the robotic instruments allowing the surgery to be performed. Ultimately, the instruments are in direct control of the surgeon.

The surgery was approved by the United States Food and Drug Administration (US FDA) in the year 2000 and since then over five million procedures have been performed using Intuitive Surgical's da Vinci platform. The fourth generation Xi system has seen significant advances and the future of robotic surgery is more exciting than ever.

One of the drawbacks of robotic surgery remains the added costs associated with the procedure. The monopoly of Intuitive Surgicals, which has generated over 1,500 patents, has contributed to this. In 2019, a number of patents are due to expire, opening up the space for significant competition with a potential for cost reduction. The Telelap Alf-X (TransEnterix Corporation) was approved by the US FDA for gynaecological and certain general surgery procedures last year and systems have been installed in the US, Italy and Japan. This system also tracks the surgeons' eye movements in order to move the instruments which is a unique feature and something other companies will seek to emulate. The Revo-I system, developed in South Korea, is a traditional master-slave platform with four arms. It has an open console design allowing the surgeon more peripheral vision. It has begun human trials and the first successful feasibility study for prostate cancer surgery was published last year. There are other companies in advanced stages of development and the Medtronic MiroSure device is expected to be launched in India (before any other country) in the next year or two. All these developments are expected to spur increased competition and a resulting reduction in cost, leading to more widespread adoption of robotic surgery.

One limitation for any minimally-invasive surgical approach is the loss of the ability to touch the tissue with the fingers (haptic feedback) which is useful to the surgeon, especially in more difficult cases with large, advanced tumours or in repeat surgeries. With robotic surgery, the surgeon relies only on vision to operate, and the addition of haptic feedback to robotic instruments will be a significant advancement. Research using pressure or tactile sensors and other components such as 'haptic gloves' to simulate touch is ongoing. All robotic companies are trying to figure out how to make this work, and this will be a race worth looking out for.

Another avenue of research is further miniaturisation of instruments, while still maintaining their incredible dexterity. This will be specially useful in paediatric surgery where current instruments can be too large. Robotic systems are also trying to advance to single-port access which allows all the instruments to be placed through a single, albeit slightly larger, port, thereby minimising incisions. The da Vinci SP (single-port) system was approved for surgery in 2018. Perhaps, some years down the line, there will be nanorobots coursing through patient's blood vessels and reaching the diseased tissue to operate – no incisions, no pain!

Training in robotic surgery remains a roadblock for many surgeons and improvements in simulation and training modules would make a significant impact. The integration of machine learning with large databases could give surgeons guidance by allowing a step-by-step guide or short video to pop up. Such integration between robotic systems, operating rooms and databases of trainers or videos would help overcome a surgeons' initial learning period.

Twenty years ago, robotic surgery was conceptualised for long-distance surgery. However, due to technical difficulties, this couldn't be realised. There were isolated reports of transatlantic surgery but it never became a practical occurrence. With more advanced and faster communication networks, it is possible that tele-surgery will be a reality in the future. The surgeon could literally operate from anywhere in the world, as long as the infrastructure needed was available in the patient's town. This could potentially allow delivery of the best possible care to anyone in the world, irrespective of geographic location.

Artificial intelligence is a buzzword on everyone's lips today. Johnson & Johnson has partnered with Google to form Verb Surgical, which is developing a 'digital surgery programme.' While it is still quite early in development, it is expected to include advancements in data analytics, machine learning, and connectivity. A recent study from this device reported on completely autonomous suturing using the robot in an animal model. Artificial intelligence could also potentially play a significant role in pre-surgical planning, intra-operative 3-D imaging and navigation allowing for even more precise and subtle operations. People expect that ultimately robots will replace surgeons and actually perform the surgery. Nevertheless, I believe that this still remains well in the future. However, given the speed at which artificial intelligence research is progressing, you never know when surgeons' jobs could be under threat.

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What keeps women representation low in radiology?

While women make up for a considerable number in Indian medical education India, the number of women radiologists is minuscule. Most experts believe that diversity among healthcare practitioners is important for representing the increasingly diverse Indian patient population they serve. Diversity promotes broader experience, different perspectives and encourages innovations. It also leads to higher performance and a competitive advantage. Then why does radiology have a long-standing history of having the lowest women representation among all medical specialities? What's keeping women healthcare professionals from opting such an important medical disciple?

Express Healthcare spoke to different medical professionals to understand their fears, challenges and expectations from radiology practice

Female medical students, in their formative years, need to be exposed to women radiologists in strong leadership roles

Radiology, as a post graduate branch, continues to be a top draw among medical graduates. Though there are just a handful of seats at the pan national level, radiology remains a highly coveted branch.

In the 1990s, there were few women medical graduates whose first choice was radiology.

Thankfully, that trend is changing now with more female doctors entering this field. Compared to traditional disciplines such as gynaecology and paediatrics, however, radiology still remains largely a male dominated field.

Why is this so? What are the barriers that prevent women from taking up radiology as a career and what can professionals in this field do to change that?

As a female radiologist myself, currently helming the division of ultrasound, X-ray and breast imaging at Wockhardt Hospital, South Mumbai, there a few actionable reasons for the above and also some myths which need to be urgently dispelled.

Drawing from my own personal experience, during our four years of medical school, our exposure to radiology as a potential future field was limited — a meagre 15 days. Instead, we were far more exposed to mainstream specialities such as internal medicine, paediatrics, obstetrics and gynaecology and hence, most of us viewed these as potential careers *vis- a- vis* radiology. Radiology was generally thought of as a 'background non-clinical stream'— also an investment — rich stream, if you were thinking of going into private practice straight after post-graduation.

The truth, however, could not be further from this — 20 years in this field and counting — I can say with confidence that radiology is an exciting medical branch at the forefront of technology and innovation. It remains a necessary part of the preliminary and advanced work up for each and every patient. There is much scope for work flexibility for women, especially during the challenging years of motherhood. For a female radiologist, this discipline offers a superb work- life balance.

Given these facts, it is surprising how few young women even now have their first choice as radiology.

The key reason for this, according to me, is a lack of strong female role models.

During our radiology post-graduation years, there were just a handful of women, we could look up to and approach regarding our own dreams and career path. While there were women who were a part of radiology faculty in hospitals and private practice, there were and still are, only a few women who could be potential mentors and are in strong leadership positions, compared to, say ,other branches such as obstetrics and gynaecology.

Currently in India, there are just a few women radiologists heading hospital departments, chairing conferences and running successful full time private practices. Even scientific publications have fewer women authors than men.

If we break down radiology sub-specialists, currently, there are more women working part time in ultrasound and breast imaging compared to either full time jobs or in cross-sectional imaging and interventional radiology.

Given the fears of radiation exposure, young female medicos are also hesitant to pursue this field as this may hinder or postpone their plans for motherhood. This acts as a barrier for women wanting to pursue radiology, more so for interventional radiology and nuclear medicine.

This, according to me, is an erroneous view.

Radiation exposure is most during post-graduation years where adequate protection is provided with the use of PEE such as lead aprons; thyroid shields etc., and prudent radiation use is advised. Radiation levels were well within the permissible range in most of the departments, including the hospitals I worked with, were quite considerate about women radiologists desirous of starting families and rotating them in alternate areas such as ultrasound during these periods. To sum up, the radiation exposure versus motherhood conflict is easily manageable.

Though the best and brightest opt for radiology, it is true that if you want to strike out on your own, one needs to invest in radiology equipment which may run into crores of rupees and the early years to recover that investment and turn the venture profitable may be challenging. Hence for women eager to be their own bosses, this acts as a deterrent. Most successful radiology private set ups that I have come across are still family setup or partnerships where investment and responsibility of recovery is not managed solely by women.

Gender diversity in our radiology pool offers a better opportunity for our patients- richer and more diverse experiences, a competitive edge and encourages innovation. Also, in this century, radiology is at an exciting time where, with the use of AI and intelligent assistants, the process of reporting and diagnosis are being speeded up. Additionally, the use of non-invasive imaging guided procedures is fast replacing many of the traditional open surgeries.

Senior women and male radiologists need to be more encouraging and form willing mentors to enthusiastic youngsters.

More women radiologists occupying roles of clinical directors and heads of departments will greatly help in inspiring the next generation of women to take up radiology.

Dr Bhagyam Nagarajan
Consultant Radiologist
Wockhardt Hospital,
South Mumbai

The answer lies in making the environment conducive for women to participate more actively

As I sit and pen these thoughts which are my personal opinions based on my experience of more than two decades in radiology in a large metro city i.e. Mumbai, I realise someone else thinking about this in a different setting and city may have a different take on this. So here is my two cents on this subject.

I am known to be a staunch feminist (who as a teenager managed to argue and convince her advocate grandfather to add daughters and daughters-in-law names in the family tree). I can confidently say that radiology is a branch of medicine where I have never faced any discrimination as a female, both as a resident and lecturer in a municipal hospital as well as a practising consultant in private hospitals.

To begin with, earlier the number of women joining radiology was much more than men. When I joined radiology residency 22 years back, my batch had five women and a single guy (you can imagine the joke in the department as to how he was dominated by females). The department itself had approximately 75 per cent of residents as females. But over the years, this distribution has slowly changed. In my hospital, in the last three years, we had eight male and four female residents. The reason for this, in my opinion is more men wanting to join radiology rather than women not wanting to take up this speciality. As radiology has evolved over the years from being limited to X-rays and ultrasound, to include CT, MRI and interventional radiology, it has become a truly clinical speciality with active involvement in patient management as well as financial stability, leading to the increase in males opting for this speciality.

Radiology is a branch where there have always been enough women who have been successful in teaching as well as private practice. I have not come across women being discriminated against when applying for radiology residency or jobs neither have I seen a difference in the pay based on gender. In fact, I have always been part of departments with women majority. At one point of time, except for the head of the department and the peons, rest entire staff including radiol-

Dr Malini Lawande, Consultant, Innovision Imaging and Nanavati Super Speciality Hospital, Mumbai

ogists, technicians, receptionists and typists consisted of women! There are challenges that we women face, but they are the same that any woman faces in any profession anywhere. We all find it a challenge to balance work, home and children. I have been lucky enough to sometimes work from home when needed but I realise this is not always practical in all situations and circumstances. But as radiologists, most of us have the freedom to adjust our work timings especially when we are in a group practice. We, as women do not want any concessions; we just need the flexibility to work around our timings while doing our full share of work. Uniformity with respect to maternity leave (maybe short paternity leave too...as after all, we are talking of equality!) is something the radiology fraternity can consider as a step forward in the right direction. The areas in radiology where women are under represented are as office bearers in the local and national radiology associations and in the upcoming branch of interventional radiology. But I believe this again is a matter of choice and not discrimination. Women are equally encouraged to actively participate in the association activities which they do to the best of their ability. But when it comes to taking up positions of responsibility in the office and administration, although nobody is stopping them, most of the women choose not to as they feel they will not do justice due to lack of time and energy in discharging these additional responsibilities.

Interventional radiology is a sub speciality that women radi-

ologists are hesitant to take up as difficult work-life balance and radiation risks are the challenges that are tough to face.

On the other hand, there are more women in academic institutions where they have an excellent opportunity to play an important role in training the residents who are the future of radiology.

I believe radiology is a sub speciality that women have always had a strong and equal presence in. Yes, there are few areas where some change would be welcome. We need to discuss and debate the ways in which women interested in these areas can be encouraged and promoted. And by this, I do not mean any reservation or concessions for women, as that is never a true solution. The answer lies in making the environment conducive for women to participate more actively by choice.

It is a level playing field and no one is stopping us. We need to decide to go and play!

As Mercedes Joubert rightly said, *'True equality is not the superiority of women, but the equal status of man and woman.'*

We need mentorship programmes where women can find the right guides to see what can be done to position themselves in the field

Over the last decade, radiology has struggled to recruit, retain, and advance women. The number of females in radiology continues to be abysmally low. According to a survey by the Association of American Medical Colleges, in 2017, while men and women graduated from medical school at a nearly equal rate, only 27 per cent of women graduates became radiology residents.

These maybe numbers from the US, but in India too, the percentage of women radiologists isn't too high.

There are several reasons for the low numbers. For starters, radiology has very negligible or sometimes no exposure during MBBS/internship. Often medical school curricula includes radiology a little late – by the third or fourth year, a time when students may have already decided on a speciality. Also, later choices are influenced by what we do during internships. That is why fields like OBGY, paediatrics, medicine, psychiatry become more appealing than radiology.

It is not just about early introduction in curricula. Sometimes, the way radiology is taught may be the issue. In most curricula, radiology re-

Dr Manisha More, Radiologist Resident, Bhatia Hospital, Mumbai

quires you to sit behind the resident watching them read films. This does not provide window to patient management. We need radiology programmes that show different aspects of jobs, like discussing cases at tumour boards with other specialties, or calling surgeons to make recommendations based on imaging findings. There is a chance that if more women saw that, they may want to opt for the field.

Thirdly, female medical students may not see role models in radiology -- the way they do in fields like paediatrics, internal medicine, or surgery. We need to support female radiology faculty's careers to get more women in radiology. If the female faculty is developed in an academic environment that's culturally supported, and we help them get promoted into leadership positions, it is likely that there are more female role models in radiology. For this, regular workshops and meets are needed for women in radiology, bringing in speakers on topics like how to get promoted, developing an educational portfolio, and work-life balance.

A majority of women who are already practising radiology highly recommend the field for women, keeping the humongous opportunities in perspective

Today, women are equally contributing in all professions and healthcare is no exception. It is observed that every year, a significant number of women take admission in Medical colleges but very few women opt for radiology as a higher study option, resulting in a very low number of female radiologists all over the world.

According to an article cited in *Applied Radiology*, in 2006, women constituted only 25 per cent of radiology residents, while they constituted 45 per cent among the total number of medical students. Unfortunately, in 2014-15, the percentage remained stagnant at 27 per cent. There had not been any significant increase in the percentage, since then.

But, at the same time, the entire gulf-region is thriving with female radiologists from India. As a matter of fact, radiology as a profession has grown immensely, offering lucrative career opportunities and good pay scales, then why such less number of women opt for radiology as a viable career option.

Why do women refrain themselves from taking up radiology?

While the list of potential reasons is exhaustive, most of them are misnomers. According to experts, below are a few

reasons why women aren't opting for radiology globally:-

Exposure: One of the prime reasons for women not choosing radiology as an option is because of their minimal exposure to it in the early years of medical education. Most of the medical schools do not include radiology until the third or fourth year, and by then, the majority of the students have already decided on a speciality, that they want to pursue.

Role models: Like in internal medicine, gynaecology, paediatrics and surgery, female medical students do not see many role models in radiology. Hence, they do not have anybody to look up to, that can act as an inspiration for them. Most of the women are apprehensive of taking up something new if the number of women in the same domain is relatively less.

Technology: Going by the theories that are not very relevant now, women do not take up radiology as they are afraid of technology. It is seen that some female medical students are afraid of the various components of Physics and its applications and high-tech approach used in radiology, making them not opt for the same. But many women radiologists that are heading radiology departments and are oc-

Varun Mehta,
Director - Human Resources,
SRL Diagnostics

cupying senior most positions have proved this wrong. Today, women are equally comfortable and tech-savvy to grasp with these concepts and it is substantiated by the number of girls becoming engineers.

Patient contact: Women are more inclined towards specialities that involve human touch such as gynaecology, paediatrics etc. The potential lack of patient contact can be seen as one of the reasons why women don't choose radiology. However, according to experts, women, medical students interested in patient contact can consider paediatric radiology and imaging.

Also, interventional radiology is another area with a lot of patient contacts, so women can opt it willingly if given a chance.

Scope

In several kinds of radio-imaging, e.g. breast imaging, uterus ultrasound, etc., patients prefer women physicians. Whether it's diversity in religion, sex, ethnicity etc., diverse healthcare professionals bring different outlooks to the table and respond differently to patient care. Moreover, diverse leadership also goes a long way in impacting healthcare policies of an institution. A diverse workforce also becomes more inclusive of the population they're treating.

A majority of women who are already practising radiology highly recommend the field for women, keeping the humongous opportunities in perspective. Despite radiology not highlighted well in the undergraduate curriculum, the awareness about its applications have increased manifold. In the last decade, the trend has changed and many toppers from both the genders are opting for radiology as their first choice.

What makes radiology a suitable profession for women is that there are no emergen-

cies like in paediatrics and gynaecology; one can choose schedules at will, offering a distinct advantage of flexible working hours. The remuneration for radiologists is in-line with seniority and skills. Because of the high-demand for female radiologists, their salaries are quite high and that too for limited working hours. The best thing about being a radiologist is that there are no geographic or language barriers (as patient-communication is less) and one can even start from where they had left, after a sabbatical.

With all the perceptions made about radiology in the minds of people and especially women, it is important to bring out the necessary changes. There should be changes in academic curriculums of medical schools that enable students to have an idea about all the sub-specialities within the first two years itself. This will help them in cultivating interest in a particular subject and they can learn it right from the start.

Improving gender diversity in radiology shouldn't be taken as a commitment but rather as an opportunity to bring one-of-a-kind viewpoints into the picture and help healthcare professionals to push themselves ahead in serving patients in an increasingly compassionate manner.

We have already seen that female role models have had great influence on women choosing to enter internal medicine and surgery in recent years. Women want to see other women in radiology positions making a big difference to medical students. Global data from last decade's surgery literature has showed that when female medical students saw happy women in the

residency programme during interviews, they realised they could be happy in that programme too.

Another reason some women state for not opting for radiology is the potential lack of patient contact. Those bothered by such issues can consider choosing fields like paediatric radiology and women's imaging. Interventional radiology is another area with a lot of patient contact. One more issue is exposure to radiation

as a major fear among females and their families as well.

All in all, we need more initiatives that encourage women to choose the field. We need mentorship programmes where women can find the right guides to see what can be done to position themselves in the field. If a student wants a mentor, they need to make it a high priority, because there are many competing priorities. Another way to increase the number of

women is by showing radiology's impact to students. Over the years, radiology has become an indispensable area. Be it cancer patients or trauma patients, they all require imaging. It is important to project all of this in the right manner.

There is a pressing need, now more than ever, to contemplate and continue an open dialogue on the gender gap in radiology. We need to collectively move toward

greater diversity in our profession. In terms of the future of women in radiology, it is possible that as medical curricula changes to be more inclusive of radiology, it will start to change the way women view the stream. There have to be more efforts to offer numerous opportunities for professional development and mentorship, along with tools and support for women faculty, staff, and trainees.

As undergraduates, young doctors are often influenced by good teachers/speakers

Radiology as a medical discipline has a long-standing history of having the lowest women representation among all medical fields all over the world. Given the job security and demand for female radiologists, especially in the Indian scenario, where working women have to manage work, home and kids, radiology as a profession with a controlled lifestyle would seem more appealing. However surprisingly, multiple studies done all over the world have seen a relatively fewer number of female doctors opting for this field. As against 40-50 per cent representation of females in any medical profession, radiology consisted of <1/3rd female residents, as reflected in a recent report by AAMC (Association of American Medical Colleges) in 2015.

Is it really important to have an equal number of females as males in any field? Does it really make a difference? Equal representation of females in any workplace not only reflects a strong team with no gender bias but has also shown to be important in patient care. Diversity among healthcare professionals is not only important in religion and ethnicity but also in gender as it reflects the diverse population that we cater to.

A study was done by Lara Hewett, a medical student from South Carolina, published in *Academic Radiology* states the cause of low percentage of females to be the pipeline of female students opting for this branch rather than gender bias in this field. Multiple reasons have been put forth by experts in the past few years.

As undergraduates, young doctors are often influenced by good teachers/ speakers. It makes them aim higher and visualise a promising future. There are very few female radiologists seen as heads of departments, chairing big positions, research guides or editors of major radiology journals. It is important to have a female role model for young females to choose this speciality. Promoting deserving female radiologists to become leaders will make it easier to encourage females to enter radiology.

Radiology is not a part of the undergraduate medical curriculum until the final year, hence exposure to this branch is very late. Most students already make up their mind about their favourite speciality by then. The internship at the end of the training merely has 15 days radiology posting which is far from sufficient to get a good peek into the prospects of this branch. The lack of insight into the field fails to generate interest amongst students to take it up as a life long profession. It is

Dr Shraddha Sinhasan, Consultant Radiologist at Jaslok Hospital and Research Centre

only in the first year of radiology residency that students realise the impact of radiologist's job in patient management.

Radiation exposure may also be one of the reasons some females hesitate to take up radiology. Radiology associations across the world must increase awareness amongst undergraduate students that radiation when used reasonably and responsibly in safe limits with appropriate monitoring, negates health hazards. There needs to be no radiation-related fear in the minds of female undergraduates willing to choose this speciality.

There is relatively less patient contact in radiology as compared to other clinical branches and thus may hinder female doctors who are willing to choose a branch with more patient interaction. These students must look at breast imaging and paediatric radiology as future prospects. In India, sociology as a subset of radiology remains a good career option for females who want to refrain from working

in radiation or who wish to have more patient interaction.

In our country, this profession is seen as an opportunity with potential for a lucrative private setup thereby attracting more men to this field. Also, technology as a subject has always been more attractive to men compared to women and may be one of the many reasons for the gender disparity. This is merely a theory and all bright medical students, male or female is unlikely to be afraid of technological advances.

In recent years, there has been some bridging of the gender gap in radiology in India. Statistics in other countries also show an increase in the percentage of female radiologists in age group <35yrs which is very promising. Young doctors should remember that the flexibility of lifestyle choices offered by this profession ranges from interventional radiology, private practice, hospital job or work from home which is incomparable to any other medical profession today. With more efforts from major radiology associations in India and across the world, the apparent gaps in the system can be filled and gender disparity in this major medical discipline can be hopefully resolved in the coming years.

> Radiology is not a part of the undergraduate medical curriculum until the final year, hence exposure to this branch is very late

India has been making significant progress on expanding access to treatment

Charles Gore, Executive Director, Medicines Patent Pool, talks about the organisation's supporting access in low- and middle-income countries and its ability to deliver quality and affordable medicines, in an interaction with **Viveka Roychowdhury**

You joined Medicines Patent Pool (MPP) as Executive Director in July 2018. As a recovered hepatitis C patient, how do you view the role of organisations like MPP in public health?
I originally got involved, in the UK in the 1990s, in hepatitis C advocacy because I had such difficulty in finding reliable information and appropriate support for myself and I didn't want anyone else to have to go through the same struggle. Quite soon the advocacy became more about access to treatment as new medications became available and I became a passionate believer in the need to ensure access for everyone in need, whether they are marginalised people in developed countries or simply living in developing ones. Because, I was aware of what the MPP had achieved in HIV, when the organisation wanted to consult with the affected community and other civil society partners on whether to expand into hepatitis C, I was delighted to be able to facilitate that at the World Hepatitis Summit in 2015. That expansion has been absolutely critical in driving down the price of hepatitis C treatment. It is just an example of the central role that the MPP has in supporting access in low- and middle-income countries (LMICs). The MPP is not the whole answer to access by itself – access is far too multi-faceted and there are many other organisations with

Charles Gore, Executive Director, Medicines Patent Pool, at a hepatitis C medical camp set up at village Malerkotla, Punjab, to test and treat people from disadvantaged communities. This was part of his recent trip to India in February this year

equally critical roles – but its ability to deliver quality, affordable medicines is a very important component of the answer. And the partnership approach with industry (both originator and generics) has proven to be a highly effective way to accelerate access to treatment.

What difference will you bring to the implementation of MPP's 2018-2022 strategy which is being expanded beyond HIV, Hep C and TB?
I have a vision of a world in ten years' time where no essential drug is launched without a comprehensive access programme that ensures that everyone who

needs it gets access to it at more or less the same time, no matter where they live. To achieve that, we need to show that the MPP model works in essential medicines and is a viable access strategy. This is a current focus for us. At the same time, we will not diminish our work in HIV, hepatitis C and TB. In hepatitis C there is still much to be done, even when we have the licences, and in TB getting the licences remains a formidable challenge.

What could be the hindrances to achieving the targets by 2022? And how can these be tackled? (A funding crunch, lack of sufficient support from governments, etc?)

For two of our five 2022 targets, we are well on track to achieve them ahead of time: MedsPaL, our free online patent database (www.medspal.org) will have patent information on all patented medicines on the WHO Essential Medicines List by the end of the summer, once the new list is published by WHO; and prices for a 12- week course of curative hepatitis C treatment has already dipped below $50 in some parts of the world, notably South Asia.

With regard to new licences outside HIV, hepatitis C and TB, although we are well advanced in our process of prioritising essential medicines and

beginning discussions with pharma companies about licences, these are new areas for us and there will be many challenges. It may be more difficult to get the broad territorial coverage we have achieved in HIV, at least in the beginning. Governments may be much less willing to commit money to supporting uptake, even if we can significantly reduce prices, since financing will have to come from domestic resources for the most part.

Civil society may not be as strong in some disease areas to generate the political will. Generic companies may therefore be less willing to take a licence with very uncertain demand. We believe all these challenges are surmountable, but we are likely to face them. As regards our target of 20 million people on MPP-licensed HIV drugs, we have the licences to make that happen. What we need is continued commitment by governments to diagnose people and link them to treatment. Our last goal of having a licence for a shortened pan-TB regime looks the most challenging. First the world needs to make the investments in research and development to ensure that there are promising new pan-TB regimens being developed to be licensed. To date, there has been a massive funding gap for TB R&D estimated at over $1.3 billion a year. While the pipeline does look more promising than a few years back, there is still a long way to go and there is a need for

all stakeholders to live up to the commitments made last year at the UN General Assembly.

Your efforts towards awareness and advocacy were instrumental in getting the World Health Organization (WHO) to declare July 28 as World Hepatitis Day. Where are we in terms of achieving the goal of eliminating hepatitis B and C by 2030?
WHO released a report in May on progress. It clearly shows that while some countries and some elements needed for elimination are on track, many countries and some particular areas such as harm reduction are perilously behind the curve. The report is a wake-up call for the world. There are only 11 ½ years until the end of

> I have a vision of a world in ten years' time where no essential drug is launched without a comprehensive access programme that ensures that everyone who needs it gets access to it at more or less the same time, no matter where they live

2030. That is very little time to develop an elimination plan, implement it and see the impact. Funding of course is often cited as a major obstacle. But it shouldn't be. The basic tests for hepatitis B and C cost under $1, while in many LMICs curative treatment for hepatitis C is less than $100 and treatment for hepatitis B less than $40 per year, thanks in no small part to voluntary licences. These interventions are so cost

effective every country should be thinking of including them in their basic Universal Health Coverage package and they should also be considered in terms of best buys for cancer prevention.

Similarly, what is you opinion of India's progress on eradicating TB?
India, like many countries heavily burdened with TB, has been making significant progress on expanding
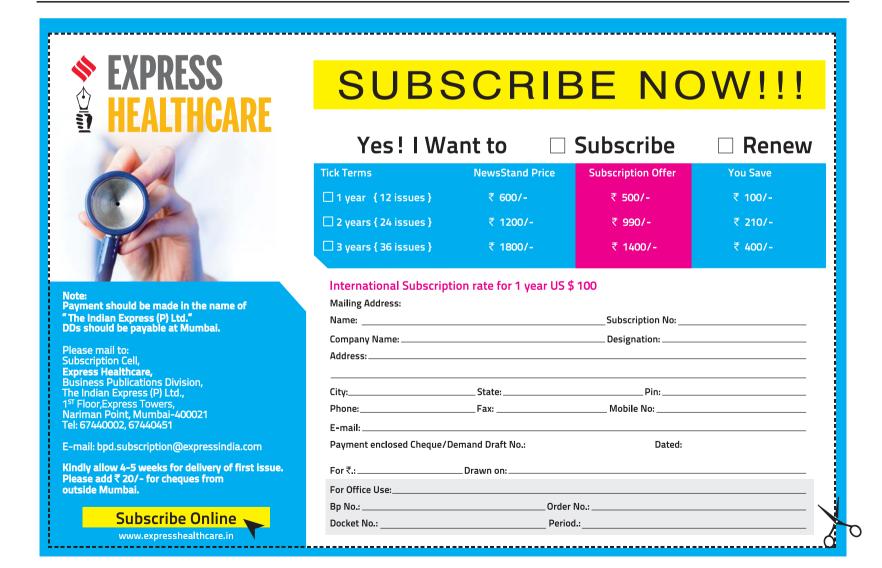
access to treatment. I think the political will is there but there are huge challenges, one of which is the lack of a key tool – a short regimen that can be used for both drug-resistant and drug-susceptible disease.

Could you tell us about your recent field trip to India and the outcomes of MPP's projects in India?
The MPP's recent field trip to India was for us to understand and document

the impact our licences have on the ground by meeting, talking to and, where appropriate, interviewing individuals affected by HIV or hepatitis C. We talked to a wide range of stakeholders such as doctors, government officials and broad civil society, but also of course Indian generic companies since they make up the majority of our manufacturing partners. To date, the MPP is less well known than I'd like, despite its extraordinary impact in enabling the delivery of more than eight billion doses of affordable, quality-assured, life-saving medicines. In order to expand successfully into new areas we need more people to understand the unique solution to access we offer and make use of it.

viveka.r@expressindia.com

PUBLIC HEALTH

Evidence Action is committed to National Deworming Day Programme by MoH&FW

Evidence Action is committed and always looks for evidence of a solution that works, and then turn it into a scalable solution for millions of people, informs **Priya Jha**, Country Director, Evidence Action to **Prabhat Prakash** in an exclusive interaction

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NDD aims for high quality and high deworming coverage consistently, with continued engagement with various ministries and departments converging for a fixed day programme

What is Evidence Action's vision for the initiative of Dispensers for Safe Water and Deworm the World Initiative and the rationale behind these?
In India, the Ministry of Health & Family Welfare leads the National Deworming Day (NDD) programme. As a technical partner to the Ministry, Evidence Action provides technical assistance to the national and state governments to implement, strengthen and sustain a high-quality NDD programme that leverages existing education and health infrastructure. The programme targets children and adolescents aged one to 19 years.

Dispensers for Safe Water is a programme which provides a simple solution to the problem of unsafe water in rural and remote communities. Chlorine dispensers are placed in the immediate vicinity of wells and other water sources. Community members go to their water source to fetch water, place their bucket under the dispenser, turn the valve to dispense a correctly measured amount of diluted chlorine, and then fill the bucket with water. The chlorine disinfects the water as the community member is walking home, and by the time he or she arrives, much of the chlorine smell has dissipated and they are left with clean and safe water.

Evidence Action is committed and always looks for evidence of a solution that works, and then turns it into a scalable solution for millions of people. We can measure self-reported diarrohea, and while we cannot measure actual diarrohea reductions due to the cost and complexity of direct measurement, our detailed models suggest that we avert nearly 450,000 cases of diarrohea per year and nearly 400 deaths of children under the age of five per year in the intervention areas.

How much has Evidence Action invested in the deworming initiative in India?
Evidence Action is the technical assistance partner to the Government of India and select states. It does not fund the Deworming programme. The Deworming programme is funded through government sources.

Is there an MoU with the government?
Evidence Action has an MoU with all the 11 states it works directly with for the NDD programme. With the GoI, there is not an MoU but we are recognised as the TA partner for the NDD programme.

How would you compare each state in terms of adopting the deworming initiative in India?
All 36 states and UTs in the country are mandated to implement the NDD programme, as per the frequency based on worm prevalence. As such, states budget for the same, plan, implement and monitor the programme and report the coverage to the GOI. There is no comparator though some states proactively undertake efforts to reach more children and engage with stakeholder departments. For instance, Rajasthan and Telangana engaged with private schools well ahead of others. States like Chhattisgarh proactively targeted children aged one to 19 years, using census population. Tripura reached out to children in brick kilns and from migratory populations as well as added some WASH initiatives at schools and anganwadis. Jharkhand consciously reached out to children in slums through a camp approach. So, each state has some specific initiative that they undertake.

How many schools have been a part of this initiative?
As of February 2019 round; 8.7 lakh anganwadi centres, 7.02 lakh government/ government-aided schools and 1.75 lakh private schools reported coverage of the NDD programme across 33 states/UTs. The target number of schools (government and private) is reviewed and updated before every NDD round. The number is validated through the coverage report prepared after every NDD round.

INTERVIEW

Our tagline is 'transforming healthcare through innovations'

Dr Dipanjan Sujit Roy, CEO, WISH Foundation in an interaction with **Prathiba Raju** speaks about how the non-profit organisation is building a value-added primary healthcare centre and transforming healthcare through innovations and to bring in innovative, in processes, products and devices

Why do you think primary healthcare centres are important for India?
Currently, the country's population is approximately around 1.37 billion. For such a vast country, the first point of contact should be primary healthcare centre (PHC), which is the basic structural and functional unit of the public health services and 99 per cent of our health problems and issues can be solved at this level. For this, we need a robust PHC as it will be of major help in the current system and government hospitals like AIIMS, Safdarjung Hospital will not be over-burdened. A majority of these patients from northern states go even for OPD consultation to such big hospitals, which showcases that PHCs are not functioning optimally as they should have been. In order to have a better health outcome, importance should be given to PHCs.

Can you elaborate on WISH's 300 primary healthcare clinics?
Wadhwani Initiative for Sustainable Healthcare (WISH) is a non-profit organisation, which delivers improved PHCs by building a value-added model that can be showcased and adopted by the government. Our tagline is transforming healthcare through innovations and to bring it to processes, products and devices. Ours is a PPP model, which strengthens the PHC delivery system of a particular locality with early, door step diagnosis and preventive care, helps in reduction of maternal and infant deaths and reduces the

burden of communicable and non-communicable diseases (NCDs) using innovative approaches. We just don't run the PHC but we are into preventive and promotive service also. As of now, WISH is running 300 such hubs ,spoke-models of primary health, wellness centres and associated sub centres in five different states — Rajasthan, Delhi, Madhya Pradesh, Uttar Pradesh and Assam.

Any particular reason for only being in these five states?
Apart from Delhi, the other four states of Rajasthan, Madhya Pradesh, Uttar

Pradesh and Assam are EAG states (Empowered Action Group) or referred as 'bimaru' (unhealthy) states. These states lack good public health infrastructure. So, we wanted to focus on such states instead of the performing ones, for example — Tamil Nadu, Karnataka or Kerala. We are in MoU with all the four states where we have put up an innovative PHC model with the best practices and standards. It demonstrates to the state governments on how it can be replicated and scaled up in other places. We started our work in Rajasthan; some of the best practices were implemented in other states

also. For example, we give technical and management assistance to Mohalla Clinics in Delhi and play an advisory role with the Government of Madhya Pradesh where we try to help them by putting up health and wellness centres. Similarly, we worked with governments of Assam and Uttar Pradesh.

Health being a state subject, each state government has its own preferences, issues and problems. So, how does WISH help them to overcome these challenges?
Each state is unique and has its own challenges and capacities. So, we do our in-

depth analysis and closely engage with the state governments. There are plenty of challenges our team has faced. We have the expertise to overcome them and provide better primary healthcare to the population. For example, in Assam, the situation is completely different than that of Rajasthan, so the standard operating procedures (SOP) or the way we look at health and wellness centres is different. We do a case-to-case and state-to-state basis study and understand the issues. Further, state government officials are advised on what will be the best for a particular state

and for the population in that particular locality. Few examples are an urban model of dengue prevention and healthcare service in Gorakhpur, Uttar Pradesh and an urban technical support programme of strengthening primary healthcare delivery in Madhya Pradesh. WISH provides innovative technology and connects the last mile population for a better healthcare delivery.

What are the issues you have addressed in the states. Any changes your model has achieved?
Wadhwani Initiative for sustainable health is supported by philanthropist Sunil Wadhwani. Along with government funding, WISH also lends some portion of funds, which helps the centres and gives better outcome-based approach. For example, we have added a lot of 'point of care' devices in these centres. Only in Rajasthan, WISH has direct service delivery as per Indian Public Health Standards (IPHS). In order to address the manpower issues in PHCs of Rajasthan, we approached retired government doctors to continue their services. As for frontline health and administrative workers, we have associated with local people who were willing to

> ## We don't just run the PHCs but we are into preventive and promotive services. As of now, WISH Foundation is running 300 such hub and spoke model of primary health and wellness centres and associated sub centres in five different states

join as per government salary. WISH's Aadarsh PHC model was adopted in 2015. In 2016, Government of Rajasthan asked Boston Consulting Group to do a quick survey on the model, which indicated that there has been a substantial improvement in process indicators in maternal and child health, communicable diseases, non communicable diseases and in geriatric, specialised ophthalmology.

How do you see the health and wellness centre initiative by the central government? Are you associating with it?
The national health policy, looks at transforming 150,000 PHCs into health and wellness centres (HWC). In this HWC platform, WISH is currently running nearly 50 centres in the five before-mentioned states, where we provide tele-medicine through which specialists

can be consulted by patients. During tele-consultation, we make sure that the patient is accompanied by a nurse, midwife or a frontline health worker. Usually gynaecology and cardiovascular diseases are dealt more frequently in these centres. In each healthcare centre, we provide 12 services. The government has a mandate to transform 150,000 PHC to HWC which is a challenging task, in which WISH is playing a small but unique role of showcasing 50 centres which can be demonstration models. We are also working into a deeper implementation plan and the presentation will be shared with the government and the states, who wants to implement or scale it up much faster.

Can you brief us about WISH Foundation Artificial Intelligence (AI) and how it is going to help the healthcare domain?

The Wadhwani Institute for Artificial Intelligence (WIAI) is also working on a few simple apps, which is going to help the healthcare domain to give better health outcomes. For example, one AI-based solution will be on quick identification referral system for high-risk pregnancies.

How are you using the collected health data?
We do generate a lot of data but the data is maintained and owned by Government of India. It's not owned by us, whenever the government wants us to analyse it, we support them and create a dashboard for the decision makers to take certain decisions.

WISH Foundation has been working with Mohalla Clinics, how do you see this model? What kind of help is given by WISH?
In Delhi, mohalla clinics has

been one of the models for urban healthcare, where WISH is the knowledge management partner. We do not run clinics. We give the digital information system and make the processes easier. We have tried to make this model efficient, effective and in mohalla clinics, we have introduced Swastha ATM, a medicine dispensing machine. The prescription is also digitised, so the chance of error is much less.

Can you tell us about the funding pattern?
Our founder donor gives us a decent grant of money, which gets completely transformed into healthcare initiatives in the five states. And, we also have donors like USAID and government donors like BIRAC. Besides, the Government of Rajasthan and the Aditya Birla Group also funds us.

Why creating robust PHC is important?
Primary healthcare is not a good return for investment, so you will not see many private players who are willing to work here. But unless we improve our PHCs, the intended general health improvement of the country can not be achieved. If PHCs become robust then it will make a huge difference in the healthcare delivery in India.
prathiba.raju@expressindia.com

Evidence Action is committed and always looks...

How is Evidence Action funded?
We have some committed organisations, individual philanthropists and others who support our evidence-based approach to programmes that have high impact, are scalable and reach millions.

How has the response been so far for this initiative?
Since its launch in February

2015, progress of NDD has been encouraging and it has gone from strength to strength. The programme targets to reach almost 26-30 crore children and adolescents twice a year (as per frequency based on worm prevalence) through NDD rounds. It is motivating to witness the coordination of efforts displayed by lakhs of teachers, anganwadi workers, ASHAs and ANMs across the states in the country. The programme has consistently

improved, added new elements which have been instrumental in improving the overall programme implementation and performance. Another interesting development has been an understanding and acceptance among stakeholders about the contribution of deworming to overall nutrition efforts towards building of a healthy nation. There is growing evidence and understanding of parasitic intestinal worms

and their impact on children and adolescents. The success and reach of the programme are based on inter-sectoral coordination and convergence.

How do you plan to scale it up?
The programme is already being implemented across the country with the frequency as mandated. With each NDD, efforts are being made to improve coverage of children-whether they are out of

school, in other education streams like junior colleges, vocational training centers etc. The programme is aligned to the guidance of WHO on programmes for Soil transmitted helminths (STH) control and global targets. NDD aims for high quality and high deworming coverage consistently, with continued engagement with various ministries and departments converging for a fixed day programme.
prabhat.prakash@expressindia.com

Understanding factors that help retain and sustain CHW in health systems

Rohina Joshi, Senior Research Fellow, The George Institute for Global Health explicates on the role of Community Health Workers (CHWs) and how a sustainable model is required to retain them in the Indian healthcare domain

CHW FORMS the essential link between communities and health systems in low-and-middle income countries. Often working as volunteers on performance-based incentives, CHWs deliver several interventions aimed at attaining the Sustainable Development Goals for health. CHWs have been credited with improvements in health and social outcomes, particularly in relation to reproductive and child health. Yet, many CHWs work without adequate training, remuneration, supportive supervision or basic entitlements under domestic labour laws which results in low motivation levels and high attrition rates.

India has one of the world's largest CHW initiatives. The George Institute for Global Health, conducted a discrete choice experiment to identify the key motivational factors that may help retain Accredited Social Health Activists (ASHAs) in service in Andhra Pradesh, India. A discrete choice experiment is a survey which elicits preferences of individuals from a range of choices. It helps researchers and policy makers understand how individuals select attributes of a programme. We developed an android-tablet based DCE for ASHAs (*https://link.springer.com/content/pdf/10.1186%2Fs13690-019-0346-0.pdf*). Our study which included 299 ASHAs, found that more than 85 per cent of the participating ASHAs wanted opportunities to progress their career and were willing to sacrifice Rs 2530 ($35.45) out of their monthly salary for a job that offers promotion. Other factors that they chose included

having a fixed salary (as opposed to performance based incentives) and free family health care.

Our results are also broadly consistent with DCEs done among nurses in Malawi, and Laos, and community health officers in Ghana which showed career development and continuing education are the two influencers in shaping

Policy decisions should take health worker preferences into account to motivate, retain and sustain CHWs and their efforts in achieving SDGs

the preference profile. These findings are similar to a mixed-methods study done in Haryana which identified the passion for work, financial incentives, community recognition, and training as the key motivators. While training with an opportunity for promotion is not a direct financial incentive, it offers job security, higher salary, more au-

thority and recognition. Priority free family health-check and low workload were other driving factors that affected the ASHAs' choices. These findings support the growing evidence of the importance of the non-financial interventions in motivating community health workers in developing countries. Financial incentives should ideally be

accompanied by a non-financial package that could be tailored to the local context. Both options are indispensable, where monetary incentives provide security and allows for personal development of the workers; non-monetary incentives provide satisfaction and can optimize the CHW's performance.

The recent World Health Organization guidelines for optimising CHW programs recommends training, supportive supervision, appropriate remuneration, written contracts with detailed job description, health worker rights and opportunities for career development to motivate and retain CHWs in the health system (*https://apps.who.int/iris/bitstream/handle/10665/275474/9789241550369-eng.pdf?ua=1&ua=1*).

Government of India recently announced a revised pay scale for the ASHAs with social security cover. Given that different states in India have the authority to implement the new recommendations, the following years will see how this policy is rolled out in the different regions of India.

This study has relevance for both India and other countries with CHW programmes. CHW programmes across the globe face similar issues of low motivation, and poor morale which leads to poor health outcomes of the community. Understanding health worker choices and addressing them could resolve some of these issues. Policy decisions should take health worker preferences into account to motivate, retain and sustain CHWs and their efforts in achieving SDGs.

STARTUP

Streamlining ayurvedic practice

Ram N Kumar, Founder and CEO, NirogStreet shares his views with **Prathiba Raju** on how technology-led Ayurveda platform Nirog Street aims to nurture future ayurveda experts with the right kind of knowledge and impactful tools

Why do you think common man still has trust deficit when it comes to ayurvedic treatment or doctors? What will you do to bridge this gap?
People trust ayurveda but when it comes to ayurvedic doctors and medicines they don't have the same trust. Trust is lost when we have more unqualified doctors than qualified doctors. The biggest issue is that in the modern age where other healthcare streams such as allopathy etc. are riding on knowledge, content and evidence-based innovations, torchbearers and experts of ayurveda (world's holistic and most reliable healing system) are still struggling for the right kind of knowledge-sharing tools that can bring the much-required trust.

NirogStreet aims to bridge this huge learning gap by equipping established doctors and nurturing future ayurveda experts with the right kind of knowledge and impactful tools. Once the doctors pass out from medical colleges, they don't have a platform to learn or track clinical progress on a real-time basis. So, most of the doctors rely on theory and books to upgrade their practice but what is required is the practical knowledge with live case studies. NirogStreet Ayurveda app is the country's largest database of curated and certified ayurveda practitioners. This app aims to build an interactive, knowledge-oriented and robust information sharing platform for practitioners, academicians and students.

Another big issue with ayurveda doctors is that most of the time their practice is focussed around a single brand. They also give open medicines to patients. It is not possible for any single brand to offer all medicines for all ailments. We have changed this trend by offering a plethora of trusted and authentic brands under one roof to participating doctors. Now, they can easily prescribe multi-brand medicines so as to ensure timely and effective recovery and cure. We are also pushing the ecosystem to stop the practice of open medicines as it is associated with a large number of health, safety and trust risks.

With technology-based intervention, we curate and empower doctors by working closely with Ministry of AYUSH, regulators and research organisations. Our platform provides peer-to-peer learning where content and cases are created by a real doctor for real doctors so as to bring in standard practice protocols in ayurveda.

With the increase in anti-microbial resistance (AMR) globally and particularly in India, do you see an opportunity for ayurvedic treatments?
AMR has emerged as a global threat and the credit goes to modern healthcare practices and inappropriate use of antibiotics. For example, atopic dermatitis is a typical Japanese problem with no cure available. A herb-based system can easily manage such issues. So, in AMR all traditional medicines such as ayurveda, unani, Chinese medicines and African medicines are bringing success. Wherever surgery is not required, ayurveda is preferred over allopathy.

Ministry of AYUSH is barring non-AYUSH scientists from undertaking any research work on AYUSH drugs and

> ❝ NirogStreet Ayurveda app is the country's largest database of curated and certified ayurveda practitioners. We are witnessing a great shift where modern diagnostics is now collaborating with ayurveda

treatments. How do you see this step?
The irony is that people today are selling anything and everything in the name of ayurveda. To strengthen the trust in ayurveda as the first call of treatment, certain standards and norms need to be set. Those who don't consider reading classical texts which are the base of ayurveda have no right to take the lead in doing research work on AYUSH drugs and treatments. It is a right step by the ministry where they have mandated at least one ayurveda doctor to be a part of the trial before it goes for commercialisation. However, isolation doesn't help in the long run. The best way is to bring all the different segments of research on one platform to create new drugs and treatments for a better life.

Your startup is working on various disease areas, be it diabetes, Alzheimer's or liver protection medicines. How and why should a person avail your medicines, what is your USP?
Our USP is simple. NirogStreet is a trust-based platform for streamlining the supply chain for ayurvedic medicine, transforming it into a proper healthcare system by engaging, empowering and aggregating fragmented ayurveda doctors and clinics. We provide skills-based certification, inventory and order management tools and quality real medicines (multi-brand) to ayurveda doctors to create an experience that patients can trust.

The biggest failure of ayurvedic doctors and the reason behind lack of trust is fake medicines and lack of quality assurance. It is not possible for any single brand to offer all medicines for all

ailments. Apart from learning and certifications, Nirogstreet platform urges ayurvedic doctors to prescribe multi-brand medicines so as to ensure timely and effective recovery and cure.

NirogStreet is said to partner with CSIR - Indian Institute of Integrative Medicine (IIIM) to conduct research on medicinal cannabis (marijuana) for pain management. What is the status?
Cannabis has a special mention in our classical ayurveda text as Vijaya and is known to have its origins in India. Cannabis can be used as a medicine under ayurvedic classical preparation, however, it falls under the narcotic law. We are working to give ayurveda-based scientific validation to this medicine in partnership with CSIR, ayurveda doctors and other scientific communities.

How can we combine modern diagnostics with traditional ayurvedic healthcare? Give examples.
Modern diagnostics are playing an important part in ayurveda healthcare. We are witnessing a great shift where modern diagnostics is now collaborating with ayurveda. *Simple mutra parikshan* (urine examination) as per ayurveda, helps in understanding a lot of diseases and now it is being developed as a critical part of modern diagnostic protocols. Modern diagnostics such as blood test, along with ayurveda traditional diagnostics like *nadi parikshan* can give very accurate data point for doctors to practice. A collaborative approach can provide better medication which will also add growth to ayurveda.

prathiba.raju@expressindia.com

INTERVIEW

Take care of your dose

Adherence to medicines is a must for people suffering from chronic diseases, and Caredose is helping them in doing so, informs **Gauri Angrish**, CEO, Caredose, to **Akanki Sharma** in an exclusive interview

What led to the formation of Caredose? What prompted you to come up with such an idea -- any incident or personal experience?

I've always had an inclination towards creating something that would positively impact multiple people and understood at an early age that healthcare was the only avenue to do so. Keeping this in mind, I studied biotechnology from the University of Nottingham with a focus on stem cells. However, after moving back to India, I saw that research opportunities in stem cells were limited here. Thus, I wanted to understand the business side of healthcare and therefore joined McKinsey & Company's pharmaceutical and medical device vertical. My role there involved interacting with and working on projects for large pharmaceutical manufacturers. That is how I got exposure to the concept of medicine non-adherence and more importantly understood the huge negative impact of medicine non-adherence -- not just on patients, but also on each and every stakeholder in the healthcare spectrum.

I knew I had found a problem worth working on but lack of experience and in-depth knowledge of how things work in healthcare prompted me to quit McKinsey and start a physical pharmacy store in Delhi. I spent two years just running the pharmacy and understanding how the supply chain works. Post this, I started my research in existing solutions for improving adherence and saw that the only options were app alerts or reminder services, which, in my opinion, were not comprehensive at all. So, I recruited 50 patients from our pharmacy network across multiple chronic ailment and devised our initial offering with them, modifying it each month based on their feedback.

Which cities are you currently active in and how many patients have benefitted through your services till date? Do you provide your services for every disease or are these specific to some major diseases?

Currently, Caredose operates in cities across Delhi, Haryana and Uttar Pradesh. Our next target is to expand the footprint in five new cities including Hyderabad, Mumbai, Pune, Chennai and Bengaluru. We will also be looking at global expansion next year. Our target countries include Indonesia, Qatar, the UAE, the UK, Nigeria and South Africa, where we will be focussing on both private and public sectors.

Our service is primarily focussed towards patients with chronic ailments like diabetes, hypertension, cancer, kidney diseases, neuro diseases and so on. Managing medicines for such users can be difficult and overwhelming. Our aim is to provide these patients with the easiest way to buy and manage their regular medicines. After launching our services, we realised that several post surgery, pre/post-natal and tuberculosis patients were also subscribing to Caredose and benefiting from it.

You were in talks with the central government for providing your services to tuberculosis patients via TB health facilities run by the RNTCP. What is the current

development in this regard? Are you working with any specific state government too?

Yes, we have partnered with the RNTCP, Ministry of Health, World Health Organisation and Clinton Health Access Initiative to provide our proprietary smart dispensers to ensure and track real-time non-adherence in tuberculosis patients and link them up with actionable alerts to optimise patient care and treatment outcomes. We have carried out successful feasibility tests, and have been approved for a grant by United States Agency for International Development (USAID) as well. Additionally, we were invited by the University of Harvard, at their annual global health symposium, to speak about our technology and plans to impact global health. Post this they are now assessing us for a grant for a large trial, across multiple cities. With respect to state governments, as of now, we are only working with the Delhi State TB office but are already in talks with other states.

What progress/advancem-

ents in technology have you noticed in India among medtech providers? What more is needed for eradicating TB?

Technology has advanced by leaps and bounds amongst the medtech providers in India. Improved data penetration, voice-learning modules, robotics, machine learning and artificial intelligence are helping the patient-provider models of care. Increasingly, medtech providers are acknowledging and appreciating the need for multi stakeholder alignment to be able to make an impact. Last-mile delivery in healthcare and personalisation of medicines/treatment are growing segments in the industry given the needs of the users. With regard to TB, there is a need for optimising public resources and aligning the supply chain to be able to deliver care to the patients within the stipulated timelines. Unfortunately, in our society, strong stigma attached to TB and gender inequality make it even tougher to achieve effective treatment outcomes. Substantial efforts towards women empowerment and spreading awareness around TB need to be made across all socioeconomic classes. Innovative technologies and targeted education, on the back of a collaborative effort between the private and public health sectors can help us eradicate TB in India.

The central government has plans to eradicate TB by 2025. Do you think this target is achievable? What is the role of Caredose in it?

The goal set by the Government of India is definitely not an easy one but when one sees the steps that are being taken towards eradicating TB, it is easy to say that this goal is achievable. Eradicating TB is not simple and requires inputs and efforts from various stakeholders. It is great to see that they have been extremely proactive in this regard and are promoting a "cafeteria approach" which involves getting multiple stakeholders together and providing patients with end-to-end care, from diagnosis to treatment to cure, to ensure positive patient outcomes.

Caredose fits into the treatment aspect of the patient's journey, and as adherence is important for successful completion of treatment, it will play an essential role in not only ensuring adherence, but also tracking and communicating it in real-time, without any input from the patient.

How should our healthcare ecosystem respond to a TB patient's needs? Give 4-7 key steps leveraging innovative technology/ies.

A lot is already happening resulting in increase in understanding a TB patient's needs and provision of solutions accordingly. A few things I can think of are: increasing focus on diagnosis of TB along with latent TB, integrating all technologies on a single platform to allow for seamless end-to-end care, focussing on creating awareness about TB to negate the social stigma, especially around women with TB and collecting and analysing relevant data to keep improving the treatments and technologies based on real-world data.

akanki.sharma@expressindia.com

INTERVIEW

Dozee will evolve and revolutionise the way health tracking is done globally

On the eve of the International Yoga Day, a less than five-year-old health tech start-up company, Dozee has introduced a meditation feature to its contactless health monitoring device. The company has developed the device under the 'Make in India' initiative and it is senior citizen-friendly as well. **Pritish Gupta**, Chief Operating Officer and Chief Business Officer, Dozee, talks about the significance of newly added feature with **Usha Sharma**

Tell us about Dozee's contactless health monitoring device and its key features.

Once placed under the mattress, Dozee measures heart health, respiration, sleep quality, stress levels and other clinical parameters while all they have to do is just sleep on the bed normally. Every morning, users can see their data on the app (available free of cost for both iOS and Android) that gives rich insights about their health. Not only does the device track health parameters, but also provides personalised recommendations to improve further. With the newly launched Mindfulness feature, users can experience the power of meditation by following simple guided steps and will get the first-of-its-kind quantification on how meditation has impacted their vitals and stress levels.

Dozee, built closely in collaboration with top doctors and institutions such as NIMHANS, Jayadeva Institute of Cardiovascular Science and Research, has been proven to be 98.4 per cent accurate as compared to medical devices.

Dozee has proved life-saving in many cases, helping individuals to catch early signs of health deterioration arising from conditions such as heart attack, sleep apnea and tuberculosis. It is being extensively used by individuals to monitor the health of their parents remotely from the app.

What is the learning so far from the data you have gathered since the launch of the sleep monitoring device?

We built Dozee with the aim of providing the easiest of monitoring for one's health. Since the time of launch, we have seen multiple times that health deterioration is preceded by an individual's heartbeat and respiration showing early signs of deviation from healthy range. This enables us to catch any illness before its symptoms are visible, and have been able to save multiple lives.

Another insight we had is that there are conditions like sleep apnea, from which around 15 per cent Indian adults suffer. But the issue is it has very less detection rate and Indians have even lower awareness about its incidence. Apnea is a condition in which individuals have limited (or stop) breathing multiple times during sleep. But with Dozee, users have gotten to know about Sleep Apnea from the comfort of their bed.

Tell us about the benefits of Dozee Mindfulness and how cost-effective is it?

With Dozee Mindfulness, we aim to reach out to a larger number of people who want to opt for natural remedies to treat modern-day lifestyle diseases such as hypertension. Dozee's Mindfulness not only helps to reduce a user's stress levels through easy and simple breathing practices, but it also quantifies the efficacy of meditation by measuring its impact on heart rate, respiration rate and stress levels. With this feature, we aim to bring the power of meditation in everyone's home by providing easy-to-follow instructions and evidence-based personalised recommendations.

Why is there a rise of chronic health-related issue in India and how can such device help to reduce it?

Our present healthcare system is reactive where we only react on detection of a disease or a medical condition. Plus, increasing stress levels and worsening sleep quality of individuals have led to an increase in lifestyle diseases.

With Dozee, our endeavour is to change that paradigm to a preventive and proactive approach. We believe Dozee will continue to evolve in the coming years and revolutionise the way health tracking is done across the world. The core idea will always be to simplify healthcare. Healthcare need not be complex and the power should be within the reach of an individual to take charge of our health.

Population of the elder age group is growing faster than the young age group. In this scenario, how can your device address emerging issues in geriatric care?

Seniors are generally at high risk of having health complications. Monitoring their health on a regular basis is hence essential. But the challenge in existing solutions was that it was too difficult for seniors to adopt to technology, and more importantly having them to use it continuously. Seeing the challenge we faced with making our parents/ grandparents adhere to healthy habits, we created Dozee. Dozee has made health monitoring as easy as sleeping on the bed. Seniors don't have to do anything at all and that is why we have been getting health data of even 85+ years old for the last six months, without even missing a day.

This simplicity in usage is coupled with our caretaker feature, which enables their kids and doctors to monitor them from anywhere in the world. Our AI engine flags case of health deterioration even before they become serious, a feature which has not only saved their lives but have saved a lot of money.

u.sharma@expressindia.com

> **Healthcare need not be complex and the power should be within the reach of an individual to take charge of our health**

INTERVIEW

The healthcare vertical is rife with error and misuse

Ashish Thapar, Managing Principal and Regional Head – APJ, Verizon in an interaction with **Sanjiv Das**, elaborates on the alarming rate of breaches in the healthcare sector, its impact and ways to prevent it

> **Effectively monitoring and flagging unusual and inappropriate access to data that is not necessary for valid business use or required for patient care is a matter of real concern for the health sector**

2019 Verizon Data Breach Investigations Report (DBIR) is built upon analysis of 41,686 security incidents, of which 2,013 were confirmed data breaches. Amidst this, how many incidents were reported from the health sector?

Unfortunately, there has been a surge in the number as well as the size of cyber-attacks in the healthcare sector. Out of 2,013 breaches, about 15 per cent are from the healthcare sector. The statistics below have been gathered from DBIR 2019 on the healthcare sector:

◗ **Frequency**
466 incidents, 304 with confirmed data disclosures

◗ **Top 3 patterns**
Miscellaneous errors, crimeware and privilege misuse represent 81 per cent of incidents within healthcare

◗ **Threat actors**
42 per cent external, 59 per cent internal, four per cent partner and three per cent multiple parties (breaches)

◗ **Actor motives**
83 per cent financial, six per cent fun, three per cent convenience, three per cent grudge, two pre cent espionage (breaches)

◗ **Data compromised**
Medical 72 per cent, personal four per cent, credentials 25 per cent

What was the methodology used to collect the data? How many countries/focus areas were taken into consideration while going in for collecting the data?
The collection method and conversion techniques differed among contributors. In general, three basic methods (expounded below) were used to accomplish this:
◆ Direct recording of paid external forensic investigations and related intelligence operations conducted by Verizon using the VERIS (Vocabulary for Enterprise Risk and Incident Sharing) Webapp.
◆ Direct recording by partners using VERIS.
◆ Converting partners existing schema into VERIS.

For a potential entry to be eligible for the incident/breach corpus, a couple of requirements must be met. The entry must be a confirmed security incident, defined as a loss of confidentiality, integrity or availability. In addition to meeting the baseline definition of 'security incident,' the entry is assessed for quality. We create a subset of incidents (more on subsets later) that pass our quality filter. The details of what is a "quality" incident are:

The incident must have at least seven enumerations (e.g., threat actor variety, threat action category, variety of integrity loss, et al.) across 34 fields or be a DDoS attack. Exceptions are given to confirmed data breaches with less than seven enumerations.

The incident must have at least one known threat action category (hacking, malware, etc.)

For the second year in a row, the healthcare vertical is the only industry to show a greater number of insider attacks. What type of breaches are common in the health sector?
The healthcare vertical is rife with error and misuse. In fact, it is the only industry vertical that has more internal actors behind breaches than external. Ransomware accounts for 70 per cent of all malware in healthcare.
◆ Social attacks (mostly phishing and pretexting) appear in approximately 13 per cent of incidents in healthcare and are a definite matter for concern. Phishing (48 per cent of social attacks) occurs when an attacker sends a communication—usually an email—to an individual attempting to influence them to open an infected file or click on a malicious link.
◆ Pretexting is a similar social attack but is somewhat more involved on tricking someone and less dependent on a hyperlink or an attachment. In this scenario, the criminal emails, calls or even visits an employee in person and engages them in conversation to fool the victim into providing the attacker with credentials, or other sensitive data, with which they can launch an attack.
◆ The healthcare industry has a multi-faceted problem with mail, in both electronic and printed form. The industry is not immune to the same illnesses we see in other verticals such as the very common scenario of phishing

emails sent to dupe users into clicking and entering their email credentials on a phony site. The freshly stolen login information is then used to access the user's cloud-based mail account, and any patient data that is chilling in the **Inbox, or Sent Items**, or other folder for that matter is considered compromised – and its disclosure time

◆ Misdelivery, sending data to the wrong recipient, is another common threat action variety that plagues the healthcare industry. It is the most common error type that leads to data breaches, where documents are a commonly compromised asset. This could be due to errors in mailing paperwork to the patient's home address or by issuance of discharge papers or other medical records to the wrong recipient.

What makes it more vulnerable and how can the vulnerabilities be fixed?
Healthcare is not only fast paced and stressful, it is also a heavily-regulated industry. Those who work in this vertical need to do things right, fast and remain in compliance with legislation such as HIPAA and HITECH (in the US) and other regional or global data privacy statues. Effectively monitoring and flagging unusual and inappropriate access to data that is not necessary for valid business use or required for patient care is a matter of real concern for this vertical. Across all industries, internal actor breaches have been more difficult to detect, more often taking years to detect than those breaches which involves external actors.

Another concern that is bothering the healthcare companies is the threat of medical devices being tampered with or made to malfunction by adversaries. These are very scary scenarios where let us say an insulin pump, drug infusion pump or a pacemaker; the devices that keep people alive, can be hacked to malfunction leading to a critical medical emergency for a patient. Things to beconsidered to avoid

vulnerabilities:
◆ **Easy access:** Know where your major data stores are, limit necessary access, and track all access attempts. Start with monitoring the users who have a lot of access that might not be necessary to perform their jobs and make a goal of finding any unnecessary lookups.
◆ **Snitches don't get stitches:** Work on improving phishing reporting to more quickly respond to early clickers and prevent late clickers.
◆ **Perfectly imperfect:** Know which processes deliver, publish or dispose of personal or medical information and ensure they include checks so that one mistake doesn't equate to one breach.

Can you elaborate on how huge can be the adverse impact of breaches of medical data?
The impacts of medical data breaches could be humongous. Healthcare sector has seen a great amount of digital automation and it continues to advance in how medical care is being provided to patients which often results in more data being gathered and processed. The sensitive patient data or protected health information (PHI) is processed and transmitted across several systems that may not be adequately

protected against cyber-attacks. In the hands of criminals, PHI can be abused in all types of crimes including identity theft, prescription fraud, and the provision of medical care to a fraudulent third party in the victim's name. Another very important perspective is that the healthcare data has a very long/permanent life as it cannot be changed unlike a credit card information which can always be changed to limit the exposure.

How has India fared in measures to prevent data breach as compared to other countries?
The healthcare industry in India is growing at an exceptional rate of 15.92 per cent per annum, according to the Indian Pharmaceutical Congress, which will help the industry grow to the $55 billion mark by 2020, positioning India in the sixth place globally. Apart from the growth of the industry, digitalisation has also led to a rise in collection and analysis of data making it susceptible to the cyber criminals and being infected with malware.

With the right to privacy now being made a fundamental right in India and increase in the number of data breaches, the Ministry of Health and Family Welfare (MoH&FW) has decided to

roll out the draft legislation titled Digital Information Security in Healthcare Act (DISHA). The act seeks to regulate the generation, collection, storage, transmission, access and use of all digital health data. Further, the personal data protection act (yet to be passed in the parliament) should pave the way for stronger data protection framework in the country

A regime to mandate disclosure of data breaches to regulators and affected entities would also be very helpful in creating effective deterrence and transparency in the industry.

What type of steps are required in terms of building policies, creating strategies and investment at micro and macro level?
A critical step in defending your reputation and the security of your customers is managing the risks involved in collecting and storing personally identifiable health information. The question to be asked is 'Are you protecting against today's threats or tomorrow's?' Below are a few points to consider protecting the healthcare industry from an attack:
◆ **Know your data and the risk thereof:** This is the most fundamental step that many organisations tend to miss or

handle insufficiently. Companies should look at measures to devalue data by using controls such as encryption, tokenisation and truncation. An application/system designed while keeping security in mind right from the start is the best approach to drive better protect, detect and respond controls.
◆ **Instituting a policy:** Ensure that policies and procedures are in place which mandate monitoring of internal Protected Health Information (PHI) accesses. Make all employees aware via security training and warning banners that if they view any patient data without a legitimate business need there is potential for corrective actions.
◆ **Don't spread the virus:** Preventive controls regarding defending against malware installation are of utmost importance. Take steps to minimise the impact that ransomware can have on your network. Data shows that the most common vectors of malware are via email and malicious websites, so focus your efforts around those factors.
◆ **Reduce risk footprint:** The theft or misplacement of unencrypted devices continues to feed our breach dataset. Full Disk Encryption (FDE) is both an effective and low-cost method of keeping sensitive data out of the hands of criminals. FDE mitigates the consequences of physical theft of assets by limiting exposure to fines and reporting requirements.

Risk management in combination with robust cyber response strategy is the key to both mitigation of cyber threats and recovery from a breach. A healthcare entity that knows the risks and controls the data flowing both within and outside its walls is better equipped to protect sensitive data, mitigate and respond to possible security incidents and, most importantly, assure the safety and security of its patients.

sanjiv.das@expressindia.com

Blueprint for cybersecure healthcare

Increasing inter-connectivity with technological advances are rapidly ushering transformations in healthcare delivery to enhance patient care. However, it has also made medical devices more prone to cyberattacks and have emerged as a major concern. In fact, a report released by SecurityScorecard a couple of years ago had highlighted that 'healthcare is the fifth highest in ransomware counts among all industries'. Therefore, even as data protection laws and device testing standards become stringent, it has become imperative for healthcare providers to take proactive measures to eliminate the risk in their medical devices with interconnected capabilities. Therefore, two renowned cybersecurity solutions providers, McAfee and e-Mudhra, share insights on strategies to deal with this mammoth problem, in exclusive interviews with **Lakshmipriya Nair**

'Healthcare information is rich in both, financial and personally identifiable data, fetching up to $60 in the black market'

Venkat Krishnapur, VP-Engineering and MD, McAfee India, highlights the huge cybersecurity threat posed by medical devices and systems in hospitals and outlines measures to mitigate this menace

Can you give us an overview of cybersecurity threats through medical devices? How complex and multifaceted is this issue?

The healthcare industry today is moving towards a network of connected medical devices – network and cloud connected equipment such as nurse stations, patient monitors, diagnostic devices and scanning systems, among others. Similar in nature to other Internet of Things (IoT) devices, medical equipment is a vulnerable attack surface. Typical attacks include large scale cyber-attacks which range from ransomware, data exfiltration, distributed denial-of-service (DDoS) attacks malware to network breaches. These devices can also be exploited for large-scale data theft considering how healthcare information is rich in both, financial and personally identifiable data, fetching up to $60 in the black market.

Hackers can further put the patient's life in danger by gaining control of control devices such as blood gas analysers. McAfee research has also unearthed vulnerabilities in the hospitals' picture archiving and communication system (PACS) such as unencrypted traffic between client and server, click jacking or default accounts that could be misused by cybercriminals for extortion.

How can we assess the major vulnerabilities in the use of any medical device?

Assessment of risks related to medical devices should encompass a technical assessment, security programme assessment and include a risk management strategy. The first step will identify the network of all connected medical devices by type, network interfaces and device relationships. It also recognises devices with the likelihood of security incidents and mitigation opportunities. The Medical Device Security

Program will evaluate physical security controls, patch management and incident management. It will gauge elements of access management such as user credentials and segmentation. Multiple stakeholders involved in device management can effectively secure and manage devices through a Medical Device Security Risk Management Strategy. It helps address contextual issues such as purchase of the device, implementation, maintenance and disposal.

How can we safeguard and assure the safety, effectiveness, and security of medical devices, even as we leverage the transformational abilities of technologies such as IoT?

Firstly, organisations must develop an incident response plan as a rapid recovery mechanism. Patches on general purpose devices must be updated regularly and end point protection should be changed from default to advanced to block malware executables. Enhancing the anti-spam filter can help evade ransomware attacks through uncommon file formats, packed several levels into .zip files to evade detection. Use network segmentation to separate critical devices required for patient care from the general network. Keep your backup data safe by disconnecting it from the production network in the event of a ransomware attack. Most importantly, foster a culture of

security within the organisation as lack of user awareness remains a key vulnerability to undertake cyber-attacks.

How can the healthcare providers be made more aware and informed about the cyber security vulnerabilities and empower them to prevent them?

Multi stakeholder collaboration between regulators, manufacturers, industry experts and healthcare professionals along with proactive preparation are vital for maintaining the security of devices. Building a community will enable enhanced collaboration and provide them with a platform to voice out the challenges of addressing device security. A strategic plan that maps out industry best practices for designing and building security into medical devices can generate consensus between key industry players. It

'Almost every discussion of cyber security relates back to the confidentiality, integrity and availability (CIA) triad'

Biju Varghese, SVP, Enterprise Solutions, SAARC & APAC, e-Mudhra illuminates on strategies to fortify enterprise security and the role e-Mudhra can play in developing standards for security in medical devices and systems

Cyber security threats through medical devices have emerged as a real knotty problem. Can you enlighten us about the complexities of this menace?

As medical device technology continues to evolve it is inevitable that more use will be made of commoditised hardware and software. Smartphones and handheld devices are increasingly used as the patient-to-device interface since they provide local processing power alongside an ability to connect into the Internet and transfer clinical data to hospitals, family doctors and researchers. These users wish to analyse and process data on clinical systems and databases, often spread across multiple geographies. The flip side to this is the increasing threat of device compromise, hacking and disruption. According to recent research, the three most common vulnerabilities in healthcare cybersecurity are user authentication deficiencies, endpoint leakage and excessive user permissions — which, combined, account for nearly 37 per cent of all critical risk scenarios. Identity spoofing continues to threaten enterprise security across all sectors, including healthcare.

What are the methods to evaluate major vulnerabilities in the use of any medical device?

The vulnerabilities specific to medical devices are not commonly detected by vulnerability scanners. The fact in clinical environments is that most teams don't know the proper way to figure the vulnerabilities in the devices. The primary usage for a vulnerability scanner is to find and track the assets and start performing the individual risk assessments on them—that is, independent research of known vulnerabilities, network segmentation, and appropriate alerting mechanisms for devices.

What are the strategies to defend medical devices from cyber threats, even as we leverage the transformational abilities of technologies such as IoT?

Almost every discussion of cyber security relates back to the confidentiality, integrity and availability (CIA) triad. Effective use of Public Key Infrastructure can ensure the confidentiality of data transmitted, integrity of data and authentication of devices. A full scope of testing and evaluations allows manufacturer that a product's interoperability with other devices and platforms is confirmed, helping ensure an ideal user experience while securing information and maintaining performance. Full-scale testing also ensures communication channels are secure, thus enforcing the confidentiality and integrity of data transferred between the device and IoT infrastructure. Testing the infrastructure, in turn, provides assurance that end-user' sensitive data is adequately protected against unauthorised disclosure, theft of service, or other concerns.

What are the ways and means to spread awareness among healthcare providers about the cyber security vulnerabilities and enable them to prevent them?

Best practices and industry-specific standards should be used to develop the security minded processes driving the operation of a secure networking and computing infrastructure. A secure ecosystem should be monitored and maintained via regularly scheduled audits and the use of outside teams for tasks such as penetration testing, software evaluations, and hardware assessments. It is also critical to conduct regular security awareness training and ensure employees are regularly trained on security best practices.

How can medical devices be made fail-safe from a security point of view? What would it involve?

It requires tie up with medical equipment manufacturers and embedding secure elements like 'Trusted Platform' module which can perform cryptographic functions to ensure confidentiality, integrity and authentication.

How can e-Mudhra help in developing a safe environment for healthcare in the digital era?

e-Mudhra, being a thought leader, can work with the regulators and help develop standards for security in devices. This can also ensure interoperability across the devices.

You have a blockchain solution called emBlock. How can it usher improved efficiencies in cyber security?

Most medical devices today collect, store and transmit patient-specific data. And like nearly every situation where data is centrally stored and transmitted to another central data store, there is a risk that the data may be hacked from the device or captured during transmission by those with less-than-honourable intentions. Blockchain provides an alternative whereby the data is cryptographically protected, immutable and private. This is not possible with traditional data storage and transmission processes. Through blockchain applications it is possible for machines to share their operating data with those responsible for maintaining it without violating compliance and privacy issues. Sensitive information, such as patients who have been treated with the device, types of procedures, and images or other information can be shared with the maintainers but can be used for auditing, reporting and compliance. Blockchain can also keep service records that may be required depending on the device and its purpose. Blockchain can be leveraged to keep permanent records of the development, design, production and distribution of medical devices as well as all of the parts from suppliers. Once the information is submitted to a blockchain it cannot be changed, resulting in permanent traceability for every device.

lakshmipriya.nair@expressindia.com

is also important to educate and motivate the first-line defense–people – about the latest modus operandi of cybercriminals, governance and compliance requirements, cybersecurity policies and adequate training to deal with cyberattacks.

Is it possible to make these products 'secure by default'? What would it involve?

Incorporating default security requires a 'Security by Design' approach, a proactive and ground up approach to enable security controls throughout the development process — building in security from the start, rather than as an add-on, is key. This entails identification of assets, threats and vulnerabilities during the software development process and in the code being deployed. Using advanced data analysis tools, the process identifies the impact of threats on device functionality and end users, including potential vulnerabilities from outside sources. Use of static analysis tools can provide manufacturers with process documentation, test completion and software readiness reporting capabilities to provide information related to the cybersecurity of their device at the premarket submission phase.

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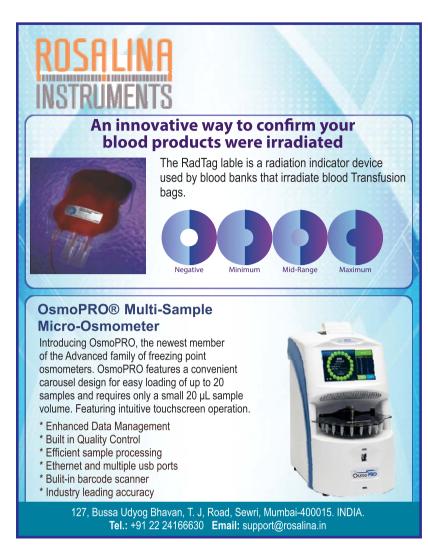
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Insertable cardiac monitor a boon for prognosis of cardiac arrhythmias

Dr Balbir Singh, Chairman Interventional Cardiology and Chairman Electrophysiology and Pacing, Medanta - The Medicity Hospital, Gurgaon elucidates on how Abbott's new technology sensor-enabled mapping catheter helps in diagnosing complex arrhythmia

The rapid rise of cardiovascular disease has increased the need for more electrophysiologists. Can you share the benefits offered by electrophysiologists? Do we have enough number of electrophysiologists in the country?

With increase in cardiovascular disease burden, 272/100000, the arrhythmia burden is also on the rise. Increase in heart rhythm disorders have increased the demand for electrophysiologists. An electrophysiologist's role is critical as they can prevent sudden cardiac death. They also treat dangerous heart rhythm issues called arrhythmias (irregular heartbeats). Some of the examples are atrial fibrillation, ventricular tachycardias, supraventricular tachycardias etc.

As per Indian Heart Rhythm Society (IHRS) we have close to 150 electrophysiologists in the country for a population of 1.25 billion countrymen whereas a country like the US has close to 2500 electrophysiologists for a population of 327 million. This clearly shows the huge gap between supply and demand.

What are the major changes you are seeing in the interventional cardiology space and how is latest technology like the remote monitoring via insertable cardiac monitor helping in cardiovascular disease?

❝

Technologies like the insertable cardiac monitor help physicians in remote monitoring. It has improved the prognosis of cardiac arrhythmias manifold and has thus helped healthcare professionals extend therapy benefits well in advance

The interventional cardiology space is expanding at lightning speed, and with technology getting dynamic as we speak, more and more patients are getting benefits of healthcare. Technologies like the insertable cardiac monitor help physicians in remote monitoring. This is one technological advancement which has improved the prognosis of cardiac arrhythmias manifold and has thus helped healthcare professionals extend therapy benefits well in advance.

How does Abbott's new product, which is a sensor-enabled mapping catheter used in patients? Can you explain the features of the product which helps?

Abbott's new product is a multi-point mapping catheter which is used to understand heart rhythm disorders in detail. The design of the catheter itself is unique which gives us a better understanding of the directionality of arrhythmia propagation and has helped in rapid identification of complex arrhythmias.

What are the advantages of the new product for patients with complex arrhythmias? As of now in how many patients this new technology is used. What is the result?

The new catheter helps in accurately mapping the source of rhythm disorder in the heart. It helps reduce procedural time. It significantly reduces radiation exposure to the patient and the physicians. In many cases, radiation may be completely avoided. The new catheter increases the success rate of the procedure and minimises the complications. So far, I have successfully treated five patients in a span of just a week since the launch.

Is Medanta doing any tele stenting, what are the advantages and risks involved in it?

No, not as yet, but it's definitely on the wish list.

Wish list of Indian medical device industry from Modi 2.0

Rajiv Nath, Forum Coordinator of Association of Indian Medical Device Industry (AiMeD) talks about the expectations of the new government and the measures needed to revitalise the sector

THE TRIUMPHANT victory of Prime Minister Modi has re-invoked more positive feelings. People believe that '*Acche Din*' will come to the Indian medical devices industry and expect continued action on the partially finished agenda by Modi 2.0.

The first term of the Modi government has been very eventful and progressive for the presently valued $10 billion Indian medical device market. It saw a series of serious measures being taken by the government for the Indian medical devices industry

which looked positive and beneficial to the end consumer. Now, there is an urgent need for the government to expedite steps for patients' protection, stronger quality and safety regulations, price controls to make medical devices and quality treatment accessible and affordable and ethical indigenous manufacturing viable

Wish list of Indian medical device industry

◗ Need to regulate all medical devices under a patients' Safety Medical Devices Law to protect patients

◗ Need to protect consumers from exploitatively high MRP

in medical devices by rationalised price controls

◗ Need to encourage employment and Make in India of medical devices to address 70-90 per cent import dependency with a predictive nominal tariff protection policy as done for mobile phones. This would ensure a vibrant domestic industry by ushering competitiveness and price stability

◗ Need to incentivise quality in healthcare products in public healthcare procurements by preferential pricing for Q1 e.g ICMED instead of L1 to ensure patients access ac-

ceptable quality. We stress these are vital and strategic to meet the health-for-all National agenda of PM Modi. It is also aligned to the Health Policy 2017 to make quality healthcare accessible and affordable for common masses and place India among the top five medical devices manufacturing hubs worldwide. It will also help end import dependence and thereby tackle an ever increasing import bill of over Rs 31, 000 crores! It will also help reduce pseudo manufacturing and unethical marketing.

Carestream goes green with packaging and e-waste recycling

Corrugated trays and e-waste partner help enable easy recycling and are part of Carestream's initiatives for greater environment compliance

CARESTREAM HEALTH has adopted the use of corrugated trays for their product CARESTREAM DRYVIEW Laser Imaging Films. The company was earlier making use of white expanded polystyrene (EPS) foam tray for shipment. The change to corrugated cardboard trays comes as Carestream takes up greener initiatives for greater environment compliance.

The use of corrugated cardboard trays will help decrease solid waste disposal and provide fibre that can be reused. This change is environmentally advantageous, as the corrugated tray is more easily recycled and prevalently accepted in recycling streams. The new packaging provides the same excellent protection during shipment and handling as the earlier used packaging configuration.

In addition to changes in its packaging material, Care-

stream India has also partnered with an authorised e-waste partner for responsible disposal of e-waste generated by the company. To ensure that the recycling of e-waste is taking place in a safe manner and in no way detrimental to the environment the company has partnered with experts in the field, through government approved vendors.

These initiatives also come on the back of feedback received from customers. "We learned that our customers were keen on us taking up eco-friendly practices. Customers asked and we listened. We look at our growth from a sustainable perspective. These initiatives and partnerships will help us work towards that direction." said Sushant Kinra, MD, Carestream Health India.

The new packaging has already been rolled out for the 11X14 inch (28 X 35 cm) films with other sizes to follow.

PRODUCTS

Virosil: A Swiss, eco-friendly, chlorine-free fumigant

Virosil is an eco-friendly formulation manufactured and marketed by Sanosil Biotech in technical collaboration with SANOSIL AG of Switzerland

SANOSIL BIOTECH, a Mumbai-based company which is the first company to pioneer the novel concept of eco-friendly fumigation in operation theatres in hospitals and healthcare industry with its product Virosil. Virosil completely replaces the use of carcinogenic proven formalin. The product, Virosil is based on Hydrogen Peroxide (H2O2) and Silver Ions. (nanotechnology). The combination of these two ingredients gives a broad spectrum synergistic activity on all kinds of viruses, bacteria, fungi, yeasts, molds, protozoa and algae. It is a clear, colourless, odourless, tasteless disinfectant which is non-carcinogenic, non-mutagenic, revolutionary and can be used where other chlorine based disinfectants have been feared.

An operation theatre can be made 100 per cent sterile within 60 minutes using Virosil as a fumigant. Healthcare workers will not face any irritation as our product is 100 per cent eco-friendly. This also results in faster turnaround time for OT's and prevention of hospital acquired infections.

Our formulation is presently being used in reputed hospitals and institutions in the healthcare industry as a very effective fumigant and disinfectant thereby providing an microbe free and a completely safe and sterile environment.

The added benefits of Virosil is that it does not give any foul odor, irritation to the eyes, requires no de-fumigation and is very safe and easy to handle as per our recommendations.

Our formulation (Virosil) was being earlier marketed by Johnson & Johnson under the brand name Ecoshield.

The company also offers a customised disinfection audit on its website: www.sanosilbiotech.com

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Mindray promises - Better healthcare for all

Dean Zhang, Managing Director, Mindray India

WITH THE vision of "Better healthcare for all", Mindray takes it as its responsibility to bring medical expertise to more people. Exchanges on medical knowledge and technologies, we believe, will help accelerate the development of healthcare industry and make the world better. Mindray has been dedicated to this cause and will always take it as an enduring undertaking.

Inspired by the needs of our customers, we adopt advanced technologies and transform them into accessible innovation, bringing healthcare within reach. While improving the quality of care, we help reducing its cost, making it more accessible to a larger part of humanity. Today, Mindray's products and services can be found in healthcare facilities in over 190 countries and regions.

Mindray is proud to have been a key contributor in India to provide cost effective products to government and private hospitals, and help cope with the rising challenges.

Founded in 1991, Mindray is one of the leading global providers of medical devices and solutions. Firmly committed to our mission of "advance medical technologies to make healthcare more accessible", we are dedicated to innovation in the fields of patient monitoring and life support, in-vitro diagnostics, and medical imaging system.

Headquartered in Shenzhen, China, Mindray possesses a sound global R&D, marketing and service network with 39 overseas subsidiaries and branch offices in 30 countries. To date, Mindray has 10,000+ employees globally.

Mindray India started its direct operations in India from 2006 and since then it has continued to achieve the Miracle it set out to. In a short span of time since, Mindray has established a network of sales and support team in India, and all the major cities have our representatives. The company has achieved the major goal of being close to our customers. We have established regional offices at Gurugram, Mumbai, Kolkata and Chennai and 4 warehouses. We have built a culture that is driven by commitment, ingenuity and integrity.

In India we have always taken extra initiatives to provide latest high-quality, innovative and cost-effective products and a very good service team and very good professional clinical support team. We are so glad that increasingly Indian hospitals have accepted us over past two decades – and also, very importantly, that they are very happy about the product, service and support. This gives us a lot of confidence. We work very closely with the end-user and customer and medical professionals. We also now have many very good reference installations in university hospitals and city-level top hospitals and diagnostics centers all over India.

Mindray being a complete healthcare solutions provider will continue delivering the products and services that meet customer needs. We believe that every life is equal and deserves the right to receive quality healthcare service. We will continue striving harder toward our aim of providing healthcare within reach.

Nice Neotech - HIGH FLOW OXYGEN THEREAPY

TECHNOLOGICAL developments have been the most transforming force in the advancement of neonatal care. Yesteryears witnessed scaled down version of technology of adults, which did not meet the very different and unique physiologic needs of infants. The challenge of saving smaller neonates and those with complex surgical cardiac anomalies and medical conditions warrant the use of high tech equipments. The spectrum of medical equipment is continuously undergoing changes in design, catering to the renewed demands of the end user necessitating the products to be user friendly. The medical equipments at nice

Neötech Medical Systems are characterized by innovative drive and pioneering spirit and designed to meet the ever changing complex needs of the 'health care' Industry.

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BPL is poised to build a strong hold in the Indian ultrasound market with its latest E-Cube 8 series

OVER THE past three decades, ultrasound scanning modality in the diagnostics imaging segment has undergone huge technological advancement - From a A-Scan to B-Mode to colour doppler to 3D/4D imaging to elastography. The applications of ultrasound scanner also has moved ahead from a simple OB/Gyn application to a whole-body application including intra-operative, emergency medicine, cancer screening, musculoskeletal and transoesophageal applications.

Ultrasound equipment were a preferred choice for diagnostics as it is low on cost, no radiation and wide range of use. Indian ultrasound equipment market in 2018 was estimated to be Rs 1400 crores and is growing at an average rate of 10 per cent. Indian ultrasound market has a potential to grow much higher.

BPL Medical Technologies entered into ultrasound business in partnership with M/s Alpinion Medical Systems, South Korea in the year 2015 and since then we have been growing significantly year on

Sajiv Subramanian, Director- Ultrasound and MIC,
BPL Medical Technologies

year. Despite being a new player in the market against well-established competition, we were able to carve out a space for ourselves with – superior and stable products, reach through our exhaustive distribution reach. Through BPL Smart Upkeep, our flagship service programme, we are

proud to have over 1,70,000 satisfied install base of BPL Medical Technologies products in the market.

Alpinion Medical Systems, our partner from Korea began the ultrasound business in 2007, with focus on developing core technologies and delivering the best value to customers.

As a dedicated ultrasound company Alpinion has come up with a range of colour doppler ultrasound scanners from entry level ECube 5 to premium end ECube 15 Platinum. Alpinion is also one of the few manufacturers of high intensity focussed ultrasound (HIFU) for non-invasive ablation of tumors and pathogenic tissue.

With continuously changing medical landscape and technology, to meet the demands of patients, doctors and maintain the optimum quality, the latest launch from Alpinion stable is E-cube 8 series providing high performance, outstanding image quality along with convenience and accurate diagnosis the E-cube 8 series is the indispensable partner for your daily practice.

E-Cube 8 series comes with the latest i7 processor with transducers powered with power view to dissipate heat for stable images. The SSD for a speedy diagnostic flow, a large processing channel for high resolution images, get displayed on the 21.5" LED monitor with easy operational ac-

cess. The 10.4" touch screen located on the control panel, which can be electronically adjusted for better operator assistance.

A user-friendly control panel with a simple and easy interface reducing clinical fatigue. An in-plane switching (IPS) technology, helps eliminate image distortions with a wider field view which can be accessed by user without being restricted by location or environment

The E-Cube 8 series' s high-performance transducer's, the high image clarity assists you in performing examinations more quickly and making more accurate diagnoses. The single crystal convex transducer with Crystal Signature™ a proprietary technology can achieve thermal conversion efficiency 90 per cent higher than PZT, thereby providing detailed and clear images for an improved prognosis. The high frequency linear transducer with outstanding linear image quality perfectly suitable for breast, thyroid, musculoskeletal and vascular examinations.

LIFE

● BOOK REVIEW

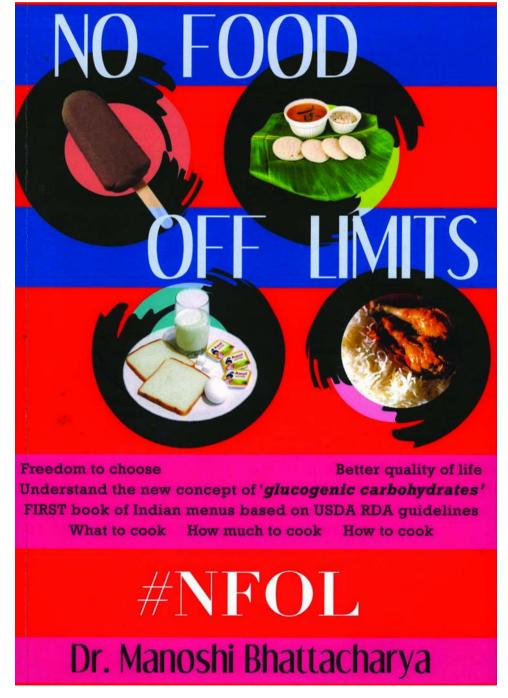# Dr Manoshi Bhattacharya puts no food off limits

In her book, *No Food Off Limits*, physician **Dr Manoshi Bhattacharya** reasons that how much (portion size) is as important as the what (ingredients) and how its made when it comes to cooking healthy tasty food for diabetics. Under medical supervision, diabetics and their caregivers could use this workbook as a base guide to modify their favourite Indian recipes and methods of cooking into meal plans which are appetising as well as healthy

BY **VIVEKA ROYCHOWDHURY**

Let food be thy medicine, and let medicine be thy food. This oft used quote, attributed to Hippocrates, sums up the approach of *No Food Off Limits*. The author Dr Manoshi Bhattacharya introduces her concept of glucogenic carbohydrates and claims that it is the first book of Indian menus based on the US Department of Agriculture Recommended Daily Allowance USDA Recommended Dietary Allowances (RDAs) guidelines.

Designed as a slightly weighty book of recipes, with appetising photos of yummy looking food, the book is based on the author's experience of cooking and caring for her diabetic mother. She set out to understand why familiar Indian foods, and not imported fast foods, had turned our country into the diabetes capital of the world. The book is built on the principle that how much (portion size) is as important as the what (ingredients) and how its made when it comes to cooking healthy tasty food. Thus the recipes are based on familiar Indian preparations, the difference being that the author specifies the grammage for each ingredient, even the spices. It uses the çooking-for-one' concept, allowing individual preferences to be included in the preparations and daily meal plan.

The book is about 'bridging the gap between the world of allopathic medicine and the world of eaters' and using 'food as medicine.' While that may conjure up visions of uncontrolled gorging, the disclaimers placed in prominent places across the book quickly burst this bubble. As a responsible physician, starting out her journey with the Indian Navy no less, the author makes physician supervision mandatory for patients on diabetes medication as the menus-for-the-day can cause hypoglycaemia for such patients.

The flip side to using 'food as medicine' is that like medicines, food need to be consumed in a controlled manner, with due thought given to the recommended balance of carbs, proteins and fats. A huge benefit of the book is that it speaks the language of the patient/consumer, relating concepts of nutrition tailored for western foods to Indian staples like *idli*, *rotis*, etc.

The author draws on a series of papers authored by her over the years, which explain the basis for this approach. She starts by analysing changing patterns in our diets, joining the dots from a gradual shift over the centuries from the Pastoral Age diet of large quantities of high-fibre carbohydrates, small amounts of digestible carbohydrates, moderate fats, moderate proteins, to an increasing and frequent intake of high-fibre carbohydrates associated with significant drop in protein and fat consumption between 1775 and 1947. 1947 onwards saw an increase in the frequency of intake and quantities of low-fibre and

refined carbohydrates, and fats with protein intake improving only marginally. *(Bhattacharya M. A historical exploration of Indian diets and a possible link to insulin resistance syndrome, Appetite 95 (2015) 421e454)*

Another review paper explains the need for a new term for practical eating: 'Carbohydrate' – fiber = Glucogenic-Carbohydrates. When expressed in grams to be consumed in a day, it makes it easier for practitioners to prescribe weights of raw plant produce and for patients to comprehend the instructions. *(Bhattacharya M. A history of evolution of the terms of carbohydrates coining the term 'glucogenic carbohydrates' and prescribing in grams per day for better nutrition communication. J Pub Health Catalog 2019;1(4):1-8)*

And in a third communication, she makes the point that Indians are not developing diabetes only by the same culprits identified in the west: sugar, white flour, potatoes and processed foods. She suggests that the way out is to

prepare several traditional menus-for-the-days for each of the 36 ethnic regions of India, de constructing them into the weights of raw ingredients to be used. These weights can be adjusted to deliver the grams of macro nutrients per day deemed ideal for the patient by his doctor. Such a system allows patients and their care giver to cook their meals in the styles they are used to, with slight modifications to the process and in marginally different proportions. *(Bhattacharya M. Calculate weights of raw-ingredients that go into customized menus for the day, to prescribe recommended grams of glucogenic-carbohydrate, fiber, protein and fat, instead of counting calories. J Pub Health Catalog 2018;1(4):108-111)*

Today, there is support for the proposal to use 'food as medicine.' For instance, the American Diabetes Association (ADA) emphasises that medical nutrition therapy (MNT) is fundamental in the overall diabetes management plan, and the need for MNT should be reassessed frequently by healthcare

providers in collaboration with people with diabetes across the life span, with special attention during times of changing health status and life stages. *(Nutrition Therapy for Adults With Diabetes or Prediabetes: A Consensus Report Diabetes Care published online on April 18, 2019)*

Content wise, the book starts with an explanation of studies conducted in the West, putting them into the Indian context. The mythbuster double spread has some surprises in store. For example, dals have twice the amount of glucogenic-carbohydrates than protein so its a myth that they do not raise blood glucose. It transitions into a cook book, starting with a list of seven menus-for-the-day with a nutrient analysis, covering a regional flavour per day. It starts with a North Indian menu on Sunday, while other days feature recipes from Bengal, Kashmir, UP and Punjab, South India as well as a continental menu plan. The recipes include tips like first immersing potatoes sliced for finger

chips in water to allow the starch to leach out, reducing the carbohydrate content. I am sure at least some of us do this but now we know the benefits.

The book has a detailed bibliography which will be useful for doctors and clinical staff. Most importantly, the book has testimonials, (a fair number of whom are doctors themselves), which will inspire patients to stick to the plan, even when it is more tempting to fall back into traditional cooking habits.

As clearly stated in the book, accurate weighing is the crux of this work but this could prove tedious to follow over a prolonged period of time. Most of us cook by instinct, balancing the spices and ingredients by past experience. Not too many users will weigh each raw ingredient, the cooking dish and then the cooked item itself so complete adherence might be a problem. But the book was eight years in the making and the author's exhaustive efforts must be appreciated.

More importantly, we need

to make these changes for the sake of the next generation. We are leaving them a legacy of diabetes. We cannot do much about the genes we pass on but we can also pass on a tool kit to deal with them. Healthier habits can only be passed on by leading by example and not a will drawn up by the family lawyer. We need to therefore ingrain them in the next generation.

The foreword from Prof Bernadette Nirmal Kumar, President, European Public Health Association, Section for Migrant and Ethnic Minority Health, and a commissioner on The Lancet Commission on Migration and Health 2018 has a very pertinent quote from WHO Director General Dr Tedros: "If we are to win the war against premature deaths caused by NCDs, we must also win the battles in our kitchens, shops, supermarkets, restaurants, schools and lounge rooms." Dr Bhattacharya's book *No Food Off Limits* is an important step in this journey.

viveka.r@expressindia.com

● APPOINTMENT

Fortis Healthcare appoints Sanjay Sinha as CHRO

Sinha will lead the HR function at a group level

FORTIS HEALTHCARE (Fortis) announced the appointment of Sanjay Sinha as its new Chief of Human Resources Officer (CHRO) effective June 17, 2019. Sinha will lead the Human Resource (HR) function at a group level. He will be based out of the Corporate Office of Fortis in Gurugram, Haryana.

Sinha has a career spanning over 29 years spread across industries like telecom, IT, services and infrastructure. Prior to joining Fortis, Sinha was associated with the Hinduja group companies HGS and HTL, Nortel Networks, Polaris, Siemens and NTPC. He has a global experi-

ence with MNCs in Asia Pacific and Greater China, the US, Canada, Latin America, the Middle East and Europe.

Speaking on the appointment, Dr Ashutosh Raghuvanshi, MD and CEO, Fortis, said, "With a proven track record as a successful leader in HR, he has consistently delivered results over the years. Sinha has a deep understanding of the talent management and engagement. I have tremendous confidence in Sinha's capability to align Fortis's world-class patient care with global best HR strategies to drive and extend the next phase of Fortis's market leadership."

Sanjay Sinha, CHRO, For-

Sinha has a career spanning over 29 years spread across industries like telecom, IT, services and infrastructure

tis, said, "This is a tremendous opportunity for employee engagement as well as nurturing industry talent to strengthen our talent pool.

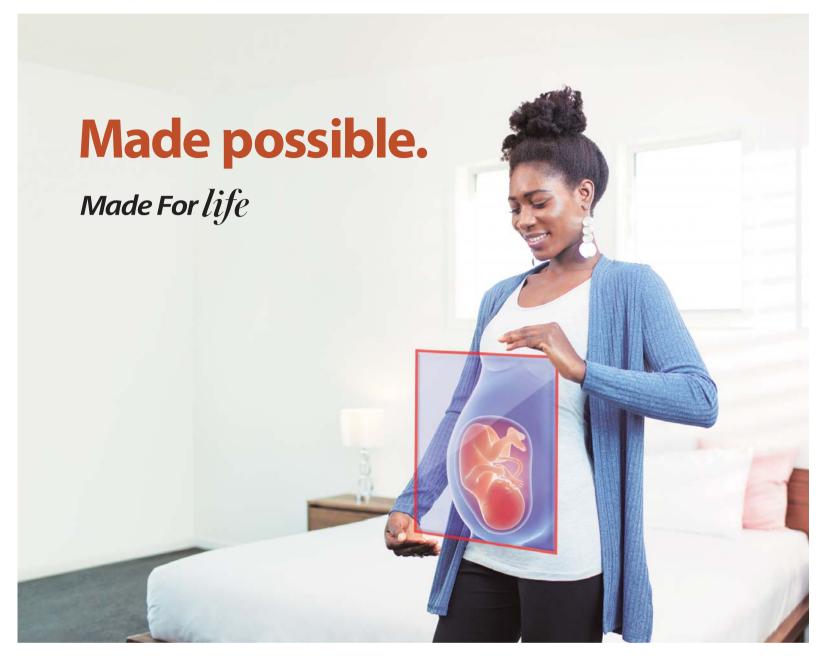The values and culture at Fortis' are already well in line with those of global leaders, and with some innovation and planning, I am certain that we can reach — and exceed — our goals."

Sinha holds a post-graduate degree in Management (MBA) from Faculty of Management Studies (FMS), Uni-

versity of Delhi. He is also certified Executive Coach and holds certification on psychometric instruments related to Personality profiling by Thomas International and Association of Psychological Types (APT) on DISC and MBTI. He has many research reports to his credit.

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