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+ Strategy

Anuj Arenja,
co founder,
QI Spine Clinic

WHY CFOs SHOULD LEAD THE DIGITAL TRANSFORMATION IN HEALTHCARE?

Digital technologies offer a wealth of opportunities for healthcare leaders to create value. With their growing significance, CFOs in healthcare need to embrace a corporate policy that drives digital transformation within their organisations, in order to ensure sustainable growth

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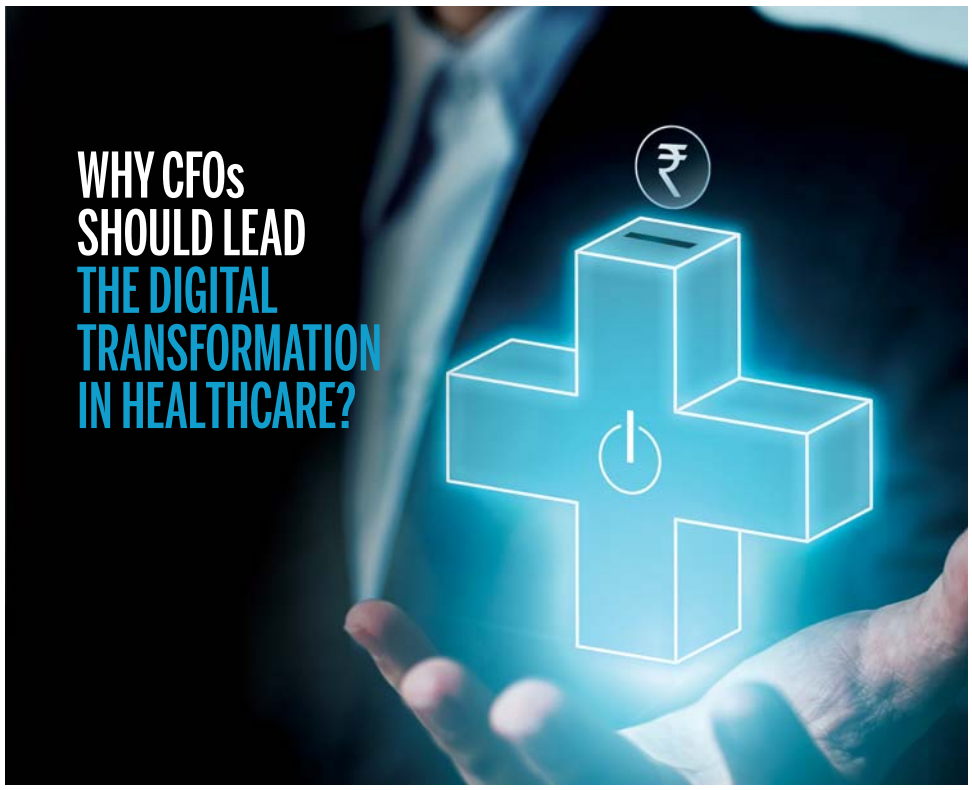

Digital technologies offer a wealth of opportunities for healthcare leaders to create value. With their growing significance, CFOs in healthcare need to embrace a corporate policy that drives digital transformation within their organisations, in order to ensure sustainable growth | P-14

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Taking Ayushman Bharat to the next level

In spite of increasing regulatory scrutiny, segments of India's healthcare ecosystem continues to attract investor interest. The diagnostic sector is turning out to be a favourite, with Metropolis Healthcare's IPO oversubscribed nearly six times, offering an attractive exit to PE partner Carlyle. Dr Lal Pathlabs' IPO offered a similar exit to Westbridge Capital and TA Associates at a good return. Hoping to chart the same course, reports are that China's Fosun International is pursuing Chennai-based Medall Healthcare, as existing PE partners like Peepul Capital want an exit.

In the hospital segment, PE players are driving consolidation. TPG, Temasek and Blackstone, the PE players backing Manipal Hospitals, finally won the race for Medanta, managing to outbid the KKR- Radiant Life Care combine. This consolidation will continue as India's major hospital chains see stressed performance, first with the Goods And Services Tax and then as regulators trim the margins on pharma components of the healthcare delivery ecosystem. These measures range from price caps on stents, knee implants and more recently a large number of oncology drugs most of which are sold directly through hospitals.

But hospitals have more or less negated the government's attempt to make healthcare more affordable for the end-users i.e. the patients. Most hospitals have compensated for these cuts by re-pricing the service and product components of their packages, hence an ICRA report analyses that the performance of listed hospitals have probably bottomed out, with some improvement in Q3 FY2019 after subdued performance in the last financial year as well as in the first half of this financial year. While one needs to wait and see if this uptick will continue, the underlying fundamentals of the sector continue to be favourable. Thus, in spite of stressed margins, these hospitals have used debt to fund expansion plans, counting on these fundamentals to play out as their capex cycle ends.

In fact, a squeeze on profitability is making hospitals take a hard look at all costs, with the bottom line being better efficiencies. We are set to see interesting partnerships. Like the one between B2B medical supplies provider Medikabazaar and the Association of Healthcare Providers India (AHPI). Reportedly worth Rs 1000 crore, this partnership for central medical supplies procurement attempts to address a major pain point of smaller hospitals: the lack of clout and scale to bargain for better prices. Beyond providing medical equipment, further value add comes from the provider's proprietary age artificial intelligence (AI) and machine learning (ML) tool which will give hospitals real time stock projections, to aid inventory optimisation, leading to better efficiencies.

The incoming administration will have to address the concerns of corporate hospitals. In turn, the latter will have to meet the government half way

Technologies like hospital management information systems and telemedicine are already leading to better efficiencies and patient convenience and care. An EY report, Transforming healthcare in India, points out how a top Indian hospital's telemedicine center achieved 85 per cent reduction in the number of patients that had to be transported to the hospital.

Will consolidation and technology-driven efficiencies lead more hospitals to sign up for *Ayushman Bharat - Pradhan Mantri Jan Arogya Yojna* (AB-PMJAY)? Seven months after its launch in last September, as of April 3, 2019, approximately 2.89 crore e-cards have been issued out of a target population of 50 crore. According to the AB-PMJAY site 15,291 hospitals have been empanelled so far; 554 of them under the private not-for-profit category and 6935 categorised as private for profits. Larger corporate hospitals and chains remain wary, citing reports of implementation glitches and low package rates.

As the seven phase general elections continue across the Indian sub-continent, the fate of numerous initiatives like AB-PMJAY hangs in the balance. However, it will be difficult for any political party to justify rolling back a scheme which attempts to tackle one of India's biggest challenges: increasing access of healthcare to the under privileged sections of society. The incoming administration will have to address the concerns of corporate hospitals. In turn, the latter will have to meet the government half way and consider strategies to tap opportunities at the bottom of the pyramid, trading better occupancy rates for lower profit margins.

But the larger question remains, will increased access lead to better health outcomes? Or will there be more surgeries simply because they are being covered under the scheme? This is what the new government will have to track very closely, in order to ensure that as a payor, it can negotiate not just a bigger but a better bang for the buck and take this initiative to the next level.

VIVEKA ROYCHOWDHURY *Editor*
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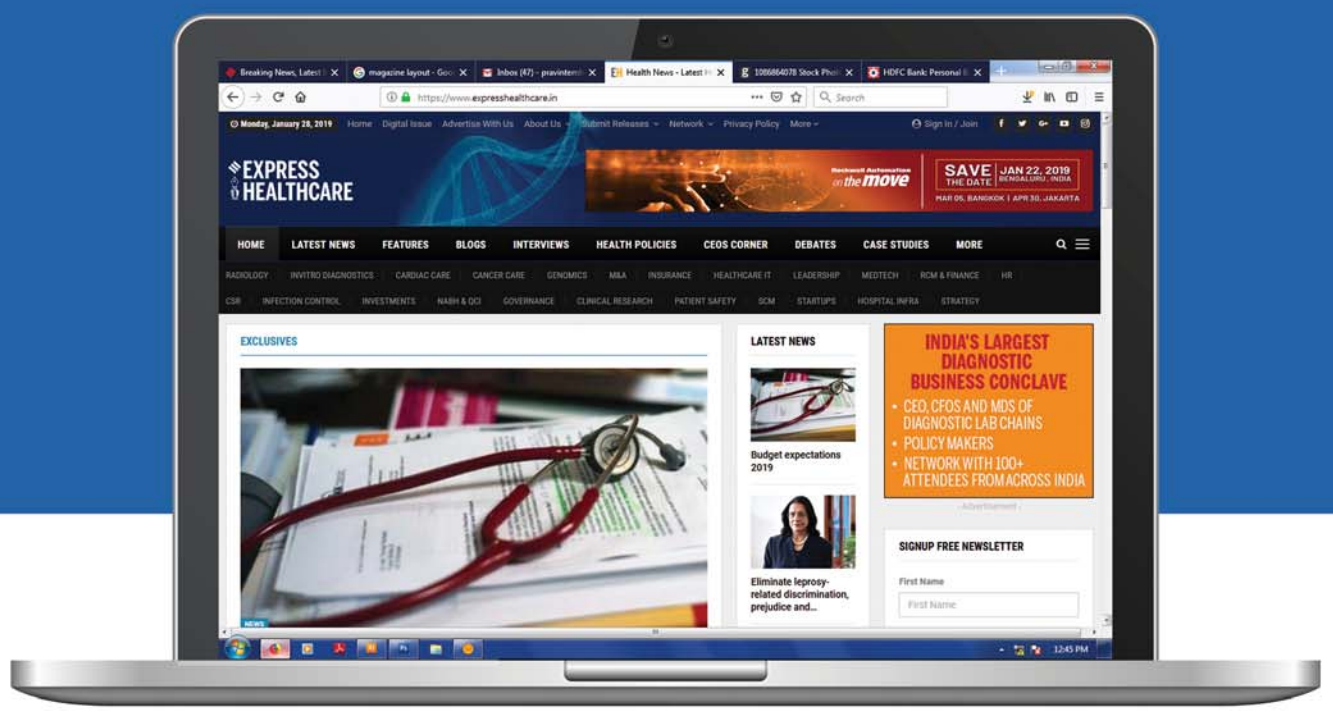

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INTERVIEW

‘There is a huge spectrum of growth for SME lending in the healthcare sector’

We aim to blend the robustness of traditional financial institutions with the data-driven approach of modern fintech companies to provide unique funding solutions for healthcare SMEs like diagnostic chains, pharmacy chains, hospitals, nursing homes, etc., informs **Shachindra Nath,** MD and CEO, Ugro Capital to **Viveka Roychowdhury**

You can’t apply uniform parameters to judge the creditworthiness of an IVF clinic, dentist’s clinic or a small doctor’s clinic

After you took over Chokhani Securities in July 2018 for Rs 40 core, you re-branded it to UGRO Capital. As a founding team member and former CEO of Religare Enterprises, why did you decide to now focus on SME financing? What will be the funding/lending strategy in terms of re-payment timeline, terms etc?
Well, during my stint at Religare as group CEO, I gained quite in-depth exposure and understanding on SME lending. The SME credit opportunity is large and very underpenetrated, as traditional banks don’t prefer to lend to the segment. That’s precisely the reason why the SME sector’s contribution to the country’s GDP still stands at 30 per cent, whereas, in more developed economies, the share typically hovers around 45 per cent. The sector is still untapped and underpenetrated from the lending point of view because of its diversified nature. For instance, the business cycle and the cash flow cycle differ from automobile component manufacturers to hospitals to educational institutions. The one-size-fits-all approach doesn’t work here. Because of the ballooning credit gap, 70 per cent of the capital requirement in the SME sector is fulfilled through informal channels. As SMEs are regarded as the key growth driver of the Indian growth story, we firmly believe that the scenario has to change. And the key to cater to the sector effectively is to develop an in-depth understanding of various business models. Hence, we have adopted a sector-focussed lending strategy for the SMEs.

We also offer customised loan products. The loan tenure could be anywhere between three months (in case of supply chain finance) to 8-10 years (for instance, secured business loans with property as a collateral).

What is the total quantum of funds available for lending? Who are the major PE and other partners?
We have raised over Rs 950 crore of capital from a diverse source of investors including large private equity funds like PAG, Sameena Capital, NewQuest, ADV, public market funds like IndGrowth and Abakkus Capital, insurance firms like PNB MetLife and HNIs/family offices.

Why was healthcare chosen as one of the eight focus SME sectors for lending?
We worked with CRISIL for over a period of 18 months to analyse macro- and micro-economic factors and their impact on different sectors. Healthcare emerged as a sector with a large credit demand.

Overall institutional debt (including bank and non-bank loans) for the healthcare industry is projected to touch Rs 3 trillion-mark by FY 2021-22 at a CAGR of 15 per cent from an estimated Rs 1.5 trillion in FY 2016-17.

In addition, demand for healthcare services focussed on lifestyle-related diseases (non-communicable diseases such as cardiovascular diseases, oncology, diabetes, etc) is all set to rise. The healthcare delivery market in India will cross Rs 8 trillion by FY2021. There is a huge spectrum of growth for SME lending in the healthcare sector, thanks to this.

In fact, healthcare has emerged as one of the fastest growing sectors in India due to the presence of multiple players such as diagnostic chains, pharmacy chains, hospitals, nursing homes, etc. Nevertheless, there is a demand-supply gap, as the sector is not adequately serviced by the banks and other traditional lending institutions. We believe that in order to improve the overall healthcare delivery in India, this bridge must be gapped.

Who would be your potential clients?
We are mainly focussing on small SME players like nursing homes, diagnostic centres, pharmacy chains, small hospitals, etc.

What are the funding bottlenecks that they face when approaching the traditional sources of loans?
The conventional lending approach of the traditional sources is the biggest funding bottleneck for the SMEs. The archetypal P&L-

based lending approach doesn't work for entities like a local diagnostic chain as the revenues of such business entities are not always documented. In such a case, the process of assessing creditworthiness has to be based on parameters such as footfalls at the branches of that diagnostics centre, experience and credentials of doctors attached to that centre, etc. Moreover, one needs to develop critical sub-sector expertise to understand the business model inside-out. Because, you can't apply uniform parameters to judge the creditworthiness of an IVF clinic, dentist's clinic or a small doctor's clinic, as footfall-count will always be the lowest at an IVF centre compared to others. But, every footfall at an IVF centre generates more revenue than a footfall at a simple doctor's clinic.

Another key aspect is that of underwriting. Loan against property concept will not find any taker in this sector, as most of the business runs on rented property. So, one has to look at options like loan against medical equipment which is quite expensive in nature -- dentist's chairs, eye-testing equipment, etc. The traditional banks or NBFCs are not in a position to underwrite because of their rigid approach. We score over traditional lenders' banking on our incisive understanding on various business models of the players in the healthcare sector. Even the margin of a pharmacy changes when it gets affiliated to a doctor or a hospital. Experience of doctors also impacts the revenue of a hospital significantly. Based on those insights, we have developed customised scorecards for each of those players which help us to underwrite properly. In addition to it, we have deep sector specialisation to understand, reach and serve the customers better.

How does UGRO Capital go about prospecting and servicing this segment?
We have adopted a few approaches. We collaborate with online healthcare service aggregators to reach out to doctors, diagnostic centres, clinics, etc. We assess their demand based on the clinks, appointments, etc. We also tie up with hospitals, diagnostic/pharmacy chains to explore lending opportunities to their supplier ecosystem. The third one is traditional branch-led lending wherein we service the loan-seekers at our branch offices spread across the country.

How many such clients does UGRO Capital service since lending began in January this year?
Being a listed company, we are not in a position to disclose exact numbers.

Could you illustrate the value add of your company with a few examples?
We help entrepreneurs grow and contribute to the development of the overall healthcare service quality. Supported by a team with a strong track record of execution, we aim to blend the robustness of traditional financial institutions with the data-driven approach of modern fintech companies to provide a unique solution to the funding needs of small businesses. We are building a truly new generation lending platform which would leverage digital capabilities across the value chain – customer acquisition, credit underwriting, and post-disbursal monitoring.

We hope to, through our understanding of the sector, provide solutions to entrepreneurs and through them improve the overall healthcare service quality.

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PRE EVENT

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

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

THE 4TH edition of Healthcare Senate, India's largest private sector Healthcare Business Summit, will be held from July 11-12, 2019 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 strategies. Retaining relevance in the fast changing healthcare environment took centre stage, as did running sustainable, responsible and profitable businesses.

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

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

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

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

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

EH News Bureau

WHY CFOs SHOULD LEAD THE DIGITAL TRANSFORMATION IN HEALTHCARE?

Digital technologies offer a wealth of opportunities for healthcare leaders to create value. With their growing significance, CFOs in healthcare need to embrace a corporate policy that drives digital transformation within their organisations, in order to ensure sustainable growth

By Raelene Kambli

Imagine yourself visiting a digitally transformed hospital. At its very entrance you see, a huge screen that guides patients on important information about admission process, OPD services, various healthcare services offered by them, as well as a map of all health clinics, diagnostics and pharmacy centres. The hospital also has a well organised digital patient application and response service system that helps patients to fasten their admission process. You move further to see various clinical departments, diagnostics centres which are up to date with the latest advanced technologies; every single system is digitally driven and backed by AI. Further, you see a comprehensive EHR system that tracks and analyses patient data to provide significant clinical information, You also see a dynamic hospital information system that tracks each and every clinical and non-clinical function within the hospital. Moreover, this hospital is extremely steadfast in customer services, inventory systems, pharmacy activities and more. But the most interesting aspect of this hospital is its financial management and response service system.

Let's enter the CFOs office in this hospital!

Take a pause and quickly glance through his desk —clean and paperless. Aahaa, here is his super computer which is constantly fed with information on the current cash flow, operations, inventory updates, payment systems and the scale and pace of all internal and external dynamics that contribute to the hospital's balance sheet. The system is smart enough to also give a heads up on critical areas and possible crisis that can impact profitability, ensuring that the CFO can take immediate action to mitigate the problem in time and save the organisation from a huge loss.

Do you think, that this kind of a digitally hightech hospital system in India is too arty to believe?

Many digitally savvy healthcare executives are already aligning their people, processes, and culture to achieve their organisations' long-term digital success and having such systems within hospitals will soon be a reality.

In the present time, technology is no more a luxury or a 'nice to have' capital expenditure for a healthcare organisation. Understanding where technology can be leveraged and where it can't – is critical for modern healthcare leadership and an intelligent financial decision. As experts say, return on Investment (ROI) and Value of Investment (VOI) are the two key factors that decides the future of digital transformation within an organisation. Therefore, CFOs and financial leaders within hospitals and various healthcare businesses become significant agents who can influence this transformation.

So what does this mean for CFOs in this space, whose role has traditionally been measured in terms of controllership and compliance?

These two traditional metrics are no longer defining the qualities of effective financial leaders today. The most critical skills for successful financial leaders in this space are beyond finance management and are moving towards general management and creative strategy for digital success.

Let's find out how CFOs in healthcare are aligning with today's digital landscape and how their creative strategies will lead their respective organisations through their digital transformation journeys.

CFOs as change agents

Most financial leaders in healthcare believe that true success of their organisation lies in achieving a sigificant and sustainable market share while ensuring customer satisfaction and loyalty. Other metrics include improved top and bottom line growth, improved EBITDA as well as horizontal and vertical growth of business segments. Interestingly, they feel all of these can be achieved by bringing in a digital transformation within their organisations.

"Digital is the new oil for fuelling organisational objectives and growth. Digital has been identified clearly as one of our levers for growth going ahead in our strategic plan including embracing data and using digital as a medium and channel for fuelling growth and reach. We have started using digital mediums to educate the masses on various diseases, prevention and early detection of diseases, through various digital mediums like You Tube videos, live Facebook chats with our doctors etc. We have invested heavily into a sophisticated Hospital Information System (HIS) at all our facilities which will provide us information and inputs which will help drive higher credibility with our patients and people visiting our centres as we try to provide standardised offerings across our hospitals network. We have developed patient apps, feedback mechanisms which is helping us connect better with our patients and helping us improve our service offerings in real time world. We have already started to see benefits of the same in the current year," shares Sameer Agarwal, CFO, Manipal Hospitals.

Similarly, Johar Sabuwala, CFO, HN Reliance Hospital, Mumbai says, "Digital technologies play a key role. It can help in providing better transparency and portability of patient data and reduce transaction cost. Especially, in EMR, if effectively rolled out, can help in reducing duplication, storage, retrieval and faster decision making, which at times can be a life and death situation. Lot of analytics is now being done on the fly with cost of hardware going down and the improvements in quality of user interface for quick decision making for the clinicians and business leaders. We too have invested in some cutting edge technologies and have fine-tuned our systems and processes to enhance patient and doctor experience."

On the same line, financial advisors and financial solution providers from the healthcare sector also believe that digital technology can be a great enabler for growth from a financial strategy point of view. "We are into healthcare consultancy and to be precise, in data analytics. We majorly find most of organisations, be it a small size proprietor or national level giant, all use multiple softwares to handle their different departments i.e. operations, stores, accounts, logistics, HRMS & Payroll. I personally find that any healthcare organisation can multiply its growth if it rightly utilises digital technology. However, one should understand that implementing software is different than utilising its output. There are many useful tools available which help organisations to connect the dots and make it usable to increase their revenue or profit."

Healthcare technology specialist, Niranjan Ramakrishnan, Vice President, Digital Lexir Resources, explains the financial gains of utilising digital technologies in an organisation business processes. He informs, "Effective utilisation of sales CRM and customer management tools directly defines the top line growth. Implementation of robotic process automation systems, control systems such as inventory systems and business intelligence platforms for data analysis directly defines the 50 per cent of EBITDA. Adoption of new technologies such as 3D printing and 3D milling, digital denture etc., moves us up in the ladder of innovative industry player. Information exchange mobile application and web portals, chatbots and AI tools keeps the customers engaged."

Giving an example of how digital technologies can boost his business (an ambulance service company), Manish Sacheti, CFO, Ziqitza Health Care discloses, "We believe in the benefits of technologies such as Internet of Things (IOT) offer. Electronic patient care report (E-PCR) can save a lot of money in terms of printing traditional paper PCRs, as well as, eliminate the cost of storage of patient data. Cloud technology and Big Data too can reduce the cost of logistics, considerably. Ambulances are now being fitted with an on-board diagnostics system which can immediately sound off an alarm for any kind of system failure, there by avoiding accidents. Additionally, these on-board tech assistance systems can also reduce fuel costs, by optimising the driving patterns. Thus, when technology is combined with analytics, we can bring in greater efficiency in operations. This will result in cost savings for the company as managing

Niranjan Ramakrishnan, CHCIO, Vice President Digital, LEIXIR RESOURCES

Sameer Agarwal, CFO, Manipal Hospitals

Johar Sabuwala, CFO, HN Reliance hospital

Manish Sacheti, CFO, Ziqitza Health Care

cash flow and other operations within the organisation will become more stream-lined and productive."

This certainly indicates that financial leaders see immense value in IT investments. The question is, how do they realise the value of this investment and make their organisations profitable?

Shifting technology from Capex to Opex

Traditionally, CFOs most often prefer to account technology investment as capital expenditures (CAPEX) over operating expenses (OPEX)because they could take advantage of amortisation and depreciation of those investments over an extended period of time. "CAPEX intensive technology and OPEX driven technology are two different preferred expenses models and it all depends on the type of business ownership. In private equity driven businesses, the valuation is the biggest factor of success of the business. As CAPEX is shown on the company's balance sheet, it can be exchanged for an asset, be amortised and depreciated over its lifespan and adds value to the business. Hence, CAPEX intense model of technology expense is preferred as it results in better EBIDA. In proprietorship, shareholder driven and charitable trusts etc., the OPEX model helps the organisations as business earns the OPEX expenses or pays for it as per the capacity and utilisation," explains Ramakrishnan.

Sabuwala sharing his opinion says, "For larger organisations a capital investment makes more sense as you remain in full control and ownership of your systems and data, of course provided that you have already invested in IS security." Further citing an example of how an investment in cloud computing and software as service (SAS) functions as OPEX, he expounds, " Cloud computing and SAS has got immense impetus with significant reduction in data communication cost. These products would be available on an OPEX model so one may avoid high initial capital commitments. This has given small to mid-sized companies an opportunity to jump on the bandwagon of deploying newer technologies. However, these products are for masses and may not be customisable to your needs."

Mittal shares a different view. "Categorisation of expense is not driven by its need but by its period of a useful life. A big server cost is different from a PET CT programme. Accounting policies applicable in India are well defined to achieve transparency for user of financial programmes. I don't agree that there is a need for conceptual change with technology expenses," he believes.

Further on, Agarwal believes that some of the investment in technology is better treated as asset class while placing certain IT spending in OPEX. "Sustainability of superior performance of the organisation is driven by its investment in assets which help generate revenue and control costs. I believe, technology should be treated as asset class, which can be tracked in the balance sheet to ensure that there is a regular discussion on the benefits generated by it and is also reviewed for its obsolesce. I am also aware of the fact that more technologies would move to Cloud, some of these spends might get into OPEX which may impact the operational performance (esp EBITDA) in the short run. This will improve cash flow and the benefit of which would be realised in the long run as spends on cloud could be managed and adjusted on the basis of performance and expansion of the organisation," he elaborates.

On the other hand, there's a growing argument that considering technology as OPEX have distinctive advantages. "By shifting technology to an operational expense, we can easily fund our requirements. This also enables us to make multiple investments across the business, as the capital is not tied up in large upfront expenditures," opines Sacheti.

"This model has already entered implementation stage in the life sciences space. The industry is looking for vendors to provide their services without large investments from their end. The investments are already in and it is a matter of time for the ROI to start flowing in," informs Subhasri, Sriram, CFO, TAKE Solutions.

According to some financial experts there are some inherent challenges with capital spending on technology :

- Large amounts of cash required
- Error-prone guesswork to estimate future capacity needs for static hardware/software
- Lengthy and arduous processes to estimate budget and get it approved
- Once the technology is purchased, the company is stuck with it – despite technology advancements or changes in company growth

Moreover, technology developments are occurring faster than healthcare organisations can digest and that's why some CFOs are slowly shifting from a reliance on CAPEX to OPEX. Some of the benefits of shifting from CAPEX to OPEX are:

- Pay only for the capacity it needs at the moment and scale as requirements change
- Ease and speed up the budgeting process because short-term spending requirements are less
- Make multiple investments across the business since capital isn't tied up in large upfront expenditures
- Fund expenses faster through operations rather than needing to borrow money or divert money from other projects to pay for large, upfront technology costs
- Smooth out cash flows over time instead of requiring lumpy outlays

Having said that, Agarwal has rightly pointed out that as more and more organisations move towards cloud platforms, there will be a considerable amount of IT spending that will move to OPEX. All these decisions will depend heavily on each organisations IT requirements. Therefore going forward, CFOs and financial leaders will need to be agile with their corporate planning and strategies for digital transitions.

So how will success look like for CFOs?

Key to success

Experts inform that digitally influenced CFOs and financial leaders will firstly need to have the ability to maintain responsible investments, be committed to use data in real time to make intelligent decisions and break down silos within the organisation. Secondly, they will need to be abreast with the latest technologies to identify and invest in the right technology to not only generate internal efficiencies, but to improve responsiveness to consumers and have a foresight in determining how technology investments can help drive new business areas.

Here are some strategies that modern day financial leaders in healthcare are adopting to ensure successful digital transformation within their organisations.

"Strategies that are getting discussed and implemented would be around continual automation and upgradation of technology in all spheres or work. Also, upgradation of skills, enhanced training of existing staff, change in organisation structure to bring in skill sets to drive digitisation and faster adoption of new age technologies will be areas that will require some deep thinking. Moreover, CFOs will also need to look at change in process of hiring of transaction-oriented staff to include digital, analytical resources in finance and supply chain functions to bring better forecasting abilities, driving more economic decisions for long-term profitability, growth and sustainability of the organisation," Ramakrishnan points out.

He also has a strategy to monitor this system. "The monitoring of the progress would be done through monthly / weekly review of the action plans, dashboard for execution, business driven through digital medium, adoption, training programmes and in the long run would be evaluated on the business performance based on sustainable growth and profitability," he maintains.

Likewise, Sabuwala believes that adoption remains the key challenge for any new technology roll out. "Younger users are fast to adapt provided they see a value addition. However, they can be equally ruthless if the solution is not right. Testing and acceptance of the proposed solution with a mix of demographic of your targeted users remain the key to successful transition to newer digital technologies. Selecting an influential person from amongst the users to be an ambassador for your proposed solution also helps in absorption rate of newer technologies. Moreover, mobility, where possible, also helps in better adoption by doctors and patients as information is consumed more and more on mobiles devices and tabs," he suggests. "Periodic reviews with the task force and user groups helps to mitigate any unforeseen eventualities. One can course correct, if required and incorporate user inputs for improvements. Change approval boards play a key role to ensure changes suggested by user groups are evaluated diligently before making the required developments," he adds further.

Talking about the approach that Mittal would take for his company, he says, "I will first adopt the most suitable SOP, and will incorporate it in to software step by step, will design report in alignment with SOPs and deviations will be the key areas of every review. SOP has to be reviewed every six months with reference to various audit outcomes."

"Training and help desk are two important enablers to make sure the movement to digital is voluntary and meaningful rather than forceful and authoritative," feels Sriram.

Ramakrishnan recommends some steps for CFOs. He advises, "The primary objective of the digital transformation projects should aim in solving the pain points, saving costs,

contributing towards better EBIDA and most importantly, improving the customer experience. These initiatives ensure maximum adoption of technology and digital transformation. Innovation, increased revenue, efficiency and productivity improvement and ROI etc., takes its own time and adoptions would be slow. Instead of identifying the technology and finding a use case, the digital transformation team along with CFO should find the key issues that hurts the business and customers, and find solutions through the technology. Digital road map plan is prepared after acquiring the best business insights, understand the real issues and tangible benefits. Form IT Governance Committee (with sponsors, promoters and top management as members), IT Steering Committee (with heads of various business units, functions and departments) and IT Execution Committee (end user representatives along with IT team, vendors and partners) is the next step. Put together 30 days, 90 days, 180 days., 365 days and 18 months plan are with clearly defined deliverables, user acceptance criteria and most importantly, measures to track the tangible benefits are the mandatory step in monitoring the progress."

Sharing his recommendation for the future, Sandeep Makhijani, Watson Health Leader, IBM Asia Pacific, suggests healthcare financial leaders looking to invest in cognitive technologies to come up with a careful and appropriate strategy for their organisations to align with such technologies. "In India, the use of cognitive technology in healthcare is still in its infancy. The next decade is likely to see a surge in innovation from established organisations and entrepreneurs alike. Given the complexities, initiatives need to be managed carefully. For healthcare organisations interested in exploring cognitive capabilities, it's important to first develop a cognitive strategy. Specific goals must be established and critical data sources must be identified, along with services and processes that can fully benefit from cognitive technologies. To build cognition into the devices and systems that matter, the underlying IT core must be open and stable. Hybrid cloud resources underpin this work, along with trusted security throughout the network," he mentioned.

Finally, to achieve digital success, financial leaders will need to be change agents. As mentioned above, the healthcare industry is soon going to witness a surge in the utilisation of services such as fintech, cognitive technologies, IOT, blockchain and more, which will augment the functions and leadership of CFOs . In future, CIOs of healthcare organsiations can help financial leaders in understanding the right utilisation of digital technologies, facilitating them to take intelligent financial decisions. Thus, a healthy collaboration between the CIOs and CFOs to drive digital transformation will be key to secure business success.

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Data driven spine rehab

Eight years after setting up its first clinic in Mumbai, QI Spine Clinic has reportedly prevented over 8000 spine surgeries. Founders Nithij and **Anuj Arenja** currently have 22 clinics across four cities and plan to expand to 80 clinics in the next five years, with a pilot clinic in the US to go live in a few months. A review of their clinical and business strategy

By **Viveka Roychowdhury**

A choreographer with severe slipped disc starts dancing again. An 80 year old with osteoarthritis avoids spine surgery. A wheelchair bound housewife starts walking again. A 54-year-old runs 15 marathons despite disc derangement. A 40 year old professor suffering from severe back pain recovers within 12 weeks of specialised spine therapy.

The common link to all these cases is the Mumbai based QI Spine Clinic (the Clinic), positioned as India's first specialised medical service dedicated to the non-surgical treatment of back and neck conditions. The Clinic was born out of the pain and personal experience of one of the founders, Nithij Arenja, who was unwilling to undergo spine surgery while dealing with his own obesity and back pain.

His search for a conservative non-surgical path of treatment towards recovery from back pain led him and brother Anuj to collaborate with global experts. The result was a proprietary, technology enabled spine rehab programme that employs a data driven approach combining custom built software, predictive analytics, devices and services to deliver superior patient outcomes and patient efficiency.

> Most treatments fail because of lack of diagnosis. With advanced diagnostic technology, we use our spine function test (DSA) to pinpoint the exact cause of pain and base our treatment plan on it

Business strategy

QI Spine Clinic is one of the ventures of Arenja Holdings, an investment house that specialises in the promotion and incubation of greenfield healthcare ventures. The group has investments in a couple of healthcare ventures besides the Clinic ranging from gyms (QI Lifecare), health and fitness equipment (Trinity Healthtech), and ambulatory cardiac care (New Heart). With a focus on common chronic lifestyle related diseases, these businesses claim to leverage advanced technologies and evidence based protocols, aiming to change the conventional approach to prevention, diagnosis, treatment and even reversal of these diseases. QI Spine Clinic's tag line is 'Reversing Spinal Disorders' while New Heart is about 'Reversing Cardiac Disorders'.

Since its launch in 2011, the Clinic claims to have a success record of 91 per cent in treating even the most severe conditions and having prevented over 8000 surgeries that were prescribed. They currently have 22 clinics spread across four cities (Mumbai, Pune, Delhi and Bengaluru). Anuj Arenja, CEO, QI Spine Clinic reveals that they plan to expand to 80 clinics in the next five years and will also be opening in other countries like the US, where the pilot clinic will be operational in a few months. Though most clinics, spanning approximately 1500 feet, have been fully owned by the promoters to date, they planned to take the franchisee route where required, especially in tier 2 cities. This strategy will certainly allow them to expand much faster, once they find like minded partners.

While Anuj cannot reveal names and details of external funding, he indicates that they are supported by senior professionals in the healthcare industry as well as private equity players in their personal capacity. As of now, their expansion will be funded internally and by regional partners.

Global burden of back pain

There clearly is a need for such services. A 2010 study on the global burden of lower back pain revealed that back pain is the #1 cause of disability in the world. Out of all 291 conditions studied in the Global Burden of Disease 2010 Study, low back pain (LBP) ranked highest in terms of disability (YLDs), and sixth in terms of overall burden (Disability-adjusted life years - DALYs).

More recently, in March 2018, *The Lancet* published three papers on low back pain to highlight the global impact of this problem and the associated social and economic factors and personal and cultural beliefs. According to the authors, disability due to back pain has risen by more than 50 per cent since 1990. Globally, years lived with disability caused by low back pain increased by 54 per cent between 1990 and 2015, mainly because of population increase and ageing, with the biggest increase seen in low-income and middle-income countries.

In India, 50 – 80 per cent of individuals suffer at least one episode of back pain in their lifetime. As Anuj explains, the global point prevalence of low back pain LBP was 9.4 per cent. DALYs increased from 58.2 million in 1990 to 83 million in 2010. As prevalence and burden increased with age, an ageing demographic profile unfortunately means that incidence of LBP will only increase.

At an individual level, back and neck pain results in missed work days (absenteeism due to lower back pain is four days per year on an average, surgery patients can lose up to 48 work days per year). It is estimated that disability in basic movement like sitting, standing, twisting, bending which may hamper certain occupations. Slipped disc, disc bulge, and disc herniations, mechanical lower back pain, sciatica, spondyloarthopathy, spondylolisthesis, cervical radiculopathy/neck pain/cervical spondylosis are some of the common conditions that are treated at the Clinic.

Healing the healer

Patient testimonials reveal that back ache and spinal disorders do not spare healthcare professionals. In fact, they tend to show up with the most severe manifestations of neck and back pain as they ignore it or look for quick fixes till it becomes unbearable.

Consider the case of a 62 year old gynaecologist. When her back aches first made their appearance, she thought she could

Isolation technology delivers targeted treatment and faster recovery

Treatment devices with sensors provide live biofeedback for doctors and patients

recover fast just with painkillers as she led an active lifestyle and exercised regularly at her gym. When the backaches got worse, she signed up for physiotherapy sessions. These sessions gave temporary relief and allowed her to resume her work, only to lay her up again. After years of sporadic episodes, which got more frequent, her pain became so severe she was bed ridden. An MRI revealed micro fractures in her spine which finally prompted her to turn to QI Spine Clinic.

Unfortunately, neck and back aches can strike at any age. A 36 year old anaesthesiologist found that he could not walk properly nor bend due to back pain. A 35 year old clinical hypnotherapist got back pains after a caesarean section.

Healthcare professionals like dentists and ophthalmologists have the highest risk of developing back pain due to awkward postures and prolonged work hours. In fact, according to QI Spine Clinic, 70 per cent of dentists suffered from back pain as their work requires them to bend at awkward positions to perform dental surgeries, procedures and even regular check-ups. This makes them one of the most vulnerable segments in the medical community to suffer from back pain.

More such patient testimonials on the Clinic's site reveal a common refrain that the approach and staff impressed the doctor patients with their "scientific approach to back problems." Far from promising overnight relief, the staff cautioned that results would take time but their patience would be rewarded with more permanent relief and importantly, an awareness to changed lifestyles, postures, etc. to proactively prevent or reduce the severity of future episodes.

Data-driven clinical edge

QI Spine Clinic claims to help patients tackle back and neck conditions with non-surgical precision rehabilitation and treatment, using the latest isolation and pain management technologies to first diagnose the cause and then treat it.

Explaining some of the treatment guidelines followed and the success rate, Anuj says, "85 per cent of back pain is caused due to mechanical issues in the spine. Surgery is required in less than 5 per cent cases after conservative management of the condition has failed. In fact, globally, a physiotherapist's or chiropractor's consent is required before a patient undergoes spine surgery. In India, the scenario is different. Most patients suppress their pain by self medicating with painkillers which provides temporary relief. Few try physiotherapy but the pain keeps returning."

The USP of QI Spine Clinic's spine therapy is that is it guided by technology from Germany. "The QI Approach is a four step programme which eliminates all randomness in treatment through data intelligence and ensures that very precise and guided care is delivered to the patients through their journey. Our smart algorithms grade the case type, remove subjectivity and suggest a treatment plan which has guaranteed outcomes," according to Anuj. He points out that most treatments fail because of lack of diagnosis. At the heart of the QI approach, is advanced diagnostic technology, like the spine function test (DSA) which pinpoints the exact cause of pain which then becomes the base of a customised treatment plan. Their cell repair technology reduces pain and activates healing at a cellular level and isolation technology ensures targeted treatment to the exact areas of a patient's spine.

The advantage of avoiding spine surgery makes the QI approach an attractive proposition, provided patients have the patience to set aside time for the sessions and make the lifestyle changes required. Arenja admits that their treatments and procedures are not covered by insurance, though they are in talks with a few to explore this possibility. He points out that very few primary care categories are currently covered by Indian insurance providers. The average treatment cost ranges from Rs 6000 - Rs 25000 compared to surgery which ranges from Rs 3 to 6 lakhs. Though the cost of treatment may seem steep, the value proposition goes beyond the costs, as there is no post-surgery care required. Anuj points to feedback videos from patients as proof that the programme works, stating that they are the only clinic chain to have over 2900+ Google reviews across centres with an average rating of 4.7 stars. According to Anuj, patients from low income groups are treated free of charge.

Prevention better than cure

The good news is that proactive patients can benefit from QI Spine Clinic's approach as well.

"Early diagnosis, personalised correction of ergonomics and preventive spine health check-ups is where our guidelines can help," says Anuj pointing out that there are many ways to prevent back and neck pain but getting treatment on time is most important. Most patients waste time and money and end up delaying their treatment by going to different doctors and hospitals. He stresses that visiting a spine specialist first can prevent their problem from getting worse.The Clinic has been spreading awareness of these methods in the general community as well as among physicians by regularly conducting workshops in societies, engaging in patient education programmes and corporate events and also conducting health talks in schools. This is besides participating in regular continuing medical education (CMEs) and other doctor events. The Clinic also conducts workshops, like a recent one for dentists at Mumbai's Nair Dental College and at a health talk at a United Nations event in Delhi.

Future prospects

Given the ageing demographic and increasing stress in urban lifestyles, the incidence of neck and back pain is only going to increase. QI Spine Clinic's future growth hinges on increasing the awareness about neck and back pain as a potentially chronic problem as well as collaborating with physiotherapists and orthopaedic surgeons to increase awareness about better treatment protocols. While the founders are prepared to experience some push back from physiotherapists who see the Clinic as a competitor and orthopaedic surgeons who advocate spine surgery, the founders consider themselves collaborators rather than competitors. Expansion into new cities will be successful not just by identifying the right real estate to attract a sizeable patient pool but more importantly, getting this collaborative clinical network in place.

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Health in poll manifestos – A review

Rajeev Ahuja, a development economist, formerly with the Bill and Melinda Gates Foundation (BMGF) and the World Bank, compares the three political parties – the Bharatiya Janta Party (BJP), the Congress and the Communist Party of India (CPI) manifestos from a healthcare perspective

FROM THE health sector perspective, the promises made by the three political parties (the BJP, the Congress and the Communist Party of India (CPI)) in their manifestos make for an interesting comparison.

The Congress party manifesto that begins with a quote from its party president, Rahul Gandhi, reads, "I've never broken a promise that I've made." Yet, the promises made in the Congress manifesto are tall, almost to the point of appearing unrealistic. Whether it's about enacting right to healthcare act or doubling the share of public health spending in GDP over the next five years, these promises are definitely a tall order. More so, when the party opposes the insurance based-model of care that leverages the private providers and instead supports public system for delivery of healthcare to achieve universal coverage. Those familiar with the Indian health sector would know that the insurance-based model for hospital care, RSBY, was in fact promoted by none other than the Congress and its allies when they were in power. This flip-flop stance of political parties, even if this remains confined only to promises, statements or conversations, doesn't augur well for the health sector.

Here is another promise made by the Congress in its manifesto. It reads, "We will ensure that all vacancies at all levels in PHCs and in public hospitals are filled within a period of one year." Those familiar with the reality of health workforce supply in the country would know how unrealistic this promise is."

There is a lot in common between the manifestos of the Congress and the CPI. The CPI also promises to enact right to healthcare, to raise the share of public health spending to 3.5 per cent of GDP in a short-term, to scrap insurance-based model of healthcare, to implement clinical establishment act to bring accountability among providers of care, to make healthcare affordable, to strengthen medical education and training and so forth. Of course, there are other promises too made by each of these parties in their manifestos but nothing comes across as very striking.

Now, look at the health promises made by the BJP in its manifesto. There is nothing on health that its incumbent government hasn't said during its tenure. There are no new promises or commitments and therefore no surprises. It promises continued support to Ayushman Bharat and reiterates its goal of establishing 150,000 Health and Wellness Centres (HWCs) by 2022. It also envisages providing telemedicine and diagnostic laboratory facilities at HWCs. As is the case with manifestos of other political parties, BJP talks of continuation of reforms in the area of medical education and training and making healthcare affordable to the masses. It talks of coming up with an essential list of medical devices and a separate pricing policy to make medical devices accessible and affordable. Additionally, it talks of making national nutrition mission a mass movement, achieving full immunisation coverage of children and pregnant women by 2022, and eliminating TB by 2025 through a special mission.

None of the above manifestos takes a holistic view of the challenges in the health sector. Among the three manifestos, BJP's manifesto is leanest of all and has some striking omissions. For example, it doesn't talk of healthcare regulation in the country. This could perhaps be due to the National Health Policy 2017 that explains government's stance in dealing with various health sector challenges. Regardless of what gets mentioned in manifestos of different political parties, health in India has become a political priority. Manifestos of different political parties is not necessary the right place to gauge its importance. Why? One, it's not clear to what extent voters' behaviour get influenced by party manifestos in the midst of other, more visible, factors such as personality of local candidates, track record of serving candidates seeking re-election, local development issues and so forth. Two, non-fulfillment of promises made in manifestos provide ready ammunition to opposition parties against the party in power. Nevertheless, it is interesting to study and compare health sector promises made by different parties in their manifestos to see if they are setting the expectations right.

Manifesto for a caring health system

Indranil Mukhopadhyay, Associate Professor, OP Jindal University, Associated with People's Health Movement speaks on the needfor healthcare to be an integral part of every political party's agenda

IN THE middle of summer heat, while the country is going through vigorous debates and rigorous campaigns for arguably the most contested general elections ever- when heat strokes are on the rise, blood banks are drying up, political violence is taking lives and people are being promised moons, one looks for an election manifesto that promises a more caring health system. Because in health what matters is care, care as a right; care when lives are at stake, taking care that lives are not at stake, not at least, prematurely.

India's health system is characterised by lack of care particularly for the vast majority of people who need it the most. It is organised to ensure hegemony of the powerful and privileged and the scream of deprived voices remain systematically unheard. Thus people die avoidable deaths, delay their health needs, lack of access to appropriate and good quality care that submerge the poor into deeper

pauperisation or indebtedness in their desperate attempts to save lives of their near and dear ones.

A series of policy measures undertaken over the last decade by successive governments have encouraged commercialisation and let the rule of profit govern health priorities. Public private partnerships (PPP) of various forms, particularly, government funded health insurance schemes (GFHIs) like Prime Minister's Jan Arogya Yojana (PMJAY) being major drivers of expansion of commercial interests in the health sector. Not only public systems have been systematically dismantled in this process, rules of profit have taken over the values of comprehensive care even within the public system, thus blurring the boundaries between public and private systems.

Enormous volume of evidence has been generated by now showing that GFHIs are ineffective to provide financial

protection to people and accentuate inequities in access to health services rather than addressing those. People's Health Movement, large sections of public health community, numerous academicians including Prof Amartya Sen and John Dreze and sections within government have been calling for scrapping such programmes.

Manifestos of major political parties reflect the contestation between profit and care.

The manifesto of Bharatiya Janata Party (BJP) shows its determination (Sankalp) to give commercial interests a permanent share in government resources and create avenues for assured profit with major scale up of the Prime Minister's Jan Arogya Yojana (PMJAY). In contrast, two major political parties in the opposition, Indian National Congress (INC) and the Communist Party of India (Marxist) (CPIM) have promised to scrap PMJAY, in a way responding to the demands of the health movements.

An alternative health system, based on values of care cannot be realised without locating care in the discourses of rights of citizens. In that context, it is heartening to see that both INC and CPIM have recognised the importance of health care as a right of citizens and pledge to do this through strengthening of public systems and expansion of free provisioning.

It is also laudable that both these parties are willing to commit more than 3 per cent of GDP as public investment on health while BJP chooses to ignore the issue of public investment. The track record of incumbent NDA government is particularly marked by continuous cuts in union government allocations for health, which BJP does not seem to be interested to correct if the NDA is voted back to power.

A common thread in all the manifestos is the promise to expand medical, nursing and para-medical education to address the issue of healthcare shortage. Merely producing more doctors may not help in addressing shortage of health services in vast part of the country. The problem is as much in the distribution as it is in overall supply. Over the last decade or so number of doctors produced per year has increased considerably, but access in rural areas and underserved remote areas has not improved adequately. Major expansion in medical seats has happened through setting up private sector educational institutions, where medical education is being traded with high capitation payment, which essentially favours the rich.

Any expansion of medical, nursing and paramedical education has to be equity focussed, providing opportunities to people from backward areas and deprived sections, imparting publicly oriented education, rather than catering to the needs of commercial medico-industrial complex.

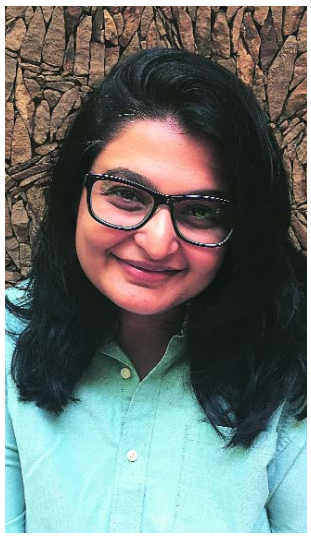
A supply driven approach to expand health services, may not be sufficient, even if it is centred around government health system. A complete reorientation of hierarchical government system, where system is accountable to people, its free from any forms of discrimination; where people participate in decision-making processes and policies reflect the diverse health needs of the nation is needed. However, such reorientation is not easy. Among many things enormous political will would be needed to take the powerful medico-industrial complex head on. Whether the next government is willing to take on that challenge would depend entirely on how we vote and whom we chose to represent our aspirations.

Ideological shift – towards mental health

Rajvi Mariwala, Director, Mariwala Health Initiative (MHI) informs that mental health which has long been neglected in political manifestos, for the first time gets mentioned by few political parties

MENTAL HEALTH sees a landmark in 2019, with finding clear mention and provision in the Indian National Congress and the Communist Party of India (Marxist) manifestos. This is the first time mental health has been found in a political manifesto. Looking at all national party manifestos as far back as 1991 - we see that mentions and provisions for persons with disabilities and women see clear provisions but mental health has been neglected, despite facing stigma and oppression, just like vulnerable communities such as persons with disability, women and the LGBTQ community. For example, progressive steps for the LGBTQ community saw a mention for the first time in 2014, when CPI (M) included queer rights in its manifesto for 2014, followed by the Aam Aadmi Party (AAP), the Congress and the Communist Party of India (CPI). It required a coalition of campaigners with information, videos and a public petition to engage with political parties to put mental health on the map in 2019. The Bridge The Care Gap coalition had reached out to multiple parties and engaged with them over months to enable this milestone - but other major parties are still silent on mental health - an issue that affects over 150 million Indians as well as suicide being the leading cause of death among youngsters aged 10-24 in the country.

However, mental health content in both the Congress (I) and CPM manifestos signal a few significant shifts both in terms of actionable commitments and ideological content. Importantly, both commit to rights-based work on mental health with the intent to implement the Mental Healthcare Act 2017 (MHCA). The CPI(M) manifesto also vows to implement the Rights of Persons with Disabilities Act (RPD) as well as compliance with United Nations Convention on Rights of Persons with Disabilities (UNCRPD). Mental health institu-



tions and practise has seen grave human rights violations, be the restraints of chemical and physical nature to familial violence. Such an ideological focus and paradigm shift on informed consent, patient rights, and right to community life possibly has not been seen in the overall health/medical sector. Additionally, by promising the enforcement of the Mental Healthcare Act (MHCA), 2017 both parties signal that universal mental healthcare is a justiciable right. This means that not only is mental health a right for each individual, but also recognising that responsibility for this will be incumbent on a variety of stakeholders including the judiciary as well as law enforcement officials.

While these ideological shifts are critical, progressive and rooted in social justice— what about the actionability of these ideological premises? Crucially, both parties have promised adequate budgetary allocations for the implementation of the MHCA. According to the National Mental Health Survey (NHMS) of India, 2016, India spends less than one per cent of its entire health budget on mental health. Without this promise, the commitment by these two parties would remain on paper. Some important provisions of MHCA 2017 that are easy assess, include integrating mental health at primary, secondary and tertiary healthcare levels— which would remain a pipe dream without requisite budgetary allocations.

Secondly, the MHCA asks for constituting and functioning Central Mental Health Authority (CMHA) and state mental health authorities and mental health review boards which must oversee social audits and day-to-day implementation of the MHCA which would include complaints about human rights violations and gaps in services. Thus, the promises in the manifestos themselves have road maps as well as measures to ascertain how these campaign promises have been fulfilled. This accountability is a key premise for further progress on rights based mental health and is cause for cheer. This has been a historic year as we finally see political will to work on mental health, but, the push must remain to hold the political apparatus accountable to implement the MHCA, law of the land, in both letter and spirit.

INTERVIEW

‘MHD has a pricing strategy based on competition benchmarking with a scientific approach and methodology’

Pramod Alagharu, CEO, Manipal Hospital Dwarka shares insights with **Prathiba Raju** on the 400-bedded multi-speciality facility which focusses on patient centricity as its core value

In Delhi, patients in general have a lot of trust deficit with private hospitals and see them as a profit-making business. Manipal is trying to change this mindset and the first step is by bringing predictability in billing. The pricing strategy is based on competition benchmarking and we have a scientific approach and methodology towards it

You were previously the Regional COO of Manipal Hospital and now in your new role as CEO, what do you aim to achieve ?
The Manipal Group has been trying to enter the Delhi market for quite sometime now and with this new hospital we have entered the northern market. My role has been clearly mandated and it is to bring in ethical practices, clinical excellence and patient centricity which is the Manipal culture. These values and practices will be followed at the new multi-speciality facility in Dwarka (Delhi)as well. Also, we want to be transparent in our billing process. In Delhi, patients in general have a lot of trust deficit with private hospitals and see them as profit-making business. Here, we are trying to change this mindset and the first step is by bringing predictability in billing. At MHD, the pricing strategy is based on competition benchmarking and we have a scientific approach and methodology towards it. Nowadays, more and more patients are looking for close-ended packages and we are working towards it as the patients are more satisfied with this method. This multi-specialityfacility in Dwarka is supposed to be the next flagship hospital after Bengaluru. Moreover, we would like it to be seen in the tertiary and quaternary space. The facility has all the state-of-the-art equipment and best clinical talent. One of our strengths has been education and we have a strong alumni base not only in India, but also abroad. Therefore, we have robust clinical research and teaching programmes. For instance, we have a DNB programme in Manipal hospital Bengaluru, which benefits a number of clinicians. Similar teaching programmes will be started here as well.

Delhi is saturated with corporate hospitals. So how different would be MHD? What would be your USP? Will Dwarka as a location help you?
Dwarka is one of Asia’s largest residential township which has a lot of elderly people who require a good healthcare facility. To serve this huge population at Manipal Hospitals Dwarka, we have 55 specialities and sub specialities with highly credible doctors and medical services. We don't have to refer a patient outside as the hospital has all the facilities, particularly the critical care and emergency. For example, we have systematic emergency medicine speciality, which has round-the-clock senior manpower who can tackle any kind of adult or paediatric emergency Lab services are available 24x7. The hospital also has a strong pre-hospital care service—currently we have a comprehensive ambulance fleet which caters to paients from across Delhi/NCR . We have a large fleet of ambulance services in the hospital. We get a call on our call centre (40407070) and it immediately gets diverted to the doctors who address the needs of patients by real-time monitoring. In serious cases like stroke and heart attack, the doctor accompanies the patient in the ambulance and starts treatment. Even our cath lab functions round-the-clock so

we can give immediate care to any cardiac patient. Apart from this, we have robust digital technology – the whole premise is Wi-Fi enabled, with the vision to become the first paperless hospital in the country. The hospital has top-of-the-line Hospital Information System (HIS) and Electronic Medical Records (EMRs) for each and every patient, which brings in ease and transparency in the way we operate.

Do you think managing cost containment, cost optimisation and revenue enhancement for big hospitals chains is a challenging task? How do you manage it? Do you plan to increase your current footprint in Delhi?

The focus of the first two years will be to cater to the healthcare needs of more and more people and our concern is always going to be patient care. Revenue and cost are natural outcomes but our focus is to earn the trust and goodwill what Manipal is known for and is proud of. Our immediate focus is not to add more beds to this facility, but considering the way healthcare is progressing, we will definitely like to add more sub-specialities. Manipal would definitely be spreading its footprint in the northern space.

Why do you think technology advancements are important for big chain hospitals? Manipal Hospital, Dwarka has embraced digital and tech advancements, how is it helping patients?

We believe in moving towards digitisation. Manipal has robust healthcare data of 60 years and with Artificial Intelligence we are well poised to undertake that journey. For example, we have a tumour board where clinicians discuss any kind of disease patterns detected as well as reasons and ways to mitigate it. The hospital also has a comprehensive and pervasive IT infrastructure to enable clinical and administrative work flow. We have various advanced technologies such as wireless point of care system, real -time location system, mobile clinical devices, critical medical devices, intelligent information systems, facility control systems, sensors and digital communication tools. As far as lab services are concerned, MHD also has immediate transfer of samples, medicines and documents are enabled using an automated pneumatic chute system to minimise delays and ensure safe and hygienic transfer. Further to it, the hospital is using bar coding to ensure correct identification of blood samples and better asset management control. The hospital has state-of-the-art PACS system, telemedicine, remote monitoring, endoscopic suites, robotic suites and hybrid OT facilities.

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INTERVIEW

Watson Health has more than 15,000 clients and partners

IBM Watson Health completed three years in business. Is the supercomputer technology living up to the audacious expectations, IBM created for it in the beginning? **Sandeep Makhijani,** Watson Health Leader, Asia Pacific, IBM Watson Health reveals their progress and plans with **Raelene Kambli**

What is IBM's vision towards solving the most pressing health challenges through data and AI insights?
IBM launched Watson Health three years ago with a clear goal of find the best ways to bring AI and other technologies to help medical and health professionals tackle the world's biggest healthcare challenges. We are continuing to improve the ways that Watson Health technologies can be integrated into clinicians' workflows and existing processes, as well as continuing our focus on scientific research and localising products. We're continuing to focus on our efforts in this area to build trust and ensure our technology is delivering clinical value.

Tell us about Watson's achievements in India so far?
We have collaborations with many hospitals in the Asia Pacific region, (which includes India) as well as across the world for implementing IBM Watson Healthcare solutions. In India, we have two leading healthcare entities – Apollo Hospitals and Manipal Hospitals - who have adopted Watson for Oncology. At Manipal Hospitals, for example, the multidisciplinary tumour board uses Watson for Oncology to review challenging cases, and they have found that the technology is 92 per cent concordant with their multidisciplinary tumour board, according to a study in the Annals of Oncology.

How does the technology actually work for Indian physicians and patients?
Emerging technologies like AI are set to transform the healthcare sector in India.

From hospital care to clinical research, AI applications are changing how the health sector works to reduce cost and improve patient care. At Watson Health, we have impacted over 15,000 clients and partners, 80,000 professionals and 185,000 patients and consumers with our AI solutions.

For example, Watson for oncology is trained by oncologists at Memorial Sloan Kettering Cancer Center, and is a cognitive computing system that uses natural language processing to ingest patient data in structured and unstructured formats. The system provides physicians with treatment options that are derived from established guidelines, the medical literature, and training from patient cases. Watson for Oncology is continuously learning over time, and doctors have access to peer reviewed studies, clinical guidelines, and expert perspectives.

Similarly, IBM Watson for Genomics analyses massive bodies of genomic, clinical and pharmacological knowledge to help uncover potential therapeutic options to target genetic alterations in a patient's tumour. Using this genomic analysis, Watson produces a report for physicians, which identifies genetic alterations that are actionable based on literature as well as drugs and clinical trials that target those alterations.

Is the technology exclusively based on training by human overseers, who feed Watson information about how patients with specific characteristics need to be treated? If yes, what happens to those rare cases?
IBM Watson for Oncology is trained by Memorial Sloan Kettering (MSK) to compliment the work of oncologists, supporting them in clinical decision-making by enabling them to access evidence-based, personalised treatment options from more than 300 medical journals, more than 200 textbooks, and nearly 15 million pages of text providing insight and comprehensive details on different treatment options, including key information on drug treatment selections. The system has been trained to support treatment of 13 cancer types which represent 80 per cent of the global cancer prevalence. The initial treatment options based on the MSK training are generated for each patient with the associated reference material such as the textbook and medical journals etc. The physician then determines and discusses the appropriate treatment with the patient. Usually, when a cancer patient visits an oncologist, the doctor based on his experience, knowledge of the cancer type, various clinical diagnosis of the patient determines the treatment plan which typically includes drugs, radiation, chemotherapy and others.

What happens to the system if the historical data of patients is not well organised by hospitals? How will Watson react to such crisis?
Watson for Oncology is capable of identifying the key attributes from a patient's record. If information that is important for treatment decisions is missing from the record, the treating oncologist will be prompted to enter that information into the system manually before Watson for Oncology can provide treatment options. Ultimately the treatment decision is always up to the doctor and patient.

Has IBM published any scientific papers demonstrating how the technology affects physicians and patients?
We have published more than 50 studies on our Watson AI technologies, and more studies will be coming out this summer. In June 2018, the latest study of Watson for Genomics was presented at the annual meeting of ASCO (American Society of Clinical Oncology), where the Guangdong Lung Cancer Institute in China found that Watson for Genomics matched the bioinformatics molecular tumour board's manual analysis of mutations in 43 per cent of lung cancer cases. But in the other 57 per cent of cases, Watson for

Genomics found 1.54 additional mutations, on average, that the bioinformatics molecular tumour board had missed (n=115). With that additional level of accuracy in the genetic alteration of a tumour or lung cancer, the targeted therapy can be further fine-tuned by the clinician for the patient. We have done several such clinical studies which show that there is a very good concordance for both Watson for Oncology and Watson for Genomics.

In another study, disclosure of Watson for Oncology recommendations resulted in prescriber treatment changes in five per cent of cases. The adherence rate in the 106 cases where decision changes were made improved from 89 per cent to 97 per cent (ASCO 2018 http://abstracts.asco.org/214/AbstView_214_229459.html)

Major hospital chains such as Apollo and Manipal have tied-up with IBM Watson so far? What has been their experience, challenges and benefits so far?

Apollo Hospitals implemented Watson for Oncology and Genomics to help physicians provide patients with personalised, evidence-based cancer care. This agreement was the first-of-its kind Watson for Oncology and Watson for Genomics deployment in India. The solutions also helps oncologists at Apollo surface relevant data to bridge disparate sources of information and identify treatments that are personalised to each unique patient.

Manipal Hospitals have been using Watson for Oncology to help identify evidence-based cancer care options for their patients. The benefits of man + machine are clear to the doctors. According to studies from Manipal, in 93 per cent of breast cancer cases, Watson matched the recommendations of the hospital's tumour board —a group of 20 physicians who typically study each case for a week and spend an hour discussing it. It's been fantastic for us to be collaborating with them and calling them our clients in India.

Various reports and investigations in the US, claim that that the supercomputer (Watson) isn't living up to the lofty expectations IBM created for it. What is your opinion on the same?

Across the various areas of Watson Health our efforts are having an impact.

In just three years:

- Watson Health has more than 15,000 clients and partners.
- Watson Health cognitive offerings have impacted care or social services for more than 295,000 people.
- More than 50 peer-reviewed publications, posters, and abstracts support Watson Health cognitive offerings and 500+ pieces of scientific evidence demonstrate how our AI data and analytic tools are being used by clients and partners in healthcare and life sciences.
- IBM has more than 2,500 active granted and pending US patents in healthcare and life sciences. 400 of those are specific to Watson Health.

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Protecting patient privacy in the era of mHealth

mhealth has ushered in new paradigms in healthcare but also increased vulnerabilities in management of medical data. **Ashutosh Tiwari**, Managing Director, Chairman, VBRI points out that cloud and blockchain are the most plausible solutions to address this burgeoning concern

THE GLOBAL health expenditure was recorded by the World Bank at 9.8 per cent of the GDP in 2015 and since then it has increased a lot. New technologies have entered the healthcare sector under the purview of cloud medicine ranging from Artificial Intelligence (AI), Internet of Things (IoT), programming learning, big data science, and automation to blockchain. The result is widespread adoption of mobile technology in the healthcare sector, especially in mHealth, telemedicine, and EHRs (Electronic Health Records).

The number of mobile phone users is expected to reach 4.68 billion in 2019, with India counting for 730.7 million mobile phones, as per Statista. The proliferation of mobile phones, expansion of communication network, and advents of the new age technology has spurred the growth of eHealth, more precisely mHealth across geographies. Statista has also highlighted that with the global digital health market increasing to over $ 200 billion , the global mHealth (mobile health) industry market size will also reach $ 58.8 billion by 2020.

Mobile health technology has immense potential to enhance healthcare quality, decrease expenditure, increase access to services, and develop personal wellness and public health. Be it mHealth, telemedicine or EHRs, the protection of patient data rises as an alarming concern. However, the adoption of mHealth has taken the power away from healthcare professionals and placed it straight into cyberspace, making all the medical data vulnerable. Not just the medical practitioners, industry experts, and governments but patients are also concerned about their data going awry.

Protecting patient data in the right way

mHealth requires recording data about a person's physiology, physical activity, or social behaviour and stores all this data for further analysis by doctors and medical experts. This data can be misused by cybercriminals for wrong purposes, or by a third party with hidden motives. That is why the protection and safeguard of

patient data are crucial. In regards to protecting the privacy of patient data in today's era of mobile technology, cloud and blockchain are the most plausible solutions to address this burgeoning concern. The problems arising from the use of technology can only be resolved using smart implication and integration of other technologies.

Both the issues of data integrity and patient consent can be addressed with blockchain. This technology creates a 'hash', a one-way mathematical digest of the medical record ensures the safety and authenticity of the patient data. Just like cryptocurrency, the patient data recorded with blockchain and located on a secured cloud network can be accessed only by the authorised doctors and medical practitioners, ensuring the privacy of patient data. Blockchain makes it extremely difficult to tamper with patient data, whereas cloud facilitates timely secure access of the patient data anywhere in the world, whenever needed.

On the government front, credibility and accountability of healthcare providers need to be ensured, and therefore, implementation of policies to control access and authentication of personal health information (PHI) is a strongly suggested step for every economy adopting mHealth. India, being one of the fastest growing nations in the world, must create regulations such as HIPAA (the Health Insurance Portability and Accountability Act) exercised in the US. The nation with over 1.3 billion population has great potential of adopting healthcare technology, and supportive government policies can surely expedite the process.

The roadmap ahead

Adoption of technology is essential for the healthcare sector to evolve and reach into the farthest corners of the world, facilitating every individual with quality healthcare. Although mobile consumer devices have been quickly adopted by patients, caregivers, and healthcare providers for health applications, yet it has become difficult to protect sensitive health-related data from the threats posed by mobile devices connected to the Internet.

VBRI Group has patented a mobile e-clinics technology in India which will help people in the Indian countryside to get timely medical help at their homes. The technology is currently in the third-phase of field trial and is getting useful feedback from users. This mobile e-clinics technology is concerned about the patient privacy and technical improvement, which will provide error less medical help and access to doctors to the people in the Indian countryside via smartphone.

Cybersecurity in Healthcare: The Indian perspective

Vivek Tiwari, Founder, CEO, Medikabazaar highlights the need for healthcare organisations to invest in cybersecurity and suggests practical solutions for hospitals to follow

WE ARE witnessing a world where almost every human activity is digitised – from drones being used for surveillance purposes to purchasing a month's grocery through online shopping portals. Given that digitisation was an inevitable, we have all seen the advantages at large, but this has come at a cost. The cost is privacy.

According to a recent article in The Economist, data (not oil) is the most valuable resource in the world today. Giants such as Google, Facebook, and Amazon are offering their services free of cost. However, they are taking something much more critical in return, our data. More the data, more personalised are the services they can provide. As our data gets accumulated in the vast and unending space of the internet, it is highly vulnerable to getting exposed publicly by hackers who can gain access to such sensitive information. Therefore, cybersecurity has become the central issue of our time.

Much like other industries, healthcare has seen a tectonic shift. Electronic Health Records (EHRs), telemedicine, use of robotics in surgeries, AI and ML integrated systems have made diagnosis/treatments more proactive and efficient. Although this has made life easy for both doctors and patients, massive troves of patient data issues regarding its safety have stirred up quite a debate. According to a report titled, 'Cost of a Breach: A Business Case for Proactive Privacy Analytics,' by Protenus - a company dedicated towards protecting patient data— the healthcare industry in the US lost a colossal $6.2 billion due to data breaches.

So what are these cyber threats which endanger the data of millions?

Ransomware Threats: This type of cyber threat infects computers and disables users from gaining access to the system by encrypting the data on the hard drive. The perpetrators of the ransomware attack who have the decryption or other forms of release keys hold the victims for ransom until their demands are met. If the perpetrators demand money, then the payment is made via Bitcoin. Reports have stated that ransomware threats have become common in the healthcare industry. The WannaCry ransomware attack in 2017 is one of the striking examples in recent times that affected more than 200,000 computers in 150 countries. The attack resulted in the loss of billions of dollars worldwide.

Phishing: This cyber-attack is done through emails asking for personal and sensitive information. The emails are sent from personal and business accounts which tricks victims into thinking that the email is from a known source. Therefore, victims provide the required information without second-guessing. Phishing is done to collect private information from people, which can then be used for any purpose. Medical establishments with EHR system or other forms of online data sets are prone to phishing attacks.

Malware: This is quite similar to ransomware. It uses phishing attacks to gain access to the networks and encrypts the data. Malwares are complex and can be hard to decode. Again, healthcare facilities with EHRs and digital databases are at risk of getting affected by malware. Medical centres should be more wary of malware due to some concerning statistics. According to a 2018 survey conducted by an American non-profit organisation, Healthcare Information and Management Systems Society (HIMSS), "credential stealing malware" was voted as one of the top three potential cybersecurity threats with 11 per cent.

There are primarily two victims when hospitals face cyber-attacks. One is the hospital and the other victim are patients whose data are compromised and can be sold, exposed publicly or worse, can be used for fraud. Hackers can collate different pieces of information from

numerous datasets to create a new identity and use that to commit fraudulent activities. This is known as synthetic identity theft.

India sees a positive integration of technology and healthcare. According to PwC's 2018 Global Digital IQ Survey, it was revealed that Indian healthcare establishments are extensively employing Artificial Intelligence (AI) and Internet of Medical Things (IoMT) in their operations. The implementation of AI in medical fields such as breast cancer screening and preliminary symptom-based diagnosis has resulted in cost-effective medical care and better survival rates respectively. IoMT sensors have been implemented in ICU beds and ambulances which has resulted in efficient tracking of patients' vitals and proactive medical care. These mechanisms involve the recording and storage of sensitive patient data and are highly vulnerable to being illegally encrypted by hackers and data leaks.

India has seen its fair share of cyber-attack incidents. According to a 2016 report by Times of India, a Maharashtra-based laboratory's pathology reports were leaked online. Information of approximately 43,000 patients including those who have HIV, were leaked on the internet.

Prassant Kumar, Co-founder, CEO, Caresoft Consultancy - an Indian healthcare IT company-echoed as to why such incidents in healthcare facilities, occur. He said, "The healthcare industry has been underinvesting in IT security for long with the main focus just on regulation rather than looking at cybersecurity as an enabler for a healthcare institution to function."

"Not investing intelligently on human resources to make them understand the behavioural aspects of users to not only detect but also predict some of the threats, as humans are the weakest link in the cybersecurity framework," he added.

Anuj Kapur, COO, Lucideus, a Mumbai-based cyber-security firm, reflected a similar situation. "We see that India's healthcare sector lags in cyber-security investments in comparison with most other major industries," said Kapur.

He continued, "Medical devices collect large amounts of personal information, financial information, and essential medical information, making it a lucrative target for hackers. These devices still run on outdated and vulnerable operating systems, making them vulnerable to attacks with ransomware, with no alternative but to pay when one occurs."

"Healthcare organisations on an average spend only half as much on cyber-security as other industries, and this has to change with hacks and data breaches being reported across the world," added Kapur.

As per the Cyber Crime Report 2017 by KPMG, 46 per cent of end users in Indian companies are not able to report cases due to an absence of awareness about "where and whom to report?" 34 per cent of users do not report incidents as they fear personal repercussions while 11 per cent do not report as they believe that such cases can affect the company's brand image and reputation. However, there is a silver lining. The report said that 79 per cent of Indian organisations identified cybersecurity as one of the top five risks.

As healthcare establishments have been severely affected by cyber-attacks, it is of the utmost importance that specific steps are taken which can ensure cyber safety. Here are some practices which can be implemented.

1. Hospital staff (especially the ones handling data on a regular basis) should be trained on cybersecurity along with being updated continuously on latest forms of threats and security standards. More so, employees must be made aware that every staff member is responsible for protecting data.

2. Access to datasets should be allowed to only those employees who require the information for specific tasks. Restrained access to data will result in better protection.

3. Installation of any new applications or software should be executed after the authorisation from the appropriate departments/authorities. This way, proper checks, and balances can be put in place which can prevent cyber mishaps.

4. As healthcare providers use cell phones for their activities, it is essential that phone data is protected via encryption or other methods.

5. It is a must to create a back-up dataset and store it away from the central network system. Ensure that the data is regularly updated so that in the case of a breach, the back-up data can be restored.

6. Keep strong passwords and update them regularly.

7. Any and all systems connected with the internet must be protected with a firewall.

8. To prevent phishing attacks, be wary and alert about emails asking for personal/sensitive information. Try and affirm the legitimacy of the email by sending it to the appropriate authorities.

9. Anti-virus software installation is essential but updating the same is more crucial. This will ensure that the system is safeguarded in the best possible manner at all times.

10. Physical access to servers, computers, and other devices with sensitive information, should be controlled and placed in highly secured areas.

INTERVIEW

'Transplantation of Human Organs Act, 1994 requires a little amendment

The industry welcomes the recent move of the Government of India, classifying organ preservative solution as 'drug' and bringing it under the Drugs and Cosmetics Act. However, the industry seeks amendment in the Transplantation of Human Organs Act, 1994. **Pavan Choudary**, DG, Chairman, Medical Technology Association of India (MTAI) informs **Usha Sharma** that each patient, whose organs are no longer in their optimal state for harvesting can save eight lives through organ donation

Tell us about the market for organ preservative solutions in India as well as globally? What is its current size and by what percentage is it growing?
The global market for organ preservative solution (OPS) is poised to cross $240 million mark by 2021 and is expected to grow at a CAGR of 7.8 per cent. Though America and Europe lead the market for OPS, India is expected to see significant growth as factors, such as multi-organ failures in ageing population, advancement in technology and the ensuing quality through the government's recent announcement to regulate OPS could lead to a significant increase in the size of the market.

How many players are offering organ preservative solutions in India and for which organs?
We wouldn't know the exact number of companies that offer OPS. To name a few such companies; Sandor, Dr Franz Kohler, Bristol-Myers Squibb, Krishgen, Waters Medical Systems, Organ Recovery Systems etc. are supplying OPS in India. Currently liver, kidneys, heart, lungs, eyes, pancreas are among the eight commonly preserved organs in India.

How does organ preservation solutions increase the longevity of organs? So far these solution are used to preserve which organs? Can you explain the science behind it?
OPS, as the name suggests is a solution that is used in the time window between extraction from a donor to the implantation of the organ in the recipient's body. An OPS comprises of chemicals such as glutathione, raffinose and adenosine etc. that help in slowing down the metabolism while the organ is in the solution and also help restore normal metabolism during reperfusion (transplant surgery).

What kind of research is ongoing in this segment and what are the key learnings so far?
Current research is on in the frontier of normo, sub-normo and hypothermic perfusion technologies, hypothermic surgery, bioengineering, organ banking and gas persufflation.

Recently, the government has classified organ preservative solution as 'drug' and brought under the Drugs and Cosmetics Act, how will it impact the industry? What are your views on this move?
We welcome the government's recent move to classify OPS as drugs with the intention to regulate them. OPS is a highly critical device, especially for a country like India where there is a wide gap between the number of organs required and the organs available. More than two lakh CRF patients await transplants and we have been able to meet the demands of around five per cent only. Regulating the OPS in India will help ensure that only solutions of the best quality are used in the interest of patient safety and better transplantation outcomes.

Tell us about the role of Medical Technology Association of India (MTAI) in steering the growth of organ preservative solutions and how are you planning to execute it?
The main point which we would like to make is that the Transplantation of Human Organs Act, 1994 requires a little amendment. It should be made mandatory under this act for the doctor to turn off the ventilator when the patient is brain dead. The ventilator keeps the patient artificially and phonily alive post his brain death. In 24-48 hours the heart also invariably gives up (after brain death). The organs then are no longer in their optimal state for harvesting. Each patient can save eight lives through organ donation. Doctors find this point difficult to make as it brings up other human angles and is an identity conversation (a conversation which influences one's image in others' eyes). MTaI understands their dilemma and will strive to spark a well-informed yet humane dialogue on this issue with the policy makers.

Will there be any representation to the Government of India on the recent move?
We are continually engaged with the government to help and provide any industry expertise on regulation of medical devices. The point which we have made above regarding OPS is the point which we would like to reiterate to the policy makers through our representation after which we will leave it to their collective and comprehensive wisdom.

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INTERVIEW

'Let's end malaria by 2030'

Dr Pyare Lal Joshi, Senior Advisor, Malaria No More (MNM) elucidates to **Prathiba Raju** regarding the need to spread awareness on malaria and eliminate it by 2030

Though malaria is easily preventable, why does India still account for six per cent of all malaria cases in the world, six per cent of the deaths, and 51 of the global vivax cases?

India's extensive geography and diverse climate support ia an ideal environment for sustaining malaria parasites and their vectors. The climatic diversity influence the distribution of vectors and species of malaria parasite; as a result, malaria in India takes a number of different forms, including forest/tribal malaria, urban/slum malaria, industrial malaria and plains malaria. This makes the disease a complex, dynamic and a daunting task to be eliminated.

The highest incidence of malaria occurred in India in the 1950s, with an estimated 75 million cases and 0.8 million deaths per year. With the launch of the National Malaria Control Programme (NMCP) in 1953 and National Malaria Eradication Programme (NMEP) in 1958, the death toll declined to zero deaths and 0.1 million reported cases in 1965, virtually eliminating the disease from the country. The development of resistance to dichlorodiphenyltrichloroethane (DDT), thereafter led to a resurgence during the early 1970s. In 1975, as many as 6.5 million cases were reported.

As of now, India has made considerable progress in reducing malaria burden and the disease is on the decline. Among the 11 nations with 70 per cent of the world's burden of malaria, only India has managed to reduce its disease burden, registering a 24 per cent decrease between 2016 and 2017 (World Malaria Report 2018). It currently accounts for four per cent of global malaria cases and 52 per cent of malaria deaths outside African region. India is no longer among the top three countries with the highest malaria burden. However, 1.25 billion Indians—94 per cent of its population--are still at risk of malaria, the report noted.

With the effective use of vector control measures like consistent use of insecticide treated nets, Long-Lasting Insecticide-treated Net(LLINs) and indoor residual insecticidal spray, malaria parasite is susceptible. However, acceptance of these tools may vary from area to area because of local culture and practices. The disease is also fully curable with currently available antimalarial drugs, however, effectiveness of detection of malaria parasite and its prompt treatment depends on treatment seeking behaviour, compliance and completeness of treatment especially in inaccessible and hard to reach tribal areas.

The combination of plasmodium falciparum and plasmodium vivax, six primary malaria vectors, several ecotypes including urban malaria, and various transmission intensities ranging from unstable to hyper endemic create a challenging epidemiological scenario in India.

What is the role and aim of Malaria No More (MNM) in India? Can you elaborate on the work you are doing in Odisha and North-eastern states?

Malaria No More (MNM) is a non-profit organisation headquartered in Seattle, USA, that envisions a world where no one dies from a mosquito bite. Since its inception in 2006 – MNM has mobilised the political commitment, funding and innovation that has contributed to the world turning the tide against malaria and to achieve one of the greatest humanitarian accomplishments – ending malaria within our generation.

In 2016, MNM expanded its operations to support India's 2030 malaria elimination goal. It focusses on working to reduce malaria cases and deaths using innovative strategies, better data and new technologies.

MNM is working with the central government to elevate malaria as a priority health issue and is also working with the Odisha government to engage a range of leading technical, academic, private sector, and media partners to support expansion of the state's drive towards malaria elimination. In January 2019, MNM supported Odisha government's efforts with a donation of one million rapid diagnostic tests to accelerate its efforts toward malaria elimination.

Specifically, MNM is providing technical assistance to the Odisha Vector Borne Disease Control Programme (OVBDCP) to support overall strategy development, capacity building, strengthen malaria surveillance and reporting, improve data collection and data-driven decision-making, enhance private health sector reporting of malaria and create compelling health education and behaviour-change campaigns.

Does MNM mobilise funds? Is there any difficulty or challenge you face in giving funds?

MNM is uniquely elevating malaria on the Indian health agenda. It does not provide funds directly but advocates for the need of funds and mobilise the resources from different sectors.

Do you think the malaria parasite is turning out to have greater genetic diversity and how do you see this?

Plasmodium falciparum is most affected by resistance to antimalarial drugs, which constitutes a major challenge in the fight against malaria. Moreover, there is great genetic polymorphism within *P. falciparum* species and people living in endemic area are frequently and simultaneously infected by several plasmodium strains. This genetic diversity of the parasite is one of the main factors responsible for the slow acquisition (several years) of immunity against malaria. This genetic polymorphism of the parasite also constitutes a challenge for the development of an effective anti- malarial vaccine.

Is increasing anti-microbial resistance becoming a hurdle to eliminate this vector-borne disease?

Antimalarial drug resistance poses a very significant threat in the fight against malaria and if not taken care of well in time, could prove to be the undoing of malaria control programme. At present, Artemisinin-based Combination Therapy (ACT) seems to be effective in most of the cases. However, the prospect of resistance emerging is not very unlikely. Therefore, regular therapeutic studies need to be undertaken to determine drug susceptibility to malaria parasites. In India, both plasmodium falciparum and plasmodium vivax are sensitive to current drug regimens being used under the programme.

However, along the Cambodia-Thailand border, *P. falciparum* has become resistant to almost all available antimalarial medicines, making treatment more challenging and requiring close monitoring. There is a real risk that multidrug resistance will soon emerge in other parts of the sub region as well. The spread of resistant strains to other parts of the world could pose a major public health challenge and jeopardise important recent gains in malaria control.

What are the immediate steps that should be taken to eliminate Malaria in India?

Malaria remains a public health problem in India. The disease contributes not only in mortality and morbidity but imposes economic burden, loss of working days, school absenteeism, and impacts quality of life. It also exerts an enormous economic and social burden on the affected population groups, individuals and communities.

The immediate steps for vector-borne disease elimination includes life-saving LLINs and other anti-malaria tools, health systems strengthening support to reach the most marginalised, strengthened epidemiological and entomological surveillance, partnership-building and community participation.

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INTERVIEW

We need to prepare our society to take care of an ageing population

We need a specific policy and a dedicated department equipped with right professionals to prepare the country's healthcare structure towards an ageing future, says **Kewal Kapoor**, Director & Creative Strategist, CHAI Kreative and Return of Million Smiles (ROMS). He gives more details of the ROMS initiative and their plans to create an AI application to bolster the elderly care ecosystem in India, to **Viveka Roychowdhury**

> We have the fastest growing above 60 population in the world. It's like a ticking time bomb

What has been India's response to the demographic shift toward an ageing population?
There is a huge denial of the fact that we are witnessing a shift towards an ageing population. Neither is anybody talking about it, nor is this fact significantly highlighted. I believe as a nation and society we are not ready to accept that we are already ageing.

The semantic of 'young India' in popular perception continues to propagate the myth that we are largely a young country reaping the demographic dividend of a young population. We have completely ignored the fact that the population of senior citizens is also on the rise. In the long run, this will lead to a situation where the burden of dependent people will increase on the people who earn. The lack of focus on this shift implies that we are completely unprepared to meet this situation; there has been no focus to improve our elderly care structure, health structure or policy structure to address this shift. It's going to be a catastrophic situation.

Unfortunately, the issue is not even covered in mass media. The only reference that you find of senior citizens in our news pages is when they are abused or there is a crime against them. The demographic dividend of an ageing population has neither been researched nor documented or understood. A meager pension network is not sufficient to cover all people, plus with an increasing trend towards nuclear families there will be a huge paucity of caregivers for the elders. If you merely look at available data, you will be shocked to know that we have the fastest growing above 60 population in the world. It's like a ticking time bomb.

What has been the response of the healthcare sector like hospitals, clinicians etc?
There is no response as the crisis of ageing is not even understood by the health professionals. With an increasing ageing population, there will not just be an increase in physical ailments and need for caregivers but also an increase in incidence of mental and neurological conditions such as depression, dementia, Alzheimer's etc. The healthcare sector is hardly prepared to meet this growing requirement. The healthcare sector hasn't witnessed any significant changes in the last two decades except that now you have some basic level of disease support systems in select hospitals. Some hospitals today have dedicated geriatric wards but there number is limited. Preparedness in terms of nursing staff to care for the elderly is also highly inadequate. What is worse is that there is not even any significant awareness about the need to start preparing for the future except may be about introducing people to healthy living in terms of dietary habits.

How has the Ministry of Health & Family Welfare addressed this issue?
At the policy level there has been some recognition of the issue and there have been some positive changes as compared to a decade back. Unfortunately, it has not translated into any positive change on the ground; there is no movement in terms of having a decentralised agenda to address the issue it at primary healthcare level. We need specific policy and a dedicated department equipped with right professionals to prepare the country's healthcare structure towards an ageing future. We also need to move away from NGO culture in this area which over emphasises on trends such as old age facilities or mobile van treatment which are short term, stop gap arrangements. The world is changing and we need to gather available knowledge

and prepare our society at large to take care of an ageing population. We must seriously look at conducting positive experiments in this space through application of AI, with support from the government.

What was the rationale/genesis for the ROMS India or 'Return of Million Smiles project?
Return of Million Smiles is an initiative aimed at sensitising people about the state of the vulnerable elderly community, thereby providing them not only the social security but also an emotional support to live a dignified life. Through this initiative, we want to challenge age discrimination and stereotypes associated with old age. We aim to start a small movement to motivate the young to support the elderly and motivate seniors to live and enjoy life irrespective of age.

We are working to build a cohesive and integrated eco system for the elderly that can provide a one-stop-solution for different needs from awareness to communication to policy and advocacy. We want to lend a global perspective to ageing and want to introduce technological solutions at various levels to improve elderly care. Our motive is to fill the huge void that exists in awareness and social support for the care of senior citizens in India.

> We are working to build a cohesive ecosystem for the elderly that can provide a one-stop-solution for different needs from awareness to communication to policy and advocacy. We want to lend a global perspective to ageing and introduce technological solutions at various levels to improve elderly care

How does it work and who are the partners?
Currently, ROTMS is a sole initiative of CHAI Kreative and Advisory which is committed to changing the way people look at ageing in India. At this stage, except a partial association with a PSU, this is an initiative completely planned and ideated by us. In this stage, our focus by and large has been on raising awareness and conducting research and advocacy for creating a better society for the elderly. We will look for more partners gradually as we move towards other stages of our work.

How is the project funded?
It is currently funded by us in our individual capacity except as mentioned above a small support from a PSU.

How has the project, ROMS India been instrumental in changing Government of India policy toward ageing and introducing second life as priority?
After multiple representations to the Ministry of Labor and Employment during which we showcased our data and research, we were successful in convincing them about the need to bring about a policy change that recognises the second life as a priority. We signed an exclusive MoU with them under which we carried extensive and intensive research for two years for creation of an elderly ecosystem that will cater to this need. It was a non-funded arrangement.

We are also working extensively on mental health side of old age. Maria Abendawala Kapoor as partner and chief strategist has played a pivotal role in building a new the product which we can't talk about at this stage but will launch it later this year. Her main idea was that "till we don't pay attention on mental framework, ageing can't be looked at cohesively".

What were the major challenges and how were they resolved?
The major challenges that exist are lack of awareness and fallacy. Not only is there lack of understanding about elderly care, there are also a number of myths and false facts propagated around. We have tried to counter this by creating communication and awareness. We made films and created other awareness content to address this lack of awareness. As of now, most of our effort has been self funded. We are looking for investment, not as equity but as borrowing to build a system at the cost of $10 million which will be useful in India but for elders across the globe.

What kind of clinical support is required and how is this provided?
We wish to align with hospitals as this is not our core area of expertise; we will work to provide multiple solutions in the field of elderly care.

What have been the outcomes of this project?
Outcome has been good. While in the initial phase, our focus was mostly on awareness and advocacy, now we are preparing to launch path-breaking products and services launch in the realm of elderly care, not only in India but also abroad. In fact, we are the only organisation in the country who is dealing with ageing in a cohesive manner.

What are the plans to expand this project?
We are working to bring an elderly ecosystem portal that will be a repository of knowledge about elderly care. We are investing in R&D for content generation as well as creating an AI application to bolster the elderly care eco system in India. We wish to engage with the government as our first customer for this application. We are also planning to host few creative events in India and abroad to highlight the phenomenon of ageing and ways to ensure it is a happy process.

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INTERVIEW

There is a dire need to focus on re-training and upskilling the existing lot of doctors

Savitha Kuttan, CEO, Omnicuris elucidates to **Prathiba Raju** about the need for digital CME programmes that upgrade the knowledge and skill sets of the doctors

How did the concept of Omnicuris evolve?
With the increasing disease burden and the rapid advancements in medical sciences, it becomes necessary for doctors to keep themselves updated with latest knowledge in their field. A digital solution that will help busy practitioners to have up-to-date medical information on their fingertips is the need of the hour. In India, there was a lack of online platform that offers credible medical content relevant to Indian context. And the idea to found Omnicuris was a step in this direction. We have collaborated with multiple medical associations, institutes and state governments to improve quality of healthcare in India by the Continuous Medical Education (CME) through our platform.

Does it help doctors to keep up with the latest advancements in medicine?
A lot of doctors have benefitted from the CMEs provided by Omnicuris as it helps in being up to date and also enhances their skills in different specialities. We plan to come up with new courses to expand the content base so that more and more doctors could take advantage and serve larger population. In future, we expect to collaborate with various associations such as Indian Medical Association (IMA), Association of Physicians of India (API) and The Federation of Obstetric and Gynaecological Societies of India (FOGSI) to expand our course base.

How many doctors have you trained in your programme?
We have trained one lakh doctors so far and expect to reach out to 2.5 lakh doctors by the end of 2019. Every CME module is broken down to small chapters that are practical and case-based. Once doctors complete the modules and clear the quiz, they would be eligible for certification from respective medical associations and institutes. Our medical team is planning to come up with a curriculum, which is based on the needs of the doctors. On a monthly basis, we train at least 15,000 to 18,000 doctors.

> We have collaborated with multiple medical associations, institutes and state governments to improve quality of healthcare in India with CMEs through our platform

What are the specialities you touch upon? How much is the fee for the courses offered?
We offer courses in ten specialities across medicine and all these courses are absolutely free for doctors. The courses are only targeted at allopathic doctors. Soon, we plan to launch a course on preventive cardiology, besides focussing on pre-diabetes aspects. Basically, our focus is aimed at specialities related to National Health Mission (NHM) including non-communicable diseases, maternal and child health, and mental health, among others. As an impact-driven organisation, we focus on increasing our reach to doctors both in urban and rural areas. Doctors can login to the platform by signing up with their registration number and access the courses for free, except a few paid ones. Currently, most of the content is generated by our in-house team and rest of the matter is curated from different sources.

Can you give us details about collaborations with state governments? Do the needs of public health doctors differ from those in private hospitals? Elaborate.
Omnicuris in partnership with the government of Madhya Pradesh, Karnataka, Maharashtra and Tata Memorial Centre, Mumbai, has trained 90 per cent of medical officers in Madhya Pradesh on early diagnosis of cancer. Though there are a lot of common training needs for both public and private doctors, public doctors need more specific requirements to align with state-specific healthcare goals. For e.g., when a state government is planning to add ICU setup in few blocks, it will need to train its medical officers on emergency medicine topics. Additionally, we have tied up with government bodies to take medical courses to practitioners in tier II and tier III cities.

How do the KOLs help you with the programmes?
Key opinion leaders (KOLs) are specialists in their fields and they provide us with credible and latest medical content which are video recorded for publishing on the platform. All these KOLs are associated with one or the other premier medical institutes in the country. For e.g., Omnicuris partnered with AIIMS to train 20,000 gynaecologists in India. These gynaecologists were trained by specialist doctors from the country's premier institute.

What is your revenue model?
Omnicuris sources its funding from speciality medical associations and pharma companies. We focus on generating revenue only to the extent of sustaining our operations. Our operational cost is optimised to an extent that we are able to focus on our vision of improving quality of healthcare without worrying about external funding. Medical associations, pharma and device companies have always been a key contributor to CME ecosystem. Our role is to make sure that there is a right balance of quality and content neutrality while retaining industry support.

Omnicuris has been able to raise around Rs 1 crore in seed funding from a Hyderabad-based angel investor.

What would be the growth and need of such programmes in the future?
We see that the need of such programmes will continue to grow given the improved focus on quality of healthcare providers in our country. The failure of doctors to timely detect diseases and give proper treatment is a hurdle in providing quality healthcare. So, instead of saving lives, an ill-informed doctor can prove dangerous to his patient's life. With the introduction of central government's *Ayushman Bharat* insurance scheme, the burden on healthcare scheme is only expected to rise. As India faces shortage of doctors, there is a dire need to focus on re-training and upskilling the existing lot of doctors to serve affordable healthcare.

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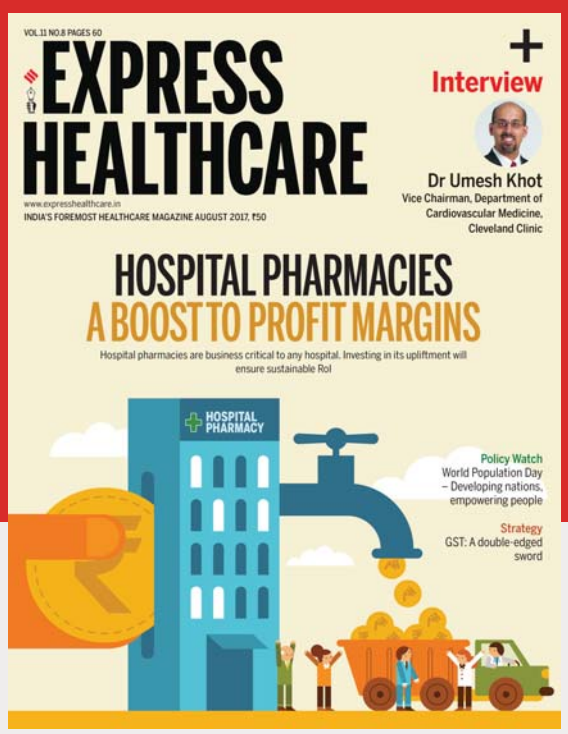
THE BOOSTER FOR THOSE WHO BOOST THE HEALTHCARE SECTOR



When it comes to nourishing this sector, experts prescribe a regular diet of Express Healthcare. The magazine has been the source of a healthy dose of expert information, incisive category analysis and remedies for industry ailments since 20 years, thereby earning the trust of industry professionals. It's no wonder then that the finest in the field trust the foremost in the field.

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How good quality imaging can enhance better medical outcomes?

Dr Bhawan Paunipagar, Consultant Radiologist & Co-ordinator of Dept of Radiology, Wockhardt Hospital Mumbai Central suggests ways in which radiologists can maintain quality standards in their practice

Quality has become a hot topic in recent years, the entire medical fraternity is being pressurised by patient advocates and the regulatory bodies to focus on high quality patient care. Many aspects of healthcare quality have been identified that are lacking and that need regular measurement and improvement.

Similarly, radiology as a n important medical discipline is also coming under scrutiny by regulators with all parties questioning the value and effectiveness of practitioners. Therefore, quality is becoming a critical issue for radiology practice in India. Measuring and improving quality is essential not only to ensure optimum effectiveness of care, but to comply with increasing regulatory requirements and to combat current trends leading to commoditisation of radiology services.

A key challenge to implementing quality improvement programmes is to develop methods to collect knowledge related to quality care and to deliver that knowledge to practitioners.

There are many dimensions to quality in radiology that need to be measured, monitored, and improved, including examination appropriateness, procedure protocol, accuracy of interpretation, communication of imaging results, and measuring and monitoring performance improvement in quality, safety and efficiency.

Several important trends are making quality the centre of attention for both radiologists and the parties judging them:

(i) Radiology is becoming more visible and central in healthcare delivery.

(ii) There is an exponential growth in medical imaging, and the threat of radiology becoming a commodity in the era of the Internet and international teleradiology.

(iii) Imaging is increasingly performed by non-radiologists or by radiologists at remote locations who may not have access to the same information as local practitioners.

Hospitals are responding by looking for ways to track quality indicators and deliver vital knowledge to physicians to prevent errors and improve measurement and monitoring of practice efficiency and patient safety.

National Accredition Board for Hospitals (NABH) is one such body that plays a vital role in approving and laying down guidelines to address quality issues.

Current approaches to quality assessment and improvement are costly, time-consuming, and incomplete. The tasks required are voluminous and data-intensive, challenges for people but not for machines. While cost may be a factor hindering adoption of informatic technologies, the lack of education is also important—few radiologists and administrators are aware of the potential of informatics to provide the functionality they need.

Quality measures are becoming part of the regulatory, compliance, and reimbursement framework. In response to these changes in the healthcare environment, radiologists and hospital administrators are being spurred to plan and implement quality measurement and improvement procedures.

Quality is the extent to which the right procedure is done in the right way at the right time, and the correct interpretation is accurately and quickly communicated to the patient and referring physician.

Beyond the direct pressures on the medical system to improve healthcare quality, there is also a business case for quality in radiology. With the advent of picture archiving and communication systems (PACS), radiology is under threat of becoming a commodity.

Finally, quality is ultimately the core aspect of the professionalism in medicine. Ultimately, radiologists are best equipped to discover problems limiting the effectiveness of their practice and to guarantee the quality of their services. There is a growing perception that all radiologists provide an equivalent service globally and that cost is the only factor that need be considered in the marketplace. However, radiologists can differentiate themselves from competitors if they can demonstrate better quality.

Stephen Swensen, former Chairman of Radiology at Mayo Clinic, makes a compelling argument “Radiology as a commodity will crash and burn in this flat world. For cents on a dollar, you can have images interpreted in other parts of the planet using teleradiology. Unless we can differentiate our product by quality—meaning quality as a combination of outcomes, safety and service, we have to be able to not just say that we're better but have to be able to prove it too.”

Appropriateness of the examination is represented by the right procedure. There are two aspects: appropriateness of the examination requested by the referring physician and appropriateness of the examination performed (the imaging protocol). Radiologists and referring physicians must be knowledgeable about which imaging procedure is appropriate for each clinical indication. The procedure protocol is represented by the right way. Once the correct procedure is requested, the correct protocol for the procedure must be selected and communicated to the technologist who will perform the study.

Accuracy of interpretation is represented by the correct interpretation. Once the imaging procedure has been performed, the images are reviewed by the radiologist. The radiologist's task is to accurately perceive and interpret the imaging observations (radiologic diagnosis).

Communication of results is represented by accuracy and quick communication. Once the radiologist provides an interpretation and recommendation, those results must be communicated to the referring physician and the patient in a timely manner, depending on the type of result (ie, critical results vs noncritical results).

Radiology interpretation comprises three steps: (a) perception of image findings, (b)interpretation of those findings to render a diagnosis, and (c) decisions and recommendations about case management (next tests or treatments). Each of these steps pose pitfalls to accurate image interpretation. Informatics method can support radiologists and help them reduce errors during each of these steps:

These methods include just-in-time methods to deliver knowledge at the point

of care, computer-aided detection (CAD) to assist with perception, and decision support applications to reduce variation in interpretation. CAD is an informatics method for improving quality by helping radiologists perceive abnormal imaging observations. In CAD systems, a computer programme 'reads' the images, detecting particular types of imaging findings that it has been trained to recognise. The central task of these systems is detection of particular imaging findings, such as calcifications, masses, or nodules.

A related task is diagnosis (ie, interpretation of imaging findings). Because CAD systems seek specific types of image findings, the radiologist should not consider these systems a substitute for evaluating the entire image. There are many other types of image findings that could be present beyond the ones that the CAD system is trained to detect. Furthermore, CAD systems may not detect lesions that they are built to recognise.

CAD systems generally display regions of suspected abnormality as annotations on the image that the radiologist reviews. The CAD programmes are usually trained to be very sensitive (so as not to miss any true-positive lesions on the images).

Consequently, there will often be one or more false-positive findings—CAD annotations on the image that the radiologist believes do not represent abnormalities and can be ignored.

Thus, the CAD reading is often regarded as a second opinion. The diagnosis is ultimately made by the radiologist, who takes into account the CAD output. Many studies have shown that such second opinions, whether rendered by a radiologist or a computer, increase the overall accuracy of the radiologist.

Finally, measuring and monitoring performance improvement in quality, safety, and efficiency is represented by patient and referring physician. Ultimately, the effectiveness of radiology is judged by the accuracy of a radiologist's performance, efficient service, and avoidance of unintended patient complications. Radiologists and institutions must measure and monitor indicators of quality, safety, and efficiency in their services to prove that imaging and their interventions are of high quality.

Responsibility for quality is fundamental to the practice of radiology. Computer applications to measure and improve quality can be successfully deployed. Informatics methods should not be regarded as futuristic developments on the horizon; such applications are already in routine use at many institutions and will likely become more prevalent in the future. Ultimately, as radiologists, quality is not just our goal, it is our responsibility, and deploying informatics method will help us achieve our objectives of perfect diagnosis for a perfect treatment plan.

HCG launches US FDA approved digital pathology solution

The technology is expected to improve precision, speed, efficiency and ease of use to provide significant clinical benefits

HCG INTRODUCED US FDA approved digital pathology solution by Philips Intellisite Pathology Solutions across all its centres in India. This technology marks a step forward in cancer treatment through precision, speed, efficiency and ease of use with immense potential to provide significant clinical benefits to both the physicians and patients.

With the advent of digitisation, anatomic pathology is undergoing an important change to keep pace with growing demands in precision medicine. Digital pathology has revolutionised the field of histopathology, by the technology of converting the entire glass slide to a digital image which can then be acquired, viewed on a medical grade monitor, annotated, archived, shared and networked across the globe.

Speaking at the launch, Dr BS Ajaikumar, Chairman, CEO, HCG said, "Pathological diagnosis is one of the most important steps in oncology and at HCG, we have always believed in organ-specific pathologists reviewing the samples. With digital pathology, the way the samples are presented and its magnification are infinitely better than the human eye reviewing them. The best advantage however, is that several people can review the slides at the same time, in separate geographies, to arrive at the best conclusion that would benefit the patient. For instance, in countries like India and Africa, where it may be difficult for patients to get expertise, digital pathology will bridge that gap. This is surely a path breaking concept and in the future, this will prove to be a paradigm shift in the way we treat patients."

Also present at the conference, Dr Veena R, Consultant Pathologist, Head, Histopathologist, Strand Life Sciences, Bangalore said, "In this era of precision oncology, there is a need for quantitative diagnosis than just qualitative descriptive diagnosis. Integration of all relevant patient records including imaging and genomics data is the need of the hour, which is certainly not possible with analogue workflow. With Digital Pathology, we have access to all patient information at the click of a button which allows us to compare and collaborate with physicians and experts all around the country and beyond. Furthermore, it allows trained sub specialists to work on specific cases rather than taking a generalised approach. Right case to the right specialist at the right time is an important decision to not only save on the cost of wrong treatment but also to protect the patient from adverse effects of therapy."

Digitisation of pathology services will result in improved accuracy of reports through physician and pathologist collaboration across the network ensuring faster turnaround time for patients and clinicians. Further, integration with clinical data, imaging data and genomics data will ensure that treatment protocols are tailor-made for each patient.

With the introduction of digital pathological services, HCG has moved further in revolutionising cancer treatment, making it possible to focus on improved outcomes for patients.

NEWS

Study reveals high levels of body fat associcated with differences in brain's form and structure

Both men and women, higher total body fat percentage increased the likelihood of microscopic changes to the brain's white matter

OBESITY REPRESENTS one of the world's most challenging public health problems. The global pandemic has led to a greater incidence of cardiovascular disease and type 2 diabetes. Previous studies have also tied obesity to an increased risk of accelerated cognitive decline and dementia, suggesting that the disease causes changes to the brain.

To learn more about these changes, the researchers analysed brain imaging results from more than 12,000 participants in the UK Biobank study, a major trial begun in 2006 to learn more about the genetic and environmental factors that influence disease. The brain scans used sophisticated MRI techniques that provided information on both the neuron-rich gray matter and the white matter, often referred to as the wiring of the brain.

The results show some clear associations in the patients between body fat percentage and brain form and structure, also known as its

morphology.

"MRI has shown to be an irreplaceable tool for understanding the link between neuroanatomical differences of the brain and behaviour," said study lead author Dr Ilona A Dekkers, Leiden University Medical Center, Leiden, the Netherlands. "Our study shows that very large data collection of MRI data can lead to improved insight into exactly which brain structures are involved in all sorts of health outcomes, such as obesity."

"We found that having higher levels of fat distributed over the body is associated with smaller volumes of important structures of the brain, including gray matter structures that are located in the centre of the brain," said Dr Dekkers. "Interestingly, we observed that these associations are different for men and women, suggesting that gender is an important modifier of the link between fat percentage and the size of specific brain structures."

Analysis showed that, in men, higher total body fat percentage correlated with lower gray matter volume overall and in specific structures involved in the reward circuitry and the movement system. In women, total body fat only showed a significant negative association with the globus pallidus, a structure involved in voluntary movement. For both men and women, higher total body fat percentage increased the likelihood of microscopic changes to the brain's white matter.

The ramifications of these findings, not yet fully clear, could be of significant importance. Smaller gray matter volume suggests loss of neurons, and changes to the white matter could adversely affect the transmission of signals within brain networks. Since the smaller subcortical gray matter volumes are also known to play a role in the food-reward circuitry, these changes may also make it more difficult for obese people to control their weight, said Dr Dekkers , although more research will be needed to support that connection.

The reason for obesity's adverse effects on the brain are not precisely known. Research has shown that the low-grade inflammation characteristic of obesity can have harmful effects on brain tissue. There is evidence that cellular responses produced in the brain due to inflammation may be behind these effects.

The study looked at overall body fat percentage and did not distinguish between the different types of fat in the body, which Dr Dekkers said may be an area for additional research. Of particular interest is the visceral white fat found around the abdominal organs. This type of fat, also known as belly fat, is part of metabolic syndrome, a group of factors that increase the risk of cardiovascular disease and diabetes.

"For future research, it would be of great interest whether differences in body fat distribution are related to differences in brain morphological structure, as visceral fat is a known risk factor for metabolic disease and is linked to systemic low-grade inflammation," said the study's senior author, Hildo Lamb, Director of the Cardio Vascular Imaging Group, Leiden University Medical Center.

Source: RSNA

Report reveals paucity of radiologists in the UK

The current shortfall is 1,104 though that could rise to 1867 by 2023

THREE OUT of four imaging leaders in the UK don't think the National Health Service employs enough radiologists for them to provide "safe and effective patient care," according to a new report from The Royal College of Radiologists (RCR). Also, 49 per cent of leaders "strongly disagree" their department is staffed to safe levels.

The RCR's Clinical Radiology UK Workforce Census Report 2018 includes feedback from imaging department leaders from all 172 UK health boards and trusts where radiologists are presently employed. Respondents provided their answers between September and December 2018. The survey had a 100 per cent response rate.

Other findings include:
Three in five consultant vacancies for clinical radiologists have been infilled for at least a year.

The current radiologist shortfall is 1,104, though that could rise to 1,867 by 2023.

Demand for imaging examinations such as CT and MRI scans went up 10 per cent each year over the last five years.

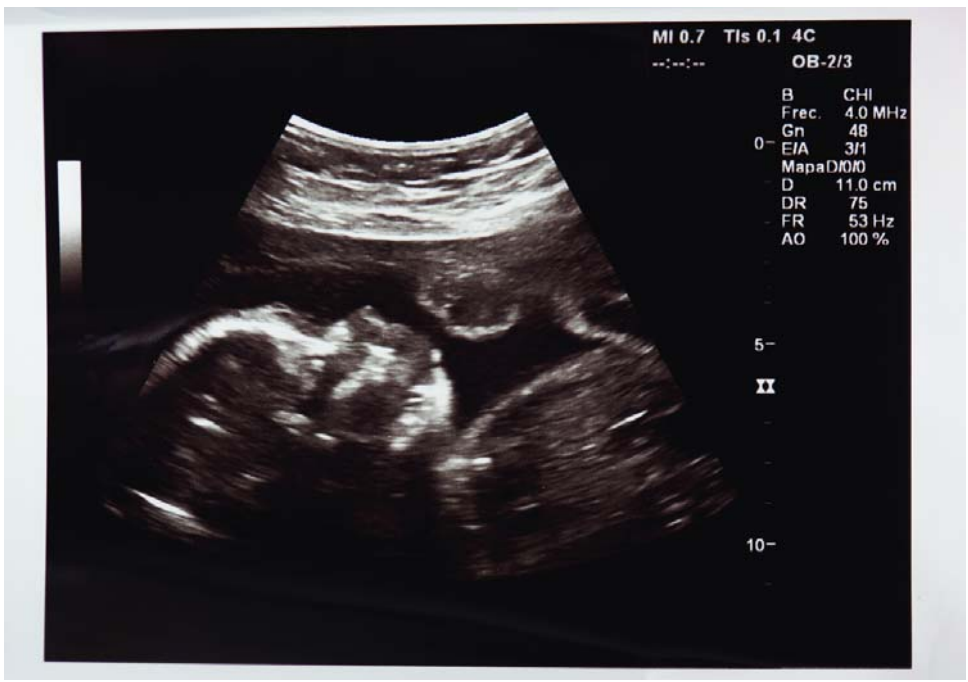
"Diagnostic and interventional radiology is fundamental to modern healthcare, from getting a fast, accurate diagnosis to planning surgery to cancer care and trauma management," Mark Callaway, Medical Director of Professional Practice for Clinical Radiology, RCR's and the report's lead author, said in a prepared statement. "The UK-wide shortage of radiologists is not news to the RCR, but service leaders are now telling us loud and clear that staff shortages are putting patients at risk, with three-quarters saying they cannot guarantee a safe service."

United Kingdom, Diagnostic, interventional radiology, cancer, radiologist

The future of ultrasound systems market's expansion by 2022

Ultrasound system continues to be an irreplaceable commodity, and its market is expected to expand steadily at 5.5 per cent CAGR by 2022, according to a report by Fact.MR

WITH THE increase in adoption of advanced imaging systems in the healthcare industry, ultrasound market continues to be an irreplaceable commodity. Moreover, in the view of rising healthcare costs, affordable and accurate imaging and diagnosis achieved through ultrasound technology will continue to attract patients, and render profits even in conventional medical settings. The report on the global market for ultrasound systems projected a steady growth for the market during 2017-2022. The market, which is pegged to reach $ 6 billion by 2017-end, it will soar steadily at 5.5 per cent CAGR to reach $ 7.8 billion towards the end of 2022.



In the light of this report, a few predictions can be made about how the global ultrasound systems market will expand by and throughout the year 2022. Firstly, application of ultrasound systems in cardiology is bound to increase, as can be inferred from the report. Alarming rise in incidence of cardiac disorders throughout the globe is expected to drive the adoption of ultrasound systems. Between 2017 and 2022, more than $ 430 million worth of incremental opportunity will be created by application of ultrasound systems in cardiology. The report also predicted that nearly half of ultrasound systems sold in the global market during the forecast period will be developed on 2D ultrasound imaging technology.

Secondly, healthcare infrastructure in developed economies such as US and Canada is expected to promote the adoption of ultrasound systems. The report projected that by the end of 2022, North America's ultrasound systems market will reach an estimated value of $ 3.2 billion. During this forecast period, North America is also anticipated to be the largest market for ultrasound systems in the world.

Moreover, the report also observed an impressive growth in the ultrasound systems market across European countries. In 2017, more than 25 per cent of the global ultrasound systems market value is expected to be accounted by sales of ultrasound systems in Europe.

Although demand for ultrasound systems in the Asia-Pacific excluding Japan (APEJ) region is projected to be lower than the before mentioned regions, manufacturers will still be interested in laying down their production units in this region. In such manner, the APEJ ultrasound systems market is likely to account for more than 15 per cent of the global market revenues throughout the forecast period.

Based on the portability of ultrasound systems, the report also expects a higher demand for standalone systems. By procuring revenues worth $ 4.2 billion, standalone ultrasound systems will dominate the global market with more than 70 per cent revenue share towards the end of 2017. On the other hand, portable ultrasound systems will showcase a robust revenue growth at 6.4 per cent CAGR, albeit, reflecting a little over 17 per cent share on the global ultrasound systems market.

Furthermore, hospitals will remain the largest end-users of ultrasound systems in the global market, and account for half of its value in the years to come. Meanwhile, diagnostic centres will contribute to nearly 20 per cent of the global ultrasound systems market, procuring revenues worth $ 1.6 billion by 2022-end. The report has also profiled leading players in the global ultrasound systems market, which includes names like General Electric Company, Koninklijke Philips NV, Toshiba Corporation, Siemens AG, Hitachi, Fujifilm Holdings Corporation, Esaote SpA, Shimadzu Corporation, Analogic Corporation, and Samsung Electronics.

13,419 abstract submissions made to RSNA 2019

The attendees will be exposed to a wide-range of opportunities to learn at the world's largest radiology conference from December 1-6

ABSTRACT SUBMISSIONS for RSNA 2019 hit an all-time high with 13,419 submissions received.

According to RSNA website, the large number of abstract submissions will provide RSNA 2019 meeting attendees with wide-ranging opportunities to learn at the world's largest radiology conference, to be held December 1-6, 2019 at McCormick Place, Chicago.

RSNA is the premier meeting to present the best science and education in medical imaging. Each year, more than 50,000 participants attend the annual meeting to learn the latest in radiologic education, research and technologic innovation.

BOOK REVIEW

A tale of gumption and glory

World Class is a book that tells a compelling story. It has all the prerequisites: adversity and conflict, their resolution and several takeaways. The fact that it is a real life account makes it more inspiring

By **Lakshmipriya Nair**

A book authored by Dr William Haseltine, Chair and President of ACCESS Health International, World Class: A Story of Adversity, Transformation, and Success at NYU Langone Health, is a tribute, a case study and a step-by-step guide, all rolled into one.

Written in a simple and lucid style, the book traces the journey NYU Langone Health, an ailing, mediocre medical centre, traversed to become a world-class institution renowned for clinical excellence, patient satisfaction, and safety performance. Reportedly, today it ranks number three in the US, just behind Harvard and Johns Hopkins. At the same time, it also brought around a reversal of its fiscal condition and went from an organisation that was bleeding tens of millions of dollars to become a highly profitable venture.

And Dr Haseltine believes that its metamorphosis is inspiring and offers crucial lessons on leadership, quality, best practices, innovation and systems thinking. He stated at the launch of the book in New Delhi, "The NYU Langone Health case study offers valuable lessons for India in transforming healthcare delivery through systems thinking, innovation in medical education, and leveraging the powers of digital health. It also demonstrates the boundless possibilities of an integrated care model and is an important example of that all healthcare leaders in India and elsewhere can learn from."

He has gone into a great deal of details, interspersed with several pertinent examples, to describe and explain the various 'levers of change' applied by the medical centre applied to turn its fortune around in less than a decade. And, with the help of the comprehensive interviews with the people who helped the centre in undergoing this transformation, the author has drawn out acute assessments and inferences, and presented them along with his opinion and recommendations for healthcare systems in both, high-income and low-income nations across the globe.

But, what makes the book interesting is that Dr Haseltine is in a unique position to provide two important perspectives — of a seasoned healthcare professional and as a patient. He reveals in the foreword that while working on this book, he was also being treated for head and neck cancer at the hospital. This has given him deep insights into the actual working of the institution and he states, "I can say with utter conviction that my experience as a patient at NYU Langone has been qualitatively better than care I have received elsewhere, even in the most renowned hospitals in New York City and Boston." His personal experience makes the book more believable and relatable.

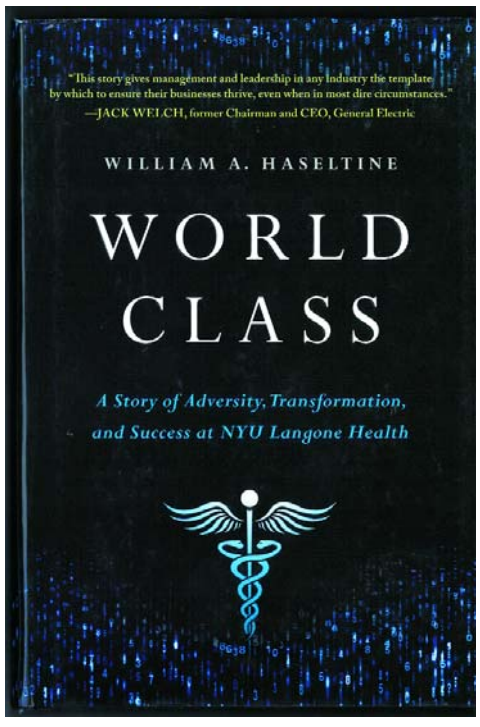
It also has some really powerful statements from the two leaders of the organisation, Robert Grossman, CEO and Dean, and Kenneth G Langone, Chair of the Board of Trustees, NYU Langone Health, who were instrumental in the successful transformation of the medical centre. Take this for instance, "Excellence is a moving target. If you sit on the status quo, you will fall behind." Another gem is, "Culture trumps vision, culture trumps strategy; culture trumps everything."

Thus, the impact of the book is multifaceted, and it tells a compelling story. It has all the prerequisites: adversity and conflict, their resolution and several takeaways. The fact that it is a real life account makes it more inspiring.

lakshmipriya.nair@expressindia.com

ABOUT THE AUTHOR

Dr William Haseltine is a biophysicist, professor, inventor and entrepreneur, well known for his work on cancer, HIV/AIDS and genomics. As the Chair and President of ACCESS Health International, Dr Haseltine is striving to ensure that quantum advancements in medical technology gets translated to improved health outcomes around the world. He is an advisor to governments, biotech and pharma companies



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LEVERS OF CHANGE

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- Breaking silos

Raviganesh Venkataraman is the new CEO of Cloudnine Hospitals

He will be responsible for driving and overseeing development and execution of Cloudnine's corporate strategy, business developments, M&A, systems and policies across the company, delivery excellence, leadership development etc

BENGALURU - HEADQUARTERED, Cloudnine Group of Hospitals has appointed Raviganesh Venkataraman as its CEO. Akash Malik, outgoing CEO has been with the Cloudnine Group of Hospitals for six years and had expressed his ambition to pursue other entrepreneurial opportunities beyond healthcare.

As the CEO, Venkataraman will be responsible for driving and overseeing the development and execution of Cloudnine's corporate strategy, business developments, M&A, systems and policies across the company in doctor and customer relationship management, delivery excellence, quality, building top talent and leadership development.

As a professional with over 25 years of working experience across verticals, Venkataraman has been a part of several industries and geographies in India and Asia with specialities in strategy, project planning and execution, supply chain management, sales and distribution and organisation development.

Venkataraman was until recently a Director on the board of Metro Cash and Carry India and has held leadership roles in the past with Bharti Airtel, Subhiksha Retail, Coca Cola India, Titan Industries and Godrej Boyce.

Speaking on his appointment, Dr R Kishore Kumar, Founder, Chairman, Cloudnine Group of Hospitals said, "We are very pleased to have

Raviganesh as the CEO of Cloudnine Group of Hospitals. We are confident that his leadership, collective knowledge, expertise and experience will be extremely beneficial for us to successfully implement our strategy and take advantage of the market opportunities ahead in the space of maternal and child healthcare. We look forward to leveraging his expertise in steering the group forward."

Rohit MA, Co-Founder, MD, Cloudnine Group of Hospitals said, "After a thorough and thoughtful nation-wide ranging selection process, on behalf of the board I am delighted to introduce Venkataraman as the new CEO. We are confident that his deep industry experience across verticals and the ability to have led large teams across the country will help us drive our continuous evolution as the trusted, innovative partner that our customers rely upon in the maternal and child healthcare space.

Venkataraman, the new incoming CEO, Cloudnine Group of Hospitals stated, "I am thrilled to have been offered the opportunity to serve one of the leading maternity and childcare group of hospitals in India. Cloudnine Group has a great organisational culture and an amazing market capability. I look forward to building on this success whilst simultaneously ensuring we remain focussed on delivering the very best of services to our customers. I am committed to ensuring that we not only stay at the forefront in this space but we continue to innovate and lead the market as we have always done."

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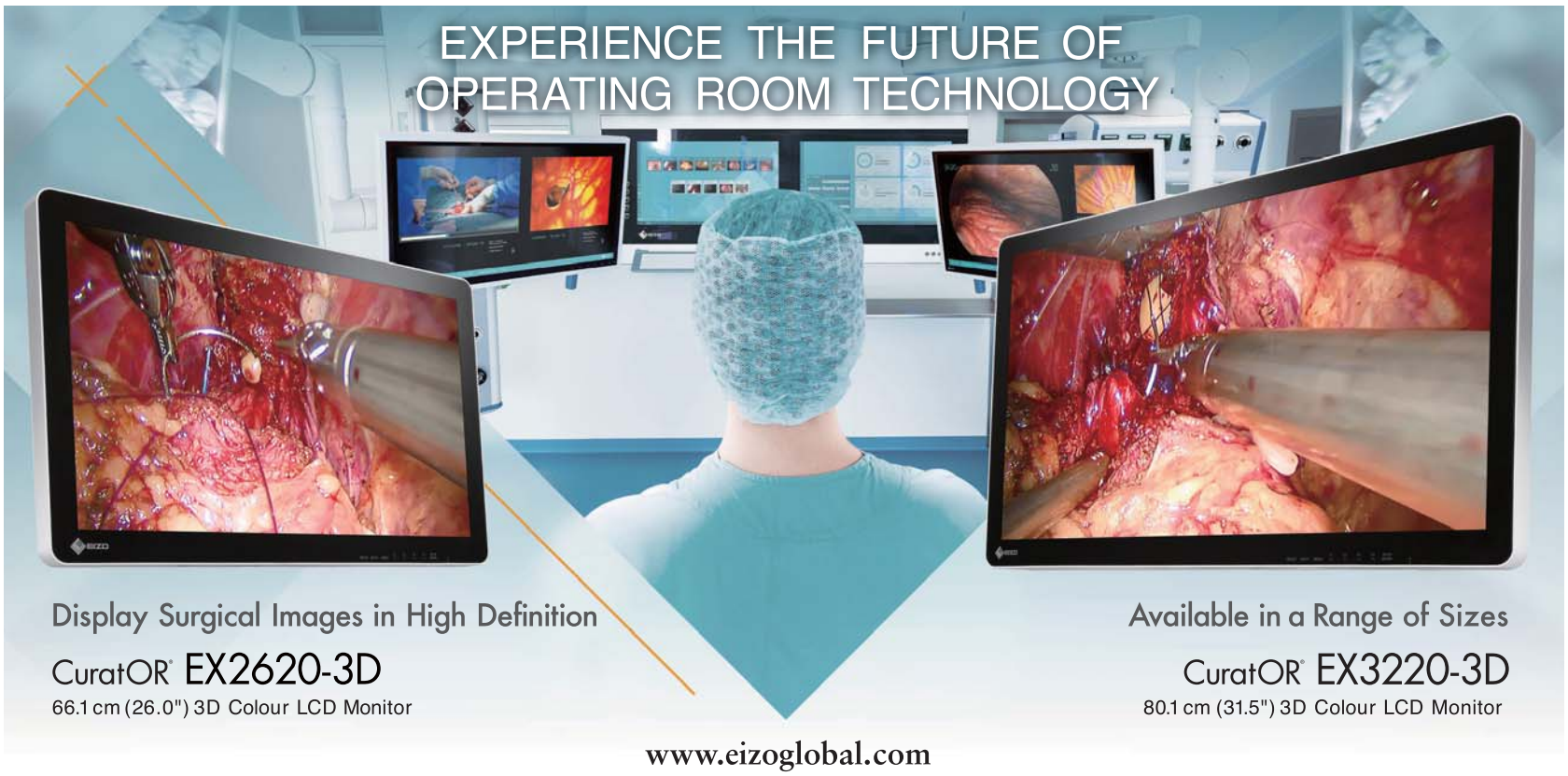
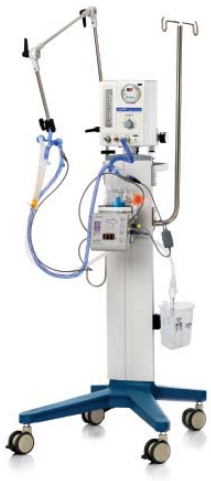


Continued monitoring and updated technology have been the strengths of nice Neotech



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Cath Lab : Advance technology with better imaging resolution and low Radiation dose

Perform complex procedures with insightful guidance and with ultra low radiation dose. We need to adopt this new technology for safety of our patients, informs **Dr Sanjeev Chaudhary**, Senior Cardiologist ,W Pratiksha Hospital

Advancement in cardiac and vascular interventions. Get high-quality images for the full spectrum of cardiac and vascular interventions with advance biplane mixed cardiovascular X-ray system. Perform complex procedures with insightful guidance and low X-ray dose. This low dose is safe for both patients and treating cardiologist. The use of ionising radiation is associated with a risk of inducing malignant disease and causing skin or eye damage to the patient and the personnel. Ionising radiation is used extensively in cardiac diagnostic and percutaneous coronary interventional (PCI) procedures. The radiation is associated with a small but definite stochastic risk of inducing a malignant disease. However, low-dose radiation exposure has also been shown to induce an increase in the number of circulating lymphocytes and chromosome aberrations, which represent surrogate biomarkers of cancer risk. The long-term cancer risk increases with increasing cumulative dose and there is no known threshold value. Furthermore there is a deterministic risk of skin damage both to the patient and the operator, as well as a small risk of eye injury to the operator.

Over the past decade, various new techniques have been introduced to minimise the harmful effects of radiation. Angiography systems manufacturers have replaced their image intensifier angiography systems with digital flat panel detectors, which are more sensitive and allow lower-dose imaging. Researchers have also introduced numerous other technology improvements in efforts to lower dose.

Operators can do more to reduce dose in their own labs, possibly reducing dose by 30-40 per cent just by changing their habits. This includes reducing frames rates and better use of collimation. Changing the angulations of the C-arm, positioning the tube in relation to the operator, and reducing the distance between the X-ray source and the patient also can greatly reduce scatter radiation exposure.

All of the new angiography systems released in the US market over the past few years offer dose-lowering technologies. The Philips Allura Clarity is an example of the next-generation system that can help lower standard procedural dose by 50 to 75 per cent. The operator can easily adjust frame rates to reduce dose and the system incorporates Philips' Clarity IQ software to achieve excellent visibility at low X-ray dose levels for patients of all sizes. The software helps correct for motion, reduces noise, auto-enhances the image and corrects pixel shift on cine images.

Toshiba's Spot Fluoroscopy software and the Siemens Artis series incorporate both new X-ray tubes and detectors to lower dose. The new X-ray tube uses flat emitter technology, which enables smaller, square focal spots that leads to improve the image quality with low dose.

We need to adopt this new technology for safety of our patients. These technologies are costly but much safer than cheaper versions of cath labs available and installed at most of cardiac centres in India. In India, W Pratiksha Hospital has now acquired the latest version of the machine with these advances includes improved X-ray tubes, more sensitive detectors, and software to help to improve an image quality and reduce noise at lower dose settings. In comparison with cost, this technology is costlier with previous technologies, but we have not changed the treatment cost for the patients. It has improved the image quality and offered overall low dose radiation which is safe for patient and treating cardiologist.

Dr Sanjeev Chaudhary with his team

Why ambient light is important in the reading room?

Anantha Narayanan, Country Manager, EIZO Corporation, gives an insight on how ambient light can be of great use to radiologists to bring in more contrast and fatigue

Controlling ambient lighting in reading rooms is vital to ensuring that radiologists can see scans and notice potential problems as optimally as possible. There are two main reasons why it's important: contrast and eye fatigue.

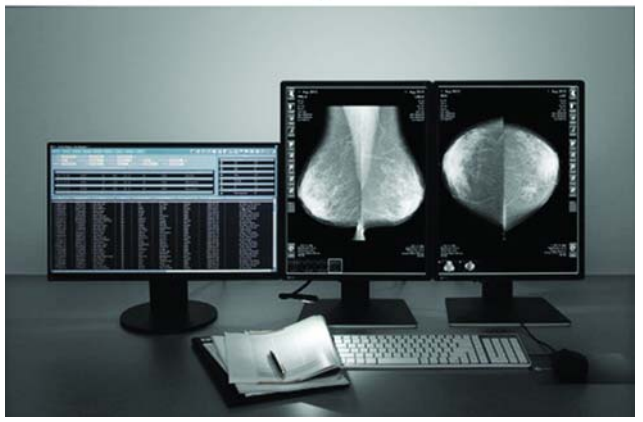
When viewing medical images, one of the most important factors for accurate diagnosis is contrast. The higher the contrast, the more differences in shades our eyes are able to see. Most medical monitors aim to provide high contrast screens, which is certainly the first and most important way to increase contrast. But even with a high contrast monitor, ambient light can greatly reduce contrast.

The most obvious ways ambient light affects contrast is through:

1) Diffuse reflections: when light is reflected uniformly across the screen, whitewashing the blacks on screen.

2) Specular reflections and glare: When light is reflected onto the screen directly from an external light source, or reflected off of an object, causing glare or a 'specter' of the object to appear on screen. This can be distracting and reduces the contrast at that specific location.

However, the most major way that ambient light can reduce contrast is by affecting the eyes' ability to adapt to a certain level of light. At any one time, the human eye can detect a contrast ratio of 1000, however this ratio is not definite, but rather relative. For example when in a dim tunnel you will be able to see most things clearly. When you suddenly exit into the sunshine outside, most objects will be brighter than the objects in the tunnel, so they will appear as white to your vision. This is because in the dim tunnel, the darkest objects become 'black' to your perception, and the bright objects become 'white' to your perception. Anything brighter than the dim light would automatically register as 'white' to your vision – thus when you step outside you will suddenly be blinded because the majority of objects will be brighter than anything in the tunnel.



This is relevant in the reading room, because if the screen and ambient light are quite different (either brighter or darker) your vision will constantly be readjusting between the ambient light and the screen. Despite your eyes adjusting to the screen, as soon as you look away to a brightly lit wall, light or object – your eyes will begin readjusting to this change in contrast. So, when you look back to your screen you will no longer have optimal vision until several minutes have passed.

In general it is recommended that the ambient lighting matches the brightness of your screen – which is stated to be 20 to 40 lux when the screen is at a brightness of at least 350cd/m2 (or 420cd/m2 for mammography), as per the American College of Radiology guidelines. However, the European guidelines for quality assurance in breast cancer screening diagnoses recommends 20 lux or less. Studies have shown that ambient lighting below 7 lux is too dark, and over 100 lux is too bright, so regardless of which recommendation is followed – ambient light must not be too dark or too bright. Additionally, before beginning work, a radiologist should allow their eyes to adjust for about 15 minutes to bring their vision to the optimal level.

Another way ambient light can affect reading accuracy is through by causing eye fatigue. The quality of human vision is incredibly varied – depending on environmental factors as mentioned earlier, and also on physiological factors. Eye fatigue – apart from being uncomfortable – can also temporarily degrade one's vision. Having optimal vision is vital in radiology, so it's important to reduce any eye fatigue.

In a room where the ambient light is greatly different to the screen, every time you move your eyes from the screen to another location, your pupils will either dilate (if the ambient lighting is less) or contract (if the ambient light is greater). This constant dilation and contraction tires the muscles in your eye – leading to eye fatigue. This can also increase the amount of time that is needed for your eyes to adjust to a new setting.

> The best way to control ambient light is with dim lights that are positioned behind the screen

Eye fatigue can also be caused by glare and reflections on the screen, which causes the eyes to refocus each time vision is passed over the brightened area.

The best way to control ambient light is with dim lights that are positioned behind the screen. As overhead lights – even dimmed ones – can cause glare and reflections it is recommended to position lights behind the monitor.

However, many radiologists may find that this environment is too dark to comfortably read papers and make notes. For this reason a small light positioned below or beside the monitor is ideal for illuminating papers and notes on the desk.

In this way the ideal ambient lighting level can be achieved without causing discomfort on the eyes, or reflections on the screen.

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