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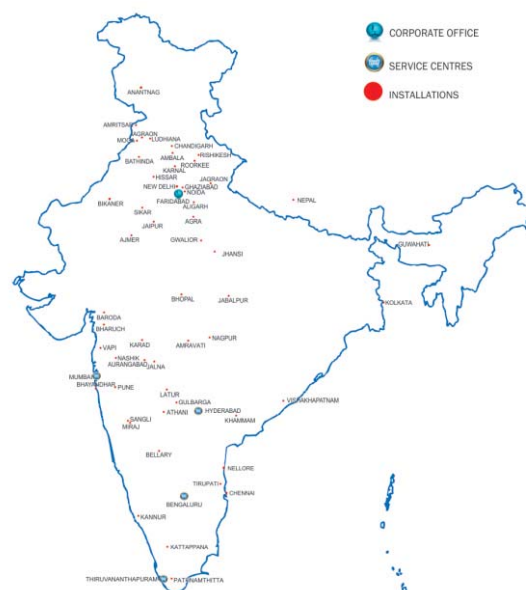


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## Public Health

Mary Rodgers

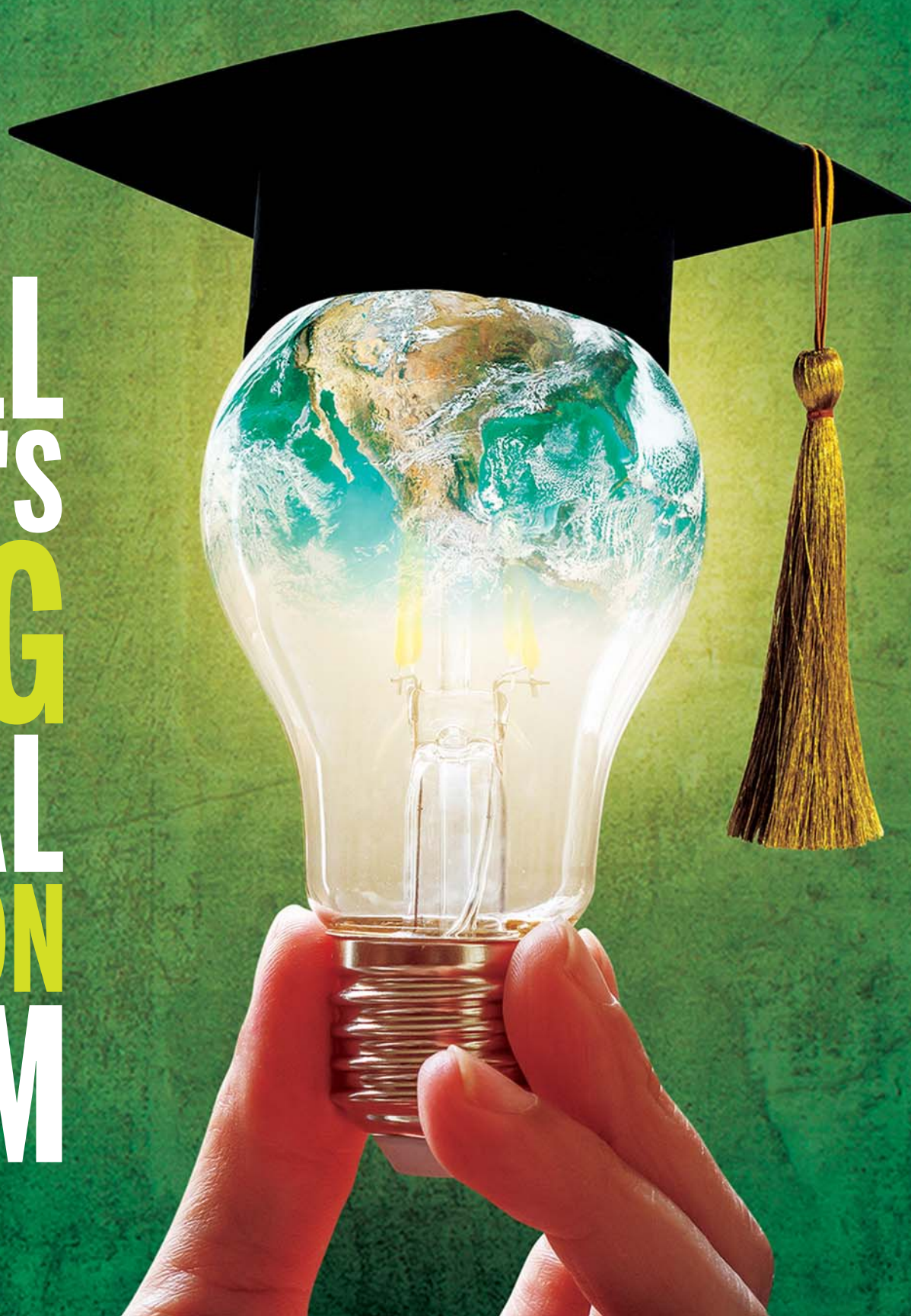
'virus hunter',  
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Cancer Care

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# THE PILL FOR INDIA'S AILING MEDICAL EDUCATION SYSTEM

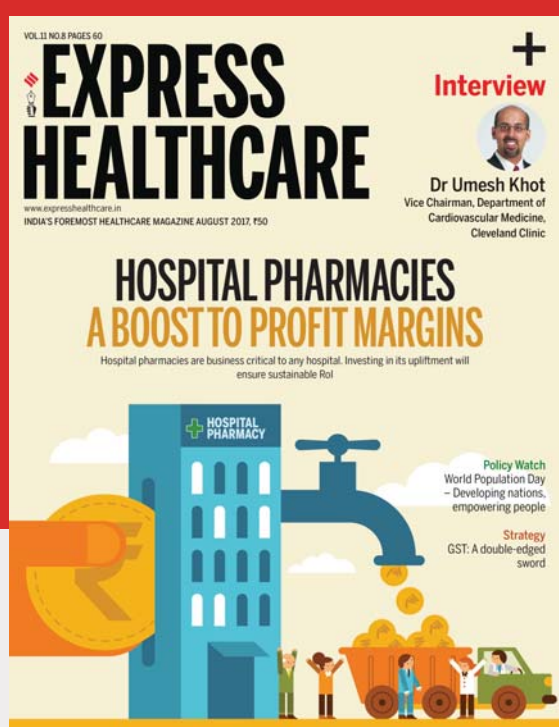






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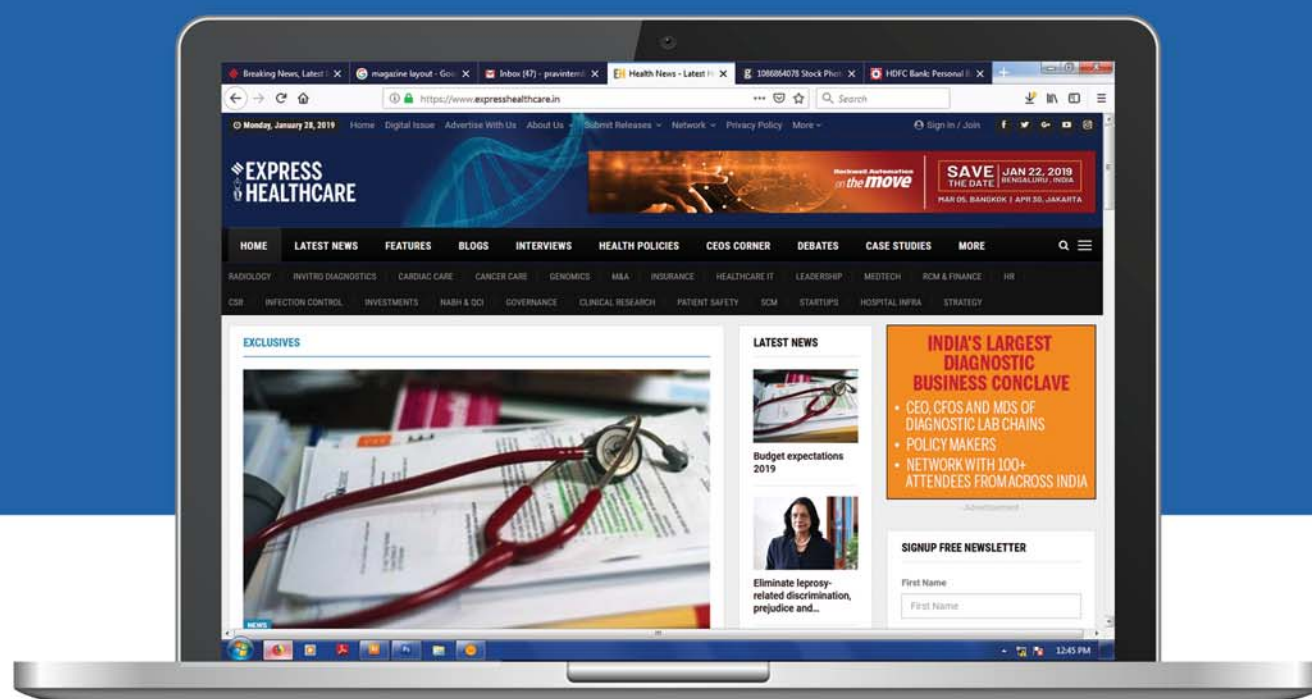
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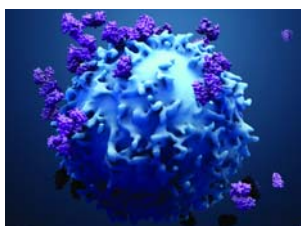
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# The challenge of taming 2019-nCoV

**O**n January 31, the WHO finally declared that the outbreak of novel coronavirus (2019-nCoV) which originated in Wuhan city, China constitutes a Public Health Emergency of International Concern (PHEIC). The WHO is being criticised for delaying this announcement as it is almost a month and a half after news of the first patient. All signs are that the virus is highly transmissible, even before the first symptoms are visible in the incubation period of 14 days. This silent spread could even result in a potential pandemic.

As per the January 31 WHO release, 2019-nCoV has already claimed 170 lives in China. Of the 82 cases in 18 countries, only seven had no history of travel in China. There has been human-to-human transmission in three countries outside China, one of these cases is severe. On January 30, a student from Kerala studying at China's Wuhan University became India's first positive case of the 2019-nCoV.

As with the Nipah virus, and before that, SARS and MERS, 2019-nCoV is a zoonotic virus, capable of jumping animal species before infecting humans. The virus is the latest test of healthcare systems across the world. As Dr Tedros Adhanom Ghebreyesus, Director-General, WHO said in the January 31 press conference to announce the PHEIC decision, "Our greatest concern is the potential for the virus to spread to countries with weaker health systems, and which are ill-prepared to deal with it...We don't know what sort of damage this #2019nCoV virus could do if it were to spread in a country with a weaker health system. We must act now to help countries prepare for that possibility."

The WHO protocols and technical guidance documents for containment, including active surveillance, early detection, isolation and case management, contact tracing and prevention of onward spread of 2019-nCoV infection, have been updated on the WHO website.

In India, observers are hopeful that our hospitals, both public and private, will gear up and do a fair job of containing the virus. In 2018, the Nipah virus outbreak was localised to two districts in Kerala: Kozhikode and Malappuram, thanks to alert hospital staff, rigorous quarantine measures and tracing of contacts. Nipah like protocols are reportedly being followed for 2019-nCoV as well.

India's first positive 2019-nCoV case, a medical student from Kerala studying at China's Wuhan University, is currently in the isolation ward of a hospital in Kozhikode and according to an update from the Ministry of Health & Family Welfare (MoH&FW), is 'stable and is being closely monitored.'

Kerala reportedly has 806 people under observation, with 10 in isolation wards in hospitals, and the rest in home quarantine. At least 10 persons are quarantined in three hospitals across Maharashtra for possible exposure to 2019-nCoV as well. The MoH&FW has also issued a list of frequently asked questions as well as a travel advisory to cancel all travel to China. Besides the Ministry of Health & Family Welfare, other ministries



**nCoV-2019 is not just a test of our clinical capabilities and logistics but of our humanity**

like External Affairs, Defence, Home Affairs, Civil Aviation, Information & Broadcasting, Labour & Employment, and Shipping are coordinating to tackle this latest health crisis.

The larger question is, with no sure cure, treatment protocols are evolving by the day. The WHO has released a protocol designed to investigate the First Few X cases (FFX) and their close contacts. One hopes that personnel in India are following this standardised protocol so that epidemiological exposure data and biological samples can be systematically collected and shared rapidly. This objective is that the information from the FFX 2019-nCoV investigation can be analysed across many different settings globally for timely estimates of 2019-nCoV infection severity and transmissibility, as well as to inform public health responses and policy decisions.

The Coalition for Epidemic Preparedness Innovations, a 'public-private coalition that aims to derail epidemics by speeding up the development of vaccines' has announced funding for three programmes to develop vaccines against nCoV-2019, but it is still very early days yet. Reports have also come in that a combination of anti-HIV medications, two anti-retroviral medications - lopinavir and ritonavir - could be effective against the coronavirus as well.

While the race to find a cure continues, we should also analyse how we can prevent such zoonotic diseases in the first place. Better sanitation, especially at the so-called wet markets is a given but less obvious measures like improving overall basic hygiene should also be a non-negotiable. The *Swachh Bharat* campaign should be pursued with renewed vigour, not just around inspection and competition but as a habit.

There are already worrying reports of the strain on health systems in India. For example, a patient who returned from China and was screened at Mumbai's Kasturba Hospital commented that the 'municipal hospital had poor prevention control mechanism'. According to media reports, the hospital's isolation unit maintains no separate air conditioning, no negative pressure in the ward to prevent cross-infection and has only windows for ventilation.

The government will have to turn to private hospitals to allot rooms for quarantined patients to supplement those in public hospitals. But given that the beds will be occupied for a longish period of time, will corporate hospitals agree? The quarantine will also impact normal hospital operations and might also keep away paying patients who might fear the disease and also stigmatise quarantined patients and their caregivers.

This is where the WHO DG's advice is most important: "This is the time for facts, not fear. This is the time for science, not rumours. This is the time for solidarity, not stigma." nCoV-2019 is thus not just a test of our clinical capabilities and logistics but of our humanity.

VIVEKA ROYCHOWDHURY *Editor*  
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## POST EVENTS

# Gandhinagar hosts 73<sup>rd</sup> Annual Conference of IRIA and Asian Radiology Forum

IRIA 2020 witnessed top leaders and experts from the national and international radiology fraternity come together to discuss on ideas and issues crucial to the sector. *Express Healthcare* presents exclusive coverage of the key highlights and excerpts of some vital sessions held at the event this year



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

Top leaders and experts from the national and international radiology fraternity were present to grace the occasion. Some of the dignitaries were Dr Hemant Patel, National President - IRIA and Organising

Secretary IRIA 2020; Dr Harshad Shah, Organising Chairman IRIA 2020; Dr Dinesh Patel, Organising Chairman IRIA 2020; Dr Mohan K; Dr Asutosh Dave, Organising Secretary IRIA 2020; Dr C Amarnath, Organising Secretary IRIA 2020; Dr Rajeev Singh, Secretary General IRIA; Dr Ankur Shah, Chairman Scientific Committee IRIA 2020; and Dr Deepak Mehta, Chairman Scientific Committee IRIA 2020.

IRIA 2020 kickstarted its sessions with the inauguration of the new committee for

ICRI, IRIA's academic body. The focus of IRIA in the last few years has been improving radiological education and encouraging budding radiologists. After the auspicious lamp lighting ceremony, the new office bearers for the year 2020 were introduced and felicitated.

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

Dr Upreti, spoke about

ICRI's vision for the current year and how the team would ensure improved education this year. He also spoke about the success of their budding radiologist training programmes that were organised last year to inspire young and aspiring radiologists of the country. "ICRI focusses on setting SOPs and standards for practice for radiologists across the country. This year too, we will focus on improving standards and setting SOPs for efficient radiologist practices in India," Dr Upreti mentioned.

Further, Dr Upreti also informed that the blueprint for

the next years has been prepared in consultation with the President-Elect, Dr Deepak Patkar. The ICRI will continue its work in the field of education while conducting the budding radiologists' programme, mock tests, CMEs and the outreach programme envisioned and started by President Dr Hemant Patel, he said.

Dr Lunawat further informed the audience on the successful event that inspired the ICRI in 2019.

The ICRI members then launched the newsletter for IRIA that will be circulated



## POST EVENTS

amongst IRIA member periodically for knowledge sharing and more. The organising committee members of all the educational programme of 2019 were felicitated.

Dr Deepak Patkar, President, Elect, IRIA 2020 said, "During the year ahead, our efforts will be on improving radiological education in the country and abroad. This year, we will be coming out with a whitepaper on AI in radiology, which will enable radiologists to understand the true potential and application of AI. We will also launch an international mentoring programme for radiologists across the world. This programme will focus on knowledge sharing and mentoring of young radiologists across the world. The aim is to further extend our studies in sub-specialties of radiology and advance our



► An award and oration ceremony was also conducted by ICRI which saw young and upcoming radiologists being lauded for their contribution to the field. While Dr C Amarnath was presented the NG Gadekar Oration 2021, Dr Mihir Mitter Oration 2021 was presented to Dr Sikandar Shaikh.  
► Dr Abhijit Taori received the Dr VP Lakhanpal Gold Medal for best academic contribution in the year 2018. The Onco Imaging Award 2019 was bestowed upon Dr Akanksha Aggarwal.  
► Afterwards, fellowships (FICR) were awarded to Dr Anjali Prakash, Dr Amit Disawal, Dr Bhawan Paunipagar, Dr Darshana Paunipagar, Dr Mahesha BM, Dr Paramjeet Singh, Dr Rashmit Dixit, Dr Sameer Vyas, Dr Rajat Jain and Dr Smita Manchanda.

research work. Additionally, we will further our outreach programme to improve access to radiological services in the

country."

Dr Patel informed that 2019 had the maximum number of radiological programmes in the

history of IRIA. He mentioned that next year too the focus will be to further these efforts. He also spoke of the vision behind

starting the newsletter service to the radiologists to keep them well informed on the educational programmes that will be conducted in the year ahead.

While summing up the morning programme, Dr Ravi Kant, Guest of Honour for the day urged the audience to focus on patient-oriented medicine. He said there is need for the radiologists' community to work closely with other healthcare providers to improve the quality of care in the country.

"Utilisation of learning resources should be used to their fullest potential to ensure maximum support for students, and integration of government and private educational institutes and organisations will help with that," said Abhijit Sheth, President - National Board of Examination, who attended the event as the Chief Guest.

## Prospects of AI in radiology



The panel discussion on AI in radiology focussed on how radiologists can enhance their practice using AI applications. Led by Dr Deepak Patkar, panelists in this discussion, Dr Deepak Takhtani, Dr Harsh Mahajan, Dr Shailesh Lunawat, Dr Jan Kimpen, and Dr Amit Kharat delved into the opportunities associated with AI and addressed the fear surrounding AI. Experts on the panel started off by examining the events in which digital technologies are driving exponential growth of health data. They also looked at AI's various clinical applications available to Indian radiologists and examined workflows associated with it.

Dr Jan Kimpen said, "AI will help turn large amounts of data into actionable insights to support and empower people. Integration of AI is critical across the full end-to-end flow in radiology, notably as an enabler but also as a foundation to the integration." Further talk about the need for radiologist to integrate AI into their workflows, Dr Amit Kharat pointed out that around two-third of the world's population does not have access to X-ray. Therefore, AI can be that assistant which ensures and improves access to radiological services across the world.

The panellists also spoke about licensing of AI products in radiology and the pre-requi-

sites for the same.

Dr Deepak Takhtani and Dr Harsh Mahajan addressed queries related to what makes the connection between radiology and AI so special compared to the rest of the specialities in medicine.

Dr Takhtani pointed out that there are many challenges in the path to make AI truly understood and applied. He asserted that there is still a long way to go for organisations, radiologists and the imaging community to crack the code in AI but the journey is exciting and has immense scope.

During the discussion, a pertinent query about the commoditisation of radiology services was raised. Some radiologists felt that there is a

risk that technological innovations are commoditising imaging as technical services and could undervalue the expertise of radiologists. To that, Dr Harsh Mahajan agreed that commoditisation of radiology is already happening, and with AI the commoditisation will increase. Having said that, the community needs to understand that this makes for a strong business case where tapping the untapped areas is a must since by doing so even the patients will be at an advantage.

Further on, Dr Amit Kharat expressed his views on the significance of getting involved with patients and ensured that AI enhances patient experiences. "It is important to get

involved with patients. Look at clinical radiology and AI can assist the radiologist to do so," he added.

The panel then discussed the RoI when it comes to investing in AI. Experts on the panel referred to burnout faced by many AI companies and unanimously said that right now the RIO cannot be an immediately recovered. The current focus is to make the machine learn. But it will be a long-term goal.

At the end of the discussion, the panel spoke about the ethical and medico-legal aspects involved. The question of who owns the data kept lingering and the panellists were hopeful of finding answers to these questions soon.



# Effectiveness in ART and Follicular monitoring

**Dr Natasha Gupta**, obstetrician and gynaecologist, gives an update on the role of USG Imaging

One of the highlights of the day was a presentation on 'ART and Follicular monitoring' by Dr Natasha Gupta, obstetrician and gynaecologist. She spoke about the role of USG Imaging, particularly how TVS can play in Antral Follicle Count (ART) and follicular monitoring with respect to in vitro fertilisation and embryo transfer. Apart from giving out a baseline USG assessment for ART, ultrasound also assists with polycystic ovarian syndrome (PCOS) diagnosis and treatment management and other adnexal/uterine pathologies like congenital uterine anomalies, fibroids, etc.

Dr Gupta also briefly talked about important fertility parameters like Antral Follicle Count, which is a great predictor of ovarian reserve, ovarian volume and ovarian blood flow. She then told the audience how the latest 3-D methods which have come up can help determine ovarian volume in much less time than the current methods and offer better reliability. Added to these advantages, these new developments also directly enhance the patient experience as they do not require the patient to be present during the entire scanning session.

Follicular monitoring, an important technique to conduct serial USG study of the ovary during the follicular phase, can be effectively done, says Dr Gupta, with the latest software with automatic analysis which helps with echogenicity of the image for precise follicle volume count. She then proceeded to differentiate a normal follicular cycle to an abnormal one via an array of ultrasound images.

Ultrasound scanning plays an important role in detecting an abnormal or unsuccessful cycle to provide an efficient IVF treatment, helping the patient avoid wastage of time and money. USG monitoring also plays a relevant, recurring role during the monitoring of induced cycles, said Dr Gupta as it helps to predict ovarian

response. She then talked on how the assessment of endometrial receptivity is done by ultra-

sound for a non-invasive and direct assessment.

Dr Gupta also talked about

various complications that may arise due to ART. Some of these are ovarian induction, egg re-

trieval, obstetric complications, perinatal complications and thrombo-embolic disease.



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# Integrated diagnostics -The future is here

**DR MAHAJAN** started his presentation by recalling a common obstacle that clinicians face — complex and hard to decipher radiology data. He said that there is an urgent need for integrated diagnostics. And one of the first steps in that direction would be integrated diagnostics, to combine pathology radiology and genomics.

"We need to move beyond the traditional pathology-radiology relationship," said Dr Mahajan. Such a setup will have mutual interdependence but limited touchpoints to form a deeply integrated workflow. And clear communication, he believes, will be the key to unlock the poten-

tial of integrated diagnostics.

Further speaking on the evolving sphere of diagnostics, Dr Mahajan talked about integrated tumour boards. The board will allow for a converged radiology and pathology data to be viewed together, enabling the members to be able to instantaneously resolve any discordance, and provide a reconciled report in all concordant cases. This will improve quality, reduce risks and the system has a great potential especially in case of breast cancer. "And a radiologist with the knowledge of digital data is best suited to become this new integrated diagnostic specialist," he



**Dr Harsh Mahajan, Founder & Chief Radiologist, Mahajan Imaging**

mentioned.

Dismissing that AI will make the role of a radiologist obsolete, Dr Mahajan opined that the latest development in the computational sciences will rather empower them. He stated that the radiology community needs to apply deep learning and machine learning to diagnostics and engage in large scale data curation and autonomous analysis using AI. This will ensure that the output is low, high quality and low on errors. This can be especially viable in a country like India. He also proposed curation of an India-wide normative data and a collaboration between the public and private sec-

tors to develop AI algorithms suitable for a demographically complex country like India to reap the benefits of the latest technological advances.

Dr Mahajan also talked about three possible ways of integrating genomics and imaging and said that merging the two can increase the value across the clinical continuum. The radiology community can learn from genomics, and the vice-versa is also true, he stated. He also spoke about how such an integration can help specialists to design specific screening programs in a step towards personalised diagnosis.

## IRIA 2020 honours radiologists from Indian Armed Forces

**THIS YEAR**, IRIA 2020 paid tribute to the contributions of those radiologists serving the Armed Forces of India. The occasion was graced by Mayank Chawla, Inspector General of Police. Past President of IRIA, Dr Hemant Patel and Present President, Dr Deepak Patkar, industry veteran Dr Harshil Shah together inaugurated the ceremony.

During the event, Dr Patel also launched the book published by Dr Isha Rajput, a radiologist from the Armed Forces, on a training guide on gynaecology imaging. Dr Patel spoke about his experience working on the Armed Forces project that IRIA started last year. He extended his gratitude to all the radiologists working in the armed forces and saluted their dedication to the country as these radiologists work in very difficult environments with limited resources.

Dr Patkar, in his address, urged the radiologists from Armed Forces to be a part of the training programmes conducted by IRIA.

Group Captain Rohit also



gave a presentation which showcased how radiology in Armed Forces is more focussed on fieldwork. He presented on various challenges faced by the radiologists from Armed Forces and outlined how their determination and resilience helps them overcome these challenges. He also mentioned the many landmark events that make radiologists in the Armed

Forces very valuable such as:

- Among the first sonologists trained abroad was Col RN Bagga who served in the Indian Army.

- The first MRI installation in the country was at INMAS.

- The first DR installation in India, first Plane Digital subtraction angiography lab in Asia and the first 23 Tesla MRI was at Army Hospital (Research &

Referral Hospital), Delhi Cantt.

Speaking on the varied challenges faced by army and navy radiologists, Captain Rohit also highlighted how these radiologists have to adapt to any environment and despite limited resources, are expected to perform various roles during peacetime at medium/large hospitals. The radiologist also has to adapt

during counter-insurgency operation situations, during combat, disasters such as floods, earthquake and hurricanes and sometimes even during UN missions abroad. Thus, Captain Rohit's session threw light on how crucial is the radiologists' role during combat times and mentioned the various technologies used in the Armed Forces.



# AI: Radiologists' friend or foe?

**D**r Mona Bhatia, Director and Head of Cardiac Imaging, at Fortis Escorts Heart Institute, New Delhi, in her talk expounded on how radiologists can leverage AI to their advantage. She pointed out



**Dr Mona Bhatia**  
Director and Head of  
Cardiac Imaging,  
Fortis Escorts Heart Institute,  
New Delhi

that many radiologists feel that AI could make them redundant. But the fact remains that AI is here to stay and most certainly will take over many radiological applications. AI medicine is likely to rule the next decade, she informed. So, she highlighted that radiologists need to adapt to a future which will be driven by AI. However, several challenges will need to be addressed. But, she also recalled how radiologists in the past have pioneered the digital era in medicine.

Addressing the question of whether AI in radiology will create competition or enhance synergies, she pointed out that AI will assist the radiologists. It will optimise workflows, permit more time for value-added work, enhance decision making and help in the participation of interdisciplinary teams and interventions. Further on, she urged the government and industry to look into ethics and governance as regulations are yet to be established. She said that

we need new policies, regulations for data protection and privacy as well as cybersecurity. Accountability needs to

be enforced. There is also a need for increased accessibility of AI-based technologies globally and in remote areas.

This would mean that the profession of radiology will change dramatically in the coming years. In the end,

she reiterated that synergies between radiologists and AI will definitely usher great outcomes.



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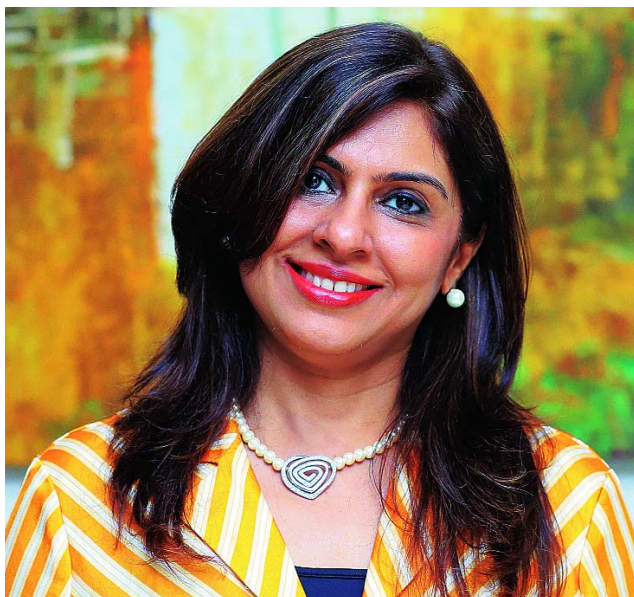
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# Role of a neuro-radiologist in contemporary multi-disciplinary management of brain tumours

**ON THE** second day at IRIA annual conclave, Dr Sona Pungavakar, Senior Consultant Radiologist, presented the Dr KM Rai oration on the topic 'Role of a neuro-radiologist in the contemporary multi-disciplinary management of brain tumours'. Dr KM Rai is credited for resurrecting the IRIA post World War II.

Dr Pungavakar started her session by talking about a case involving a woman patient who had received intramuscular magnesium sulphate injections. Her treatment and diagnosis led to her research on magnesium deposition in the brain of pregnant patients who were administered intramuscular magnesium sulphate.

Later, she emphasised on the need for a multidisciplinary tumour board to provide a treatment where many doc-



Dr Sona Pungavakar, Senior Consultant Radiologist

tors, experts in different specialties/disciplines, review and discuss the medical con-

dition and treatment options of a patient. Also called a multidisciplinary opinion, such a

board in cancer treatment may include a medical oncologist, a surgical oncologist, a radiation oncologist and a radiologist. To maximise patient care, a support team including an occupational therapist, speech therapist, molecular pathologist, a social worker, a palliative care personnel and nutritionist may also work closely with the specialists for a wholesome treatment plan.

Explaining to the audience about how such a 'tumour board' may function, Dr Pungavakar said that once the surgeon, the oncologist, the radiologist, the pathologist and the radiotherapist working in a team have collected the relevant data, they can send the inputs to the nurse navigator working on the case. Then, a collaborative discussion on the case can lead to an effective treatment

plan. The board will then conduct follow-up discussions and reviews throughout the entirety of the treatment.

Further, speaking on the advantages of multidisciplinary tumour boards, Dr Pungavakar said that such an arrangement will ensure that the patient is not confused and ensure a properly scheduled layout for treatment, especially in a country like India. A multidisciplinary tumour board is now a prerequisite for acquiring cancer centre accreditation.

Dr Pungavakar also cited a report from an International ASCO survey on multidisciplinary tumour boards where over 96 per cent responders found them to be beneficial. She later discussed case studies explaining how a tumour board approaches a treatment plan for various cases.

## Redefining a radiologist: A true clinician!

**SPEAKING ABOUT** how radiologists are so much more than just 'glorified technicians', Dr Arpan Shah, Interventional Pulmonologist and Medical Director - Pranayam Lung and Heart Institute, Vadodara spoke on the topic 'Redefining a radiologist: A true clinician!' on the second day of the annual conference of IRIA. He started out by highlighting the need for radiology to be covered more extensively in the undergraduate medical curriculum to better equip the students with the diagnosis and treatment procedures involving radiology. Quoting from a study conducted by Elsevier, he stated that 91 per cent of the students who participated in the study felt that there should be more radiology

teaching during under graduation. He then listed out five basic problems faced by clinicians while collaborating with radiologists. The first one, he recounted, is a communication disconnect between the radiologist and the clinician when it comes to report-writing and reading. Secondly, he pointed out that a majority of radiologists' efforts are focussed on diagnosis, and treatment decisions are usually then made by other providers. Talking about the third issue, Dr Shah said that radiologists tend to work around the needs and desires of the patients and referring clinicians rather than working around them. While accepting that PACS has been a tremendous boon to radiol-



Dr Arpan Shah, Interventional Pulmonologist and Medical Director - Pranayam Lung and Heart Institute, Vadodara

ogy, Dr Shah feels that it may have induced a disconnect between radiologists and their

clinical colleagues as the latter can view the images on the network and may not

need to consult with the former. All these factors may ultimately create a trust gap, which he feels is a major issue that needs to be addressed at urgency. Dr Shah then concluded his presentation by offering solutions to these problems, the most important of which he feels, is better communication on the part of both the radiologist and the clinical provider to ensure optimal patient care. "Diagnostics radiologists should provide clear, concise, precise and actionable reports," he said. Discussing and recommending possible options will also benefit patients immensely. He concluded his presentation by urging the radiologist community to become a more active part of the decision making team.



INTERVIEW

# Imaging is going to be a cornerstone of personalised medicine

Personalised medicine seems to be the next step in advancement. At IRIA 2020, **Jan Kimpfen**, Global Chief Medical Officer, Philips explains about the scope for personalised medicine and how radiology becomes an important tool in this process in conversation with **Raelene Kambli**

**What excites you about the transformations happening within the healthcare industry?**

The world of healthcare is a changing place. At one end you have the number of chronic diseases increasing but on the other hand, you have technologies that are getting better and better by the day while opening several avenues of treatment options. Today, we have electronic medical records, everything is connected to the cloud, everything is getting digital and all this data that is accumulated is then analysed by AI to get fantastic solutions. I think this transformation is really exciting.

**We are talking about personalised medicine today. What does it really**

**mean to patients and providers both?**

Personalised medicine means that for every other individual patient, you decide the best diagnosis, the best treatment option. It is not a one size fits all thing but a real personalised care option. Now, in order to make that decisions, solutions, one needs a lot of data. Big data plays a significant role in this. For instance, a patient needs an 'A' kind of diagnosis or treatment. To make that decision, the physician needs to analyse data of patients with similar diseases, put those algorithm together and find what suits them, then come up with a diagnosis or treatment for this patient.

**So what role would radiology play in personalised medicine?**



Imaging is going to be a cornerstone in the diagnostic domain for personalised medicine. Take cancer as an example. Diagnostic imaging has become of the major areas for detection of various kinds of cancers but to make it personalised, one has to integrate the data from the imaging equipment to the other data of the patient. Compare and analyse the data available. For example, whether the patient is young or old, understand the genetic compositions etc., with imaging being a big chunk of it, then a personalised diagnosis for a particular patient can be achieved.

So you say that radiology will play a major role in personalised medicine.

Yes. See take the example of cancer diagnosis, imaging

has become a very important tool in the diagnosis of various cancers.

**So how is Philips working on developing technologies for personalised medicine?**

Philips is investing immensely in research and development of digital tools and technologies that can help a doctor aggregate data from our imaging machines and also from our EMR (electronic medical records) and also from other electronic record systems; be it imaging laboratories, genomic systems, pathology system and more. We make it completely intra-operable so the integration is more seamless. Using this integrated solution cater to personalised care becomes easy.

[raelene.kambli@expressindia.com](mailto:raelene.kambli@expressindia.com)

## MRI can be a game-changer in lung imaging among children

**JUST AS** Sir Jagadish Chandra Bose believed that "The true laboratory is the mind, where behind illusions we uncover the laws of truth," Dr Kushaljit Singh Sodhi in his presentation conveyed that it is imperative to explore the true potential of the MRI tool in lung imaging among children.

He spoke about how MRI can be effectively utilised in lung scans among children. He presented various case studies that examine certain areas in which MRI can be utilised instead of a

CT. He shared examples in which an MRI can become the first line of diagnostic modality in certain lung examinations which can have a better diagnosis. He also spoke of the challenges associated with MRI which include low tissue density, susceptibility differences between tissue and air and tissue motion because of respiration and cardiac motion. He further urged radiologists to ensure that these challenges don't hinder the examination.

Dr Sodhi then highlighted



Dr Kushaljit Singh Sodhi

different MRI parameters, such as slice thickness, flip angle, TE, TR, the field of view, plane, matrix, averaging phase overlapping, slices, phase encoding direction and phase oversampling, etc. He shared his experience and pointed out some intrinsic parameters of each MRI sequence. Further on, he shared examples of applications of MRI in the paediatric thorax.

Highlighting certain areas of illnesses in which MRI can be very effective in detecting childhood pneumonia and pulmonary

infections, HIVs, leukemia and more. He additionally summarised the clinical indications of MRI v/s CT.

Dr Sodhi concluded his presentation by pointing out that lung MRI is technically feasible, radiation-free imaging modality. A rapid lung MRI is possible in less than two minutes. More studies and technological advances are required to validate the role of MRI. It has the potential to be a game-changer paediatric thoracic imaging in the coming years.

## Canon Medical / Erbis Engineering conducts CME programmes on CTO-PCIs in Chennai

Invites renowned Japanese cardiac interventionist, **Dr Kinzo Ueda** to India to share his experiences and insights with cardiologists at Apollo Hospitals and Sri Ramachandra Institute of Higher Education and Research

By Lakshmi Priya Nair

Continuing medical education (CME) is an important tool for doctors and medical professionals to disseminate knowledge about best practices, boost scientific collaboration and stay on top of the changes in the field of healthcare. Therefore, Canon Medical Systems recently organised workshops for cardiologists in Apollo Hospitals and also at Sri Ramachandra Institute of Higher Education and Research in Chennai on treatment procedures like chronic total occlusion percutaneous coronary intervention (CTO PCI).

At Canon's behest, CTO PCI specialist, Dr Kinzo Ueda, Cardiovascular Intervention Center, Takase Clinic, Japan visited these hospitals to share insights from his considerable experience of performing this procedure successfully on patients in Japan and across the world. He was accompanied by a team from Canon Medical Systems which included N Sotomatsu, Executive Director, Erbis Engineering; Tomoko Kamijima, Senior Manager, Global Strategic Marketing, Canon Medical Systems; M S Menon, Projects Director, and S Kumaran, Business Head - Cardiology Solutions, Erbis Engineering.

Earlier this year, the leading medical devices provider had conducted similar knowledge-sharing programmes at Thunga Hospital and Apollo Hospital in Mumbai. Dr Kenya Nasu, Director of Cardiovascular Medicine, Toyohashi Heart Center, Japan had come down to share his expertise with Indian interventional cardiologists in Mumbai. (Check: <https://www.expresshealthcare.in/>)



Dr Kinzo Ueda, Cardiovascular Intervention Center, Takase Clinic

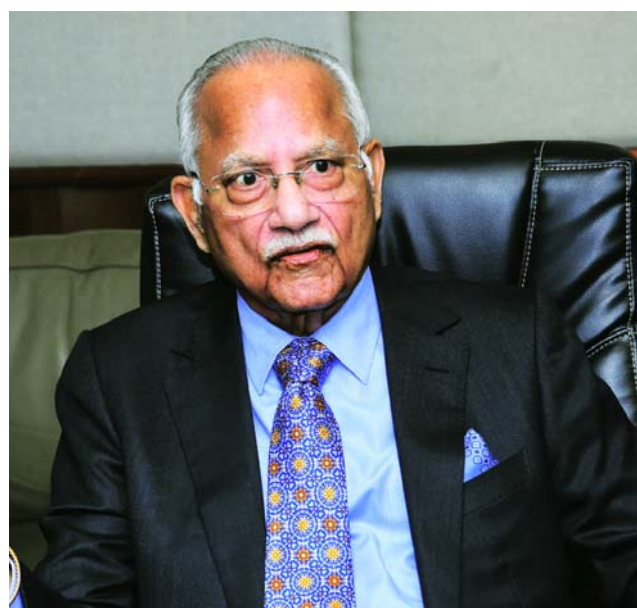
*cardiac-care/canon-medical-system-organises-a-two-day-workshop-on-complex-pcis/414897/*)

Explaining the *raison d'être* behind these initiatives, N Sotomatsu said, "We bring senior interventional cardiologists from Japan to share their knowledge and experience on newer techniques with Indian doctors to serve cardiac patients in this country. We will continue to organise such knowledge-sharing programmes." He also informed that his company's low X-ray dose cathlabs can be of great benefit to Indian patients and doctors when it comes to carrying out complex cardiac interventions. (Check Box: *New Angiographic System of Canon*)

Dr Ueda, an expert trained by Dr Hideo Tamai, a pioneer of CTO-PCIs, has been performing them successfully for a long time. Held over three days, he shared presentations and held in-depth discussions with doctors of Apollo Hospitals and

Sri Ramachandra Institute of Higher Education and Research on the various aspects that cardiac interventionalists need to consider. Moreover, he gave hands-on demonstrations of performing CTO PCIs and elaborated how new technologies and advanced training methods are enabling high success rates for this procedure.

On Day 1 of these workshops, held on December 19, 2019, Dr Ueda and Canon's team members met India's healthcare pioneer and leader, Dr Prathap C Reddy, Chairman, Apollo Hospitals Group, and Preetha Reddy, Vice Chairperson, Apollo Hospitals at their corporate office. In an exclusive interaction with *Express Healthcare*, Dr Reddy lauded Canon for their efforts furthering the knowledge of doctors and said that collaborative effort such as this is important to do more for the patient. He also welcomed Dr Ueda and discussed global



Dr Prathap C Reddy, Chairman, Apollo Hospitals Group



Preetha Reddy, Vice Chairperson, Apollo Hospitals

advancements in cardiac care and the successes achieved by Apollo Hospitals in cardiac sciences.

Dr Reddy went on to high-

light how India is facing an escalating threat from the growing prevalence of non-communicable diseases (NCDs), especially heart



diseases. Pointing out that cardiovascular diseases like ischemic heart disease and stroke are amongst the leading contributors to India's total mortality and premature deaths, he informed, "Non-communicable diseases have been established as a clear threat not only to human health, but also to development and economic growth. Claiming almost 70 per cent of all deaths, these diseases are currently the world's main killer. A growing number of those who die of chronic non-communicable diseases are in the prime of their productive years. Over the next 10 years, NCDs will cost more than \$30 trillion, representing 48 per cent of global GDP, and pushing millions of people into economic and emotional devastation as many would be breadwinners in the family. Moreover, in a young nation like India, we would lose a nation builder even before they realised their fullest potential."

Speaking on advancements in medical science and technology to ensure early and improved diagnosis, management and treatment of cardiac diseases, Dr Reddy detailed how they have brought in better competencies, helped improve outcomes of surgeries and interventions, enhanced post-treatment care, reduced hospital stay and improved overall quality of life for patients. He also said that it is essential for doctors and medical practitioners to stay updated with these new technologies, practices and procedures.

The workshop on Day 2, i.e. 20 December 2019, was held at Sri Ramachandra Institute of Higher Education and Research. The team of cardiologists who attended the programme included Dr S Thanikachalam, Dr JSN Murthy, Dr TR Muralidharan, Dr M Ramesh, Dr P Manokar, Dr R Jebraj, Dr S Ramesh, Dr S Sadhanandham, Dr S Prabhu, Dr JV Balasubramanian, and Dr B Vinod Kumar.

It commenced with a presentation by Dr Ueda on the antegrade approach to PCI and the cases where this strategy

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- Better image quality by new dynamic trace is associated with safer procedure in EVT



Team Canon with Dr Prathap Reddy, Ms Preetha Reddy and a couple of doctors from Apollo



Apollo's doctors listen to Dr Ueda's presentation on CTO-PCI

will be most successful. He also informed that Canon's systems offer a lot of features which simplify and improve the effectiveness of complex cardiac interventions. This was fol-

lowed by an interactive Q&A session wherein the attendee doctors cleared their doubts and concerns about the risks and benefits of CTO PCIs. Next, a visit to the cathlab

enabled the doctors to gain more hands-on experience in conducting this procedure.

The attendees informed that these kinds of initiatives help them learn more about

newer techniques which can improve treatment outcomes. The cardiologists also informed that these complex procedures are undertaken at the hospital but a case-by-case analysis is done before choosing between bypass surgery and angioplasty.

Post this, Dr TR Muralidharan, Professor and Head, Department of Cardiology, Sri Ramachandra Institute of Higher Education and Research, Chennai spoke to *Express Healthcare* to share express his gratification about Dr Ueda's visit to his hospital. Speaking on how these kinds of programmes deliver a lot of value to our doctors and improve their competence, he said, "Dr Ueda possesses a wealth of experience and knowledge gained by doing this procedure for over 25 years. It is a boon that he has come down to share his learnings with us. It gives us a chance to discuss our cases and concerns with him and gain from his expertise."

He also said that the Indians and Japanese have a lot to learn from each other in terms of healthcare. While we can showcase how to make healthcare cost-effective without compromising on quality, the Japanese can teach us a lot about newer techniques and technologies, which can improve treatment outcomes in a shorter time. For instance; in angioplasty, the kind of catheters, wires and balloons to use and their impact.

Dr Muralidharan also affirmed that cardiac care in India has improved by leaps and bounds over the past few years, especially in South India and all the metros. He conveyed that Indian doctors have the skill and proficiency to carry out intricate cardiac interventions. Asserting that both, central and state governments are taking significant steps to improve cardiac care in the country, he cited health insurance schemes in Tamil Nadu and Kerala's heart failure registry as examples.

On Day 3, the venue for the workshop was Apollo Hospitals. The first part of the agenda for the day comprised a visit to the cathlab for a live



demonstration of the CTO-PCI technique. The doctors who attended this programme were Senior Interventional cardiologists namely Dr Robert Mao, Dr I Sathya Murthy, Dr Prakesh Chand Jain, Dr K Dhamodharan, Dr Asha Mahilmaran, Dr KP Pramod Kumar, Dr KN Srinivasan, Dr Rajeswari Nayak, Dr Abraham Ooman.

After concluding the live demos, Dr Ueda addressed the doctors of Apollo Hospitals to give a presentation on the topic, 'Retrograde Approach – Reverse CART and Variation to it'. Giving an overview of the most crucial steps that should be undertaken to perform CTO-PCI, he explained the retrograde PCI approach and outlined how this line of treatment should be undertaken by interventional cardiologists. He stressed that the highest objective for doctors should be to achieve complete revascularisation while ensuring that it is done in the most comfortable, simplest and safest manner. Pointing out that this outcome depends on several factors including right dosing practices, he said, "My policy for complex PCI is simple and safe. Dose management is the most important responsibility for both patients and operators to make it possible."

Offering insights from his own experience, he said that Canon system's improved image quality and dose monitor has helped him enhance the efficacy of treatment. Citing an example, he says that often patients suffer from radiation-induced dermatitis as a side effect of these treatments but DoseRite dose tracking feature in Canon's cathlab, which helps to visualise, track and control doses in real-time, has nullified this threat.

Post the presentation, Dr Ueda addressed queries from the audience on the best practices to adopt for reduction in long-term mortality, lessening the risk of myocardial infarction, and lowering rates of repeat revascularisation.

After the event, Dr Prakash Chand Jain, Senior Interventional Cardiologist observed that this programme was a great learning experience. He also said that there is no diffi-

## KEY TAKEAWAYS

- ▶ Over the years, there has been a substantial progress in the technologies available for CTO PCI. They have significantly improved procedural efficacy, efficiency, and safety
- ▶ Complete revascularisation in the most comfortable, simplest and safest manner is the key goal to strive for while doing cardiac interventions like CTO PCI. This outcome depends on several factors including right dosing practices
- ▶ There is an urgent need for a comprehensive public health insurance system in India like Ayushman Bharat for improving access to new age procedures for Indian patients
- ▶ Socio-economic and cultural backgrounds can tremendously impact healthcare trends and practices



An interactive Q&A session between doctors of Sri Ramachandra Institute of Higher Education and Research and Dr Kinzo Ueda



Dr Ueda giving hands-on demo of the CTO-PCI technique to cardiologists

culty in performing any of these complex surgeries in India. All the latest technologies and materials are available at Apollo Hospitals. He went on to state that around 10-12 of these procedures are being performed each month at Apollo Hospitals, Chennai. He also opined that medical device providers should step-up their efforts to ensure radiation safety through their systems as it is a significant factor as we learn and adopt more viable ways to enhance patient care.

The doctors who attended the programme were very enthused about the workshop and opined that such endeavors are a great way to get exposure and understanding of newer treatment protocols and techniques from global experts. Dr Ueda also professed his happiness at being a part of these knowledge-exchange programmes as they allowed him to interact with Indian cardiologists and share his learnings with them.

Preetha Reddy also con-

veyed her delight in such knowledge-exchange endeavours and said, "Cardiology remains closest to the promoter's heart and the organisations' heart. Thank you for spending time with us. We have always been the first to do new procedures or adopt new ways of doing things. The combined experience of all our clinicians is very formidable. So, we are happy that we are looking at newer things, newer techniques with initiatives like this. We are looking forward to more such collaborations."

Discussions with the cardiologists at both these hospitals also underscored how socio-economic and cultural backgrounds can influence healthcare trends and practices across the world. The considerable difference in the number of CTO PCIs done in Japan and India serves as an example of this fact. It came to light that the Japanese prefer angioplasty over bypass surgeries because of a belief that the soul departs if the chest is opened. Moreover, as patients in Japan are covered by public health insurance, they can opt for more expensive treatment methods.

Meanwhile, in India, all our populace is not covered by insurance, either private or public and medical care is often an out-of-pocket expense. Therefore, cost is a huge determinant when it comes to healthcare in India and therefore bypass surgeries are more often the norm in India than angioplasties as it is a more economical option. This fact threw light on the need for a comprehensive public health insurance system in India and accentuated the massive role that a scheme like Ayushman Bharat can play in our country.

Thus, there was knowledge-sharing and the workshops were very well received in both the hospitals. These workshops also highlighted that as the healthcare landscape continues to evolve the need for such collaborations and initiatives will become even more vital to understand patients' needs better.

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# Roche Diagnostics partners with SRL Dr Avinash Phadke Lab

Roche's first partner for cobas pro solution is SRL Dr Avinash Phadke Lab in Mumbai. The solution promises to offer greater automation, flexibility and simplified workflow to support better clinical outcomes for patients



India's diagnostic technology space in the last few years have seen a surge in innovative solutions that will certainly transform the future of lab diagnosis. Technologies such as AI, machine learning,

automation are already disrupting traditional practices and remodelling current lab infrastructure while improving clinical decisions. Addressing the opportunities lying ahead, technology providers

are now going that extra mile to develop technologies that suit the needs of the next generation laboratories. Roche Diagnostics India, the company at the forefront of these innovations in July 2019 intro-

duced cobas® pro- its integrated solutions which bring several 'first-of-its-kind' features for labs.

#### The Indian opportunity

According to Roche Diagnos-

tics India, cobas® pro represents Roche's new generation of Serum Work Area solutions that endeavours to improve the speed and reliability of treatment decisions for patients and their families. This

solution promises to offer greater automation, flexibility and simplified workflow to support better clinical outcomes for patients. They are designed to reduce the time between diagnosis and therapy management and to instil greater confidence in clinical decision making. It also includes efficiency-building features like automated maintenance and calibration and an on-the-fly reagents and auxiliary loading mechanism that improves functional efficiencies within laboratories.

When asked about the striking features of this integrated lab solution, Dr Shraavan Subramanyam informs, “A fully integrated laboratory is the means to this end. One in which every component is designed to work together as one, vastly expanding the efficiency, scope and quality of diagnostic capabilities. Roche Diagnostics had introduced their industry’s first integrated system in 2002 and since then, there has been consistent evolution. cobas® pro takes integration to a different level altogether with its unique features helping labs on the challenges around “turn around time”, limited space, qualified staff dependencies and assay menu requirement and consolidation. Quite simply, we are enabling within a single automated system, a vast array of testing that gives answers to life’s critical challenges across the healthcare continuum.”

With the introduction of cobas® pro in the Indian market, Roche Diagnostics India is equipped to partner with some of the major diagnostic providers in the country and meet the needs of the current lab market. “With our portfolio of innovative solutions, Roche Diagnostics India is uniquely positioned to provide laboratories with the tools to address the challenges of the future by making testing simpler, more cost-efficient and more insightful today. With the introduction of the first of its kind integrated system to cobas® pro provides lab with convenience and efficiency packaged with unique features like cobas Autocal, Ultrasonic

## KEY FEATURES

1. Automated daily and weekly maintenance, to support reduced service efforts
2. More tests per reagent pack with cobas c pack green and cobas e pack green, to allow for long walk-away times and less loading, ordering and handling events for reagents.
3. Reagent on-board stability of up to four months for immunochemistry and up to six months for clinical chemistry to minimise operator intervention and maximise productivity
4. Loading on-the-fly of reagents and consumables without interrupting the operation, so that reagents can be loaded at any time of the day
5. Reduced calibration effort through cobas AutoCal, saving up to 92 hours of hands-on time annually
6. Increased sample integrity and unprecedented levels of cleanliness through cobas SonicWash
7. The broadest SWA assay menu consolidated on a single platform to help customers use their space efficiently

## The new solution addresses the need for further automation and simplification of the process in an IVD lab. We are proud to play a role in the transformation of the way tests are carried out and the labs function

washing, predictive loading list and automated maintenance. The new solution addresses the need for further automation and simplification of the process in an IVD lab. We are proud to play a role in the transformation of the way tests are carried out and the labs function. This adds big value to us as it helps us live our purpose of ‘Doing Now, What Patients Need Next’, Dr Subramanyam adds further.

### The user connect

Roche Diagnostics India’s first partner for cobas® pro integrated solutions is SRL Dr Avinash Phadke Lab in Mumbai.

According to Dr Avinash Phadke, Founder, Dr Avinash Phadke Labs and President, SRL Diagnostics, due to the rise in demand for diagnostic services, the lab receives high volumes of tests. The challenge at hand was to meet the demand while they maintained the quality and precision of results. The integrated automated solution was, therefore, their urgent need.

cobas® pro integrated solution gives his lab a bigger advantage to provide high quality, greater precision diagnostics reports to their patients while enhancing their functional efficiencies in the lab. He says, “The cobas pro system has a unique advantage of integrating the biochemistry and immunoassay platform at a higher throughput and giving reagent stability of up to four and six months for immunoassays and clinical chemistry respectively. The most enticing feature of this integrated solution is that is cobas Autocal where physical calibration and calibrator is not required even on changing the lots. So you don’t have to depend on manual calibration unless your external controls are out of range and you will have to revisit it manually. Another fascinating advantage is that glycosylated haemoglobin (HbA1c test) is done with a separate probe. So this integrated solution ensures that 85 to 90 per cent of your pathology test can be done on a single platform

while maintaining the sample integrity. Barring molecular tests, all biochemistry test, immunoassay tests can be done on this single platform.”

cobas AutoCal, which is an automated calibration procedure on the clinical chemistry analytical unit, saves precious hands-on time and cost of calibrators substantially. On the c 503 the calibration concept is simplified to nearly zero effort. The concept of cobas AutoCal breaks the calibration up into two parts:

The first part of a signal is related to the instrument. It remains stable and does not change, as long as no major components of the instruments are exchanged

The second part of a signal is related to the reagent, and this part can vary from lot to lot. And this contribution is evaluated in our production facilities at Roche Diagnostics and can be made available for download via cobas link

This means that for the majority of all CC tests, there is no need to manually calibrate the system anymore! Labs

technicians can automatically adjust the calibration curve simply by downloading the latest calibration data.

### The cost advantage

Now Dr Phadke also sees better business prospects and unique ROI on this investment. “If you have a very huge volume, then some of these systems are available on the reagent rental basis where if you do X number of tests, the diagnostic instrument company would place the system on rent as they think it’s viable to generate value from the installation. This works on an understanding between the diagnostic provider and the technology partner. From the provider point of view, this has an advantage in the long run when labs need to upgrade their systems with newer and advanced technologies as the obsolescence management and responsibility lies with the technology partner and not the lab. The current business models in major labs with high throughput are that the labs function of minimum reagent consumption where you assure the technology provider that you will have X number of volumes to make it viable for the diagnostics partner to provide the machines on reagent rentals.”

Likewise, Dr Subramanyam shares his opinion. “The potential benefits of the cobas® pro integrated solutions to the labs are enormous. Separating the samples to be performed on clinical chemistry and immunoassay analyser separately takes additional time and also need more people to manage different systems and tracking the samples for each system. The greater efficiency of a fully connected and automated laboratory holds the promise of substantially reducing the financial pressures on providers. With clinical chemistry and immunoassay integrating together seamlessly and with less staff time required to operate the system, laboratory staff will be free to perform more skilled roles and higher-value work, translating into cost savings, laboratory growth and better preparation for the future.”



## INTERVIEW

# “To end the HIV pandemic, we must continue to outthink this virus”

**Mary Rodgers**, ‘virus hunter’, Principal Scientist and Head, Abbott Global Surveillance Center explains to **Viveka Roychowdhury** the importance of tracking virus mutations in HIV and viral hepatitis across the world to update their diagnostic tests

**Abbott’s 20-year-old Global Surveillance Programme is the basis of the company’s diagnostics research programme leading to commercial diagnostic test products. What is the significance of your team’s recent discovery of a new strain of HIV called HIV-1 Group M, subtype L?**

It has been 25 years since we established the Abbott Viral Surveillance Program to monitor HIV and hepatitis viruses globally to track mutations to help make sure our diagnostic tests remain up to date. The discovery of a new strain of HIV called HIV-1 Group M, subtype L by our team marks the first time a new subtype of HIV-1 has been identified in 19 years – since guidelines for classifying new strains of HIV were established.

This new strain is a part of the major group of HIV (Group M), which is responsible for 90 per cent of the pandemic, and has been traced back to the Democratic Republic of Congo (DRC). The new strain discovery helps researchers and healthcare providers stay one step ahead of mutating viruses and avoiding new HIV outbreaks. Since we live in a global village, we can’t think of viruses being contained to one location. This discovery reminds us that to end the HIV pandemic, we must continue to outthink this virus and use the latest advancements in technology and resources to understand its full scope.

**What are the other disease areas tracked by Abbott’s Global Surveillance Programme?**



At present, our programme focuses on HIV and viral hepatitis – both continue to be major global public health issues. India has the third largest HIV epidemic in the world, with 2.1 million people living with HIV (2017 data). 1 Globally, more than 257 million people are chronically infected with hepatitis B and 71 people are chronically infected with hepatitis C.2-3 As the only diagnostics company with such a unique, longstanding and large-scale Viral Surveillance Program, we provide a vital tool to keep pace with these evolving threats to help make sure our diagnostic tests remain up to date.

**Since such diagnostics research has a huge impact on public health, is the company collaborating with governments of countries most affected so that the research information can be used to detect and possible contain potential pandemics?** As a leader in blood screening and infectious disease testing, Abbott created its Global Viral

Surveillance Program 25 years ago to monitor HIV and hepatitis viruses and identify mutations to help our diagnostic tests stay up to date. We partner with blood centres, hospitals and academic institutions around the world. We also partner with researchers in the Ministry of Health in some countries. So far, we have collected more than 78,000 samples containing HIV and hepatitis viruses from 45 countries, identified and characterised more than 5,000 strains, and published 125 research papers to help the scientific community learn more about these viruses.

**Last January, Abbott announced its partnership with YR Gaitonde Centre for AIDS Research and Education (YRGARE) to study the country’s viral diversity to improve accuracy of diagnostic tests. What have been the outcomes of this partnership in this first year?** Our partnership with YRG Care aims to study the country’s HIV and hepatitis

viral diversity and to help make sure our diagnostic tests remain up to date to keep pace with these changing viruses. Abbott has provided study protocol and diagnostic equipment, while YRGARE has helped in screening and sequencing data from infected populations in India.

Our initial findings show diverse strains of HCV in India. Once we are closer to publishing our research, we can share details about the specific genotypes detected in the region. What’s interesting is that the geographical classification of the HIV and HCV strains identified confirmed that higher levels of viral diversity were present in cities near borders with neighboring countries where drug trafficking routes exist. Notably, the HCV strains that predominated in the Northeastern region varied dramatically from those identified in the Northern border. These results support the hypothesis that new strains have been imported to India via the Golden Triangle and Golden Crescent opium trade routes.

**How will these outcomes help diagnose, treat and maybe prevent HIV infection in India?**

The UNAIDS 90-90-90 goals are that 90 per cent of all people living with HIV will know their status, 90 per cent of all people with diagnosed HIV infection will get antiretroviral therapy, and 90 per cent of all who are on therapy will achieve viral suppression.

Continuous research, including the new HIV virus discovery, supports the first and the most important pillar

of 90-90-90 goals. As we take it a step further to geographically classify viral strains and map where these strains cluster, this information allows us to understand what might be driving viral diversity in specific regions. This information could give us insights, not only into how we can diagnose—and even prevent—these infections, but also into where the global health community’s efforts should be focussed.

**As a virus hunter, could you comment on ongoing efforts of other virus hunters to contain and treat cases of the novel Coronavirus?**

My job as a virus hunter at Abbott means I’m always watching for the next threat to people’s health. When news like this breaks, we immediately start to track the situation. The public health community has learned a lot from past outbreaks, and those lessons likely led to a faster initial response to this one. The WHO, CDC and other organisations are taking swift action to address this serious public health concern.

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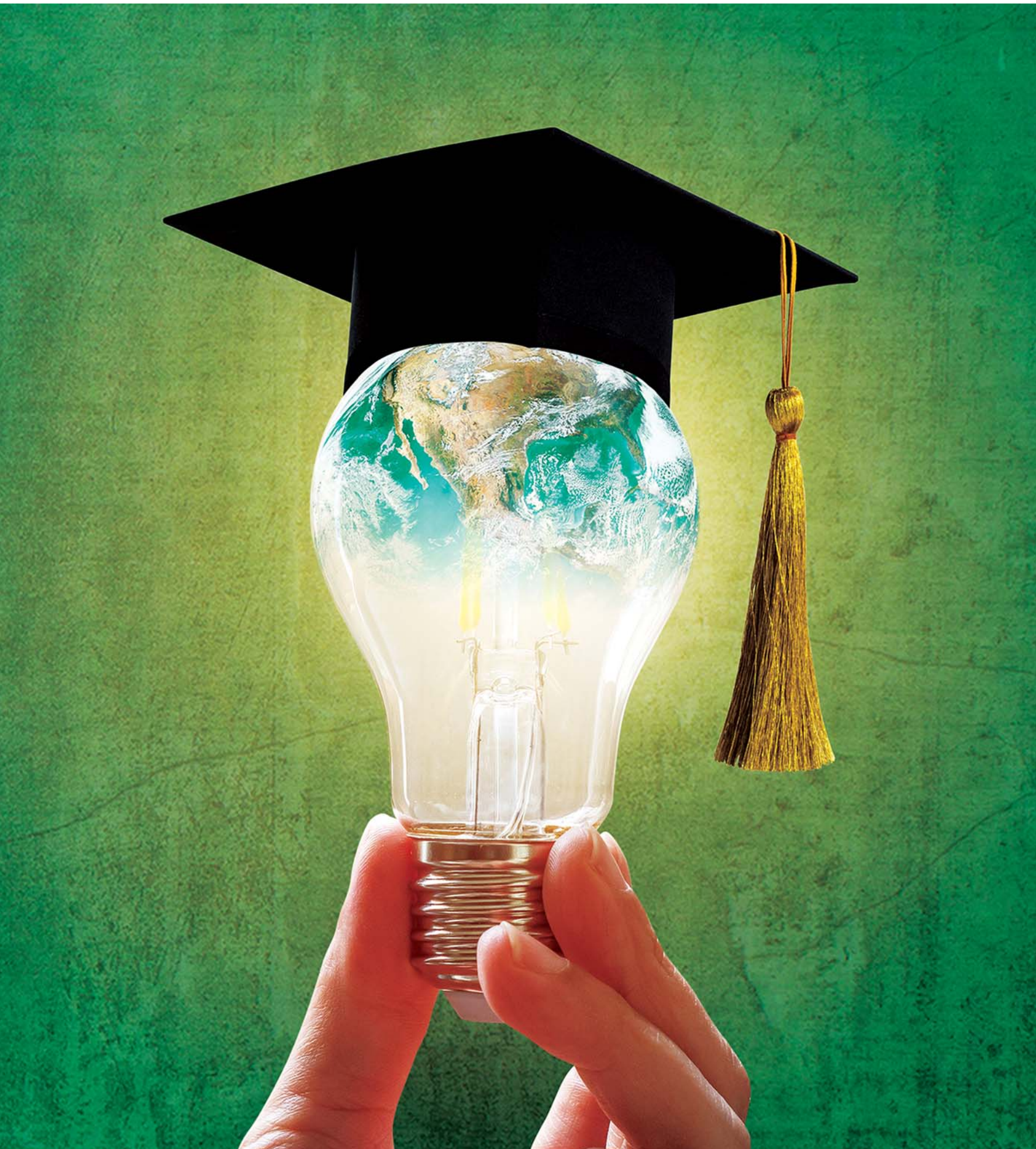
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# THE PILL FOR INDIA'S **AILING** MEDICAL **EDUCATION** SYSTEM







By Sanjiv Das

**M**edical education in India is mired with a host of controversies and is trudging along a rough path. There are around 70,978 MBBS seats in 529 colleges in India. Of this, 269 colleges accounting for 35,688 seats are government-run, while the remaining 260 colleges accounting for 35,290 seats are in the private sector. While the number of medical seats has increased in the last decade, the quality of education has remained in question. Moreover, corruption in medical education is touted to be one a major cause of concern. Private hospitals charging a huge capitation fee and donation. Although there is a tremendous opportunity in the medical education space owing to the vast patient load and a diverse spectrum of diseases. The increase also leads to a dearth of quality healthcare professionals.

The country requires 6,00,000 doctors and 2 million nurses to cater to the rising population. However, the doctor-patient ratio currently stands at 1: 1,457 people.

Though the number of institutes has increased, the ones which offer quality medical education remains minuscule. The curricula have remained mainly outdated, despite tremendous changes happening in the healthcare sector. The medical education sector has become a more lucrative business linked to large profits than service to society. The mounting corruption, suicides related to cheating for admissions, high fee structure among private institutes and more notifies us about the highly unregulated business of medical education in the country.

We approached some academicians and doctors to know about the causes of this debacle in medical education, the challenges that the industry faces, government initiatives and the way forward. So let's start by understanding the

## STEPS TO REFORM



**Dr Subhrojyoti Bhowmick**

Clinical Director for Academics, Quality and Research Depts, Peerless Hospitex Hospital and Research Center

- ▶ Having NMC inspectors from private medical colleges as well. Till date, only government faculty did the MCI inspection
- ▶ Having economic condition-based reservation in undergraduate medical education
- ▶ No caste or economy-based reservation in post-graduation and super speciality seats
- ▶ Having information technology/computer technology as a mandatory subject in the undergraduate curriculum
- ▶ Patient safety being made an integral part of all medical curriculum



**Dr JB Sharma**

Professor in AIIMS, New Delhi and Chairperson, Urogynaecology Society FOGSI

- ▶ Setting up additional AIIMS like institutions in other states
- ▶ Explore digital platforms and technology for providing a strong networked community of medical colleges that can conduct live lectures and demonstrations using digital technology
- ▶ Artificial intelligence applications can provide a revolution in clinical practice and teaching



**Dr KS Sharma**

Dean Academics Projects, Tata Memorial Centre

- ▶ Admission to all the medical colleges (Government and Private) through NEET, which is happening
- ▶ The national exit examination will be a licentiate exam and at the same time will provide the merit list for PG admissions
- ▶ The competency and skill-based medical education is badly needed
- ▶ The practical examination of UG and PG students should be broad-based and skill-based
- ▶ Post-graduate students should be rotated through rural outreach exposure during the three-year curriculum



**Dr Deepak Patkar**

Director (Medical Services) & Head, Imaging and Radiology, Nanavati Super Speciality Hospital

- ▶ Utilising digital learning techniques
- ▶ Greater emphasis on community health
- ▶ Problem-based learning approaches
- ▶ Horizontal and vertical integration
- ▶ Telemedicine services for inaccessible areas

current situation of medical education in the country and how are students reacting to it.

### The current scenario

Says Dr Deepak Patkar, Director (Medical Services) & Head, Imaging and Radiology, Nanavati Super Speciality Hospital, "In India, we have the advantage of having the highest number of government medical colleges, in spite of that, there is rapid privatisation."

But this is also a result of the lack of quality and outdated syllabus within the government institutes. Moreover, the Internet is filled with dubious websites which offer unrealistic pictures to students and encourages them to take admission in private institutions.

According to Dr Subhrojyoti Bhowmick, Clinical Director for Academics, Quality and Research Depts, Peerless Hospitex Hospital and Research Center, the medical education system in India is undergoing a metamorphosis. In 2018, undergraduate medical education training has changed after 21 years in the country. It is called the "Competency-based UG Curriculum for the Indian Medical Graduate," which essentially marks a significant shift from the classroom rote learning of the 1997-born programme to one which stresses on medical ethics, better doctor-patient relationship and outcome-based learning.

Speaking about the lack of motivation among doctors/teachers to improve medical education, Dr Bhowmick says, "Even doctors completing their post-graduation from government medical colleges sign compulsory bonds which makes it very difficult for them to join medical colleges as faculties. Lack of motivation amongst young doctors to become medical teachers is another challenge. As a result, many faculty positions remain vacant in government and pri-



vate medical colleges,” as Dr Bhowmick rightly points out.

While there are experts who think that lack of quality education among government institutes has given rise to privatisation, Dr Patkar feels that privatisation of medical education on a large scale is creating a risk of diluting the standards of medical education.

He further adds, “A few issues in the medical education system are mal-distribution, age-old curriculum, poor assessment standards and minimal sufficient faculty development programmes. The medical curriculum in India suffers from a lack of integration, maintaining traditional didactic teaching methods and limited support to research. Nevertheless, the new Ministry of Health and Family Welfare's (MoH&FW) National Medical Commission NMC bill is surely a step forward to address these issues.”

So how will the NMC bill bring respite to aspiring doctors and add value to medical education in India? How does the government plan to bring in the much-needed overhaul in medical education?

### Government's initiatives and regulations

The NMC Bill, which got approval from the President of India, is supposed to be a major step towards revamping the education system. It will be beneficial to the economically weaker students who want to pursue medicine in private colleges by paying nominal rates. Moreover, the government is constantly creating more avenue to increase the number of medical seats at the institute. Last year the health ministry initiated the process of converting 75 district hospitals into medical colleges. Their aim is to ensure that even the underserved districts of the country will have medical colleges by 2021-22. It is touted to create 15,700 seats.

Dr KS Sharma, Dean Academics Projects, Tata Memorial Centre, says, “NMC

which is under formation will soon take over MCI. This highest regulatory body will transform the present status of medical education in the form of introducing the National Exit Examination. It will also

help to regulate the fees of 50 per cent seats in all private medical colleges, which will make medical education affordable to so many meritorious students.”

Dr Bhowmick says, “I think

the NMC bill is a positive step ahead to bring in parity in medical education across the country. The bill has a provision like the National Eligibility-cum-Entrance Test for admission to under-gradu-

ate and post-graduate super-speciality medical education in all medical institutions regulated under the Bill. The NMC will specify the manner of conducting common counselling for admission in all



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such medical institutions. This would ensure that standardisation of admission process of medical students across the nation."

Dr Patkar points out "NMC Bill will also introduce parity and uniformity in terms of education standards and offer fee structure diversity. Single National Eligibility cum Entrance Test (NEET) to admit students to all medical colleges including AIIMS and JIPMER will reduce the stress level among the student fraternity and make the system more transparent and impartial. The move will improve access to quality and affordable medical education, ensure availability of adequate and high-quality medical professionals in all parts of the country. It will bring about changes in the way medical colleges are assessed, MBBS entrance is conducted and will introduce new provisions such as exit exams and regulation of course fees in private colleges."

Patkar further adds, "There are various avenues for potential changes where government authorities need to intervene such as an exploding number of medical colleges; a skewed distribution of these around the country; devaluation of merit in admission, particularly in private institutions; increasing capita-

## The NMC Bill, which got approval from the President of India, is supposed to be a major step towards revamping the education system. It will be beneficial to the economically weaker students who want to pursue medicine in private colleges by paying nominal rates

tion fees; an alarming shortage of medical teachers, with those who exist being untrained in modern teaching-learning technology."

Prof JB Sharma, Department of Obstetrics & Gynaecology, All India Institute of Medical Sciences, New Delhi, and Chairperson Urogycaecology FOGSI Society, "Our government is seriously revamping the system to cope up with requirements of the Indian population. Plans are underway to improve the admission process and strengthen medical education among institutes across the country including the central, state and privately run. Earlier students had to appear in multiple-counselling sessions across the country for admission to medical courses. Further, as per other amendments, the ratio of teachers to students has also been revised from 1:1 to 1:2 for MD/MS dis-

ciplines and the teacher-student ratio has been further increased in public-funded government medical colleges to 1:2 or 1:3 which has led to increasing in postgraduate seats as well."

Dr Bhowmick mentions, "The new MBBS curriculum has a course called Attitude, Ethics and Communication (AETCOM) where students will be assessed for how they communicate with patients especially while counselling people for organ donations, how sensitively do they offer care and obtain consent."

Not only the government's initiative but collaboration between industry and academia is likely to play a major role to boost the medical education sector.

### Industry academia collaboration

Health experts and academicians claim that the Indian healthcare sector is looking

for innovative research models to provide more active participation from industry players. Collaboration between industry and academia will lead to improvement and innovation in the industry and also helps to ensure industrial relevance in academic research. However, successful collaboration can only happen when properly planned and nurtured.

Dr Bhowmick says, "The pharmaceutical industry employs a lot of doctors who are engaged in training and research collaboration with medical colleges and hospitals. The government should allow honorary faculty positions to such doctors who have the experience of training and teaching over the years. Medical education requires a lot of funding and industry should include expenditure on development of infrastructure of medical colleges as a part of their corporate social respon-

sibility."

Sharma from TMC mentions, "The industrial organisation should actively support academic activities by sponsoring workshop and seminars very actively."

JB Sharma says, "In terms of industry-academia collaboration, there is active collaboration for conducting clinical trials for products that the companies plan to market either in India alone or even internationally. However, the level of engagement for basic research including disease research and epidemiology can be improved further by the more active participation of the industry players, including research in India specific diseases. There are various government initiatives from BIRAC, CSIR, DRDO that provide this platform."

### In the years to come

Mega reforms by the government are likely to make an impact on the medical education sector. However, these initiatives can bear fruit only if implemented in the right way. The right pill for India's ailing medical education system will be to address issues pertaining to corruption and high fees structure, appointing right faculties and blacklisting of illegal institutes.

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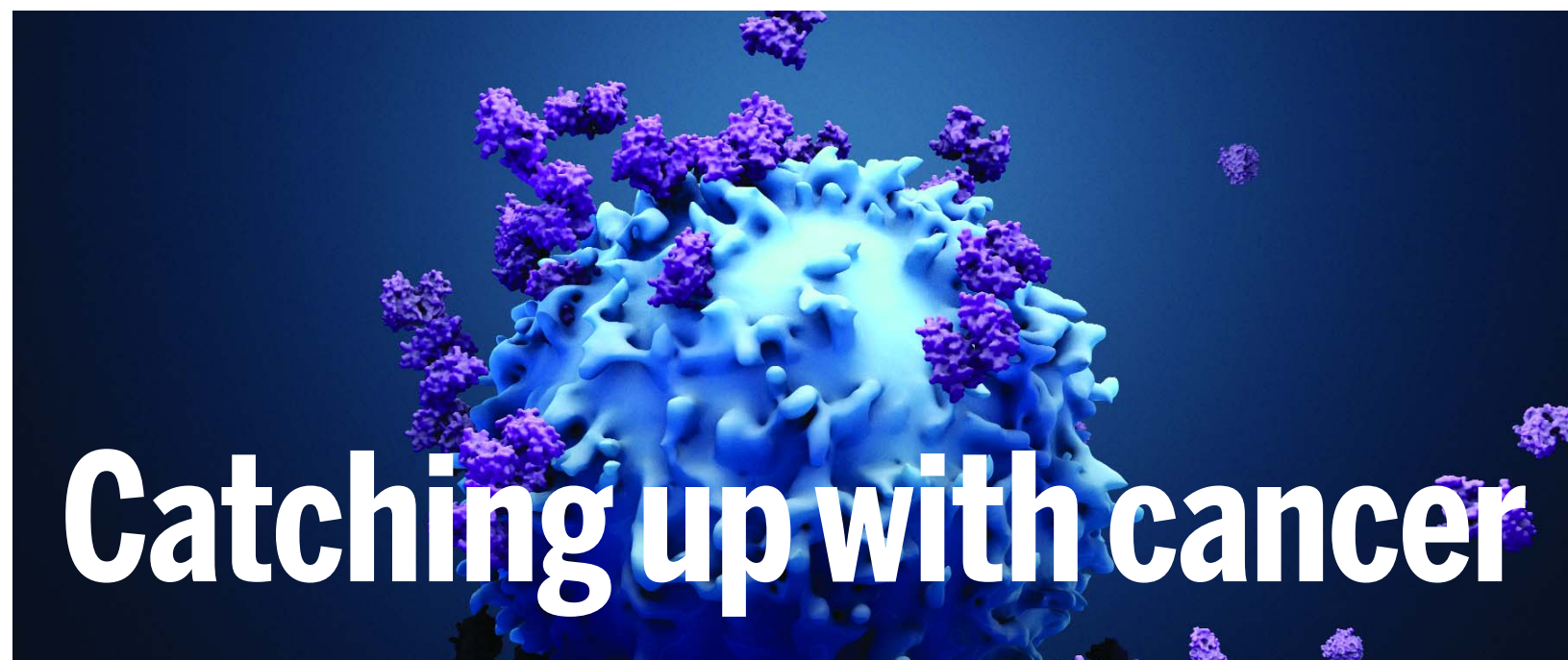
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Cancer has emerged as an alarming cause of morbidity and mortality in India. According to The National Centre for Disease Informatics and Research of the Indian Council of Medical Research (ICMR) at Bengaluru, India, 1.65 million cases of cancer were estimated to be diagnosed in 2019. This burden is likely to become double in the next 20 years. Also, we are a country of a humongous, demographically complex population with diverse cultures and lifestyles. While the North and the Northeastern states may register the highest number of gallbladder cancer, Southern states and cities like Chennai and Bengaluru are suffering from high incidences of stomach cancers. Industry experts discuss about the research avenues being explored to provide cancer treatment to such a multiplex populace By **Tarannum Rana**

## 2020 looks ahead at an exciting time in Indian oncology

2020 looks ahead at an exciting time in Indian oncology. The list of targeted therapies that are available on the biosimilars list made in India keeps expanding. Meanwhile, access to expensive therapies from the west including immunotherapy is becoming more streamlined with purchase and adoption both rising in the private sector despite the associated costs.

Homegrown technology is shining though, with the advent of CAR-T cell trials at Tata Memorial Center and Biocon, the launch of the Apollo Proton Centre, and the expansion of artificial intelligence (AI) based clinical decision analysis support for patients by the National Cancer Grid and Navya.

Proton therapy is a spe-

cialised type of radiation therapy with minimal side effects compared to traditional radiation. It can precisely target the radiation beam at the tumour and stop the beams from penetrating the normal tissue behind the tumor. This is particularly valuable for tumors in difficult to access and neurologically sensitive regions of the body, such as tumors of the skull base, spinal cord, eye, oral cavity, prostate etc. Apollo Proton Center in Chennai is the first of its kind in India, bringing this technology within reach of the pediatric and adult cancer patients who benefit from this specialized care. The cancer center has also launched an online initiative [apollocanceropinion.com](http://apollocanceropinion.com) to enable patients to know



**Dr Naresh Ramarajan, Chief Medical Officer – Navya Care**

whether proton therapy is the right choice for their tumors or not.

CAR-T cells are a specialised form of immunotherapy that

hold promise for recurrent or relapsed blood cancers, which often affect young and healthy people. Currently this therapy is expensive and only available in the US, China or Israel. Both Tata Memorial Center (TMC) and the Biocon are developing CAR-T cells in house and hope to begin clinical trials in late 2020. This will provide much needed access to our patients to another novel frontier in cancer care.

AI is making a big splash in healthcare abroad with news of large tech companies analysing health data to predict better outcomes or maximise care plans. Tata Memorial Center, the National Cancer Grid have popularised a domestic initiative ([www.navya.care](http://www.navya.care)) to use AI

technologies to speed up response time and achieve a comprehensive response to patients at scale.

Patients who are otherwise unable to get the time of experts at large academic cancer centres like TMC, AIIMS, Adyar Cancer Center etc., can use this NCG service which is AI-enabled to get rapid reviews from experts on their cases within 24 hours. The impact of this service was presented at European Society of Medical Oncology (ESMO) in late 2019 to show that patients on average saved two days of work absences, 1000 km of travel and almost RS 70,000 in costs by avoiding expensive trips to the large cancer hospitals for purposes of a second opinion alone.

## The environment of research in India is still warming up and has a huge potential in the space

Notable progress has been observed in the way cancer is diagnosed and treated today. We have seen a shift towards genetic-based testing and molecular diagnostics. New diagnostics methods based on genomic and proteomic profiling of the molecular changes associated with the disease are being developed that are important for therapeutic decision making. At CORE, we provide Patient Support Programme and clinical trials, on patients to bring down the cost of diagnosis and treatment along with prominent epidemic studies. In addition to this, Government initiatives, under public-private

partnership (PPP) model, are exploring options to provide quality diagnostic services for screening of the disease.

Thankfully, there are many hospitals and laboratories that offer targeted next generation sequencing. But still there is a dire need to focus on research for prevention of some cancers with high incidence in certain areas. With rapid advancement and availability of new technology, many more new assays are now being offered including the NGS-based assays for better and focused tumour profiling, liquid biopsy for very early diagnosis of cancers, and Minimal Residual Disease (MRD) in leukaemia.



**Dr Aparna Dhar, Head of Department: Medical Genetics and Genetic Counselling, CORE Diagnostics**

These advanced assays have helped researchers, clinicians and patients to understand

molecular basis of cancer and plan more specific and successful target-based therapies.

The environment of research in India is still warming up and has a huge potential in the space. It can include biomedical research, epidemiological studies, health services research, as well as behavioural, social, and economic studies of factors that impact health. Indian population is unique in terms of genetic diversity, culture and food habits and this provides an opportunity for a well-planned approach towards improving the way to treat and manage cancer as well as understand what raises or lowers a person's risk

of developing cancer. Recently, Government of India's department of biotechnology joined hands with UK based cancer research firm to launch a research challenge for affordable approaches to cancer. The initiative is focused to fund research projects to address the challenges in affordability, diagnosis and treatment of cancer, by bringing together research strengths of India and the UK.

We would need a planned and coordinated approach at various levels including collaboration with research groups to bring in the necessary transformation in cancer diagnosis and treatment.

## New therapies that will gradually shifting focus from chemotherapy have arrived

In earlier times, cancer was associated with early mortality due to lack of dedicated treatment approaches. Chemotherapy, radiation therapy, supportive drugs, palliative/allied therapies are the mainstay in management of cancers. However, with newer technologies being developed, the hope of improving the overall survival rates and quality of life of individuals with cancer appears within reach. Welcome to the era of molecular medicine- where diseases are not treated by their symptoms but by targeting the underlying mechanisms creating havoc in the body.

Looking back at the start of the millennium, India broke the worldwide stranglehold of high cost Anti-retro viral therapy drugs by supply of generic Anti-retro viral drugs (ARV) at low cost to the HIV-AIDS epidemic stricken African nations. Since then, India has been a major supplier of ARVs across the world. Today, India is at the



**Dr Pradeep Mahajan, Regenerative Medicine Researcher**

brink of another such revolution, this time in terms of cancer drug therapy. The prime factor for the growth of the Indian healthcare market is technological advances. We now have better diagnostic modalities that facilitate early screening, diagnosis, and prompt

treatment planning of various cancers. New therapies that are gradually shifting focus from chemotherapy to specific cancer targeted therapy, immunotherapy, and hormone therapies drive the Indian oncology drug market. Over the past five years, 70 new oncol-

ogy treatments have been launched and are being used to treat over 20 different tumor types. Many more such drugs are in the pipeline at various stages of clinical trials.

Along with newer drugs being developed, recent advances also aim to harness the power of immune cells of the body and train them to specifically attack cancerous cells. Immune effectors are capable of identifying and destroying cancerous cells that are inaccessible to conventional treatment modalities. Specificity and generation of long-term immune surveillance against cancer cells is the chief goal of immunotherapy. Several types of immune system cells such as: T cells, Dendritic cells (DC), Natural Killer cells (NK) etc., are candidates being researched in cancer immunotherapy.

Studies have shown that host immune system cells also mediate killing of cancer cells through activation of other types of cells and cytokines.

This had led to research on development of combination strategies that can capitalise on the synergistic effects of various immune cells. One such example would be combination of immunotherapy and chemotherapy, radiation or monoclonal antibody therapy.

Despite ongoing research on cancer therapy, we are just at the tip of the iceberg. The need of the hour is development of techniques that would exclusively target cancer cells and spare normal cells and tissues. This is imperative to minimise the side effects of current therapies and achieve tangible results from therapy. Future areas for development in vaccines using immune cells for cancer therapy should include applicability to individual tumor types, optimisation of cell biology including migratory and co-stimulatory properties, and the manipulation of the host and tumour microenvironments to alleviate immunosuppressive mechanisms.



## Targetted therapies: A new hope for patients

To deal with cancer, constant evolution is taking place in the medical field. The cutting edge technology and new treatment is a ray of hope for patients with cancer and can help them lead a normal life. Some of the recent developments in cancer treatment are:

► **The role of neoadjuvant chemotherapy and neoadjuvant radiation:** Earlier, in chemotherapy, it used to be the drug, given through IV, that would kill cancer cells. But, it affects the normal cells as well. One experiences side effects like weakness, loose motions and hair loss. Nowadays however, targeted therapies which those cells will only act on the cancerous cells and not on the normal cells have been invented.

► **Immunotherapy:** In this, readymade antibodies are given



Dr Manoj Lokhande Director and HOD- Surgical oncology department, Onco life cancer centre, Satara

to the patients to kill the cancerous cells. Hence, newer therapies like the targeted therapy and immunotherapy can be

opted for.

► Speaking about surgeries, when it comes to prostate cancer, robotics can do the trick as

this will reduce the hospital stay of the patient and there is no need to cut the skin for long lengths like for example, 10 cm to 15 cm. Instead, of that, it will be keyhole surgery.

► When it comes to radiation, back then, when there was a lesion in the brain, the skull was opened. But now, if there is a lesion in the brain, Stereotactic radiosurgery (SRS) or cyberknife, can be used as a non-invasive alternative for the treatment of both cancerous and non-cancerous tumors in the body including one's brain, spine, prostate, pancreas, and kidney.

► In the near future, genetic sequencing of the tumour will carry a lot of importance. Here, the expert will be able to know about the problem in each and every gene as cancer is nothing but genetic muta-

tion. The particular gene is targeted and treated properly. Thus, a focused treatment can be opted for.

► In the olden days, ovarian cancer patients were given chemotherapy. Now, hyperthermic intraperitoneal chemotherapy (HIPEC) is given to them immediately once the tumour is removed. Also, during the same surgery, a highly concentrated, heated dose of chemotherapy is delivered directly to one's abdomen, while targeting the area where one needs the treatment most.

Furthermore, after treating the patient, follow-up and rehabilitation is needed to stop any cancer recurrence. In the follow-ups, investigation can be done in the form of tumor markers, sonography, and CT scan. If the patient's tumor biology is bad then cancer may recur early.

## Hypo-fractionation form of radiation is a safer alternative to conventional schemes

There are three main modalities to treat cancer patients i.e. surgery, chemotherapy and radiation therapy.

Radiation therapy has evolved over a period of time in last century from very basic techniques to treat cancer patient till the latest machines capable of delivering much focused Radiation with sub-millimetre accuracy. It has resulted in increased cure rate by delivering high radiation doses to tumor at the same time decreased side effects and morbidities.

Evolution in the field of radiation therapy is mainly in two directions i.e. technology and radiobiology.

Technological evolution starts from very basic conventional irradiation using simple treatment fields toward highly conformal radiotherapy technique such as Intensity Modu-



Dr Wasim Phoplunker, Head of Radiation Department at International Oncology Services, Dr LHH Hiranandani Hospital, Mumbai

lated Radiotherapy (IMRT), Volumetric Modulated Arc therapy (Vmat) and Stereotactic Radiotherapy (SRT), which aim to improve the outcome by

escalating the radiation dose to target and minimising the toxicity to normal tissue and critical organs.

With the help of recent

technological advances in imaging and treatment, we can treat the moving targets like Lung, Liver etc, tumors in real time using motion management gadgets and technique like 4D-CBCT, respiratory gating to mitigate effect of tumor motion due to respiration.

Radiation therapy is very much a technology-driven modality. Technological advances have mainly been the result of integration of imaging information in every phase of treatment i.e. simulating the actual treatment before it is actually being delivered and imaging while the patient is being treated for more accuracy.

Radiobiological evolution starts from conventional fractionation i.e. small dose per session of radiation over a period of one and a half to two months to now a day, hypo-fractionation i.e. larger dose of radiation over a much shorter period of

time. It is a safe and well tolerated alternative to longer conventional schemes.

This is a big advantage for patients in term of convenience. Indeed, high-precision extremely hypo-fractionated radiotherapy has been called virtual surgery, since in many situations, it can have a radical curative effect locally that is similar to surgery. It is called Stereotactic Radio Surgery (SRS).

The past decade has seen an increase use of particle therapy particularly 'Protons'. It has an advantage that it reduces the low and intermediate dose to surrounding normal tissues due to it, certain physical property (Bragg peak).

In conclusion, radiation therapy has undergone tremendous progress over last century with technological developments that have revolutionised its clinical use.

# Cancer treatment is no more a blanket therapy but a patient tailored management

Currently, we are in era of precision medicine and things have progressed from biopsy to bioinformatics. About 1.16 million Indians are being diagnosed with cancer every year and approximately 2.26 millions are living with it.

Over last two decades genetic and molecular research has revealed that cancer is a heterogeneous disorder with different mechanism of origin and survival in different individual. This implies that cancer treatment is no more a blanket therapy but a patient tailored management. Such treatment decisions are based on individual patient's characteristics based on the type of tumour, genetic alterations and molecular events responsible for the origin and survival or the dis-

ease. Cancer diagnostics plays a large role in defining such patient characteristics.

Clinical research in cancer diagnostics and its utility in therapeutic decision making have been successfully implied in many cancer types. Breast cancer is no more a single disease entity and every patient is managed according to the burden and type of genetic alterations. This has not only resulted in better survivals but has also proved to be helpful in avoiding unnecessary treatment and hence therapy related toxicities. That is why it is termed as patient tailored management i.e. therapy that is tailored as per patient's characteristics and requirement to achieve best clinical results.

Here, two of the most im-



**Dr Siddhartha Sahai, Sr Consultant, Medical Oncology, Max Institute of Cancer Care, Shalimar Bagh**

portant molecular techniques are briefly explained:

**Liquid Biopsy:** It's a technique that has changed the outlook in diagnosis and charac-

terising malignancies. This involves isolation of the tumour DNA and exosomes from blood so that further determination of tumour nature and gene alterations can be done. Previously liquid biopsy was solely used as prognostic tool, but currently it is being used to diagnose the cancer as well as to modify the treatment depending on mutation detection. Liquid biopsy is also used to detect the cause of resistance to treatment i.e. secondary mutations and minimal residual disease. Efforts are being done to use this technique in screening of cancers. At present liquid biopsy is not recommended as a routine clinical test but it is a promising tool in modern oncology management.

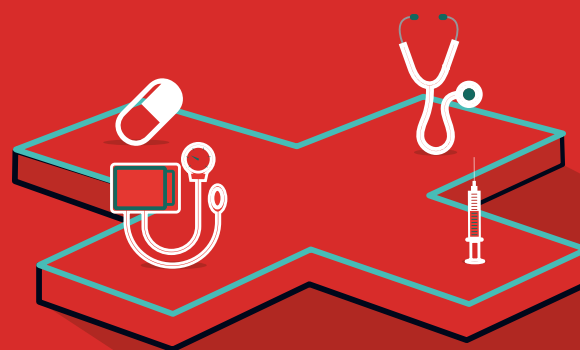
**Next Gene sequencing**

**{NGS}:** It refers to a deep and thorough DNA sequencing of tumour tissue obtained from biopsy. Almost all of tumour DNA characteristics like deletion, insertions, rearrangements, driver mutations and chemosensitivity. The complete utility of NGS in managing oncology patients is yet to be defined. It is an upcoming investigation which needs to be studied and defined for the best of care of patients. At present, NGS is used in cases where first line of treatment has failed, where cancer has recurred, where cancer is high grade or where all treatment options are exhausted. It can analyse large numbers of tissue simultaneously and find genetic variants and different genetic aberration.

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## INTERVIEW

# ‘India has about one-third of the global oral cancer cases’

There is lack of awareness, especially among the users of tobacco products, that the use of the products is strongly linked to cancer, informs **Dr Nishant Agrawal**, Professor of Surgery, Comprehensive Cancer Center and Radiation Oncology, University of Chicago in a conversation with **Akanki Sharma**

**Where does India stand when it comes to oral cancer cases as compared to other countries across the world? At present, do we have any solutions to prevent oral cancer?**

India contributes to about one-third of the global oral cancer cases. As far as prevention of the disease is concerned, labelling tobacco products—saying that these will cause cancer—and education starting in primary schools are some general measures. So far, there has not been an effective intervention. There is lack of awareness, especially among the users of tobacco products, that the use of the products is strongly linked to cancer.

**Is there any initiative or programme going on to make people aware about the harmful effects of oral cancer?**

Nothing beyond labelling cigarette packets, saying that this causes cancer.

Tell us about the solution that you have developed with Tata Memorial Hospital and Strand Life Sciences to prevent oral cancer.

We had published this research in 2015. Later, when I joined UChicago Medicine, we became aware of this grant mechanism of the Tata Centre for Development (TCD). We applied and got it. The only reason that this has been successful is because of the support from TCD since it's difficult to get funding for these types of projects. We have something that we developed in a pre-clinical laboratory and moved it to a



More than 50 per cent of oral cancer cases are diagnosed at stage three or four, which is a major challenge. At stage three or four, the prognosis is much worse and the survival rate is about 30 to 40 per cent

different country, hoping to commercialise it, which doesn't happen regularly or easily. Moreover, given the significant impact oral cancer has in India, they were equal

partners and tried to take this to the next level and develop, improve and make assays applicable within India. We later partnered with the Tata Memorial Hospital, Mumbai

and then with Manipal College of Dental Sciences to really have a certain multi-dimensional approach, so that when we do bring this to market, we have support from different sectors in healthcare.

**What possibilities did you see in saliva before thinking of developing this solution?**

Oral cancer develops in the cells of the mouth and cancer cells die just like other cells. Further, the DNA of cancer cells have errors or mutations in them. Hence, it seems obvious that the abnormally mutated DNA will also be present in saliva. So, we had a theory, which we tested, and a supportive significance where we have been able to take 100 per cent of the saliva. So, we have tried to decrease the cost of the assay and make it more applicable for India.

**What do you think can be the possible outcomes of this solution?**

The possible outcome will be the use of the assay to screen for pre-cancer or early-stage cancer to improve health outcomes and also decrease the cost of care.

**As far as oral cancer is concerned, what do you think are the major challenges? What other solutions, except the one you have developed, can be implemented to prevent the risk of this disease?**

More than 50 per cent of oral cancer cases are diagnosed at stage three or four, which is a major challenge. At stage three or four, the prognosis is

much worse and the survival rate is about 30 to 40 per cent. So, the challenge is to detect cancer at stage one or two, when the survival rate improves to about 70 to 90 per cent. The treatment is not as significant. Instead of 12 hours of surgery and one or two weeks in the hospital, the treatment may include four hours of surgery and one day in a hospital and then you go back to normal life. So, that's a big challenge we are looking to overcome: diagnose pre-cancer, so that treatment becomes much easier. We can identify the same mutations in the pre-cancer lesions.

**Are you planning to reach out to the Government of India for any help regarding this?**

Yes, we have to partner with the government. The students of Booth School of Business at the University of Chicago have taken this up as a global impact project. They are reaching out to the government, NGOs and private and public sectors, and trying to see how we can accommodate this.

**Any other important thing you would like to add?**

Beyond this assay, I think we all have a role to play. Further, prevention is indeed important for reducing incidences of oral cancer, and then early-stage detection. We all have the power to play an equal role by increasing awareness about the hazards of using tobacco products and betel quid (betel leaf, areca nut and slaked lime).

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# India is facing a surging cancer epidemic

**Dr Shankar Narang**, COO, Paras Healthcare talks about cancer incidences surge, and how India is grossly under-prepared to meet the rising burden of disease

**THE WORLD** has witnessed a major demographic and epidemiological transition over the past few decades with non-communicable lifestyle diseases overtaking communicable disease as leading killers of humankind. In line with this transition, cancer has emerged as a major public health concern. With a rapid rise in the incidence of this disease, India is facing a surging cancer epidemic. The age-standardised prevalence of cancer is estimated to be 97 per 100,000 persons with a higher incidence in urban areas. Between 1990 and 2016, the number of cancer deaths in India increased by a whopping 112 per cent and the disease incidence rose by 48.7 per cent. According to ICMR, cancer claimed over 7.8 lakh lives in India in 2018. Breast, cervical, oral and lung cancers together constitute 41 per cent of the cancer burden.

Unfortunately, India's healthcare system is not equipped to handle this surge, with a glaring paucity of diagnostic and treatment facilities outside select urban centres. There are just a few over 60 dedicated cancer care hospitals in the country which are grossly inadequate to handle the rising burden of disease. Shortage of oncologists, surgical oncologists and radiation oncologists is another major hurdle.

A study published in the *Journal of Global Oncology* in 2019 projected that cancer cases will double every 20 years as India continues to age. There is a need for not only increasing cancer care facilities but also expanding their availability beyond select urban areas.

## Shortage of specialists and infrastructure

The Indian Institute of Health Management Research estimated that India will need



**It is estimated that 40-60 per cent of available facilities are concentrated in less than 10 metropolitan cities while millions of people have no cancer care**

about 550 cancer treatment centres and over 5000 oncologists by 2021. The government had announced plans to establish 20 new advanced cancer treatment facilities across the country, one in each state, over the next few years to meet the rising burden of the disease. However, the government's plans also face the logistic hurdles such as shortage of specialists and surgeons in oncology. Lack of accessibility to cancer care beyond top tier urban areas is another worrisome aspect. It is estimated that 40-60 per cent of available facilities are concentrated in less than 10 metropolitan cities while millions of people have no cancer care facility in their towns and villages. Southern and Western India accounts

for almost 60 per cent of specialist facilities highlighting another geographical skew. Similarly, estimates suggest that India has less than 3000 mammograms installed while just around 30 per cent of the cancer centres have advanced imaging technologies such as PET-CT scanners.

We need a concrete medium and long-term plans involving both the government and private sectors to address this mammoth shortage. Not only do we need more hospitals and cancer care units we also need to create a democratic availability of the same. Rather than opening new hospitals in the state capitals or major cities, the government must strategically identify areas where cancer care is the most

inaccessible. All the new planned hospitals must come up first in those under-served areas.

Here, I would also like to urge the private sector to consider it a social obligation and take a lead in filling these voids. Private hospitals need to penetrate into smaller towns to be able to make quality care more accessible. This must be done by devising innovative low-cost models of healthcare delivery that can stay profitable yet affordable. As a healthcare provider, we are working to fill the void by taking quality cancer care closer to people in Tier 2 cities like Panchkula and Patna and also in Tier 1 city like Gurugram to ensure a more democratic availability of diagnostic and quality treatment facilities.

The government must roll out a series of incentives to the private sector such as land procurement at subsidised rates in remote areas, tax holidays and GST exemption on diagnostic equipment and machinery purchased for hospitals in smaller towns. Greater penetration of private hospitals will also help patients get the benefit of insurance through Ayushman Bharat scheme. According to estimates, there are about 2000 oncologists in India currently and this number needs to increase sharply if cancer care is to be made more accessible. Herein comes the need to increase both MBBS seats as well as PG seats in oncology and surgical oncology.

## Improving insurance penetration

As much as a debilitating disease, cancer is also a drag on resources, with cancer care among the most expensive treatments. Cancer by far remains the highest contributor to out-of-pocket expenses. Estimates suggest over 60 per cent of households who seek

cancer care for a member incur out of pocket expenditure more than 20 per cent of their annual per capita household expenditure, throwing many of them into poverty.

This is why apart from making affordable cancer care more accessible, it is equally important to increase the penetration of health insurance. We hope in the coming years, the government will work on expanding the PMJAY scheme to a wider section of the population including middle classes through options such as co-pay mechanisms. We also need to create greater awareness among people about the need for insurance.

## Focus on prevention

While the above two subjects deal with the curative part, we will not head anywhere unless we focus equally on the prevention side. Behavioural and dietary habits that are believed to be the triggers for almost one-third of all cancers include high body mass index, low fruit and vegetable intake, lack of physical activity, excessive consumption of processed and packaged foods, tobacco and alcohol use. It is estimated that over 30 per cent of cancer related deaths can be prevented by modifying key risk factors, particularly tobacco use.

Raising awareness among people about following healthy lifestyles and refraining from sedentary lives are important interventions needed at the grassroots. At the same time, we also need to encourage people about symptoms they shouldn't ignore and the need for regular preventive screenings. Unfortunately, a majority of cancers in India are diagnosed at later stages when treating them becomes difficult. Cancer screening must therefore be conducted by individuals in close consultation with their physicians.



# Bone cancer – Where do we ‘stand’?

**Dr Akshay Tiwari**, Associate Director and Head - Musculoskeletal Oncology, Max Super Speciality Hospital, Saket and **Dr Devavrat Arya**, Principal Consultant – Medical Oncology, Max Super Speciality Hospital, Saket write about the advancements, especially on the digital technology front, in the treatment options for bone sarcomas

**CANCER INCIDENCE** and cancer-related mortality are on the rise worldwide, and India is no exception. According to the National Cancer Registry Programme of the India Council of Medical Research (ICMR), the mortality rate due to cancer increased by about 6 per cent between 2012 and 2014, and the trend is expected to only get steeper. In fact, according to a recent study, an ageing India may see cancer cases doubling every 20 years, and Uttar Pradesh, Bihar, Jharkhand and Odisha, which are currently passing through huge epidemiological changes, will bear the biggest cancer burden in the next 10-20 years. The Population Cancer Registry of ICMR also shows that breast cancer and lung cancer kill the most women and men respectively. In the long list of cancers, primary bone cancer (cancer which starts within the bone itself, also known as bone sarcomas) is a rare cancer which has been shown to constitute less than 2 per cent of all cancers in this registry. These rare cancers have a similar incidence in all populations and hence are detected in time only if there is a high index of suspicion.

While they have a high mortality if not treated in time, they can also be associated with high morbidity in the form of loss of limbs. On the other hand, timely detection will affect a cure in up to 65-75 per cent of the patients. These cancers affect children and young adults more than older population, thereby affecting patients who are in productive, crucial stages of their lives. The treatment of these cancers usually involves a combination of surgery, chemotherapy and sometimes radiation therapy. The



Dr Akshay Tiwari

rarity of these cancers, coupled with a frequent need for multidisciplinary treatment, makes it imperative that these patients are treated only in specialised centres with expertise in managing bone sarcomas, including orthopaedic oncology, pathology, radiology, medical oncology, radiation oncology, physiotherapy and psycho-oncology. It has been proven beyond doubt that the outcome of patients with sarcomas is best when they are referred early to a specialised musculoskeletal oncology centre. In fact, even patients who undergo a biopsy (the initial diagnostic procedure for these patients) at a non-specialised centre have more chances of a compromise in their outcomes, both in terms of life and limb.

A lot of advancements have happened in bone sarcoma management, bringing up both survival and limb salvage rates. Accurate preoperative assessment of the extent of the tumour by MRI, precise staging, refinements in pathological diagnosis, help the treating team make the correct diagnosis, pick up the right treatment regimen in



Dr Devavrat Arya

the correct sequencing, and choose the correct form of surgery for the patient. Development of better chemotherapy protocols over decades has ensured a larger number of patients survive the disease. Equally important, if not more, is the increasing awareness among primary physicians, orthopaedic surgeons and public at large about the possibility of a bone sarcoma in a child or a young adult (or, in fact, any age group) who has an unusual bony pain not getting relieved by usual means, a bony swelling or a fracture with a trivial injury.

Like all cancers, the focus is now not increased survival along with the preservation of form and function of the limb as well. Amputations used to be commonly performed for these cancers a few decades ago. The good news is that there are now numerous centres across our country who have good sarcoma management units, even if there is a need for many, many more. At most specialised sarcoma centres in today's times, more than 90 per cent of these patients undergo a limb-sparing surgery (or limb-salvage sur-

gery), and amputations are very rarely required. This involves complete cancer removal along with a layer of surrounding normal tissue, and reconstructing the defect with a suitable means, most commonly prosthesis. Since complete removal of cancerous bone with an extra layer of bone as safety margins is curative, surgeons usually tend to err on the side of removing more bone rather than less, to be sure of complete disease removal. The two inherently contradictory attempts to remove the extra layer of bone for optimum cancer control and saving maximum possible bone for better function are the reason surgeons have to look for means to optimise both complete cancer removal but also saving not just limbs, but also joints and growth plates, if possible.

This is where new technology, computer navigation assisted bone tumour surgery, has come in as a breakthrough. Now available in India, this is a technology which enables the surgeon to exactly reproduce the precise surgical plan that is made preoperatively, making sure minimum bone needs to be removed and maximum form and function of the limb retained. As the MRI and CT scan images are loaded on to the software, the bone in question is registered (making it a 'map' to be charted by a 'GPS') and the instruments are calibrated, so as to give real-time feedback on the placement of cutting instruments with respect to the tumour. This intraoperative 'GPS' gives the orthopaedic oncologist the precision in placement of instruments on the bone reaching sub-millimetre accuracies. These instruments can then cut just the amount of bone that is re-

quired to be sacrificed for disease clearance while retaining a lot of precious bone which would have been otherwise removed.

This potentially means that we can save more bone close to a joint, thereby avoiding joint replacement in a young patient, or even a growth plate of a young child, preserving the growth potential of the limb. Navigation also shows the surgeon critical structures like blood vessels and nerves in the vicinity of bone (particularly in cancers involving the bones of pelvis and sacrum), making these major surgeries safer and more effective. Giving the surgeon more confidence to make closer cuts, computer navigation has been shown to reduce bone loss, blood loss and operative time without compromising disease clearance. Hence, computer navigation is being seen as the next big thing in orthopaedic oncology surgery, which adds to the safety and precision of these surgeries.

The rarity of these cancers, coupled with a frequent association of these symptoms with an injury in a playful child or an athletic adolescent, is a reason for a frequent delay in diagnosis and hence a delayed referral and treatment, leading to a compromise in survival and limb salvage. The need of the hour is to create awareness about the importance of early referral, and management at specialised centres right from the beginning of diagnosis and staging. A number of societies, NGOs, medical institutes and organisations in India are working towards creating this much-needed awareness which will hopefully bring further improvement in bone sarcoma management in India.

## INTERVIEW

# By igniting this spark in STEAM, society can be improved

Child Prodigy and Cancer Researcher, **Rishabh Jain** at the age of 13 created an algorithm that uses artificial intelligence (AI) to accurately locate and track the pancreas in real-time during MRI-guided radiotherapy. He was also named the overall winner of the 2018 Discovery Education and 3M annual Young Scientist Challenge. **Raelene Kambli** speaks with the genius and aspiring doctor to understand his vision for healthcare in India

## How did you get into AI at such a young age?

Some of my fondest memories come from STEM-related activities (science, technology, engineering, mathematics). I remember my first interaction with programming when I started using MIT Scratch, a simple drag-and-drop block environment. A few years later, I got exposed to the world of Lego robotics. Initially, I enjoyed building - but after a few years, I realised that my interests remained in programming. Again, the complexities of my projects grew, and I was soon working with my own Arduino programming projects. When I first started learning about artificial-intelligence in 2017, I was hooked. Since then, I have found AI fascinating and continue to use it in my projects.

## You created an algorithm that uses AI to accurately locate and track the pancreas in real-time during MRI-guided radiotherapy. Elaborate on your work.

Pancreatic cancer is a highly lethal and incurable disease of which survival rates have not improved significantly in the past 40 years. Currently, MRI-guided radiotherapy utilising high-energy ion beams is used to help shrink cancerous tumours. However, due to inter-patient variability, where the manifestation of the pancreas is different in every patient, and infraction anatomical changes such as breathing, tumours do

not get treated effectively. Despite the benefits of being non-invasive, radiotherapy tools are not becoming popular for pancreatic cancer due to manual intervention, human error, and movement of the pancreas during treatment. Today, pancreatic cancer oncologists are often forced to overshoot on the targeted pancreas to attempt controlling tumour size. My project proposes a novel artificial-intelligence-based tool to automatically segment out the pancreas in real-time. My tool, known as the Pancreatic Cancer Deep Learning System, uses a form of AI called deep learning. I trained my invention on images of the abdominal area and told it the exact location of the pancreas. After lots of fine tuning and adjusting, the accuracy began to increase and my tool became better at predicting the pancreas region. With such a capability, my invention can be paired with MRI-guided radiotherapy machines in order to offer a more accurate tool that saves more cells in the body.

## Why did you think of working on pancreatic cancer? We know that it is one notorious kind of cancers but anything that you came across triggered it?

I have been deeply moved by family friends passing away from cancer, leading me to volunteer at the Fall 2018 Purple Stride 5K run. I met several pancreatic cancer patients and survivors. It was



an inspiring moment to hear their personal stories of helplessness with a deep desire to be happy. Surprising statistics like the low survival-rate and aggressiveness hooked me in. As a technology enthusiast, I was inspired by Steve Jobs and knew how he had passed away from pancreatic cancer. I started thinking about what I could do to address the pandemic. While visiting a laboratory in Boston, I learned about pancreatic cancer radiotherapy and medical imaging. I asked myself, if I could use my knowledge in programming and AI to help tackle the pressing problem. Thus, my idea was born, and I was inspired to research in this area.

## How are you going to further your research in pancreatic cancers? Any other areas of cancer you would like to target?

I have delved deep into understanding the root of treatments and wondered if

there is a way to increase the success-rates of pancreatic cancer treatment. I am developing an AI system called The Pancreas Detective which detects the gene mutations of pancreatic cancer patients. By detecting such mutations, patients can then be given drugs that work for them. My tool is also able to shorten the current diagnosis and processing time required, offering a higher survival-rate for patients. In the future, I want to continue working on early-diagnosis for pancreatic cancer. I am interested in collaborating with a university in a medical setting. Further resources will help me improve my tools.

## You aim to go to medical school and become a doctor. So what would be your areas of interest as a healthcare provider?

I would like to go into the field of medicine and become a surgeon. I have always been inspired by my relatives in the fields of medicine, getting to see how it gives them the opportunity to make an immediate difference in the lives of people. As a surgeon, I will have the opportunity to make that difference, while also having the chance to use leading technology to cure patients. At the same time, I would love to continue my research and hopefully one day, be able to call pancreatic cancer a cured disease.

## You also advocate for improving access to scientific

## knowledge to young students. Can you share your vision on this?

I have co-founded the Samyak Science Society, a registered 501(c)3 non-profit organisation that provides and promotes for children. I envision a world where ALL students have the opportunity to be exposed to STEAM (Science, Technology, Engineering, the Arts and Mathematics) learning, regardless of age, gender, social status or ethnicity. This can be possible by creating a learning environment and providing exposure to STEAM at an early age. At the Samyak Science Society we are creating free STEAM workshops led by high school and college students to teach and mentor children-in-need. We are creating STEAM kits to donate in public libraries, schools, and clubs where we can reach thousands of students immediately. These kits will be accessible where underprivileged children can get access to engaging, hands-on content. Our activities and workshops are focussed on STEAM: science, technology, engineering, arts, and mathematics. The Samyak Science Society STEAM kit includes five activities/objects to represent each letter of STEAM - this approach works very cohesively and has had great success so far.

By igniting this spark in STEAM, society can be improved, and we can get more thinkers to work on problems like pancreatic cancer.

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## INTERVIEW

# In order to strengthen our healthcare system, we need to adopt a collaborative approach

Narrating about the progress achieved by PD Hinduja Hospital since its inception, **Joy Chakraborty**, COO, PD Hinduja Hospital and Medical Research Centre speaks about the transitions that India's healthcare sector has witnessed and how partners such as GE Healthcare have played a crucial role in this progress. In conversation with *Express Healthcare*

**PD Hinduja has been serving humanity for nearly seven decades. Help us recount how this journey has been so far?**

PD Hinduja Hospital was established in the early 1950s under the leadership of the late Shri PD Hinduja as part of their charitable mission to serve the nation. It has completed nearly seven decades. I have been part of this institute for the last 13 years and I must say that the journey of this institute has been great. Over the years this institute has been a great example of excellence and has contributed immensely to the healthcare sector in India.

To recall, the journey of this hospital I would say that it started right after partition. The situation faced by Bombay in those days was grim due to the influx of refugees. Sanitation in the crowded camps was poor. Health problems had multiplied. It was beyond the ability of the city's public hospitals to cope with the situation. Provision of an essential healthcare facility to the ailing poor thus became the need of the hour. Even in those days, the vision of the hospital was to deliver quality healthcare to the needy. In 1961, their eldest daughter-in-law Lalita Hinduja lost her husband and so she was given the responsibility to look after the hospital. She took it up as a social reform function and introduced many good clinical practices. Years later, the hospital was



registered under the charitable trust act. In the 1980s, the hospital trustees and management had a collaboration with the Massachusetts General Hospital that brought clinical expertise, knowledge and practices to the hospital and thereafter the hospital continued to achieve new heights. What was started as a small clinic has today grown to be a 400-bedded state-of-the-art one of the best institutes in the country. We are motivated to lead the pathway to medical excellence with world-class healthcare treatments and services.

Hinduja was one of the first hospitals to start the model of doctor consultant practice that brought a huge change in the society. Also, Hinduja hospital right from the beginning gave a lot of importance to learning and education as it believes that constant learning is a key to progress. This is one reason why we have been able to maintain our competence. The other important aspect that the hospital focussed was utilising the latest technologies to provide top-notch care to patients. We got the first Gamma Knife in India. That is why we have always stayed ahead in a

competitive environment and have remained relevant in changing market landscapes.

**How has Indian healthcare transformed over the last 2-3 decades?**

In my career spanning around 21 years, I have seen many gaps in the healthcare domain. There have been many demand and supply gaps when it came to healthcare delivery and services. Nevertheless, in the last 10-15 years, things have changed tremendously. Firstly, awareness among patients about health and healthcare has increased,

especially among those seeking care in private hospitals. This is also due to the rise in disposable income and the Internet boom which has made information on health and healthcare available in abundance. Secondly, there is a change in disease profiles among Indians. NCDs are on the rise — CVDs being one of the leading cause of emergencies within hospitals. The other change is the ageing population. Unfortunately, India is not geared up to address the health problems that the elderly community experiences.

Lastly, India is going through a huge regulatory change. Be it price reforms, health insurance and delivery models. Take the example of our flagship programme Ayushman Bharat scheme which is still going through its teething problems but seems to be much promising.

**What is your take on partnerships with the government? What kind of incentives should be provided to private entities to partner and deliver quality and affordable healthcare?**

In order to strengthen our healthcare system, we need to adopt a collaborative approach. Partnerships with the government are one way by which we can achieve this. However, successful PPPs in the healthcare domain are few. There is a need to create strategies that meet the

*Continued on Page 39*

## INTERVIEW

## There will be a new wave of integrated diagnostics'

Recalling the progressive history of radiology's sector in India, **Dr Harsh Mahajan**, Founder & Chief Radiologist, Mahajan Imaging shares some interesting turning points in his entrepreneurial journey. He also speaks of the contributions of GE Healthcare as his technology partner and how the radiology practice will shape the future of healthcare in India, in a chat with *Express Healthcare*

**How was the Indian healthcare scenario way back when you first started your career, in particularly the radiology sector?**

When I started my career, India was way behind the rest of the world as far as healthcare delivery was concerned, especially when it came to radiology. It is interesting to note that in 1988 when I came back from the US after completing my fellowship in MRI from MD Anderson Cancer Hospital in Texas, India had only one MRI machine in the country and very few CT scanners. We were pretty backwards in the real terms. Also, private healthcare hardly existed in those days. Apollo and Escorts were just starting off. People did not have much access to good quality healthcare services and in particularly radiology services were extremely scarce.

No government hospital had an MRI machine back then. The first MRI machine was installed in the DRDo lab of the Institute of Nuclear Medicine & Allied Sciences (INMAS). I actually came back to work in this lab because at that time I was the only MRI trained person in the country. Now the irony was that despite me being the only trained person for MRI, it took them around one year and nine months to complete my appointment process.

**So when did the transformation begin? How have patient outcomes changed in terms of affordability, access and clinical outcomes/efficacy?**



AI is the next big technology that will replicate the task that the radiologist does. It will become the radiologist assistant making the radiologist more accurate and efficient. Pick complex abnormalities. It will increase productivity and also make up for the shortage of radiologists in the country. It will create more access and in the long run, help to prevent illnesses

Major transformations happened during the late 90s and 2000s. It was the commitment of companies such as Wipro and GE Healthcare, which helped us bring in the best technologies in the country and improve the quality of care to our people. The progress has been such that today access to radiological services has improved tremendously, the quality of diagnosis has become top-notch and the affordability has also been taken care in many ways through government schemes etc. But most importantly, the maximum development began when India started to get the best medical technologies that help expand our diagnostics ability and treatment mechanisms, thanks to companies such as GE Healthcare. India's developmental journey in healthcare has been very impressive. Many new technologies are first introduced in India and then marketed in the rest of the world. That's something we should be proud of as our market has matured so well.

Today, we are developing AI algorithms for radiological sciences and fostering research in this space. This is indeed very noteworthy.

**So how did your entrepreneurial journey played a role in this transformation? So how did you procure your first MRI?**

My decision to venture into business was in 1989. I came from a very humble background. My parents were teachers and in those

days think of starting a business was an unproven idea, especially in my field. However, after I convinced my parents, I was able to convince four of my uncles who did the initial investment and then my dad's friend who was a businessman also got interested. My uncle never took back that money that they lent. I started with an initial investment of Rs 6.85 lakh. At the time the dollar was around Rs 16. We then rented a place for the first centre and spoke GE Healthcare. The machine cost nearly 2.5 crores and so we approached the banks. But then came the hassle of getting the loan. Now in those days getting a loan worth, a crore was extremely difficult. After a lot of hard selling to the banks and because the loan amount was too high, IFCI and ICICI agreed to share the loan amount. The interest rate was 27 per cent for that loan especially to get a life-saving technology in India. The import duty was 204 per cent initially with a condition that we had to do 40 per cent cases free, after which our duty would be exempted.

Now, at that time there was a shortage of foreign exchange in the country and so we had to wait for the letter of credit. With hard work and more, I was able to get the first superconducting MRI by GE Healthcare in 1990. At that time there were no MRIs in this part of the country. So we serviced people from Jammu & Kashmir, Punjab, Haryana, UP, Bihar, MP, Odisha, North East, Delhi of course, and more. The MRI really did



very well. AIIMS and PGI also got their MRI after us and GE Healthcare was very supportive. After which it took about 8-10 years for the technology to be available to all.

## Why did you choose GE Healthcare's MRI?

Now, I had worked on a GE Healthcare's MRI when I was at the MD Anderson Cancer Hospital and I was so lucky that in December 1986 the MRI was installed there and in 1987 I was doing my fellowship at the hospital. And because I had worked the GE Healthcare's MRI there, I was keen on buying the MRI for my centre too.

Another important milestone was in the year 1990 when Wipro joined hands with GE Healthcare. Prior to this, the company functioned in India through various dealers, but these partnerships actually changed the face of diagnostic imaging in India.

It was also the time when one could clearly understand that the company saw the immense potential in the Indian market and that they were very serious in establishing their business in this country.

Also, over the years GE Healthcare has shown leadership in many ways. For example, in 1997 the best 1.5 Tesla MRI that they made which had functional imaging tools like diffusion, perfusion and bold imaging (GE Healthcare's Signa Echospeed, Signa LX Echospeed machine) was first brought to India and then to Canada and third went to the US. So, that was their commitment and our potential.

## How did it improve clinical value?

It really made a huge difference in clinical outcomes, in terms of precision, efficiency and more. It opened so many

avenues for radiological progress in varied areas.

## Can you mention some of the major disruptions in the field of radiology?

Well, over years apart from MRI technology, a lot of disruption happening after the multislice CT was introduced. At that time when MRI was experiencing an ascending growth where it was explored in many areas of chest diagnosis, pelvis, brain, spine, abdomen and a lot more, CT was said to fade out or had a sluggish growth. But the introduction of multislice CT in 2003-2004 everything changed. And then the other disruption came with the PETCT.

Now PET was around when MRI was introduced but somehow the technology remained just a research tool and MRI got more prominence. Nevertheless, when CT got married to PET, that's when the disruption came. PET/CT became the

number one growth area for any imaging modality.

## What kind of trends do you see maturing and creating an impact on healthcare delivery in India?

AI is the next big technology that will replicate the task that the radiologist does. It will become the radiologist assistant making the radiologist more accurate and efficient. Pick complex abnormalities. It will increase productivity and also make up for the shortage of radiologists in the country. It will create more access and in the long run, help to prevent illnesses.

The other area that will see traction is radio-genomics. The convergence of radiology and genomics has an immense scope that currently a lot of efforts are put in understanding this field better.

I personally feel that there will be a new wave of integrated diagnostics where

a radiologist will be best suited to become the integrated diagnostic specialist who can diagnose everything and give a synopsis of the examinations and take decisions as well.

## This year marks 30 years of Wipro GE in India and you have had a long-standing association with GE Healthcare. In your lens, how have you seen their role in this healthcare transformation?

GE Healthcare has always been very supportive in terms of helping us upgrade our machines at the right time with the latest technologies and at affordable costs. They have always helped us bring the best in India and have also catered especially to our market's needs. They have been very focussed on quality and patient care and that's why our association with them has worked for so long.

# In order to strengthen our healthcare...

*Continued from Page 37*

needs of all stakeholders in the partnerships and possibly some SOPs need to be outlined.

## How has the role of medical technology evolved over the years?

The advancements and utilisation of medical technology have played a vital role in the evolution of India's healthcare system. Earlier, I spoke about the demand and supply gap and other challenges that hamper progress. I feel in future, technology will be the solution to the many problems that our country's healthcare system faces. Now there are two types of technology portfolios — Meditech (Gamma Knife, robotics, cath labs, MRIs, linear accelerators etc) and IT-based technologies.

While medical technologies come at a very high cost, IT-based applications related to patient engagement and patient education come at a nominal cost. Now with the application of AI, augmented reality and more, we can enhance patient experience and provide better care at a lower cost.

**GE Healthcare has been a valuable partner to you in your journey. What do you value most in this partnership? This year, Wipro-GE completes 30 years in India. In your view, how have they impacted the healthcare ecosystem in this country?** There are many limited numbers of technology providers who have a credible name in the eyes of customers like us. GE Healthcare is one amongst

those top credible brands. They are one of the first companies to understand the Indian market potential. They brought the best technologies to the Indian market as soon as the technology was launched. So for example, years ago when a medtech equipment was launched abroad it took a lot of time to be brought to India. Today, this has changed. Thanks to companies such as GE Healthcare. Plus, GE Healthcare, as a company has understood the price sensitivity of the Indian market and addressed it to a certain extent. Moreover, now GE Healthcare has started to manufacture equipment that suits the needs of Indian consumers.

The approach has helped them acquire a good market share in the country and also gain enough goodwill.

Providers today trust their products. Ours is a long-standing relationship with GE Healthcare. Many times we have been their first customer to buy new technology. We appreciate this partnership.

## How can Medtech companies such as GE Healthcare improve the healthcare delivery scenario in India?

We have already seen that companies such as GE Healthcare have already started manufacturing equipment that suits India's needs. It has started manufacturing many devices and equipment in India too. I hope that someday, GE will manufacture high-end radiological technologies such as MRIs in India which can be exported to south-east Asian, the Middle East, African countries too.

The second thing is the utilisation of Indian talent. India has a wide talent pool. Companies such as GE Healthcare have already started incubating and training manpower to utilise these advanced technologies. In future, we hope that India can be a great talent provider for the sector.

## What are the innovations/technologies that will define the future of healthcare in India?

AI, nanotechnologies, molecular diagnostics are some areas that will define the future. But there is a need for further research so that people can understand it better and utilise it better as well. The acceptance is yet not fully satisfying and we truly need a mindset change. Nevertheless, proper research and evidence will help us in future.

## INTERVIEW

# Our target till 2022 is to continuously support the efforts of the states and districts

Measles and rubella are endemic across the country with 95 per cent of the measles and 90 per cent rubella cases occurring under 15 years of age, informs **Deepak Kapur**, Chairman, Rotary International's India National PolioPlus Committee to **Akanki Sharma** in an

## What measures should we take to eliminate rubella and control measles?

The Government of India (GoI) launched Mission Indradhanush on December 25, 2014 with the aim to achieve full immunisation coverage for all children by 2020. In line with routine immunisation, this mission also aimed to provide vaccination to those children who are either unvaccinated or are partially vaccinated against seven vaccine-preventable diseases which include diphtheria, whooping cough, tetanus, polio, tuberculosis, measles and hepatitis.

The India Expert Advisory Group on Measles & Rubella (IEAG-MR) appreciated the recent efforts made to monitor surveillance indicators at the national level. However, elimination of standard targets are yet to be met. It was noted that significant efforts have been made to close the immunity gaps for measles and rubella through supplementary immunisation activities but it concluded that urgent improvements in routine immunisation coverage (including on-time delivery of MRCV1 and MRCV2) are required to sustain recent gains. Unless routine immunisation is strengthened, the immunity gap for measles and rubella will continue to increase.

## Share the statistics and adverse impacts of both the diseases.

Measles and rubella are an endemic across the country with 95 per cent of the measles and 90 per cent rubella cases occurring under 15 years of age. More than 50 per cent of

measles cases go unvaccinated and more than 60 per cent of the 21.5 million children, who did not receive one dose of measles vaccination in 2013, came from only six countries — India, Nigeria, Pakistan, Ethiopia, Indonesia and the Democratic Republic of Congo.

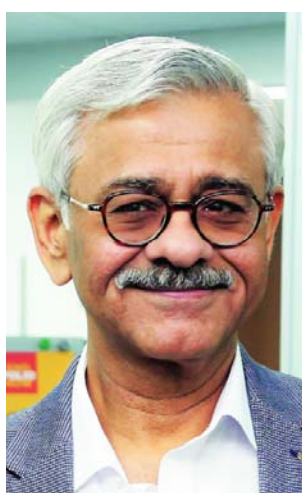
## How do you plan to contribute towards the initiative taken by the GoI to end measles and control rubella?

The infrastructure and innovations that helped India reach the poorest and the most marginalised continue to be utilised by the Global Polio Eradication Initiative (GPEI) to deliver other critical health interventions. For instance, the infrastructure and expertise that the GPEI established in India have been used to assist in the transportation and dissemination of critical vaccines for measles, hepatitis B and Japanese encephalitis vaccines, especially vaccines that require a cold chain.

Rotary International will support the Indian government to increase the level of routine immunisation, especially in five key states — Bihar, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh.

On request of the GoI, a nodal rotary representative is appointed at the state level to coordinate. Similarly, a nodal person at the district level will be appointed. This mission plans to eventually close immunity gaps and strengthens immunisation health systems for improved vaccine delivery implementation.

## MoH&FW, in 2017, had announced the rubella



## vaccine in its universal immunisation programme (UIP) as measles-rubella vaccine (MR) vaccine towards the 'obliterate measles and constraint rubella by 2020.'

**What is the current status?** The western hemisphere eliminated measles in 2002 and rubella in 2009. IEAG on MR is seeking support from Rotary for MR elimination and rotary approached the GoI to support the target of MR elimination by 2020. Globally, vaccinating against measles and rubella provides huge rewards: every \$1 invested in vaccines yields a \$58 return.

In 2017, an MoU was signed between the MOH&FW, GoI and the India National PolioPlus Committee of RI with respect to the polio eradication programme, routine immunisation including Mission Indradhanush, Intensified Mission Indradhanush and Elimination of Measles and Rubella on December 6, 2017. The IEAG-MR concluded that the strategies laid out for measles elimination and rubella/CRS

control are sound and feasible. Significant progress has been made towards the implementation of the strategies. Despite a high level of political and administrative commitments, the standard targets are yet to be met and need to optimally implement all the strategies.

## What measures should be taken to prevent its return?

While the eradication of polio in India is a huge success, there is ample work waiting to be done to protect the hard-won ground to maintain eradication. Rotary continues to support immunisation efforts in India. The effort to eradicate polio represents one of the most ambitious global health initiatives in history and we must remain dedicated to reach every last child to ensure we don't see a resurgence of the disease.

The country has taken measures to prevent polio virus coming to India from polio-affected countries and the new polio immunisation regime for travellers came into effect from January 30, 2014. The Indian embassies in the seven countries have shared this information widely to enable travellers to take oral polio vaccine (OPV). India has made polio vaccination a requirement for people coming from and travelling to seven polio-affected countries — Afghanistan, Ethiopia, Israel, Kenya, Somalia, Nigeria and Pakistan. All travellers coming from and going to these countries will be required to take OPV six weeks before their departure from their country and carry a certificate as proof of vaccination.

Moreover, efforts are made to implement school entry immunisation checks and referral for missed children for vaccination to sustain high immunity levels to prevent resurgence, if introductions were to occur.

## In context to the MoU signed with MoH&FW in 2017 to provide support and accelerate polio eradication programme and routine immunisation including mission Indradhanush, how successful have you been till date, and what were the major challenges in this journey? What helped you to overcome those for reaching your target?

Under the signed MoU, Rotary International supports community mobilisation activities through its robust rotary member network across the country. We also support advocacy and generating awareness through innovative approaches and engaging private practitioners and local leaders.

Our efforts also continue to support the government on national and sub-national immunisation days to raise awareness and help people get their children vaccinated on time always through our robust network of over 12 lakh rotary members in India. Our target till 2022 is to continuously support the efforts of the states and districts for advocacy and community mobilisation for polio eradication programme, routine immunisation including Mission Indradhanush, Intensified Mission Indradhanush and Measles-Rubella.

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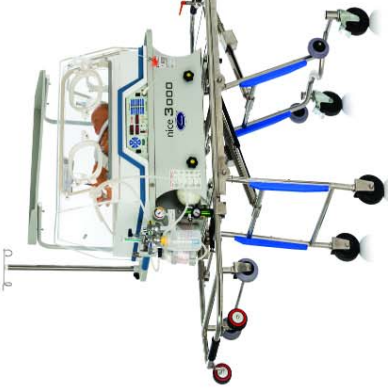


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# Siemens Healthineers India launches ACUSON Redwood Ultrasound System at IRIA 2020



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

"We are seeing an increased demand for premium medical imaging services being driven by the growing healthcare needs of a population with varied requirements, particularly in regard to chronic diseases,"

says Vivek Kanade, Executive Director, Siemens Healthineers India. We worked together with inputs from users to transform care delivery with the ACUSON Redwood and meet these challenges. This system is designed to deliver premium image quality, exceptional performance, and greater workflow efficiency."

### **Shared services radiology /Ob & Gyn capabilities**

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

A full portfolio of high-performance transducers includ-

ing compact micro-pin less technology and single crystal transducers support superb image quality. With our coherent image formation (CIF) technology, the ACUSON Redwood maintains B-mode image quality performance even in complex modes and the system's UltraArt Universal Image Processing provides several image choices right on the touch screen avoiding manual adjustment of multiple image parameters.

With a suite of AI-powered tools, the ACUSON Redwood delivers smart workflows for greater efficiency. Designed to go beyond the radiology department and bring precision imaging to more patients, lightweight and portable with 13 transducers, the ACUSON Redwood is easy to move and delivers premium imaging capabilities to the various clinical

departments within an organisation, such as radiology, cardiology and OB/Gyn.

### **Shared services cardiology capabilities**

The ACUSON Redwood is a comprehensive shared services cardiac solution. In this environment it is crucial to address the needs of a broad range of cardiac assessments which is why the system includes applications such as syngo Velocity Vector Imaging (VVI) technology, an advanced 2D quantitative tool for assessment of global and regional myocardial motion and mechanics, stress echo with a complete wall motion scoring analysis package and Left Ventricular Opacification (LVO) mode to enable cardiac contrast agent imaging.

Siemens Healthineers has been at the forefront of bring-

ing premium technology across imaging platforms and this new premium ultrasound is a testimony to the same. With the ACUSON Redwood, Siemens Healthineers enhances its portfolio of systems built on the new architecture platform, joining the flagship ACUSON Sequoia, and the high-performance ACUSON Juniper. The ACUSON Redwood has 510K clearance from the US Food and Drug Administration (FDA) and European CE mark.

### **Contact:**

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Today, with 1300+ installations across 20+ countries, Revolution™ ACTs is the best-selling CT scanner across the globe, touching 2.5+ million lives every year. It has ushered a revolution that has changed the healthcare landscape of India with about 75 per cent installations outside of metro and Tier-1 locations and over 60 per cent of customers being new users of CT scanners. With Revolution™ ACTs, GE Healthcare is driving large-scale health impact through public private partnerships in

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## **The revolution continues**

In 2019, GE Healthcare launched Revolution™ ACTs Expert Edition, a new CT platform, packed with end-to-end product enhancements like:

- An advanced multi-modality advantage workstation which will help enhance workflow and support high-end advanced applications

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The bubble CPAP system provides respiratory supports with body temperature, pressure saturated gas to the infant. Optimal humidity promotes mucociliary clearance and reduces the work of breathing.

## Infant nasal prongs and nasal mask

Contoured nasal prongs and nasal mask made from non reactive silicone along with a unique cannula body provides stability during therapy. The integrated pressure monitoring line allows the monitoring of nasal prong pressure without having lines near the infant's face offered in seven different sizes of nasal prongs and four different sizes of nasal masks. It can be used on a wide range of patients from premature to new born baby.

## Bubble generator

Bubble generator provides a convenient means to apply positive airway pressure, freeing the clinician to focus on patient care, not the device. This design delivers accuracy and stability throughout the course of therapy.

The ergonomic design allows airway pressure to be easily set without the cumbersome time consuming tasks normally associated with bubble devices.

Water feeding port allows water to be added or removed by disconnecting the expiratory circuit. Minimum and maximum lines clearly visible in highly transparent jar.

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# Pharmacogenomics- Essential to end the era of trial and error medicine

**Chandni Luthra**, Co-Founder, FutureMed elucidates on the impact that trial and error has had on patients earlier, but in today's age adverse drug reactions is considered to be the fourth leading cause of death worldwide and has almost doubled in India in the last three years

Doctors always want to get it right the first time when treating their patients, but in reality the strategy to making it "just right" is more like Goldilocks approach. When a patient comes in for a diagnosis, the doctor has the following options- aggressive, mild or standard. Most patients are prescribed a standard treatment, some may do well while others do not get any benefit or may even experience severe side effects. In such cases a new medicine will be recommended and the same cycle will continue. This trial and error may have been acceptable earlier, but in today's age when adverse drug reactions is considered to be the fourth leading cause of death worldwide and has almost doubled in India since the last three years, clinicians need to do better especially when the stakes are high, the advance of disease is rapid and cost effectiveness is a must.

Most of the drugs that are currently available are one-size fits all but there is no guarantee that they will work the same way for everyone. It is estimated that on an average 15-35 per cent of patients have an adequate or no response to beta blockers while 10-20 per cent of patients do not respond to antipsychotic therapies initially (*Indian Journal of Human Genetics*, 2011). Studies conducted by JIPMER, SGPGI and Gangaram Hospital (Delhi) also indicate that 30 per cent of Indians are sensitive to certain drugs such as clopidogrel, an anti-platelet agent widely used to treat cardiovascular diseases, subjecting both patients and their doctors to a greater uncertainty, often entailing huge costs-physical as well as financial especially for the patients.

How an individual responds to a particular drug - positive or



Information from pharmacogenetic testing is imperative, not only to understand how well the body responds to the drugs but also the exact dosage that is needed to treat the ailment. Pharmacogenomics can redefine the way drugs are developed and chosen for the patients. By understanding the genetics behind a patient's response to therapy doctors can not only reduce adverse drug reactions but also significantly lower healthcare costs

negative, is determined by a number of factors such as gender, age, lifestyle, environment, state of health, organ function, drug-drug interaction as well variations in the genetic make-up, which accounts for nearly 95 per cent of the variability in drug metabolism and its effect. Thus information from pharmacogenetic testing is imperative, not only to understand how well the body responds to the drugs but also the exact dosage that is needed to treat the ailment.

When a medicine is taken, the body needs to absorb it, dis-

tribute it to the intended area, metabolise it and finally excrete the non-utilised part either through urine, bile or sometimes exhalation. Genetic variations influence each and every aspect of this process including how well your body breaks down a particular drug. So if an individual has a mutation that breaks down a drug very quickly the body will use the drug faster and the person will require a higher dosage of the medicine to be effective. Similarly if the body breaks down the drug slowly a lower dosage would be advisable.

Research has shown that more than 85 per cent of patients tend to have significant genetic variations in the most important cytochromes, responsible for metabolising half of the medicines in clinical use. For instance, the CYP2D6 gene helps to breakdown and terminates the actions of certain beta-blockers, antidepressants, neuroleptics and antiarrhythmics drugs but approximately seven per cent of the population have a variant that makes them an intermediate or poor

metaboliser, while 35 per cent are carriers of non-functional allele of this gene, increasing the risk for toxicity and adverse reactions even on low dosage. Therefore if a doctor is prescribing citalopram or amitriptyline to treat depression it is advisable that they ask their patients to undergo pharmacogenomic testing to decide the correct dosage or choose a different drug for greater efficacy and safety.

Doctors can also use pharmacogenetic testing to determine the correct treatment for various types of cancers. For instance breast cancer can be treated by the T-DM1 drug, which works by attaching itself to the HER2 receptors on the cancerous cells. A sample of the tumour can be tested to determine whether there is a mutation that produces too much of HER2. If the test is positive and the tumour has a high amount of HER2, only then T-DM1 should be prescribed because if the tumour does not have HER2 the T-DM1 drug will not work well for the patient.

Pharmacogenomics can redefine the way drugs are developed and chosen for the patients. By understanding the genetics behind a patient's response to therapy doctors can not only reduce adverse drug reactions but also significantly lower healthcare costs by reducing the duration the patients are on medications as well as the number of medications a person might take to find an effective treatment. To this end and to make precision medicine a reality FutureMed offers pharmacogenetic tests for cardiology, neurology, psychiatry and cancer to help doctors support their patients with accurate information and the best possible course of action.

## INTERVIEW

# 'We keep five principles in mind when designing any healthcare-related app'

Tech adoption in the Indian healthcare industry is growing significantly however, many times products which are designed to be technically efficient remains unattained from a patient's understanding perspective. **Sharan Grandigae**, Founder and CEO, Redd Experience Design talks about the issues in the healthcare sector, particularly in the software vertical and differentiates the patients requirements in healthcare industry vs food or any other industry, to **Usha Sharma**

### Why does design matter so much in the healthcare sector and how do interfaces help companies?

By and large, hospitals today are using more and more technology to systematise all the interactions within them. Whether it's billing at the pharmacy or appointments with doctors, software systems are now taking care of it all. At the very heart of UX design lies understanding the psychology of a user. Being perceptive of the patient's state of mind at the very least helps us design more relevant software and in the best-case scenario, the patient forms a bond with the hospital through the software. We've designed a software application for Cloudnine Hospitals where the patient primarily interacts with the hospital through the app, including finding a doctor, booking an appointment, getting assistance during consultations, keeping track of medical history and progress over time and even engaging with a community.

### Why do you feel that software in the healthcare sector needs to undergo rethinking of the development process and how can it be done?

While things have been changing for the better over the last few years, we still feel that there is room for improvement when it comes

to user experience design in the healthcare sector. Quite often, products are designed to be technically efficient but without keeping the patient in mind. When research has shown that bedside manner is key to a patient's recovery, why is the patient so often not considered when designing products? Incessantly flashing or beeping bedside monitors, drab shades of walls in hospitals, confusing prescriptions or alarming colours used within apps are all contributing factors of a poor user experience. This not only affects the experience, but also the outcomes and the recovery of patients. The main issue in the healthcare sector is in the software vertical that is aimed at consumers/patients. It seems like software design in this space is borrowing heavily from other B2C industries. For example, if you're looking for a doctor in any speciality, you can use apps that show you the rating of doctors on a five-star scale. This has been directly borrowed from food delivery apps and is useful in identifying bad restaurants. But the idea doesn't actually translate to healthcare because the rating of doctors by other patients goes only so far as to disqualify the bad doctors and doesn't inform a patient about who the right doctor is for them. One patient may prefer a doctor who is to-the-point and lays out the



steps that need to be taken for recovery, whereas a second patient may prefer a doctor who provides reassurance. In the food delivery scenario, avoiding a bad restaurant is an acceptable outcome as it's not life threatening, but in the healthcare industry, not getting the right doctor-patient match could mean the difference between excellent recovery and prolonged suffering.

### What are some of the challenges in designing healthcare applications and products?

There are two main challenges when designing software systems for the healthcare industry — regulatory compliance and the adoption barrier of software systems. There are a number of laws surrounding healthcare and sometimes for good reason, but this also makes it tough to develop software systems because only certain methods

are prescribed by regulators. For example, there are proposals for maintaining a record of all the visitors of a patient at a hospital. Although this isn't a problem by itself, it becomes an obstacle when the law goes on to specify that this needs to be done with paper and pen. Even when workable software systems are developed, getting hospital staff and patients to use it poses a number of hurdles. Some staff worry about job security if software systems were to replace some of their functions and patients sometimes feel that they are not getting the right or the full service when using an app and fall back on human interactions.

### How does UX design adapt to the emergence of new healthcare technologies?

For the most part, healthcare technology relies on end users being relatively tech-savvy, or at a minimum, able to use

smartphones or tablets as their interfaces. For example, a client of ours who is involved in the breast cancer-detection field, had developed a device to be used on the patient, which interfaced with an app on a smartphone. So UX designers like us are regularly brought on to design these interfaces and make them intuitive and simple to use even by untrained users.

### What goes into designing a great experience for a patient in the healthcare industry?

We always keep five principles in mind when designing any healthcare-related app, especially one that is going to be used by patients — “be sensitive”, “be relevant”, “be a lifeline to all”, “be social” and “be a part of the culture”. These principles hold the user's needs at the core of the design process and build something that will be highly appreciated by them. Something else that must be paid close attention to is data privacy and security. Since any digital system can be hacked and patient data leaked, the design should work in measures such as requiring only relevant information at the right time. The identity of the user should always be treated as inviolable and its disclosure required only when absolutely necessary, using pseudonyms in other instances.

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# INVESTMENT

## INTERVIEW

### We have plans to open 25 centres in the next two years

Chennai based eyecare specialised hospital, Dr Agarwal's Healthcare has robust expansion plans and raised Rs 270 crore and Rs 215 crore from Temasek and CDC Group Plc respectively. The company aims to deliver high quality eye care at affordable prices and plans to open new centres in Tier-II and III cities. **Dr Ashvin Agarwal**, Executive Director and Chief of Clinical Services divulges the company's expansion plans with **Usha Sharma**

**Dr Agarwal's Eye Hospital is a family run business and the third generation is continuing the family legacy, tell us about the journey so far.**

Dr Agarwal's Healthcare is headquartered in Chennai founded by the late Dr Jaiveer Agarwal in 1957. The first hospital which also serves as the flagship hospital was launched in 1976 in Chennai. That was a Greenfield project. Then, in 2006, we decided to take quality eyecare to the doorsteps of the people rather than the other way round. Dr Agarwal's Eye Hospital has a network of 88 eye hospitals in 12 states within India and has a presence in Africa as well. Out of these, 70+ are in India and remaining are in the African continent in countries like Ghana, Kenya, Madagascar, Mauritius, Nigeria, Rwanda, Mozambique and Tanzania.

**The recent development of Dr Agarwal's Eye Hospital indicates that there are geographical expansion plans in place, tell us more about it.**

We have plans to open 25 centres in the next two years in India. Our focus would be more on expanding our presence in Tier-II and III locations in multiple states such as Karnataka, AP-Telangana, Kerala, Madhya Pradesh, Maharashtra and Tamil Nadu. The expansion will be done through a mix of strategic partnerships, acquisitions and greenfield hospitals. Besides adding new centres, we would invest in introducing cutting edge technology as innovation and technology has always been at the forefront of our growth.

**How much do you plan to invest and how are you raising it?**

Last year we raised Rs 270 crore from Temasek, a global investment company headquartered in Singapore. The investment was used to expand the Indian geographical footprint of the international eyecare chain, along with significant investments in latest technology for super speciality eyecare. Recently, we raised Rs 215 crore in debt from CDC Group which would go towards furthering the same vision.

**Early this year, Temasek, an investment firm made an investment of Rs 270-crore, tell us how the strategic investment plans are in line with its decisive plans?**

As mentioned above, the investment was used to expand the Indian geographical footprint of the international eyecare chain through greenfield and brownfield expansion, along with significant investments in latest technology for super speciality eyecare. We had an objective of adding about 50-75 hospitals to our network over the next three to five years with a major focus on metro cities as well as Tier II and Tier III towns. The expansion was done through a mix of strategic partnerships, acquisitions and greenfield hospitals and we will be investing further in cutting edge technology such as SMILE, FemtoLaser and Robotic Cataract Surgery across all our centres. Our aim is to deliver high quality eyecare at affordable prices at people's doorsteps.



**Give us an insight on the company's investment plans for bringing cutting edge technology in SMILE, FemtoLaser and Robotic Cataract Surgery? And how such tech expertise will help the company to grow multi-fold?**

Robotics in eyecare, specially cataract surgery, is making a huge difference in terms of accuracy, better outcomes and addressing the shortage of skilled manpower. Additionally, I see SMILE and FemtoLaser becoming more popular and making a huge difference. Lucentis is picking up to help prevent decreased vision and blindness. In the years to come, virtual reality devices are expected to play a key role in detection of glaucoma.

**The company holds a strong presence in the southern market and expanding its presence in other regions as well, how do you maintain the**

**competition in the market and what is the USP of your centres?**

The Dr Agarwal Eye Hospital Group has been at the forefront of innovation in the field of ophthalmology with procedures such as glued IOL (to treat patients with complicated lens problems), PDEK (an ultra-modern form of corneal transplants) and PhakoNIT (removal of cataract through a sub Imm incision). The latest invention from the group is a novel technique called "Single-Pass Four Throw" (SFT) along with "Pin Hole Pupilloplasty", which is also referred to as PPP. The surgical technique is being used to help in pupillary reconstruction as well as to treat complicated cases of narrow angle glaucoma. The company has an organised section of doctors that are part of what is called as the Clinical Board that deals with strategic planning for patient outcomes, patient safety and ensuring that the doctors are well educated and trained for taking on new skills needed for the job. The group also offers a DNB (postgraduate) programme and various fellowship programmes to train young, budding surgeons. The USP of the hospital group is to provide the best quality eyecare with best-in-class patient service.

**What steps are you taking in order to create a brand awareness among the masses?**

We constantly reach out to patients through screening campaigns, awareness talks at schools and workplaces. We circulate brochures, pamphlets and we like to educate about diseases, prevention and cure. The

brand also invests heavily in above the line media activities like outdoor, TV campaigns and radio campaigns. Patient awareness and communication is an ongoing exercise for the group.

**The company has its international presence in Africa, which are the new geographies on your card and why?**

Yes, we have 13 centres in Africa now. The local government has been very supportive of our presence there. We are looking at deepening our footprint in existing geographies like Kenya, Tanzania and Nigeria.

**You were looking for strategic partnerships, acquisitions and greenfield hospitals, what is the development update on this?**

There are projects in the pipeline and are confidential. We have tied up with Advanced Eye Institute in Navi Mumbai and Miralay Eye Care in Bengaluru as the first step in this financial year.

**Please share your future outlook, plans for next three years.**

We would definitely be the largest eyecare chain in the private sector in India with a robust global presence. Our brand presence would be fortified further, and we would always be on the forefront of innovation and cutting edge technology. From 350 doctors, we would have 700 doctors and around 10,000 employees from 3,500 at present- in five years' time and would strive to reach a footprint of 150 hospitals.

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# Dr Partap Chauhan conferred with Ayurveda Ratan Award in Brussels

**Dr Chauhan** emphasised on the need to encourage acceptance by legalising the classical Indian health science in European nations

As a part of a distinguished group of Ayurveda luminaries, Dr Partap Chauhan discussed with his European counterparts the key strengths of authentic Indian Ayurveda in resolving the world's need for a holistic healthcare blueprint that could potentially reduce dependency on synthetic medicines by leveraging the body's innate ability to heal itself, which by principle is the definition of Ayurveda.

At the event in Brussels, Dr Chauhan emphasised on the need to encourage acceptance by legalising the classical Indian health science in European nations. Dr Chauhan noted that until recently there was a lack of understanding and misconceptions in the West about



Ayurveda's potential and effectiveness. Dr Chauhan said, "The

attitude towards Ayurveda in Europe is undergoing a sea-

change. The earlier scepticism has given way to curiosity and

would soon lead to acceptance. There are many areas like mental health and chronic diseases for which modern medicine is found wanting but Ayurveda has an effective solution."

In addition to the Indian Ambassador to European Union, Gaitri Kumar and Geoffrey Charles Van Orden, the British Conservative Member of European Parliament, the event was attended by members of the European Parliament, Ayurveda practitioners and enthusiasts, policymakers, academicians, and several representatives and delegates from EU nations and other major regions of the world.

Ayurveda Day was first celebrated at the European Parliament on November 21, 2018.

## Nikhel Goel Joins Carestream Health India as Country General Manager

Prior to joining Carestream, Goel was working with Meril Life Sciences as Vice President – Marketing & Strategy (International Business) and had earlier worked with Johnson & Johnson Medical, Kotak Mahindra Bank, Citi Bank and HDFC Bank

**CARESTREAM HEALTH** India recently announced the appointment of Nikhel Goel as Country General Manager - India & Indian Subcontinents. In this capacity Goel will be responsible for the business of Carestream Health in India, Bangladesh, Bhutan, Maldives, Nepal and Sri Lanka.

Prior to joining Carestream, Goel was working with Meril Life Sciences as Vice President – Marketing & Strategy (International Business) and had earlier worked with Johnson & Johnson Medical, Kotak Mahindra Bank, Citi Bank and HDFC Bank.

Goel completed his MBA in

Marketing and International Business from Symbiosis Institute of Foreign Trade, and Bachelor studies in Arts. He brings more than 17 years of experience in leadership roles—with more than 10 years in healthcare—across diverse businesses including consumables and capital equipment.



"It is indeed an honour to join Carestream Health, an organisation with a strong legacy and brand reputation world-

wide. I look forward to working with the talented team in Carestream and to take this legacy to newer heights," said Goel.



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