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MAY 2022, ₹50

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Dr Sunil Solomon
Associate Professor,
Johns Hopkins University
School of Medicine

HR

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Interview

Dr Sunil Solomon
Associate Professor,
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Radiology

Radiation safety programme in Indian healthcare system

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UCMDMP: Another paper tiger?

On March 16, the Department of Pharmaceuticals (DoP) released the draft Uniform Code for Medical Device Marketing Practices (UCMDMP), as a voluntary code to regulate marketing practices by the medical device industry.

The draft was in response to industry's request for a code distinct from the pharmaceutical sector's Uniform Code for Pharmaceuticals Marketing Practices (UCPMP), as the two sectors have substantial differences. Industry associations have therefore predictably hailed the draft code. Pavan Choudary, Chairman & Director General, Medical Technology Association of India (MTaI) linked the release of the draft UCMDMP to the Modi government's move to "constantly widening the circle of probity." His statement commends the government for "following through the implementation of the UCMDMP voluntarily (which is the right way to go about it)" as it "is heartening for every company which follows a high level of ethical standards. It will surely translate into more credible healthcare delivery as well as restrain the fly by night operators- who pose a great risk for patients and the reputation of the medical device industry."

Choudary hopes that in time, the UCMDMP will "separate the chaff from the grain and give the ethical players the public esteem they deserve. Its impact will hopefully also spill over and check those operators who have found a way to circumvent the price control affected on scheduled medical devices in this government's regime."

Are we repeating the same missteps made with the pharma marketing code? The UCPMP remains voluntary more than a decade after it was introduced in 2011. While pharma industry associations claim adherence by their member companies, medical representatives and patient activist groups beg to differ.

In fact, just a couple of days before the release of the draft UCMDMP, the Supreme Court issued notice in response to a plea filed by the Federation of Medical & Sales Representatives Association of India (FMRAI) asking that the UCPMP be made more effective by providing a monitoring mechanism, transparency, accountability as well as consequences of violations. Clearly, while the intent is good, the UCPMP has not served its purpose and remains a paper tiger.

That said, the 15-page draft UCMDMP does seem to reflect some lessons learnt from the experiences of the UCPMP. Legal experts have pointed out that the draft medical devices code expands the definition of a healthcare professional (HCP), whereas the UCPMP did not have such a definition.

If the Uniform Code for Medical Device Marketing Practices remains voluntary, will we repeat missteps made with the pharma marketing code?

Hence the medical devices code will expand to cover health care professionals authorised or licensed in India to provide health care services or items to patients as well who are involved in the decision to purchase, prescribe, order, use or recommend a medical device in India.

The medical device draft code specifies that the term HCP includes individual clinicians (for example, physicians, nurses, technicians and pharmacists, OT staff, optometrists, pathologists, transfusion professionals, lab technicians, among others), provider entities (for example, hospitals, ambulatory surgical centers, pathology labs, blood banks amongst others), and administrative personnel at provider entities in India (for example, hospital purchasing agents). This term does not include health care professionals who are bona fide employees of a company, while acting in that capacity.

Another difference is that while the UCPMP was concise, the medical device code elaborates and explains what's allowed and what's not, when it comes to interactions between med device industry and HCPs, mentioning specific examples when it comes to gifts allowed, promotional materials, training and educational programmes, cash or monetary grants, consultancy/honorariums, and third-party events.

Will the outcome be any different with the medical devices sector, given that the regulator has limited options when it comes to monitoring and enforcing a voluntary code? Even though the draft says that "if it is found that it has not been implemented effectively by the Medical Device Associations/Companies, the Government may consider making it a statutory code', the fact that the UCPMP remains voluntary a decade after its release makes this threat ring hollow. There are all signs that this will become yet another paper tiger, making little to no impact on the cost of medical devices footed by millions of hapless patients in India.

Naming and shaming hospitals and doctors for accepting 'gifts' from pharma companies has not worked as a deterrent as public memory is short. Can we hope that all stakeholders adhere to the medical devices marketing practices code in letter and spirit? After all, disease and death does not differentiate between those who wield a scalpel and those who are under one.

VIVEKA ROYCHOWDHURY *Editor*
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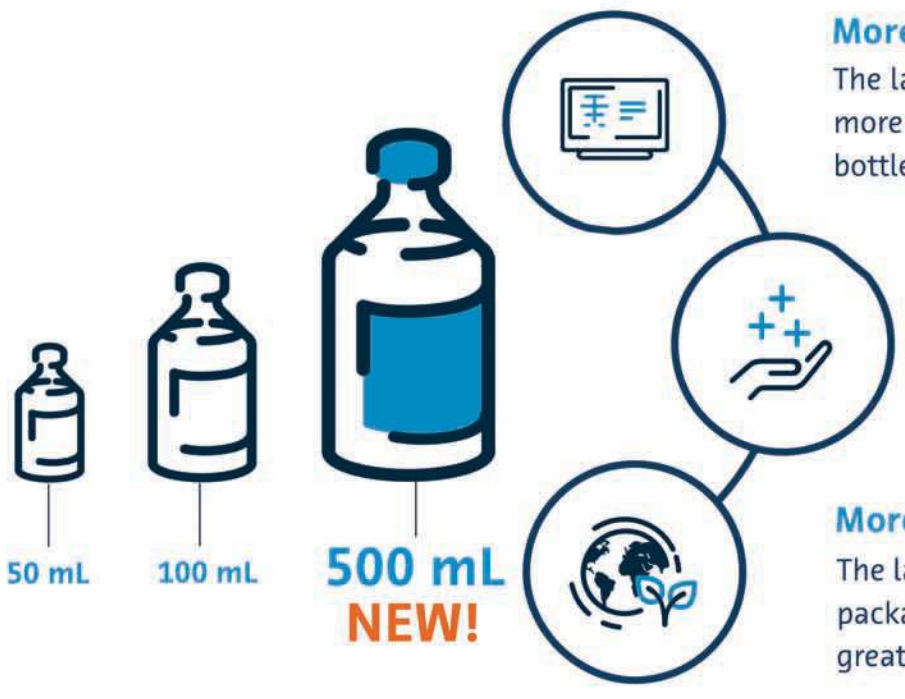

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INTERVIEW

Vision to make SafeZindagi a virtual clinic for the "Swiggy" generation

Dr Sunil Solomon, Associate Professor, Johns Hopkins University School of Medicine explains to **Viveka Roychowdhury** the importance of "virtual" outreach initiative SafeZindagi.com to screen, diagnose and treat segments with higher burden of HIV infection. He also predicts that with the pipeline of long-acting drugs, the future of HIV prevention and management could be as simple as one to two injections every 4-6 months, similar to getting a COVID booster

Dr Sunil Solomon, your mother Dr Suniti Solomon's diagnosis of India's first AIDS cases among sex workers in Chennai in 1986 was the first hard step, forcing the country to shed its denial about AIDS infection rates. Has the country managed to put the stigma of HIV infection into perspective, given that we see the same pushback in varying degrees to many disease conditions, ranging from cancer, TB, and even SARS-CoV2 infection in the early stages of the pandemic?
Stigma is something that does not change overnight. It takes generations to change and accept. But stigma towards HIV has definitely reduced over the years. I still remember my mom desperately trying to find any hospital that would be willing to deliver the child of a woman living with HIV in the 90's. Today, I have a choice based on the patient's preference.

But stigma against HIV disease alone is not enough. There are several vulnerable groups such as men who have sex with men, people who inject drugs, transwomen and female sex workers - we judge them without trying to understand them. Until, we really recognise that we are all people and we all make choices for a reason and can be accepting of the reason, there will continue to be HIV infections.

But the one thing that HIV has taught us is the power of communities and advocacy which is lacking for other diseases. Stigma exists for several of the conditions because of ignorance - treatment literacy around these

other diseases can help alleviate stigma.

The one missing on the list is mental health - in my opinion, all of us have some mental health issue and are "crazy" in some particular way but mental health is something that is rarely talked about and COVID has really brought this to light. I would almost put mental health ahead of all these other conditions and plan campaigns to make it normative and not a taboo topic.

What have been the initiatives to increase screening and diagnosis rates in these past decades?
The government of India and National AIDS Control Organization (NACO) have done a remarkable job of increasing access to HIV diagnostics - there are over 5000 centres across India where people can get screened for HIV. Additionally, there is community-based screening for key populations as well via community-based organisation. The challenge is demand generation and treatment literacy around the benefits of early diagnosis and treatment.

So, I would say it is more of a demand issue as opposed to a supply issue. Modes of communication have changed and most health information today is via social media as opposed to print and the NACO is currently expanding to include social media in dissemination which I think will further improve screening.

How is the Safezindagi.in initiative, launched last World AIDS Day, different, and what are the gaps it tries to address?
SafeZindagi is something we are piloting in collaboration with the National AIDS programmes and is funded by PEPFAR/USAID. What has happened over the past decade is the penetration of internet and mobile dating/hook up sites across India. This has resulted in populations seeking sex partners online or buy drug online and these populations are not reached by the physical facilities.

The goal of SafeZindagi is to reach these populations and provide them with education, testing and linkage to care online using "virtual" outreach workers. The vision is to make it a wholly virtual clinic to cater to the health care needs of the "Swiggy" generation.

What has been the response and learnings so far from this initiative?
I must say I am surprised from what we have seen over the past year and half. We have provided HIV testing services to over 3000 and HIV self-testing services to over 2500 clients from these virtual places. What is surprising is most of them have very low HIV risk perception despite about one in 20 testing positive for HIV.

But what is more striking is the vast majority of them have never been screened for HIV before. Given the general population prevalence of HIV in India is about 0.2 per cent, the clients we are able to test through these online avenues have almost 25 times higher burden of HIV infection.

HIV infection comes along with co-infections of TB etc. How does this complicate the management of the disease condition?
As I mentioned earlier, the key is early diagnosis and treatment. If we are able to detect and treat them early, they lead normal lives by just taking one pill a day with almost no side effects and we do not need to worry about co-infections.

In fact, the TB is more challenging and medications more toxic than the HIV medications. It does complicate treatment due to drug interactions, but there are enough medications now available in both the public and private sectors to manage both conditions. But as I previously said, the easiest way to treat TB in HIV is to prevent it by early diagnosis and management.

What is the cost burden of HIV infection at the individual, community, and country-level?
At the individual and community-level, if you seek care in the public sector the cost is essentially your transport to the site and loss of wages for the day - so really minimal. The recent introduction of dolutegravir (a very potent and safe drug) in the public sector brings the public sector

programme in India at par with any other country including the US and Europe.

At a country-level, the majority of people with HIV are in the economically productive age group of 20-50 years and so, in my opinion their productivity offsets the cost of medications. The number of annual new infections has also reduced and the key to making it even more cost-effective is to bring the number of new infections down and the most efficacious way of doing this to get as many people on treatment as possible. People who are on effective HIV treatment do not transmit HIV to others as the amount of virus in their blood is too low to effectively transmit.

What have been the recent innovations addressing HIV management in India? Are these innovations affordable and accessible to vulnerable populations in India and across the world?

As I mentioned earlier, the introduction of dolutegravir in the public sector is a game-changer in my opinion. And this is available free of charge to anyone via the public sector. The introduction of tele-health and multi-month dispensation (dispensing multiple months of medications at a time) are also both great enablers of treatment retention and accessible to all.

The biggest game changer in the HIV field globally is the introduction of long-acting drugs for HIV treatment and prevention. They were recently approved by the US FDA and we are just seeing the first generation of these drugs. Given the pipeline, I believe the future of HIV prevention and management could be as simple as one to two injections every 4-6 months. That is where the field is going. It will be sort of similar to getting a COVID booster.

You were awarded a $35 million grant from USAID to implement and evaluate innovative models of service delivery to improve the HIV care cascade in India with a focus on vulnerable populations. Can you give us an update on your work to improve HIV care in India?

A lot of our progress and plans were hampered by the COVID-19 pandemic. But still, despite the pandemic, we have been able to implement novel models and strategies that are currently under evaluations. As I have already mentioned, safezindagi.in the online platform has been a real eye opener to the risk that exists in the private sector. Via this platform, we were also able to provide HIV self-testing for the first-time in India as well as access to pre-risk exposure prophylaxis (PrEP) to these vulnerable virtual populations.

We are also piloting a self-sustainable HIV care model led by the HIV community - the TAAL+ clinic in Pune. We established one of the first trans community-led, comprehensive health care clinics for the transgender community in Hyderabad - "Mitr clinic". We have also since established two more in Maharashtra. The goal is to provide the community with a space where they have access to their health care needs. We have also established adolescent friendly health centres for children and adolescents living with HIV and their siblings with the objective to not only improve their HIV outcomes, but their lives in general.

Viveka.r@expressindia.com
Viveka.roy3@gmail.com

INTERVIEW

The world demands collaboration and the future is in collaboration

Deepali Khanna, Managing Director, Asia Regional Office, The Rockefeller Foundation and **Dr Krishna Reddy Nallamalla**, Regional Director, South Asia, ACCESS Health International in an interaction with **Kalyani Sharma** talks about the journey of Global Learning Collaborative Approach for Health Systems Resilience (GLC4HSR) and highlights that Digital and molecular technologies, that came into forefront to play the most crucial role during the pandemic, will bring disruptive changes in the way surveillance and rapid response systems are designed

Deepali Khanna, MD, Asia Regional Office, The Rockefeller Foundation

Dr Krishna Reddy Nallamalla, Regional Director, South Asia, ACCESS Health International

Please walk us through the journey of Global Learning Collaborative Approach for Health Systems Resilience (GLC4HSR) and its significance in combating the future healthcare crisis?

Dr Krishna Reddy Nallamalla: COVID-19 pandemic has exposed weak and fragile health systems across the world. We are entering the phase of gradual recovery from the shock. It is time for the leadership and governments to learn and formulate policies and strategies to build back more strong and resilient health systems to prevent future shocks and prepare for them if we fail to prevent.

GLC4HSR aims to create a platform for learning of various key stakeholders – policy makers, academia, private sector, and civil society. It will onboard these stakeholders across three regions of Asia for reciprocal learning from each-others experiences and expertise. With secretarial and technical support from ACCESS Health with its offices in South Asia, South East Asia, and East Asia, technical facilitators will pool relevant knowledge around key thematic areas that are relevant in building back better systems through systematic reviews, expert round tables, focus group discussions, interviews with leadership etc. These include pandemic prevention and preparedness, effective disease surveillance leveraging modern technologies, rapid response systems to face future shocks, and health financial and social protection to face them without hardships. The pooled knowledge will be processed into learning and policy briefs for the benefit of all the members and will be made available through a knowledge portal, and periodic peer to peer learning meetings across Asia. Pilots will be supported to implement some of the learnings relevant to a given context in improving the status of health systems within their resources.

Can you throw some light on the significance and possible challenges faced by the government and other stakeholders while working in a PPP model?

Deepali Khanna: We now

know that COVID-19 has caused immense stress to health systems around the world and disrupted essential health services. Even reaching the pre-COVID status quo itself will take immense investment of human and financial resources.

Traditionally, investments in public health and other public goods remained sorely undervalued; investments in preventive measures, whose success is invisible, even more so. Many such investments were needed to be made in countries that cannot afford them. COVID-19 has changed this to an extent and has even expanded the pie when it comes to public health investing be it government investment or the commitments by supremely influential actors like the AIIB, which recently committed to setting up a healthcare investment portfolio.

How do you see the world moving towards the post-pandemic era in terms of the revolutionisation of the healthcare sector?

Dr Krishna Reddy Nallamalla: Health will occupy top of policy agenda of every nation. Digital and molecular technologies, that came into forefront to play the most crucial role during the pandemic, will bring disruptive changes in the way surveillance and rapid response systems are designed. Countries will move faster to put national health information systems in place as is evident from the announcement of Ayushman Bharat Digital Mission (ABDM) in the midst of the pandemic. Genomic surveillance of wastewater has brought in the concept of precision public health for planning the response in most precise way. Standards-based interoperable health records with health data of entire populations being accessible through health data exchanges will be a reality across many countries. Point of care diagnostics, wearable monitoring devices,

GLC4HSR aims to create a platform for learning of various key stakeholders – policy makers, academia, private sector, and civil society. It will onboard these stakeholders across three regions of Asia for reciprocal learning from each-others experiences and expertise

telemedicine, and direct to home healthcare services will move healthcare from hospitals into communities and homes. Selfcare will become new norm with various supporting applications using AI tools. Majority of the countries will move towards universal health coverage through innovative financing solutions offered by fintech for health.

How crucial will be the role of multi-sectoral approach and knowledge/resource sharing in strengthening the global healthcare ecosystem? What is the need of the hour in this direction?

Deepali Khanna: Of the many lessons that COVID-19 taught us, one of the crucial one was to work together and not in silos. It made us share information, intelligence and have an exchange of knowledge and capabilities, which allowed several entities to work together and collaborate. The world demands collaboration, and the future is in collaboration. As globalisation advances, new technologies and demographic, epidemiologic, and economic shifts are transforming health systems in countries around the world. There is a window of opportunity to promote strategies that steer this transformation toward better health outcomes and financial protection through improved health systems performance and the expansion of universal health coverage in low- and middle-income countries.

The Foundation in recent years has committed itself to "connecting people to catalyse change" across the world. Even pre-pandemic, The Foundation aimed to advance the fields of public health and medical science to improve outcomes for all people, everywhere, improving health outcomes through equitable, data-driven health systems in communities around the world, and to accelerate a global movement calling for equitable health systems that leaves no one behind. The Foundation envision a world where community health systems everywhere are equipped to apply data-driven decisions to deliver the right health interventions to the right people at the right time.

The Rockefeller Foundation's legacy in the public health space always has and continues to aim to catalyse system-strengthening activities that create broader access to affordable health services in developing countries. The initiative includes both global and country-specific work.

In a similar spirit of collaboration, we all have to find opportunities to partner and collaborate with varying other organisations and institutions that share the vision of a healthy and equitable society.

What is the need of the hour when it comes to achieving 'Affordable & Accessible healthcare'? What are the current challenges especially in developing nations like India in this direction?

Dr Krishna Reddy Nallamalla: Geographic access to healthcare needs further improvement in healthcare supply in villages and towns. The greatest challenge to supply is the competent health workforce, especially the doctors in underserved areas. A well-developed telemedicine system coupled with strengthened primary health care may partially address this challenge. Strategic purchasing of primary care and hospital-based services from private providers through various public and social health insurance programs, bringing informal labour and self-employed small and medium entrepreneurs into health financial and social protection, innovations in health consumer financing will address the affordability of care. Accessing safe and effective care in an equitable and dignified fashion are the remaining major challenges. Two-thirds of preventable deaths in developing countries are not due to lack of access but due to poor quality of services. Similarly, two-thirds of longevity is attributed to social determinants like literacy, employment, hygiene, access to clean water, energy and air, nutrition, tobacco and alcohol consumption etc. Hence, it is equally important to address social systems as health systems.

Please tell us about GLC4HSR future plans and actions?

Deepali Khanna: Global Learning Collaborative for Health Systems Resilience is envisaged as becoming a sizable global community of health systems member countries who co-develop and share evidence to create region specific strategies for safeguarding all people against future crises.

The collaborative is designed to evolve organically. With enterprising goals such as:

Creating an ecosystem of relevant organisations working toward a future ready resilient system.

Creating a channel for knowledge creation, sharing and utilisation.

Prioritising capacities and resource needs across the engaged collaborators.

Creating an opportunity for innovators working in any of our focus areas to scale their innovations for a resilient health system.

Creating a flexi-fund for strengthening health system resilience.

The collaboration aims to create a self-sustainable model that will evolve over time.

Dr Krishna Reddy Nallamalla: We are constituting a technical advisory group (TAG) consisting of people who have rich experience and expertise in global and national health systems across Asia to mentor and guide GLC, impart their wisdom, and mobilise key stakeholders. Members are being on-boarded from each country across Asia. Work on various thematic area has already begun and will be expended to themes that are relevant to members. Focus groups will be formed around each thematic area. Quarterly peer-to-peer learning events will be organised with participation from all regions of Asia. Periodic state- and nation-level meetings will be held as a build-up to these events. These will culminate in an annual event towards end of the year. Idea is to evolve GLC into a self-organising, self-governing, self-sustainable collaborative with initial seed funding from donors like Rockefeller Foundation. GLC will be expanded in due course to other regions of the world including Africa, South Americas, and fragile states in middle-east.

Kalyani.sharma@expressindia.com
journokalyani@gmail.com

Reimagining nursing education

Gerald Jaideep, CEO, Medvarsity highlights that virtual reality training can improve nursing education and be utilised as a therapy tool or clinical intervention in both paediatric and adult populations

Technology is improving by the minute and has a deeper impact on people's lives more than ever before. Many facets of our work-life have also changed as a result of technological advancements in varied fields. In the health domain, technology plays an essential role from screening for diagnosis to therapy and post-treatment care and recovery. We live in a time when cutting-edge technology exists but isn't yet fully incorporated into the healthcare system. To do this, we must create an environment that promotes diversity and recognises nursing as a vital component of the healthcare system.

The last few decades have seen the growth of healthcare with the help of modern technology, in-depth scientific knowledge, and advanced healthcare concepts. Technology is intended to enhance patient outcomes, as well as lower expenses. Technological advances like AI and robotics can help patients with cognitive, sensory, and motor disabilities, as well as help those who are ill or injured; support caregivers, and aid the nursing workforce. Moreover, virtual reality training can improve nursing education and be utilised as a therapy tool or clinical intervention in both paediatric and adult populations.

In addition, motion monitoring systems at home can help personalise care decisions for seniors with memory issues. Nurses and caregivers should indeed be engaged in the design, development, and implementation of such systems to improve decision-making, workflow, and potential outcomes. A professional culture that encourages the use of mobile devices in clinical practice is essential. Nurses should be educated on the use of social media and internet health information appropriately, and they should encourage patients to use these tools to better their self-management. Nurses and educators should be able to use low-cost devices and software that connect with existing mobile, internet, and other digital technologies. Nowadays, nurses and caregivers use a variety of technology-driven ways to improve their productivity, such as Electronic Health Records to track patient history and smart beds to optimise patient positioning.

With this pandemic, the need for virtual health care has accelerated and as a result, significant job growth for nurses has become a necessity. Online education programs will continue to increase in popularity

In the wake of COVID-19, there has been a quick transition to the use of both synchronous and asynchronous modes of online teaching-learning modules, effective learner participation strategies, and creative assessment tools. The absence of students on the campus due to a life-threatening pandemic has provided a great opportunity for medical educators to experiment, and innovate in transforming the principles of nursing education as well as pedagogical techniques. Pre-pandemic, students practiced their clinical skills in the practice rooms with patients. During COVID-19 students were forced to adapt, thus pre-recorded demonstrations or virtual simulation resources were provided to the students to watch and practice. Educators have employed a variety of web-based platforms and learning management systems, with the inclusion of artificial intelligence, virtual reality, telemedicine, and chatbots with teachers providing formative comments remotely. Distance learning, when combined with online games, podcasts, virtual simulations, remote monitoring, and webinars to aid the learning process, highlights the significance of active learning.

With this pandemic, the need for virtual health care has accelerated and as a result, significant job growth for nurses has become a necessity. Online education programs will continue to increase in popularity. Currently, the Trained Nurses Association of India (TNAI) is running a certified free online course for students and nurses on “Essential upskills on COVID-19 pandemic management".

From 2000 to 2016, ANM schools have increased from 298 to 1927, GNM schools from 285 to 3040, B.Sc. colleges from 30 to 1752, and M.Sc. colleges from 10 to 611. Although the increase is significant, there is a gap between demand and supply. However, there is a scope for improving the imbalance in nursing education through the continuous efforts of the State and the medical fraternity. The Supreme Court has recommended a minimum salary of Rs 20,000 per month as the starting salary of a staff nurse in private hospitals. INC is in the process of developing a practical integration of service and education model for the country. Florence Nightingale awards instituted by the Ministry of Health and Family Welfare, Government of India in 1973, recognise and honour the services of outstanding nursing personnel in the country. This award, which includes a medal, certificate, citation and cash award of Rs 50,000, is given to 35 nurses every year on May 12, International Nurses Day.

Today there is a greater demand for nurses in specialty areas such as critical care, operating rooms, radiology special procedures, maternity wards, and emergency rooms. In recent years, India has seen a dramatic increase in the number of nursing education schools, despite the fact that there is still a national shortage. The commercial sector presently provides over 88 per cent of the nurse education. However, nursing education is geographically imbalanced in the country, with the majority of graduate and post-graduate education taking place in the South. Northern states such as Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh account for only 9 per cent of the country's nursing schools. Fundamental issues like fair compensation, safe and supportive work conditions, clear directions and career pathways for the nurses will be critical in developing and fostering a global nursing workforce.

While creating a balance between supply and demand for a trained and eager workforce of frontline warriors, a collaboration between nursing educators and practicing nurses should be a must. One commonly recommended strategy to improve nursing education is to recruit more faculty and support existing faculty to develop their educational provision and practices. Mentoring programs starting at the high school level would also encourage more nurses to join the profession. The salaries and benefits of registered nurses will need to continuously rise, medical institutions should aspire to not only recruit qualified nurses but also to be able to focus on keeping them. We must harness technology, guarantee that there are enough, satisfied, and qualified nurses in the country, and provide them with new chances for personal and professional advancement.

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IN NEED OF CRITICAL CARE

Driven by innovative technology, India's critical care sector needs an infusion of skilled personnel and a robust policy framework to ensure equitable accessibility and availability

By **Kalyani Sharma**

Critical care sector in India started as a designated area of the hospitals to treat the life-threatening diseases. However, with time, need and emergence of various new diseases, it has evolved many folds in terms of its expansion as a speciality offering expertise for better clinical outcome and patient care.

The criticality of the critical care sector saw acceleration during the pandemic especially the need and availability of the Intensive Care Units (ICUs) and critical care equipments like ventilators. The sector is now witnessing the rise in innovation and adaptation of new technologies. The Union Budget 2022 also saw the announcement of a new centrally sponsored scheme PM AtmaNirbhar Swasth Bharat Yojana with an outlay of about Rs 64,180 crore over six years under which establishing critical care hospital blocks in 602 districts and 12 central institutions is one intervention among others.

Sharing his views on the evolution of critical care in India, Harsh Kapoor, Partner, Deloitte India said, "The growth of the field of critical care medicine in India is a great story of how the economic changes in a country can lead to the evolution of a scientific subspecialty.

From a time when many top hospitals lacked a separate critical care department and had broad/all-purpose ICUs, we have reached an age where several hospitals have highly specialised critical care offerings. Today, several large hospitals, both government and private, have separate medical, surgical, pediatric, cardiac, cardiothoracic, neurology, pediatric and neonatal ICUs."

Dr Preet Pal Thakur Co-Founder, Glamyo Health highlights, "The importance of critical care accelerated when the pandemic hit in early 2020, wherein people realised the need of critical care. Despite this growth, the critical care faculty in India still lags way behind the total requirement of the practice and related equipment in India. This imbalance between the demand and supply during pandemic gave new light on the branch of critical care and the consecutive market in India."

The growth of the field of critical care medicine in India is a great story of how the economic changes in a country can lead to the evolution of a scientific subspecialty

Harsh Kapoor
Partner, Deloitte India

The lack of proper equipment for intensive care practice is another significant barrier to implementing a healthy critical care sector in India. It is estimated that at least 50 per cent of ICU beds have for mechanical ventilators

Dr Preet Pal Thakur
Co-Founder, Glamyo Health

The evolving market of critical care in India is witnessing several innovations being introduced in ICU units. The CT Scanner and IRT are two examples of key innovations making a significant impact on the critical care market in India

Vinay K Mayer
Director-Market Research & Consulting,
Asia Research Partners

Implementation of the existing and upcoming policy decisions can be ground-breaking for ensuring access to state-of-the-art critical care and treatment

Arvind Sharma
Partner, Shardul Amarchand Mangaldas & Co

Market overview: Investments & technology adoption

The lack of elective surgeries which was one of the main challenges during the pandemic impacted the growth of the critical market globally but it is now gaining back the momentum and on a rising side. The market experts predicts that apart from the emergence and increase in the number of chronic diseases as key drivers of market growth, several innovations being introduced in ICU units like CT Scanner and IRT will make a significant impact on its overall growth.

Vinay K Mayer, Director-Market Research & Consulting, Asia Research Partners highlights that, "Globally, the Critical Care Equipment market is expected to reach USD 976.2 million by 2027. The key drivers for this growth include the increasing incidence of chronic diseases, the increasing geriatric population, and an increasing number of motor vehicle accidents. Over the past few years, there has been a shift in focus towards geriatric patients as they account for a major chunk of the critical care market."

He also explains that, "The evolving market of critical care in India is witnessing several innovations being introduced in ICU units. These include Acute Care Unit (ACU), Critical Care Unit (CCU), and Trauma Center. The CT Scanner and IRT are two examples of key innovations making a significant impact on the critical care market in India. In India, chronic diseases are the leading cause of disability and premature death among the elderly. According to WHO, chronic disease prevalence was expected to rise by 57 per cent by the year 2020. This is necessitating an

increased focus on preventive measures and improved treatments for these diseases. As a result, the critical care market is witnessing an increase in demand for advanced equipment and therapies that can help patients with chronic conditions. Furthermore, escalating healthcare costs are driving critical care pricing upwards. The growing number of critical care patients requiring specialised and immediate medical attention is resulting in the evolution of the critical care market in India. Augmented Reality (AR) and virtual reality (VR) are some of the newest technologies that are being used to improve critical care patient care."

Talking about the investments in the sector, Kapoor said, "Critical care services are some of the most profitable non-surgical services a hospital can offer. Earlier, hospitals used to focus on improving their surgical vs non-surgical patient mix. Given their profitability, critical care services are emerging as a major revenue driver for corporate hospitals in India. Nowadays, hospitals have begun looking at their critical vs non-critical patient mix as well. Therefore, we've seen an increasing willingness among hospitals to invest in critical care technology to attract patients. Leading Indian hospitals are therefore increasingly investing in technology to improve critical care workflows, and to more accurately monitor and diagnose critically ill patients."

Arvind Sharma, Partner, Shardul Amarchand Mangaldas & Co believes, "The critical care market is poised for tremendous growth, including on account of India becoming a destination for affordable and reliable healthcare solutions. The pandemic has launched digital healthcare into the limelight and has initiated the much-needed discussion regarding India's readiness to adapt to emerging healthcare technologies. Implementation of the existing and upcoming policy decisions can be ground-breaking for ensuring access to state-of-the-art critical care and treatment."

With the passage of time, AI tools will further become more accurate and precise leading to increased adoption and acceptance among healthcare providers

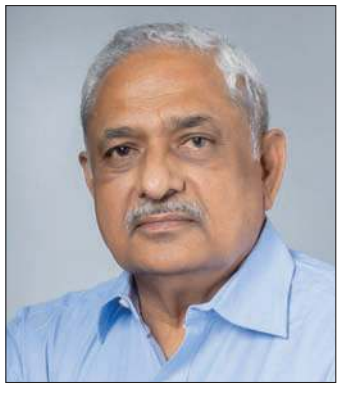
Vikram Thaploo
CEO, Apollo Telehealth

Advanced informatics systems will help intensivists monitor the patients from a centralised monitoring center or from anywhere using a handheld device. This will be complemented by trained nurses stationed at the patient's bedside

Prateek Tiwari
Director-Emerging Markets Group & Strategy, Medtronic India

The government should initiate standardised training in various domains, such as critical care. This will enhance the comprehensive skills of healthcare professionals to respond effectively and make teams better prepared to deal with health emergencies

Dr Chandrashekhar T
Director- Critical Care, Fortis Hiranandani Hospital



Critical care medicine as a part of the curriculum must be extended to more and more of medical schools in order to prepare a sufficient pool of specialists within the country

Ashok Patel
Founder and CEO, Max Ventilator

Technology & innovation in critical care sector

Lack of oxygen supply, ventilators and intensive care units posed a major challenge during the second wave of the COVID-19. The elective surgeries were on a halt and treatment of other critical diseases was also impacted. All these challenges lead to the rise in local manufacturing of the critical care equipment's, highlighted that importance of innovation and focussing on the adoption and scalability of the technology in the sector for better patient outcome.

Stressing on the rise of technology adoption, Sharma said, "Since the onset of the COVID-19 pandemic, India's critical care sector has undergone massive strain through episodic surges of COVID-19 cases seen over the last two years. The increase in the number of patients requiring intensive care substantiated the need for a robust healthcare infrastructure and adoption of advanced technologies in the critical care sector."

"Several timely initiatives were undertaken to deal with the challenges posed by the pandemic, and one of the key initiatives was the rapid adoption of telemedicine. Other ongoing digital health initiatives include: 'e-Hospital', which is a cloud-based Hospital Management Information System to help connect patients, hospitals and doctors on a single digital platform; and 'e-Shushrut', which is a cloud based computerised clinical information system for providing accurate electronically stored medical records of patients. The National Health Mission also provides support to state governments for services like telemedicine, tele-radiology, tele-oncology and teleophthalmology.1 Other initiatives like the introduction of Aarogya Setu app (for monitoring health status) and the

e-Sanjeevani (web-based comprehensive telemedicine solution that facilitates doctor to doctor, and patient to doctor teleconsultations), continue to create a huge impact in the rapidly evolving healthcare infrastructure in India", he added.

Some of the latest emerging trends in the Indian critical care sector includes remote patient monitoring and tele-ICUs which are getting a lot of attention as far as virtual care is concerned. Other technological advancements include advances in biosensor technologies, AI-based solutions and cloud systems.

Vikram Thaploo, CEO, Apollo Telehealth explains, "Innovations in battery technology and nanoscience are making biosensors thinner, lighter, smaller, cheaper, flexible and consume less power. With this, the precision, accuracy and range of patient data measurements will improve. Presently, biosensors measure vitals like oxygen saturation, heart rate, blood pressure, etc. but work is already in progress to create a combination of digestible and implantable biosensors that will be able to measure the volume of air passing through the lungs, brain activity, blood chemistry, organ functionality and much more. All these critical care data parameters will be sent wirelessly to hybrid cloud-based systems, providing vital insights to doctors to treat patients effectively."

Talking about the AI based solutions, he says, "AI's goal in healthcare is to enhance treatment techniques and bring better patient outcomes. So far, AI has been living up to its goal by playing a critical role in game-changing applications. AI technology is helping in the development of precision medicine—customised according to the needs of the patient—by synthesising data and drawing conclusions. AI-based tools are also being developed to predict the deterioration of a patient's condition well before time, provide timely clinical intervention and optimising patient outcomes. With the passage of time, AI tools will further become more accurate and precise leading to increased adoption and acceptance among healthcare providers."

Prateek Tiwari, Director-Emerging Markets Group & Strategy, Medtronic India while talking about the ICUs offering virtual care facilities, said, "With improvements and advances in primary care and home care after the pandemic, more patients are being operated outside the traditional hospital setting and in level I/II ICUs. Advanced informatics systems will help intensivists monitor the patients from a centralised monitoring center or from anywhere using a handheld device. This will be complemented by trained nurses stationed at the patient's bedside."

Challenges & road ahead

The current critical care scenario in India, though encouraging in certain aspects, still has a long way to go. Only in recent years has the Indian healthcare system understood the importance of critical care practice in its field. While the use technology is increasing, there is a greater need for skill and development. Moreover, the accessibility and availability of the critical care still needs a lot of attention and robust policy framework.

Dr Chandrashekhar T, Director- Critical Care, Fortis Hiranandani Hospital said, "The government should initiate standardised training in various domains, such as Emergency Medicine, Critical Care, Pulmonology, case management, infection control, safety testing, and isolation protocols. This will enhance the comprehensive skills of healthcare professionals to respond effectively and make teams better prepared to deal with health emergencies. All in all, the COVID-19 pandemic could be a massive chance for India to strengthen its social health for the advancement of public health to reduce fatalities and improve patient outcomes."

Stressing on the shortage of equipment, Dr Thakur added, "The lack of proper equipment for intensive care practice is another significant barrier to implementing a healthy critical care sector in India. It is estimated that at least 50 per cent of ICU beds have for mechanical ventilators. Despite this, the number is way below the essential demand, especially in the event of a pandemic surge. Currently, India relies on imported parts to assemble most of the critical care equipment; hence, to overcome this problem, the government is encouraging Indian companies to manufacture these instruments locally. While the Make in India campaign has come as a boost to the medical devices sector, it is still some time away before India can be self-sufficient in its equipment needs."

Givin the possible solutions to the most common challenges in the critical care sector, Ashok Patel, Founder and CEO, Max Ventilator highlights, "First, we need to focus on augmenting the domestic production of ICU equipment and machines. The government has made provisions through PLI schemes and clustering facilities for medical devices, equipment related to critical care also needs attention. Second, the healthcare facilities must be regularly inspected and monitored for housing mandatory ICU beds and related equipment. The ratio of ICU beds to number of over-all hospital beds i.e 1:4 ratio must be followed and adhered to. Third, similarly, it must also be ensured that all facilities have allocated mandatory manpower for critical care commensurate with their size and the footfall. Fourth, there must be regular quality audit of these critical care facilities and their machines and equipment by authorities. Fifth, the health personnel including doctors, nurses and paramedics involved in critical care must be trained to handle equipment and machines in the ICUs. Sixth, critical care medicine as a part of the curriculum must be extended to more and more of medical schools in order to prepare a sufficient pool of specialists within the country. Seventh, the hospital administration must inculcate a culture of best practices for ICU and critical care. For instance, sometimes, corrugated tubes – which are supposed to be single use device – are reused on patients. This should be dealt with sternly. Eighth, while the standards and certification systems for medical devices stipulated by developed countries' regulatory authorities are okay, we need to develop our own certification systems relevant to our own value chains and the strengths and weaknesses inherent in those value chains."

Kalyani.sharma@expressindia.com
journokalyani@gmail.com

Critical care should be made more accessible and affordable to the common masses in India

Rajiv Nath, Managing Director, Hindustan Syringe & Medical Device and Forum Coordinator, Association of Indian Medical Device Industry (AiMeD) highlights that innovations in critical care, including Intensive Care Unit (ICU) or Coronary Care Units (CCUs) and surgical/operation procedures, have helped hospitals and healthcare facilities provide better patient care and offer more comfort to those who need it

Critical care of patients that includes a close 24-hour patient condition monitoring and surveillance forms an essential part of healthcare delivery. Constant improvement and technological advancements in the field of critical care has helped doctors improve clinical outcomes and quality of healthcare delivery post-surgery or patients with one or more organs failing or needing respiratory oxygen therapy and support. Increased use of digital technology is driving a new revolution in the critical care sector, with a greater focus on improving nursing care delivery and user experience and bringing down healthcare costs by increasing productivity and reduced nosocomial infections.

In India, dedicated ICUs (Intensive Care Units) began to emerge in the early 1970s with the establishment of the first ICU in Mumbai. In the last three decades, dedicated intensive care facilities have been set up in all the major Indian cities and larger towns. Hospital Beds got transformed with removable head boards and foot boards as well as with motorised sections permitting various positions and attached electrical units and IV stands to permit monitoring and IV giving on the go.

The post-pandemic era has seen a health-tech revolution that lagged by over two decades. The first wave saw increasing trends of senior aged intensivists relying on younger inexperienced resident doctors and nurses for healthcare monitoring and care. Post-COVID critical care has emerged as a dynamic and dedicated speciality. Technology is going to increasingly impact how we practice critical care medicine in future. It will also be more advanced on a personal, humane patient care level. Our future ICUs are going to be advanced technologically with increased specialisation, greater use of telemedicine, remote monitoring, artificial intelligence and robots.

The critical care is not only about the advanced machines, medicines, medical devices, etc. but it's also about the team – surgeons, doctors, nurses, physiotherapist, etc – the people behind the critical care delivering their best to the patients. So, they should be equipped with advanced critical care training

Innovations in critical care, including Intensive Care Unit (ICU) or Coronary Care Units (CCUs) and surgical/operation procedures, have helped hospitals and healthcare facilities provide better patient care and offer more comfort to those who need it.

Highly advanced technology-based products are driving the growth of critical care market in India. Computer-based technology has made the current generation of products more physician- and patient-friendly. Synchronised ventilators with volume control and advanced pulmonary graphics are helping patients wean away from ventilators easier with lower side effects.

The emerging concept of smart & intelligent ventilation solutions contributes to an increased critical care market share. Rising investments for critical care production is also positively impacting the market share.

The pandemic also brought in the concept of remote ICUs to provide critical care services to the rural regions which helped to strengthen the healthcare facilities at rural areas with the help of tele-ICU technologies.

Sadly, there is a severe lack of accessible, affordable critical care to the common masses of India but disruptive innovative technologies are continuously working towards bridging this gap.

As we know, India faces a dearth of Intensive care beds and specialists with only 95,000 ICU beds and 4500 intensivists in the country, Tele-ICU makes remote care accessible & enables communication between off-site clinicians and bedside staff to provide Real Time support.

The critical care is not only about the advanced machines, medicines, medical devices, etc. but it's also about the team – surgeons, doctors, nurses, physiotherapist, etc – the people behind the critical care delivering their best to the patients. So, they should be equipped with advanced critical care training & will have to learn how best to adapt to and encompass these changes to achieve maximum benefits for the patients.

Prime Minister Narendra Modi's call for self-reliance 'Aatmanirbhar Bharat' and the Government of India through its flagship "Make in India" initiative relied heavily on the Indian manufacturers to meet the rising demand of essential critical care for the country during the pandemic pushing the Indian medical devices sector to become self-reliant. The government lead interventions helped the medical devices industry scale up production rapidly.

Greater collaboration across stakeholders, an integrated critical care system and a well-

Continued on Page 22

The advanced biosensor and microfluidics technology is here to stay as far as Critical Care testing is concerned

Sourav Kr. Saha, Product Manager - Critical Care, Transasia Bio-Medicals explains about advanced biosensor and microfluidics technology and highlights that it will play an important role for critical care testing

Blood gas and electrolyte analyzers are considered the most important tool, especially in an intensive care setting of a hospital. They are useful to provide vital information on different parameters from whole blood samples such as arterial gases, pH, electrolytes and metabolites. The rising demand for point-of-care analyzers and automated blood gas analyzers with advanced technology is leading to the growth of this market.

Over the last few years, technological advancements have led to a paradigm shift from the conventional electrode-based systems to the adoption of advanced biosensor-based technology using microfluidics. This technology offers a host of features that lead to better performance, reduce downtime and simplify operations and maintenance of the instrument.

Biosensor-based microfluidics technology is a preferred choice especially in portable blood gas systems. It is now also being deployed for electrolyte analysis including Na, K, Cl, iCa. Having said that, it is still to gain ground since many manufacturers are still evaluating the technology and its benefits.

The advanced biosensor technology is convenient for varying workloads. It requires minimal maintenance and intervention. In the next 2-3 years, this technology will further be adopted for additional parameters. Periodic replacement of consumables including electrodes and tubings, remain one of the biggest challenges in this segment. Additionally, other aspects such as cleaning, conditioning of electrodes and solution path, varying lives of different electrodes account for high running cost for blood gas and electrolyte analyzers, over a period of 5-7 years of operations. Over the time, this adds up to the cost per test.

Faster adoption of the biosensor technology for electrolyte analyzers is the need of the hour as it enables hassle-free operations. An analyzer integrated with the biosensor technology simply requires a replacement of the complete test pack including the reagents and the biosensor chip on the reagent pack. Moreover, consumables do not need to be replaced separately. The instrument also doesn't require daily maintenance, conditioning of electrodes, periodic replacement of electrodes, etc. The operational downtime of the instrument too is significantly reduced.

The advanced biosensor and microfluidics technology is here to stay as far as critical care testing is concerned.

Critical care should be made...

Continued from Page 21

rounded healthcare digital infrastructure are the need of the hour. Patients too are becoming more aware and willing to adapt to the use of new technologies, thereby enhancing the scope for better treatment outcomes.

Accessibility and affordability are the two vital parameters that play a critical role in developing efficient healthcare delivery systems. Due to digital and technological advancements in the past decade, a mass digitisation shift has occurred across industries. The healthcare industry has been successful in incorporating medical services such as preventive, diagnostic, therapeutic and patient education as well as self-management through various telecommunication channels. This has been of immense significance during the COVID-19 pandemic, which limited patient mobility. Telemedicine has proven to be an 'effective practice of using communications technology to link healthcare providers to their patients and each other' by accessible and affordable means.

The possibilities for telemedicine are almost endless and tele-ICU is the future especially in remote areas. Technology is being used to bridge the gap between rural and urban healthcare, making it accessible and affordable to all.

With COVID-19 making social distancing mandatory, accompanied by shortage of intensivists and infrastructure - 70k ICU beds per 5 million people - the concept of virtual care previously restricted to non-critical interventions, has only become more mainstream. Tele-ECG consultation is helping general practitioners in remote areas manage patient triage and make quick decisions. Virtual care technology is also advancing the early adoption of the 'Home ICU' concept, where patients can be given ICU care with minimum cost and in the comfort of their homes.

In an ecosystem primarily driven by analysing large amounts of data useful for predictive analysis of treatment outcomes, AI and IoT are proving to be gamechangers. They are being used by clinicians to predict, automate, advance workflow efficiency, and improve patient experience. Hospitals use this information to pre-empt resource allocation requirements, streamline patient workflow and allow clinicians to focus on delivering the best care for the patient with reduced staffing.

The COVID-19 pandemic has placed an unprecedented demand on the healthcare system in India. With a population exceeding 1.3 billion and the majority living in rural and remote regions, critical care in India face enormous pressure. A coordinated effort by various public health organisations will be crucial for ensuring adequate delivery of intensive care to critically ill patients.

Collaboration is key to critical healthcare - no one entity can do this alone. It is critical to work towards complete modernisation of the current infrastructure to make healthcare more intelligence-based, ultimately, an intelligent healthcare system, means a more efficient, affordable, and accessible healthcare for all.

The road ahead is full of opportunities. If within 2 years of the pandemic, India could ramp up rapidly with high tech innovative quality medical devices with conducive policies to encourage growth, the Indian medical device industry can achieve much greater success and help make India the 2nd factory in the world for medical devices.

Why ESG benchmarking is crucial for healthcare real estate

Anshuman Magazine, Chairman & CEO-India, South-East Asia, Middle East & Africa, CBRE highlights that while environmental consciousness, focus on sustainability and adoption of sharper governance practices should be a priority for any business, the moral responsibility of a healthcare organisation towards public welfare is higher

A sound healthcare delivery ecosystem is the backbone of any prosperous nation. From niche and nuanced infrastructure set-up including primary, secondary, and tertiary care outfits, to medical equipment, consumables, the pharma vertical, to the clinical workforce and allied services, technology driven health-tech solutions and various other elements come together to build a comprehensive healthcare ecosystem.

In India, real estate enabled hospital industry, accounts for 80 per cent of the total healthcare market and therefore, the physical building space becomes one of the crucial aspects of the segment. A 2021 Lancet report suggests that the health care's climate footprint accounts for nearly 5 per cent of global net emissions and harms public health.

Following the COVID-19 pandemic, healthcare across the globe realised certain challenges and opportunity areas. Stakeholders, including policy makers, clinicians, and other experts opened-up to the idea of re-imaging healthcare systems in the country.

In line with these changes, it is imperative to look at healthcare real estate from a renewed lens to bring efficiencies in operations, and to offer a seamless and efficient patient experience which not only brings satisfaction and delight but also enhances clinical outcomes.

ESG relevance and scope for healthcare

While environmental consciousness, focus on sustainability and adoption of sharper governance practices should be a priority for any business, the moral responsibility of a healthcare organisation towards public welfare is higher.

Presently, while Leadership in Energy and Environmental Design (LEED) and green building initiatives are being pursued by hospitals and academic centres; the larger industry is yet to weave ESG within their operation lifecycle. Similarly, from a pharmaceutical and life sciences organisations' perspective, there is a need to embed strategies that work in-tandem with government bodies, regulators, investors, and consumers to ensure increased expectations to drive responsible business practices.

This includes (but is not limited to) sustainability measures that transcend product development, such as through green chemistry, logistics & supply chains, and off-setting overall emissions via fuel efficiency and route optimisation.

Here are some practices that healthcare providers may consider when planning their infrastructure acquisition or upgrades, operations, sourcing to become more sustainable and eco-friendlier:

◆ **The ESG checklist:** It is one thing to make a public commitment to ESG but putting it into practise can be difficult. For revamp of any existing building or planning of a new asset, key ESG considerations must include - Observance of the WELL Health-Safety Rating, a new benchmark for ensuring that inhabitants work in safe and healthy environments. Considering other environmental challenges, such as rainwater harvesting, green roofscapes, energy-efficient lighting, and alternate transit options, must be given due attention.

◆ **Life Sciences:** Laboratories, manufacturing facilities, and big life science campuses are large, complicated, and costly enterprises that take years to plan and construct. From an ESG standpoint, these projects have the potential to be the lightning rod. While ESG should be applied to any organisation's purpose, mission, and operations, the threshold for life science real estate developers and renters may be considerably higher.

◆ **Updating procurement and waste management processes:** Improving waste management is one of the easiest ways to go green. Recycling recyclable materials can be ensured by reviewing the waste management procedure. If the hospital does not have an established sustainability criteria for waste management or procurement, now is the time to do so, especially if any review is followed up by new or strengthened sustainability practises and pledges.

◆ **Reconsidering the use of durable assets:** A business will be more environmentally sustainable if it shares the durable assets including transportation fleets, buildings, medical equipment, and other underutilised assets. This cuts down on both the amount of money spent on expensive equipment like imaging machines and the amount of time that expensive equipment sits idle. Asset sharing not only saves money for everyone in the network, but it also saves energy by reducing the amount of energy used to manufacture and service the items.

◆ **Synergy between people and technology:** It is critical to have tangible reporting metrics for by better measuring and quantifying current work, evaluating value creation, and analysing impact on the society. Healthcare leaders must use proven tactics and smarter technologies to identify, measure, and hold their business accountable to ESG principles. It may require new data collection processes or collaboration with third parties, but they can use proven tactics and smarter technologies to identify, measure, and hold their business accountable to ESG principles. Some have already begun to increase data gathering efforts to better report on societal racial inequalities in results and the activities being taken to overcome them - using these well-known credible metrics.

The past few years have been a benchmark for the healthcare sector, encouraging a digital and sustainable transformation that focuses on achieving global concerns and enhancing the experiences of patients & care providers. As climate change, the circular economy, and ecologically sustainable business practises continue to reshape the socio-economic landscape, it is past time for healthcare to step up its sustainability efforts.

INTERVIEW

Why hunting, tracking, analysing and studying SARS-CoV-2 and other pathogens must continue

Regardless of the pandemic moving into the endemic phase in certain regions, **Mary Rodgers**, lead virus hunter and principal research scientist at Abbott and **Gregory Orf**, Senior scientist at Abbott explain to **Viveka Roychowdhury** the importance of keeping early surveillance detection systems in place as "a threat somewhere is a threat everywhere." Thus accurate diagnosis via testing and effective vaccinations remain the essential combination in keeping case numbers down

Mary Rodgers

Gregory Orf

Dr Rodgers, in our last interview, in February 2020, we were discussing your team's discovery of a new strain of HIV called HIV-1 Group M, subtype L and you said, "To end the HIV pandemic, we must continue to outthink this virus". Do you think we will ever be close to out-thinking the SARS-CoV-2 virus?

Mary Rodgers: We've made incredible advances in only two years to build new tests, vaccines and other tools to combat SARS-CoV-2. As immunity continues to increase from infections and vaccinations, we hope to see COVID-19 rates stabilise and become endemic or potentially seasonal like the flu and other respiratory viruses. Going forward, we need to keep up our pandemic defenses through ongoing surveillance, testing and global collaboration between public health, the scientific community and industry to make sure we are continuing to keep pace with SARS-CoV-2 as it evolves.

Part of your work to out-think this virus has been about tracking its mutations as it spreads through the world. Your recently published study in Virus Evolution found significant differences in the mutations in the SARS-CoV-2 variants during Senegal's first wave in mid-2020 and the second wave in late 2020. As the world comes to terms with the latest SARS-CoV-2 variant, XE, which is estimated to be more transmissible, explain to us the significance of these findings.

Rodgers: Viruses are continuously changing through an accumulation of mutations - they are being tested by nature to make the virus fitter and more adapted to humans. Over time, the right combination of mutations shows up and the pathogenicity or transmissibility of the virus changes. At this point, it can become a variant of concern.

These studies tell us what to be looking for going forward- what mutation combinations could lead strains to develop into variants of concern because they confer a fitness advantage. We continue to retrospectively study Omicron and other variants to stay a step ahead of this pandemic and new threats.

What are the factors aiding the global spread of infections like SARS-CoV-2?

Rodgers: We live in a more global, interconnected world than ever before. And there are no shortages of pathogens- in fact there are 10 million times more viruses on Earth than stars in the universe. The next virus is just an air flight away. As such, novel disease outbreaks are increasing, driven by factors such as

globalisation, climate change, population growth and closer contact between humans and animals.

Explain to us how Abbott's app demonstrates this geographic spread, and correlates specific changes in the lineage of the virus to greater transmissibility and severity of regional and global waves of the pandemic.

Gregory Orf: In Senegal, Abbott has an existing surveillance partnership with IRESSEF, the Institut de Recherche en Santé, de Surveillance Epidémiologique et de Formation as part of the Abbott Pandemic Defense Coalition (APDC). We worked with IRESSEF to collect and analyse samples of SARS-CoV-2 from the first two waves of infections in 2020 and early 2021 for this study.

Our findings showed that these Senegalese variants had higher levels of fitness and infectivity from their mutation characteristics; in fact one variant was able to prevent Alpha's takeover in the country.

Since these variants were more fit, we decided to utilise a special kind of calculation called a phylogeographic analysis. This allowed us to take the genetic data and merge it with air travel data to predict the import of SARS-CoV-2 into Senegal, and its export and dispersal from Senegal to other parts of the world. Including air travel data was important because it adds a layer of information that can help resolve ambiguities that the genetic information alone may leave.

This type of analysis is not new, but it helped us map and better illustrate the travel of these variants' month-by-month. Of particular importance is that the early variant B.1.416, after emerging in Senegal, was exported to Europe - first to France and Spain, and then onto the UK, Italy, and others. After variant B.1.1.420 was imported from Italy, it was re-exported back to Europe as well as the US, Japan, and Australia.

These study insights are important because they illustrate for the larger public health and scientific community how far and fast a variant can travel, and which mutations are gaining fitness so we can anticipate what to look for in the next variants of concern.

Governments and policy makers benefit from the early surveillance detection systems remaining in place to inform our ability to respond rapidly and protect our communities. A good example of this recently was our APDC partners in South Africa alerting the world to the Omicron variant weeks before significant cases of it were seen outside South Africa. This head start gave world governments the chance to prepare, even if the case counts in their own countries were low at the time

This kind of work is the result of the Coalition's mission to help prevent future viral threats. The APDC is a first-of-its-kind, industry-led global scientific and public health partnership dedicated to improving early detection and rapid response to viral threats.?With 14 scientific and public health organisations, the Coalition is actively hunting, tracking, analysing and studying SARS-CoV-2 and other pathogens.

How can these insights from molecular surveillance of SARS-CoV-2 variants help scientists predict future variants and their impact?

Rodgers: Simply looking at a variant's sequence won't tell us if it will become a variant of concern- we have to look deeper to understand how that variant performs- its level of fitness, patterns of infection and transmissibility. And that's what we've been learning through our scientific studies. When we dive deeper into factors that drive a strain to become more predominant or to cause more cases, we unravel more of the mystery around SARS-CoV-2.

The argument is that with increasing community spread and some countries already close to approaching the endemic phase, would resources spent on genomic screening be better deployed elsewhere, like on medicine research or increasing hospital beds, etc. How can governments and policy makers best make use of such data while planning pandemic measures like imposition of lock downs, investing in genomic screening of samples, etc?

Orf: Continued genetic screening will remain instrumental for many reasons. First, it informs diagnostic manufacturers like Abbott about how well their tests continue to accurately diagnose cases, and it also informs vaccine manufacturers about how to further tailor or optimise their vaccines as the virus evolves. Regardless of the pandemic moving into the endemic phase in certain regions, accurate diagnosis via testing and effective vaccinations remain the essential combination in keeping case numbers down. Governments and policy makers benefit from the early surveillance detection systems remaining in place to inform our ability to respond rapidly and protect our communities. A good example of this recently was our APDC partners in South Africa alerting the world to the Omicron variant weeks before significant cases of it were seen outside South Africa. This head start gave world governments the chance to prepare, even if the case counts in their own countries were low at the time.

What are the learnings from such global viral surveillance programmes for future infectious disease research and control?

Rodgers: A threat somewhere is a threat everywhere: fighting pandemics requires a multi-sector approach that include governments, academia, international agencies, and industry working together.

That's why Abbott launched the Pandemic Defense Coalition last year. Global collaboration is needed more than ever to help us prepare for and help prevent future viral threats. The Coalition offers speed because it breaks down global barriers and streamlines sharing of virus information and samples. The quicker an emerging pathogenic threat can be found and characterised, the quicker it can be controlled – we can ensure diagnostic tests are developed to detect the threat and that vaccines and therapeutics are effective in preventing and treating it.

What is the progress on other diseases like HIV, that Abbott's viral surveillance program is tracking?

Rodgers: We continue our work on hepatitis and HIV today and have expanded our research with our Coalition partners. For example, Abbott is partnering in India with YRG Care in Chennai. We are looking at viral evolution and transmission patterns for diseases including HIV, hepatitis, and SARS-CoV-2, especially in marginalised and transient populations. Our work together can inform test and treat programs to help effectively reduce the incidence and spread of these diseases in and out of the country. We also work together with on virus discovery to mitigate future pathogens of concern.

Many countries do not have the funding or infrastructure for such studies. How will these gaps impact global health and what are the short term solutions?

Rodgers: One of the silver linings of the pandemic is that it created more awareness to gaps in public health and pandemic preparedness. That's why its critical to maintain global collaboration. No single institution can prepare a country for the next pandemic – we have to work together.

Regular communication is key to the success of these public-private partnerships. Government, industry, and academia work most effectively together to share what they're learning about infectious disease and emerging public health threats freely.

Finally, in the longer term, we'll need to build our virus-hunting workforce. The World Health Organization recommends a global ratio of one field epidemiologist for every 200,000 people. Only a fraction of countries has met that goal.

Initiatives like the Training Programs in Epidemiology and Public Health Intervention Network, which Abbott has a fellowship program with, is already training epidemiologists in more than 100 countries, can help. We must build up our pipeline of scientists and infrastructure across the world to raise pandemic defenses everywhere.

viveka.r@expressindia.com
viveka.roy3@gmail.com

A deep dive into the current high-end diagnostics industry in India

Dinesh Chauhan, CEO, CORE Diagnostics stresses that diagnostics has moved far & beyond the traditional role it used to play earlier. Today, it plays an important role with high-end diagnostics that ranges from diagnosis to patient classification and treatment monitoring

Introduction

The In-vitro diagnostic (IVD) industry today is an indispensable part of the healthcare universe helping in clinical practice with diagnosis, monitoring of diseases, providing prognosis and predicting the treatment response. In addition to this, the IVD industry is also used to assess the potential risks of developing other diseases or disorders and to guide in patient management. IVD helps in the analysis of origination of body specimens, including blood as well as tissue biopsies, then further used alone or in combinations for clinical investigations. High-end diagnostics are perceived as significant tool for high-quality medical outcomes.

The Indian diagnostics industry has been rapidly evolving. There is an increased reliance of medical experts and professionals to validate diagnosis along with the shifts in consumer psyche as well as their preference to be extra cautious about their health.

The expansion of high-end diagnostics industry in India

With the pandemic, the world witnessed a transition in the industry. People have become extremely conscious about their health and hence get tested to maintain their health quotient. Staying up to date with online consultations via telemedicine services, the diagnostic laboratories have brought doorstep diagnostics services to the consumers through the help of technological innovations. The fast-paced lives of people in today's world helps with these offerings of home testing processes and ensures further the provision of instant results making people prefer it increasingly.

With COVID and allied tests being major sources of revenue and profitability for the industry, it will now be interesting to see that now with the pandemic at its end and cases reducing, how the industry shifts its focus to their non-COVID test offerings

The way ahead for the industry

India is one of the leading hubs for high-end diagnostics services. There is huge investment ongoing in the industry which makes it easy to reach to a larger population. In-vitro diagnostics market estimated to be valued at USD 1255.18 million in 2020 and is expected to reach approximately USD 1990.99 million in 2026, registering a CAGR of nearly 7.10 per cent during the forecast period. This growth is going to be primarily driven by an increase in spending on healthcare, rising incomes, and an increased awareness to stay healthy and get preventive tests done along with high-end diagnostics and other government's measures. It's also clearly evident today that the diagnostic industry is spreading to tier II and tier III cities making it more accessible to people all over the country. An increase in collaborations across stakeholders in the medical community is also on the rise which will further enhance the way the industry progresses.

Challenges faced by the diagnostics market in India

There are some obstacles that the industry faces till today. With COVID and allied tests being major sources of revenue and profitability for the industry, it will now be interesting to see that now with the pandemic at its end and cases reducing, how the industry shifts its focus to their non-COVID test offerings. The introduction of self-monitoring through new wearables & self-monitoring tools are also new additions as well.

Although these challenges are only a few, there are some expectations. Our country has always focused on developing plans like Ayushman Bharat, National Digital Health Mission etc, but there is a need for additional funds that would ensure easier access of healthcare services by people of any strata especially the underprivileged. There is also a need to curate innovative, tech-based and affordable healthcare solution in India to ensure quality treatment and cure, especially with the occurrence of new variants like XE now. We also require significant investments in funding the R&D sector which is a crucial part for the industry.

Conclusion

Diagnostics has moved far & beyond the traditional role it used to play earlier. Today, it plays an important role with high-end diagnostics that ranges from diagnosis to patient classification and treatment monitoring. The role it plays is so critical to the healthcare system that its growth is inevitable. Diagnostics industry revolutionises the healthcare system globally, enabling clinicians, doctors, and other people from the industry to make better decisions, give patients the power to choose their own well-being, and provide taxpayers and policymakers with the assurance that they are investing in correct solutions suited best for them. We now have access to a more proven and effective approach to healthcare, one in which the role of high-diagnostics role is heightened threefold.

POC devices: Revolutionising disease detection and diagnosis

Dr Radha Rangarajan, Chief Technology Officer, HealthCube explains how Point-of-Care (POC) devices, that are simple to use, rapid and cost effective can fill the gap in disease detection and diagnosis

Early diagnosis can make the difference between life and death for many. Nearly 1 million Indians die due to complications from diabetes every year. Despite knowledge of the dangers of diabetes, most people discover their condition by serendipity, rather than systematic testing. A wound that doesn't heal, frequent urinary tract infections, or sudden weight loss are all tell-tale signs that prompt testing and diagnosis. For many, the condition has already progressed significantly at this stage, requiring aggressive treatment. How can one improve early detection and prevent complications and loss of life?

Point of Care devices are leading a paradigm shift

Point-of-Care (POC) devices, that are simple to use, rapid and cost effective can fill the gap. Rather than asking people to go to a laboratory, these devices test at home or in a doctor's clinic. The convenience of on-site testing and instant results make these devices a powerful weapon in the hands of physicians and public care experts. However, conventional wisdom in healthcare circles holds that POC devices such as glucometers or electronic blood pressure machines can be used for monitoring health parameters but not for diagnosis. The pandemic has shown that such devices combined with other "smart" features can enable diagnosis, prioritising those who need confirmatory testing in a laboratory.

The new generation of POC devices are digitally enabled, which means that not only do they provide a test result, but also save data and share results with a doctor. The doctor has the option of reviewing and monitoring the condition over time. The device may also remind the individual to test themselves at some interval or get a more advanced test done, through in-built analytics. Thus, POC devices have gone beyond testing, to providing individuals with a remote healthcare ecosystem.

Periodic self-testing combined with monitoring by physician scan be an effective way to identify and address a problem early. The American Heart Association suggests that data obtained from home monitoring of blood pressure can help physicians decide the appropriate treatment for their patient, without the need to test in a clinic. This is the paradigm shift in disease diagnosis that digital medical devices are ushering in.

> Devices and analytics have a long way to go to achieve this goal! But the success of these new technology driven paradigms depends heavily on the quality, accuracy and usability of systems

Early detection goes beyond devices

While devices may be at the heart of disease detection, artificial intelligence driven algorithms can greatly expand the boundaries of detection.

How far can this model extend?

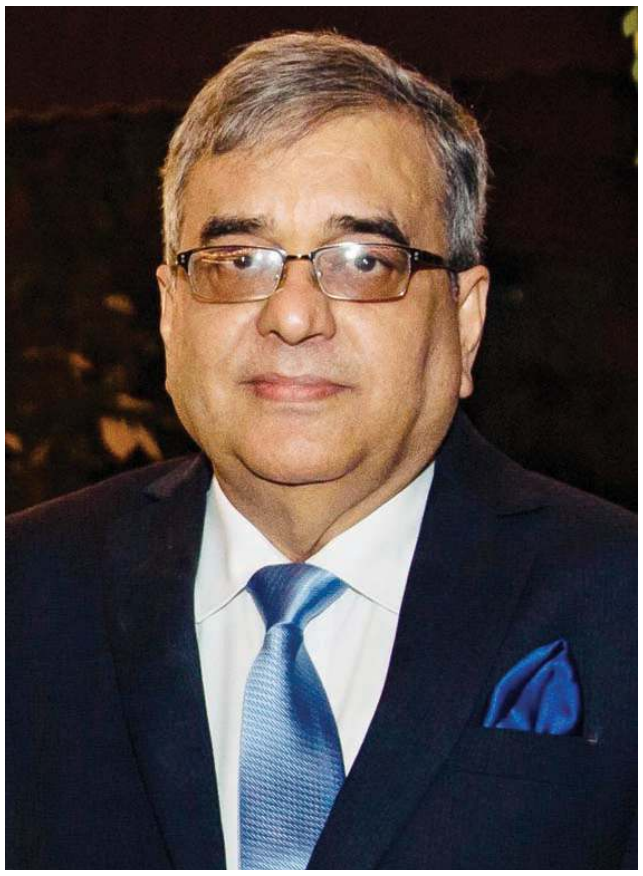
It is conceivable that in the future, we will all have handheld monitors akin to gadgets from the sci-fi series, Star Trek, to find out what is wrong with our health. Devices and analytics have a long way to go to achieve this goal! But the success of these new technology driven paradigms depends heavily on the quality, accuracy and usability of systems. With all three in play, digitised diagnostic can be a powerful pathway to healthy living. Dr Andrew Weil, a physician dedicated to health promotion and disease prevention says, "If we can make the correct diagnosis, the healing can begin. If we can't, both our personal health and our economy are doomed." Let connected diagnostics lead the way.

Digital informed consent: A futuristic solution for an indispensable healthcare need

Ajit Kohli, Managing Director & CEO, Thieme India explains that since the use of electronic devices such as smartphones is highly prevalent in India, widespread adoption of the digital consent process by our healthcare industry should not be a challenge if patient confidentiality can be guaranteed

In the present world, consent is a significant element in all aspects of healthcare dispensation. Its legal and ethical necessity stems from the basic right of self-determination. In surgical practice, before performing a procedure, it is imperative for a surgeon to obtain a patient's consent for surgery in writing, failing which he/she will be liable under both criminal and tort law.

Importantly, the consent (the permission a patient gives to the surgeon to perform the surgery) must also be an "informed" one. Informed consent means that a patient has been provided with all the necessary information, understanding, and guidance about the risks and benefits involved in a procedure, with complete transparency and without ambiguity, before obtaining the permission.



Consent related challenges in India

As per Indian law, a surgeon performing a procedure must take the patient's (if she/he is an adult, competent/has the capacity to consent) voluntary informed consent without putting any form of pressure on him/her to sign the document, and only after having furnished the information about the entire procedure and answering all the questions he/she may have. Blanket consents are invalid; separate consent forms are required for repeat procedures, blood transfusion, anaesthesia, and fresh procedures, and consent obtained during a surgery is also legally unacceptable and inadmissible. It must be obtained prior to it, barring some specific cases of emergency. Patients have the right to refuse consent or withdraw it at any time. Informed consent for medical research or publication has to be obtained separately.

Regarding proxy consent, when a patient cannot provide consent himself/herself, no clear regulations seem to be defined but the medical practitioner may proceed with the treatment by taking the consent of a close relative of the patient or even an attendant.

However, in India, sometimes patients are rushed into signing the consent form, without adequate information being furnished to them, thus rendering the entire process invalid, despite the patient's signature on the consent form. This may be because medical professionals are either ignorant of the importance and need for valid consent and its legal implications or choose to ignore them. In cases of medical malpractice, instances of missing or invalid consent have regularly come under judicial scrutiny1. Surgeons and medical institutions would do well to remember that the consent form is meant as much for the safety of the patients' right as their own, and thus should administer the entire process ethically and diligently.

The digital consent process

In recent decades, innovative digital technologies have been introduced in the domain of informed consent, especially in clinical research and practice. These digital interventions generally use the multimedia format to provide information to patients, seek their consent, and document it. These formats can be classified into three categories, namely, non-interactive multimedia, interactive multimedia, and video. Recently concluded studies have already revealed the positive results of digital informed consent, with its multimedia tools conveying information more effectively, and its desirability as the option when consent cannot be obtained in person.

Digital consent process in the developed world

In 2015, the United States Food and Drug Administration had released a guide regarding obtaining electronic informed consent. The process involved the use of e-media to obtain and document the consent using graphics, text, audio, video, live chats, etc. During the pandemic, the adoption of digital/remote technology for completing tasks became quicker, and so, several hospitals and medical institutes have moved their informed consent process to digital pathways.

For example, at the Imperial College Healthcare NHS Trust (London, the UK), remote consent channels are not only already supporting patient recovery in these challenging times, with an estimated reduction in day-of-surgery delays and cancellations by over 10 per cent, but approximately 91 per cent of patients have also highly rated their experience of the digital consent process. With the digital mode making informed consent prompt, easy, and completely hassle-free, this has the potential to become the default process of obtaining consent in future for the West and India as well.

If only the Indian healthcare industry can adopt the digital means of scrupulously obtaining informed consent, it can also benefit from this change.

Digital consent process in India: A win-win for all

Since the use of electronic devices such as smartphones is highly prevalent in India, widespread adoption of the digital consent process by our healthcare industry should not be a challenge if patient confidentiality can be guaranteed. All it needs is the availability of robust technology and processes for encryption of all forms of patient information, appropriate archiving, and easy recovery of e-documents.

Digital administration of informed consent has the potential to bring about manifold improvements in the overall quality of the entire process. It will be a big boon for patients as the use of tools like graphics and animation will facilitate their understanding, thereby not just improving their experience during the medical treatment, but also adding to the validity of their consent! For doctors and medical institutes, it will enable fast and timely collection of consent from remote locations. Since consent is very specific and at times required several times during the different parts of one treatment, it will make repeat obtaining of consent easier as well.

In India, the digital consent process has already been used in studies/surveys, and tech companies are preparing customised products to aid its adoption. However, the most pressing requirement is of the necessary validation from bodies such as the Indian Council of Medical Research (ICMR) and Indian Pharmacological Society (IPS). Only when such prominent regulatory organisations facilitate the adoption of digital consent process will it be accepted whole-heartedly in the country.

Digital CME: Changing the face of learning

Ashu Kasera, Co-founder & Director, Clirnet explains how digitisation is aiding medical education to become more accessible by eradicating the barriers of geographic and socioeconomic obstacles

Learning never stops, especially if it is the field of medicine. A healthcare professional (HCP) needs the latest knowledge and precise application as a practitioner. This makes continuous learning vital as it ensures skill development, application of knowledge, and a better attitudinal stance. Context creates the need for education; it doesn't operate in a vacuum. Today, the digital dimension is building a more polished practice of medicine and is particularly useful for continuing medical education (CME). Health practitioners are increasingly absorbing education shared over digital platforms, and technology has made accessibility, engagement, personalisation, and tracking of learning simpler and more powerful.

The strategy of incorporating digital CME has enhanced decision-making, entailed more professionalism, and has helped improve patient engagement. The pandemic-induced lockdowns have been a catalyst to the integration of digital CME. Physical training has recently transposed itself into virtual CME and will continue to expand beyond the pandemic. The potential of educational benefits that can be attained through the facet of digitized learning shows immense promise. It is as effective as physical training in equipping HCPs with high-quality, evidence-based treatment knowledge.

Health practitioners are increasingly absorbing education shared over digital platforms, and technology has made accessibility, engagement, personalisation, and tracking of learning simpler and more powerful

Mapping the convenience of digital CME

Banishing the barriers: Digitisation is aiding medical education to become more accessible by eradicating the barriers of geographic and socioeconomic obstacles. For instance, a surgeon in Arunachal Pradesh can conveniently use his handheld device or laptop to attend a digital CME taking place from the operation theater of AIIMS. CLIRNET platform has seen many doctors from the North East link to expert pediatricians and cancer specialists from across India to address the lack of such expertise in such remote locations.

Enables efficient interoperability: Digital CMEs aren't only banishing barriers but also simplifying the processes associated with physical CMEs. The digital option provides doctors an opportunity to attend lectures virtually, sometimes even in the middle of the day! This encourages more professionals to attend the sessions and saves them the time and effort required for commuting. Local CMEs were seen as an opportunity for doctors to confabulate and expand their network. This has now seen a multiplier effect with the CMEs being virtual and generating more participation. The reception from the medical fraternity has been excellent. Pre-pandemic, only 5-7 per cent of CMEs were conducted digitally; this has grown multifold to 70-75 per cent. Medical associations such as FOGSI, ASI, API, CSI, IOA, and many more, have shown a proclivity towards disseminating knowledge using the digital corridor.

Palpable convenience: Digital CMEs provide palpable convenience as they offer HCPs the expedience to choose content on demand. Many plenary sessions were hindered by the reluctance of super-specialty hospitals to send their valuable specialists to physically attend seminars. Digital CMEs have provided a convenient solution to this issue, where all physicians can attend CMEs virtually from any location. Key opinion leaders (KOL) of many hospitals can now conduct virtual sessions for more doctors. The number of participants is much higher and feedback quicker.

Changing the face of medical education in a heartbeat

Today, India stands at the edge of a revolution in the continuing medical education sector. Some of the trailblasing digital CME platforms are propelling this transformation. Experts from as many as 30–35 specialties from not just India but also overseas are associated with these virtual channels. A seamless learning experience with a continuous feedback mechanism furnishes these virtual platforms with flexibility and resourcefulness. Some of the esteemed professionals across the fraternity have praised the streamlined service that they are getting through digital CME. Accommodating India's growing network of doctors, such platforms are fostering interactive experiences that are tailor-made for patient-care challenges.

Vantage view

From a catalyst-induced alternative, digital CMEs have established itself as the new normal going forward. Leveraging the benefits of community-generated content, CLIRNET, alongwith other leading digital CME platforms, is creating a community of doctors for a synergised CME system. These virtual community channels are disruptive as platforms and important tools for the future of medical education. They will further evolve by incorporating AI, machine learning and other futuristic technology like virtual reality and 3D functionality.

INTERVIEW

Pandemic has revealed healthcare sector's ability to constantly adapt and come up with new and better ways to care for patients

Srikanth Suryanarayanan, Head – Imaging, South Asia, GE Healthcare in an interaction with ***Express Healthcare*** stresses that with Atmanirbhar Bharat taking centre stage, it is pertinent for the industry to help increase availability of infrastructure at the grassroots. He also talks about GE Healthcare's latest product - Revolution Aspire, an advanced imaging solution designed and manufactured end-to-end in India

We are still recovering from COVID-19 and the healthcare sector has been the anchor industry during this pandemic. What are some of the learnings and gaps that surfaced during this period?
Pandemics are not warnings alone. Pandemics are lessons. The COVID-19 crisis has centered on the healthcare industry and the last two years have been transformative in that context. The crisis revealed the healthcare sector's ability to constantly adapt and come up with new and better ways to care for patients, keeping in mind clinicians' best interest too. For India, the second largest population in the world, the bigger question is, how do we make healthcare more accessible to all?

With Atmanirbhar Bharat taking centre stage, it is pertinent for the industry to help increase availability of infrastructure at the grassroots. If equipment design and manufacturing were to be localised, it will not only be cost-effective but will also enable access in tier-3 and 4 cities and rural districts. Traditionally, Indian healthcare regime has been restricted to the metros, with smaller cities and towns lacking even the basic diagnostic equipment. The demand-supply gap can be bridged with 'Make in India' expanding our R&D as well as production capabilities.

> Revolution Aspire is an advanced imaging solution designed and manufactured in India, at the newly launched Wipro GE Medical Devices Manufacturing plant, in line with the government's 'Atmanirbhar Bharat' initiative

What are the current challenges that the industry is facing when it comes to providing accessible and affordable healthcare for all?
Unequal distribution of healthcare products is one of the major roadblocks in resource-constrained environments. Even though a major proportion of the population lives in rural areas, healthcare facilities with quality medical devices are concentrated in urban areas. In numbers, India has about 3 CT scanners per million people, which is 3x–10x fewer than countries with higher levels of healthcare spending and infrastructure. Similarly, PET scanners, a frontline tool for imaging cancer patients, have relatively low penetration in tier II and below areas. However, initiatives such as 'Make in India' and the Production Linked Incentive (PLI) Scheme are encouraging the sector to reduce this demand gap by reducing dependence on imports for medical devices and expanding the local manufacturing footprint. Aligned with this vision, we have recently launched our latest facility under the PLI scheme for manufacturing critical devices such as CT machines, Cathlab equipment, Ultrasound scanners, patient monitoring solutions, ECG machines and Ventilators.

Lack of skilled medical professionals has also been a growing concern in India, especially considering the increase in the gamut of responsibilities for the healthcare sector following the pandemic. A large amount of rural healthcare is managed by people who need additional medical training through professional and accredited programs to operate advanced devices. Upskilling the existing workforce is critical as rapid adoption of technology during the pandemic has also proven to be an intelligent, affordable, and accessible solution where in-person treatment was restricted.

How are you innovating and delivering solutions that address healthcare needs of India and the world, keeping patient at the center of care?
With a population of over 1.4 billion people, India faces unique hurdles in terms of high-quality healthcare. Innovating and developing products that enable faster and more accurate diagnostic results, a user-friendly interface for both clinicians and patients, and simplified remote-monitoring and cloud-based digital care pathways will aid in realising the long-term vision of a truly self-sufficient Indian healthcare ecosystem. At our Bangalore-based technology center, we are focused on identifying these unique challenges faced by the Indian health ecosystem and developing products/solutions that empower clinicians as well as improve the patient care delivery experience.

Our imaging products

empower healthcare professionals to better see inside the body, which helps improve the diagnosis, monitoring and treatment of disease.

Tell us more about your latest "Made in India" product - Revolution Aspire?
Revolution Aspire is an advanced imaging solution designed and manufactured in India, at the newly launched Wipro GE Medical Devices Manufacturing plant, in line with the government's 'Atmanirbhar Bharat' initiative. The CT system improves diagnostic reputation with higher imaging intelligence and help clinicians to diagnose disease and anomalies with greater confidence.

The Revolution Aspire CT scanner empower clinicians with increased operational efficiency with upto 50 per cent higher throughput*.1 The rotation time in Revolution Aspire CT scanner has been increased by 20 per cent, enabling clinicians to provide faster diagnosis*. That along with a significantly improved cooling rate, the scanner allows a higher rate of continuous scanning and can handle higher patient volumes per day. The CT scanner also comes with a new detector design and algorithm, along with smart features such as Smart MAR, that enables up to 30 per cent improved image quality*. As one of the most powerful systems in its segment, the system is redesigned to deliver higher performance through

tube capacity, tube current, and X-ray generator power while maintaining the same footprint. Additionally, it provides intelligent IQ to provide exceptional clinical outcomes, besides reduced radiation dosage for patients and clinicians' safety.

What is the kind of impact you hope to make with this product?
With products made in India like our Revolution Aspire CT scanner, our objective is to bridge the gap in the supply of healthcare products that provide superior care to a greater number of patients at a lower cost. We aim to enable last-mile delivery of affordable medical equipment in India, with a focus on tier 2 and tier 3 cities and towns. When you aspire to take your practice to greater heights, the Revolution Aspire is exactly what you need!

What is the future of Indian Medical Imaging? How is GE Healthcare playing its part to ensure the industry is moving in the right direction?
The imaging challenges for organisations grappling with new technologies include the need to deal with ever-growing imaging utilisation demands which have further increased with COVID-19. In addition, solving the problems of a fragmented IT infrastructure to continually improve the quality of care, keeping the patient experience as a focus is also crucial. Now more than ever, healthcare institutions need to consider medical imaging equipment that offers scalability, reliability, and quality. We are working with our customers to understand their needs and relying on our strong R&D teams to develop solutions that are future-ready.

India, being Asia's fourth largest medical device market and one of the top 20 across the globe, is positioned for a significant leap. At GE Healthcare, our goal is to support the government's vision of becoming 'Atmanirbhar Bharat' with continued innovation, keeping in mind the specific bottlenecks of the Indian health ecosystem and ensuring quality care delivery across key care pathways.

[1] *Compared to previous generation CT scanner*

Overview of demand for Indian healthcare professionals in global markets

Alejandro Coca, CEO, TrueProfile.io highlights that the medical workforce trained in India is the most in-demand set of professionals across the globe

The gambit of healthcare workers does not contain itself to doctors and nurses alone; it also entails numerous other professionals like laboratory technicians, physiotherapists, pharmacists and support staff. Each member of this sector is critical in ensuring the timely delivery of medical help and care to the masses. When the black swan event of the coronavirus outbreak took place, these workers became the backbone of the war against the virus.

The medical workforce trained in India is the most in-demand set of professionals across the globe. The demand for medical professionals is growing at a rapid pace globally, opening the doors of opportunities for healthcare staff. Today, such professionals are in high demand in countries providing advanced healthcare facilities like the UAE, UK, Ireland and the Kingdom of Saudi Arabia. They have the chance to work in a multicultural and highly specialised work environment while opening the door for professional and financial growth.

There is a worldwide shortage of healthcare workers which has resulted in the considerable growth of the demand for healthcare workers operating in the subcontinent. These professionals are renowned for their skills in overseas markets. India is the heart of medical education and houses the largest number of medical colleges in the world

The rising demand for trained medical professionals

There is a worldwide shortage of healthcare workers which has resulted in the considerable growth of the demand for healthcare workers operating in the subcontinent. These professionals are renowned for their skills in overseas markets. India is the heart of medical education and houses the largest number of medical colleges in the world. Every year, the nation notes the outflow of multitudes of healthcare workers in the international space. According to a recent report published by the Organisation for Economic Co-operation and Development (OECD) - there are 69,000 doctors and 56,000 nurses from India working in the UK, US, Canada, and Australia.

The pandemic made the global demand for Indian healthcare professionals further evident. Regions including the Maldives and the GCC were very dependent on Indian medical professionals. With the lockdown and curbs on travel, the staff from India found it hard to provide overseas support to such countries. This situation put these nations under undue pressure. They were grappling with constantly rising cases and a lack of additional medical support. Looking at the grim situation, the central government made rare allowances and arranged easy emigration facilities for healthcare workers during the lockdown. As this trend began to gain momentum, many countries introduced add-on benefits and perks like hiked salaries for nurses.

It indeed sounds good to know that the talent present in India is receiving immense acceptance. However, the question that stands is - how do you venture out and work internationally in this field?

Today's technological advances have helped to turn the world into a global village. Healthcare career platforms enable medical professionals to kickstart and grow their international careers from one online location with everything from job boards to verification, English language training, licensing, online communities and resources for healthcare workers. However, while looking for opportunities overseas, be aware of fraudulent sites that make overarching claims which fail to maintain transparency in their transactions. and deviate from industry-set standards.

Things to keep in mind while applying for healthcare roles overseas

Before you begin the process, be clear in your head regarding the country or region where you wish to work. This decision must be made after careful consideration as it will have long-term implications on your personal as well as professional life. For instance, several Indians opt for countries with a higher English-speaking population. Why? In such nations, they find it easier to settle in and provide quality service because they are familiar with the language. It puts them in a better position to communicate with their patients and colleagues.

While applying, make sure all the documents are in place. The documentation and visa requirements vary from country to country. It is advisable to go through the provided list in advance and keep everything handy. This will help avoid last-minute stress and confusion.

The future roadmap

A study conducted by the World Health Organization predicts a shortfall of over 18 million healthcare workers by 2030. The Indian Ministry of Skill Development and Entrepreneurship has announced that India will help reduce the shortage by supplying more than 300,000 medical professionals to nations like Germany, the USA, the UK, Australia, Sweden, Japan and Singapore.

These figures show that the demand for these professionals will grow in the years to come, and countries across the globe will have to establish a robust care delivery system. Increased salaries and quality of life are factors encouraging the talent from India to migrate and work in international organisations.

Wipro GE Healthcare launches 'Made in India' CT System to strengthen access to quality healthcare across India

Revolution Aspire CT System is manufactured at the company's new plant launched under the government's Production Linked Incentives (PLI) Scheme and is aligned to government's vision of *'Atmanirbhar Bharat'*

Wipro GE Healthcare, a leading global medical technology and digital solutions innovator, today, announced the launch of its next-generation Revolution Aspire CT (Computed Tomography) scanner. Revolution Aspire is an advanced imaging solution designed and manufactured end-to-end in India, at the newly launched Wipro GE Medical Devices Manufacturing plant, in line with 'Atmanirbhar Bharat' initiative. The CT system is equipped with higher imaging intelligence to improve clinical confidence when diagnosing diseases and anomalies.

India faces a dual challenge of urban-rural divide and disease burden. Even though a major proportion of the population lives in rural areas, the majority of health facilities are concentrated in select large cities. India also depends on imports for higher-end medical products such as cancer diagnostics, medical imaging tools, amongst others. With the Government emphasizing early diagnosis of Non-Communicable Diseases (NCDs) and self-reliance, through Ayushman Bharat, there is an increased demand for advanced medical devices. The Revolution Aspire CT aims to address this need and enable access to quality medical equipment across India, including tier 2 and tier 3 cities.

The Revolution Aspire CT scanner empowers clinicians with increased operational efficiency with upto 50 per cent higher throughput*. The rotation time in Revolution Aspire CT scanner has been increased by 20 per cent, enabling clinicians to provide faster diagnosis*. That along with a significantly improved cooling rate, the scanner allows a higher rate of continuous scanning and can handle higher patient volumes per day. The CT scanner also comes with a new detector design and algorithm, along with smart features such as Smart MAR, that enables up to 30 per cent improved image quality*. As one of the most powerful systems in its segment, the system is redesigned to deliver higher performance through tube capacity, tube current, and X-ray generator power while maintaining the same footprint. Additionally, it provides intelligent IQ to provide exceptional clinical outcomes, besides reduced radiation dosage for patients and clinicians' safety.

Commenting on the launch, Dr Devi Shetty, Chairman and Senior Consultant Cardiac Surgeon said, "Access to healthcare has been deeply asymmetric in India and innovative medical technology products will help bridge this gap. We are witnessing this change with cutting-edge, locally manufactured, and affordable products such as the Revolution Aspire CT scanner helping democratize the market, taking quality healthcare to tier 2 cities and beyond. It is critical for all health centres, big and small, to have access to quality diagnosis. I applaud Wipro GE Healthcare's endeavour to empower India's healthcare infrastructure with this revolutionary product for improved patient care delivery."

Dr Shravan Subramanyam, Managing Director, Wipro GE Healthcare said, "We at Wipro GE Healthcare are committed to India's vision of self-reliance. With Revolution Aspire CT system we aim to cater to the underserved markets and bridge the access gap to quality healthcare. We look forward to aligning closely with the government and will continue to invest medical devices 'made in India, for India and for the world'; and advance our mission of enabling 'healthcare for all."

Srikanth Suryanarayanan, Head-Imaging, GE Healthcare, said, "We are very proud to launch the Revolution Aspire CT scanner – our 'made in India' product. It is one of our most efficient CT scanners and has been designed with accessibility in mind. With an increasing burden on the healthcare sector following the impact of COVID-19, healthcare institutions need advanced medical devices - more than ever before, for faster and more accurate diagnosis. Our new CT, is a powerful system that empowers the clinicians as well as the patients with greater efficiency, better results and higher comfort."

The Revolution Aspire CT scanner is developed to ensure that the patient experience is seamless and stress-free. The scanner is equipped with a 70cm gantry bore aperture that can accommodate a diverse set of patients and an enhanced user interface which reduces preparation time and improves comfort. It is also incorporated with GE Healthcare's ASiR technology which supports a lower radiation dose by 40 per cent*, keeping patient safety in mind. Created as a future-ready product, the Revolution Aspire CT is built to be scalable with evolving needs of healthcare institutions.

The Revolution Aspire CT scanner has been manufactured at the recently launched Wipro GE Medical Device Manufacturing factory (MDM). The factory is one of 15 medical device manufacturers approved under the government's PLI Scheme. Aligned to the National Agenda of 'Atmanirbhar Bharat', Wipro GE healthcare has invested a little over Rs 100 crore in this facility and aims to further boost local manufacturing of medical devices in India. The plant is a 100 per cent subsidiary of Wipro GE Healthcare and has been setup as a green field legal entity.

Radiation safety programme in Indian healthcare system

Dr Avinash U. Sonawane, Head, Directorate of Regulatory Affairs & Communications and Secretary to the Board, Atomic Energy Regulatory Board explains the effect of radiation exposures and highlights that the employer/licensee of the clinical establishment is required to ensure that the dose received by the healthcare radiation professionals is within the limits set by AERB

Ever since the discovery of X-rays, ionising radiation has evolved as an indispensable tool for medical diagnosis and therapy. There has been a marked increase in the use of medical X-ray and nuclear imaging in the past decade or so, as new technologies, such as computed tomography and positron emission tomography, have become widespread. These procedures when clinically referred and properly conducted provide great benefits to patients; however, the associated radiation exposures, if not properly monitored and controlled, has the potential to cause harmful health effects.

In India, Atomic Energy Regulatory Board (AERB) is the national authority mandated to regulate the safe use of ionising radiation sources like X-rays, gamma rays under the Atomic Energy (Radiation Protection) Rules (AE(RP)R), 2004. Towards this, AERB has laid down safety codes and standards encompassing requirements for radiation safety which are in line with the best international practices and guidelines of International Atomic Energy Agency (IAEA). AERB issues license under (AE(RP)R) for operation of medical devices emitting ionising radiation and clinical establishments using such devices. AERB has deployed a web-based licensing system, i.e., eLORA (e-Licensing of Radiation Applications) to ensure efficiency and transparency in licensing process. Availability of qualified and certified Radiation Safety Officer (RSO) is mandatory requirement for issuance of licence to radiation facilities.

Presently, as per the records, there are about 91300 general purpose X-ray units; 6400 CT equip; 2500 Cath-labs; 540 radiotherapy facilities using about 800 radiotherapy equipment (linear accelerators and tele-cobalt units) for cancer treatment and 600 nuclear medicine facilities using radio-pharmaceuticals for diagnosis/therapy purposes (e.g., PET-CT using F-18 radio-nuclide (-about 330), SPECT/Gamma Camera (-200), SPECT-CT (-100)).

The effect of radiation exposure can either be deterministic, i.e., certain to happen (e.g., skin burns, hair epilation, radiation sickness) or stochastic i.e., probabilistic in nature (cell modifications, carcinogenesis). Therefore, the employer/licensee of the clinical establishment is required to ensure that the dose received by the healthcare radiation professionals is within the limits set by AERB so that the deterministic effects are prevented and stochastic effects are minimised. The dose limits for the whole body are 100mSv in 5 years with 30mSv, maximum, in a year. The dose constraints of 10 mSv in a quarter and 20 mSv in a year, which are also considered as Investigation Levels (ILs), recommended to ensure that dose limits are never reached.

There are rapid technological advances in medical radiation devices used in healthcare sector, with newer safety design features for optimisation

of exposures and instant control of exposures in case of emergency. In case of radiotherapy (RT), newer technologies offer relative benefits w.r.to quality in treatment and optimised medical exposure to patient. Newer modalities viz. tomotherapy, adaptive radiotherapy, cyber knife, proton therapy, etc. are making swift entry in many centers across the country. However, there are challenges to deal with issues like high patient load per RT equipment, non-existence of comprehensive quality audit program for dosimetry, non-availability of adequate numbers of recognised calibration laboratories for radiation survey instruments and secondary standard dosimeters (SSD).

The diagnostic radiology practice needs more focus on effective optimisation of medical exposures, use of national/international Diagnostic Reference Levels (DRLs)/Guidance Levels (GLs) for each examination, ensuring periodic QA testing of X-ray equipment, spreading awareness on radiation protection among health care professionals. Further, there are several cases reported especially in diagnostic radiology wherein dose investigation levels (ILs) have exceeded mainly due to reasons like personnel monitoring radiation badges (TLD) not worn by the person and negligently placed closed to the radiation source (X-ray machine) for extended periods of time, TLD badge worn inappropriately, i.e. i) without the cassette ii) not worn at chest level iii) not worn under the lead apron, use of lead apron with inadequate shielding etc. Hence there is a need of minimisation of such excessive exposure cases.

Nuclear medicine practice specifically needs more attention on issues such as development of guidelines for handling and use of newly introduced radio-pharmaceuticals like Lu-177, use of DRLs, dose constraints for NM procedures.

Non-reporting of incidents involving radiation harm to patients and even to radiation professionals during radiological procedures is also of concern.

AERB has recently raised issues with the Ministry of Health and Family Welfare in respect of medical exposures including establishment of national DRLs.

The way forward

Health authorities in the country are initiating various regulatory measures to ensure that radiation based medical devices and qualified healthcare professionals render quality services in diagnosis and treatment of illness, diseases, injury or impairment. To list the few – i) the National Commission for Allied and Healthcare Professions (NCAHP) Act, 2021 has been enacted with one of its objectives to ensure regulation and maintenance of standards of education and services by allied and healthcare professionals. AERB's involvement in the commission will, in particular, be beneficial in addressing the radiation safety aspects in education and training of Allied and Healthcare professionals in Medical Radiology, Imaging and Therapeutic Technology. ii) The National Council (NC) constituted under the Clinical Establishment Act, 2010, (CEA, 2010) has recently recommended inclusion of AERB radiation safety license as a statutory pre-requisite for grant of "registration" under CEA, 2010. AERB has apprised this exemplary resolution of NC to both, the CEA adoptive as well as CEA non-adoptive State Health Authorities for consideration. iii) National Accreditation Board for Hospitals (NABH) of Quality Council of India (QCI) has revised their accreditation standards which included, inter alia, the radiation safety and QA aspects in medical imaging systems. In view of such interfaces among different authorities, it is felt that there is obvious need of cohesive administrative mechanism and inter-ministerial coordination among multiple heath authorities having different rules and legislation to regulate effectively the healthcare sector from radiation safety considerations.

The innovation renaissance in NICU care

Dr Krishna Prasad Vunnam, Founder & Managing Director, Ankura Hospital for Women and Children in an interaction with ***Express Healthcare*** talks about Ankura's well-equipped NICU and his vision to spread health and joy across the country

A steadily expanding multi-chain system of hospitals that offers the best in healthcare technology and medical expertise to women and children, Ankura Hospital for women & children have saved more than 50,000 premature & other neonates with immediate medical attention babies along with very sick toddlers & kids in last 10 years.

With a value to create memorable birthing experience Ankura have welcomed over 30,000 babies into this world in past 4 years and cared for the incredible women who birthed them, with highly trained professionals in obstetrics and gynaecology.

The team of paediatric super specialists not only aid in the diagnosis of medical and surgical complications for neonates, toddlers, and children but also provide the best ever possible treatment with care.What kind of patients did you have in mind when you decided to build this institution?We felt there was a need to have specialised woman and child speciality hospitals because their needs are different from that of regular patients. We wanted to build a world with the best infrastructure, staff, and equipment that helped mothers birth the healthiest babies and provide them a quality of life that they can carry on for their entire life. We wanted to be well-equipped to even detect illnesses and anomalies that may otherwise go unnoticed.What factors did you consider while building the NICU? Personal and specialised care was of great importance. Technically skilful nurses and doctors who examine and care for patients round the clock and support the team. The infection rate had to be very low. When a unit has the lowest infection control rates, then the outcomes will be much, much better.Walk us through the experience of a preterm baby in the NICUBabies born at 36 weeks or earlier are termed preterm babies. These babies spend the first two to three months, sometimes four months, in the NICU. They're usually very sick. They need specialised environment (artificially controlled environment like womb). We control elements like the temperature of the baby and adopt the best infection control practices. The baby also needs to get the right kind of nutrition for growth and development which needs to be provided in timely manner.

> Technology has a very significant part to play in the caring of preterm babies. It has helped us keep the mortality rate in check. Moreover, it also helps the babies to live a good quality of life even after getting discharged from the hospital

Our multi-disciplinary team ensures & take extra precautions and measures so that other added complications don't arise. Skin-to-skin contact with the parents is also put in practice to inculcate a bond and keep it as natural as possible.

How has technology shaped this landscape?Technology has a very significant part to play in the caring of preterm babies. It has helped us keep the mortality rate in check. Moreover, it also helps the babies to live a good quality of life even after getting discharged from the hospital. To provide the baby the best of care, the NICU team requires state-of-the-art incubators, warmers, and ventilators. A set of good monitors are needed to check the baby's oxygen level, heart rates, and other vitals. Ideally, a hospital should also have very good hospital management software to guide and coordinate with various teams.

In the event of an emergency, if they want to update, we need to have data to obtain the right kind of feedback.

Which technology do you rely on in your journey?

Our NICU is equipped with GE products including Giraffe Incubators, SLE 5000 /6000 HFO cum high-end Ventilators, Lullaby warmers and phototherapies, and Monitors. We also use GE Anaesthesia machines in our OT. It has been a great experience with GE machines. Our staff finds them clinically rich, high performing and user-friendly.

Top three reasons you would attribute to your success

I would attribute our success to the right kind of space, right equipment and the right kind of doctors, because we need all the expertise, and the equipment to support our nursing team to provide the best care possible. All these things are equally important and we don't compromise on any of them. That would be one of the major factors I would attribute to our success.

What are your plans for Ankura?

We are currently operating in Telangana and Andhra Pradesh. We are soon launching in Maharashtra and Karnataka. Both the governments have been highly supportive of our vision and we hope the support for the healthcare sector continues and we are able to extend our services to other states as well.Where do you see technology going? What recent trends have you picked up on? Technology is ever-evolving and so are the patient needs. The post-COVID era has seen a sea of change in terms of technology usage. Where earlier people had to travel miles to get basic treatment, today, treatment is reaching people with the help of technology. Hospitals and many medical start-ups are lending services in a never-before way to the outpatients. Perhaps remote monitoring of the NICU for smaller clinics that aren't able to monitor themselves is just over the horizon. Continuous monitoring and getting freedom during last few hours of delivery is getting popular in western world and we expect similar trend to come to India. GE Healthcare recently launched a Bluetooth-based wireless patch system for foetal monitoring (Novii) which can be a trend setter. The babies and their mothers who go through the gut-wrenching experience of NICUs and complicated births are strong fighters, survivors, even. The team of doctors, nurses, and caregivers armed with the best technology can help in increasing their chances and welcoming "healthy and happy" children, mothers, and families into the world and promise them a healthier happier life ahead.

Email: teamgehealthcare@ge.com
Toll No. 1800 102 7750

Protein testing in India and Mispa i3-A game changer

Thomas John, Managing Director, Agappe Diagnostics talks about Agappe's Mispa i-series machines for protein estimation and its role in changing the protein testing market in India

Nearly 35 per cent of specific protein estimation was done by the visual latex method, with its own limitations in clarity and longer processes, till the early 21st century. Three types of visual latex processes prevalent were: normal visual method, semi-auto latex method, and fully auto latex methods. The fully automated nephelometry equipment was available in the market at an exorbitant price, whereas lower or medium-level labs could not afford to own this equipment under normal circumstances.

At this juncture, Agappe has come up with the i-series of Nephelometry equipment segment, starting from Mispa-I in 2011, with a rock bottom pricing strategy for protein analysis. Later, Mispa i2 was introduced, a semi-automated nephelometry equipment with unique channel shifting technology, at 1/10th price of the then exiting price of automated gadgets. At the same time, quality-wise, at par with any other automatic Nephelometry machine, with 26 parameters testing protocols in the machine. Mispa i2 machine came with an innovative and intelligent card system for pre-calibration, incorporating open vial stability controls in the smart card. The introduction of Mispa i Series by Agappe 2011 with the combination of Nephelometry & Immunoturbidimetry Technology for the protein estimation replaced the conventional latex method, providing a wide measuring range with high sensitivity and better linearity at an affordable cost. With this, many lower-end labs as well as most of the medium labs across rural India could own the protein testing equipment with very economical reagent pack sizes suitable for their daily load. Mispa i2 has come with a patented technology with its unique channel shifting technique.

In total, around 20,000 Mispa i-series (Mispa-I, Mispa i2 and Mispa i3) machines are presently working in both Indian continent and 60 counties across the world

Subsequently, in 2015, Agappe introduced cartridge based novel technology in Nephelometry equipment Mispa i3 and the Indian market has been provided with 4000 numbers of Mispa i3 successful installations, while world market has been provided with 2500 installations. This is a smart card based intelligent system with pre-calibrated smart card with each pack of cartridges. In total, around 20,000 Mispa i-series (Mispa-I, Mispa i2 and Mispa i3) machines are presently working in both Indian continent and 60 counties across the world.

As a strategy to popularise testing of advanced parameters in medium and lower end labs, Agappe introduced many special parameters in protein testing with Mispa i3, like Vitamin-D, cardiovascular risk profile, allergy profile, COVID profile, diabetic profile, rheumatology profile, osteoporosis screen profile etc. Multiple test profiles help the doctors to diagnose the disease very fast as well as monitor the improvement of the patients. Medium or lower-end lab with less workload can afford to possess Mispa i3 Nephelometry equipment easily.

Cystatin C is a better marker than enzymatic creatinine, which helps to find early kidney failures. Cardiovascular risk profile includes hs-CRP, Lp(a), D Dimer, Apo A1, Apo B. Diabetic Profile includes HbA1c and Microalbumin tests which can be easily estimated without any calibration at an affordable cost. Increased or decreased levels of CRP, RF, ASO, Ferritin, PCT, C3, C4 due to infections or inflammation, by dint of viral or bacterial responses can be easily estimated with the advanced UCS Technology used in Mispa i3. Due to the immune responses in the body, elevated levels of IgG, IGA, IgE and IgM can be performed in Mispa i3 with zero reagent wastage and least reporting time. New generation instrument automation with an affordable cost and convenient pack sizes for all special parameters differentiate Mispa i3 from other instruments.

Within a short span of 5 years, Mispa i3 emerged as the game-changer in the specific protein testings and the customers' first choice in protein estimation, with automation reducing manual errors & reporting in 5 Minutes. Agappe is planning to bring forth Mispa i3 Plus incorporating cloud-based technology so that we can perform many application-level corrections online as well as calibration data access from the cloud. With cloud-based technology, Agappe can give better support in proper maintenance of the equipment online. Let's together serve mankind by providing quality products to ensure accurate and reliable results for faster diagnosis and treatment.

Agappe, with its emphasis on technology development, aims at providing global standards of care at affordable Indian prices and making it accessible to the country's rural population and nearby developing countries. Agappe takes pride in its innovations while introducing the most updated technologies, with scaled-up manufacturing capacities offering competitive prices. Agappe's vision is to be a leading partner in the nation's efforts to achieve the millennium goals of 'Health For All' by making available technologically advanced, high quality and inexpensive diagnostic tools, epitomising the true meaning of 'agappe'.

Effortless and ease of usability combined with sustained training makes AML unravels most of the challenges in the critical care

Aditya Kohli, CFO & Director-Sales, Allied Medical Limited (AML) explains how his company is working towards easing the operations of the medical fraternity by offering medical products like ventilators, monitors, infusion pumps and anaethesia machines having simple and easy user interface

There are many difficulties faced by the nursing staff while treating the patient in the intensive care like working in an unfamiliar environment, lack of experience in caring for infectious patients, anxiety about being infected, heavy workload, extreme exhaustion, depression due to failure to treat critically ill patients. The situation has become worse specially post COVID-19 pandemic because of performing their duties round the clock with so many wearables like PPE kit, protective shield etc. Adverse events because of human error are at times blamed on medical personnel, previous studies reported poor designs of user interface of medical devices as the primary cause. Therefore, a user-friendly interface of an equipment may improve human-machine interactions and reduce risks.

Allied Medical Limited (AML) is working hard day and night to ease the operations of the medical fraternity by offering medical products like ventilators, monitors, infusion pumps and anaethesia machines having simple and easy user interface. A simple user interface is the visual representation of a software interface that removes unimportant elements and reduces them to simpler shapes/icons that is easily understandable by the medical staff.

Being an Indian manufacturer company, we can understand the pain and troubles that are been faced by the medical staff while treating the patients in the intensive care units, so we are continuously committed in producing the product having easy and Intuitive user interface making the user feel alleviated from the equipment end.

With the number of installation of ventilators increasing progressively in all parts of the country, application and operation always remains a challenge for the hospital staff. An intensive care unit becomes that area of a hospital where patients' serious illnesses or injuries receive special medical and nursing care. ICU nurses are highly knowledgeable and skilled health care professionals that work in an ICU in association with other members of the hospital team to provide optimum patient care. The care of the mechanically ventilated patient is an essential component of a nurse's clinical practice in the intensive care units (ICUs), therefore it seems natural to devote a great deal of work in preparing and training staff before allowing them to work with patients. AML has conducted forty-five numbers of user trainings and clinical workshops in the last three months jointly working with the clinicians to fully utilize advance modes and features available in our ventilators for early weaning off.

Intensive care medical staff play a crucial role in the management of mechanically ventilated patients and for the upkeep of the equipment in the ICU it's very important to educate and train them on both aspects of the ventilator be it application or maintenance. The agenda of training and workshop conducted by AML revolves around two topics, one is application or use of ventilator and other is maintenance of equipment. The staff is trained on all modes of ventilator and how it is suitable to use on different types of patients, what should be the initial settings to start with the ventilation, different types of manoeuvres available on the ventilator, training on the Lung recruitment tool and what additional features they can use to wean-off the patient as quickly as possible. The education imparted related to maintenance, covers all the sterilisation and cleaning process they must follow while using the ventilator, filters cleaning process (most essential method for mechanically ventilated patient that controls the cross infection and sometimes lead to fatal condition in the patient like Ventilator associated pneumonia- VAP, SEPSIS etc.), expiratory valve sterilisation and decontamination process, flow sensor disinfection and process of cleaning, fumigation of the ventilator itself.

We at AML strongly believe that learning never ends and the recent pandemic has further reinforced that learning.

"In learning you will teach, and in teaching you will learn."

-- Phil Collins

J Mitra driving point-of-care diagnostics to boost Indian healthcare

J Mitra & Company has indigenously developed India's first portable diagnostics solution – the iQuant immunoassay analyser, collaborating with IIT Madras' HTIC (Healthcare Technology Innovation Centre)

Indian Healthcare is now focusing on affordable quality healthcare closer to the point of care to avoid stress on the existing healthcare setup. Diagnostics are the absolute primary line of defence against any ailment. Accurate disease detection is the foundation for deciding the proper treatment, surgery, and medication or therapeutic course. Diagnostics drives over 70 per cent of the therapeutic and surgical decisions.

J Mitra & Company focuses on bridging the testing–patient divide. The J Mitra R&D team continuously keeps on innovating on this front. As a result, J Mitra & Company has indigenously developed India's first portable diagnostics solution – the iQuant immunoassay analyser, collaborating with IIT Madras' HTIC (Healthcare Technology Innovation Centre).

iQuant is a futuristic Fluorescence Immunoassay Analyser for quantitative and qualitative blood test parameters. iQuant can handle eleven Diagnostics tests – HbA1c, TSH, T3, T4, Dengue NS1, Dengue IgM, Dengue IgG, Vitamin B12, Vitamin D, PCT, and CRP.

iQuant is an innovative medtech offering. It mixes science, IT, healthcare, and research on the product side. On the implementation aspect, it is a brilliant combination of social environment and ground realities, coupled with business sense. iQuant is an innovative, practical, path-breaking product that meaningfully influences the disease diagnostic procedure.

iQuant is a domestic innovative by J Mitra. It is the best cost-effective solution and portable device available in the Indian market today. Moreover, it is mobile and has a self-sustaining power supply. iQuant makes it ideal for India, especially in remote hinterlands and electricity-dark areas where powered instruments are a problem.

In a laboratory, performing this wide varieties of tests requires more than one instrument. With iQuant, all these tests may be conducted on a single machine. It has unique features like ergonomic design, high-end processors, in-built memory to store up to 1-lac patients' data, Bluetooth for wireless printing, 10-inches color display, wi-fi connectivity for online support, iCloud facility for software upgradation and training, one-hour battery back-up in case of a power failure and easy portability owing to its light-weight of approx. 2 kgs.

The Quanti range test kits used with the iQuant Analyser offer user-friendliness equal to those of rapid tests; and sensitivities far better than conventional test methods like ELISA.

The absence of low-cost medical instruments often renders local medical facilities incapable of providing quick test reports and medications to patients. But the scenario is steadily changing.

iQuant, due to its design and small footprint, is targeted at medical practitioners, healthcare specialists, and diagnostics solution providers. And these are best served especially in rural areas, remote locations, and settings with limited resources. The product is scaled for small and medium labs, considering its compact desktop form factor. It allows doctors to diagnose suspected ailments quickly and, as a result, catalysing quicker treatment and recovery.

From an end-beneficiary perspective, it is about reaching out to all those patients and diagnostics-seekers who would find it extremely difficult to receive quality diagnostics solutions in their nearby vicinity. In addition, the iQuant Analyser uses test kits created specifically for Indian conditions. Given the ground reality that India has a majority of the people living in rural and semi-urban areas, the potential for usage and growth is humongous.

MEDRAD Centargo: The next big step in CT Injector technology

Centargo has been designed to maximise efficiency and automate workflow, allowing radiology staff to spend more time with their patients

The latest addition to Bayer's range of CT products is MEDRAD® Centargo, an innovative CT injection system that simplifies workflow and provides efficiencies for radiology departments.

The workload of radiology departments is continuously increasing. This growing demand is putting pressure on staff and equipment, leading to an increasing need to do more with less.

Bayer believes that technology is made for humans and not the other way around. That's why they created the new MEDRAD Centargo CT Injection System. Because hands can do more than operate machines – they have the ability to provide care!

Centargo has been designed to maximise efficiency and automate workflow, allowing radiology staff to spend more time with their patients.

Bayer's Medrad Centargo CT injection system meets every goal, be it workflow efficiency, intelligent automation or personalised patient care.

Bayer's Medrad Centargo CT injection system meets every goal, be it workflow efficiency, intelligent automation or personalised patient care

Workflow efficiency

A heavy workload demands a streamlined workflow. Centargo is designed to help simplify your day with its quick and easy setup, which helps improve efficiency.

Set up your day in less than two minutes

◆ Setting up for the start of your day can be time-consuming and a challenge. Centargo's intuitive daily set-up (the preassembled 24-hour Day Set, with optional replaceable spikes) can be accomplished in under two minutes.

More time for your patients

◆ The simple snap-in patient line auto-primes upon insertion and is ready for the next patient in less than 20 seconds, allowing you to focus on what matters most.

Intelligent automation

◆ By reducing touch-time and minimising manual data entry, Centargo brings the benefits of automation to you every day.

Minimised injector touch time

◆ An intuitive, innovative interface frees you from manual steps such as filling, priming, and recording contrast data.

Document contrast media with ease with the integrated barcode reader[1,2]

◆ Captures key data including brand, vial volume, concentration, expiry date,[3] and lot.[3]

◆ Provides easy traceability, plus access contrast and injection details[2]

Benefit from the intuitive user interface

◆ The touch screen within the scan room gives you the freedom to control the injector while staying close to your patient.

Inject in total confidence

◆ Inlet and outlet air detection in addition to automatic air removal within the day set reservoirs.

◆ Recessed connections on the day set.

◆ Two check valves in the patient line.

Personalised care: Because every body is different

Bayer's MEDRAD® Centargo CT Injection system can be supported with the innovative software products of Bayer's Workflow Solutions. By using //Smart Protocols, protocol adjustments can be automated. This way, treating every patient as an individual can become part of the routine clinical practice – streamlining personalized treatment.

Patient-centric workflow for individualised care

Gives you control

◆ Implement your site's preferred dosing options and limits, based on your own injection protocols, for as many indications as you need

◆ Review what has been adjusted and what limits are in effect as the protocol is automatically re-calculated

Enables routine personalisation

◆ Automatically calculate flow rates and volumes based on patient size (weight or lean body weight) and contrast media concentration

◆ Apply tube voltage adjustment to account for scanner settings

Provides added confidence

◆ Display site-specific eGFR guidance before the protocol is even selected.

◆ Verify that calculated flow rates and pressure limit settings comply with your policies for IV access

Award-winning design Centargo wins 2020 Red Dot Award

◆ The Red Dot Award is recognised internationally as one of the most sought-after accolades for quality design, and Centargo has been honored as a 2020 winner.

References:

1. Not available in all countries.

2. When combined with Automated Documentation software.

3. Only with Bayer contrast agents featuring 2D barcode.

For further information contact

your local Bayer Representative or visit www.radiology.bayer.com or write to Bayer Radiology, Bayer Pharmaceuticals Private Ltd. Bayer House, Central Avenue, Hiranandani Estate, Thane 400607 or email: medicalinfo.india@bayerzyduspharma.com

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MEDIKABAZAAR brings wide selection of products for Vascular Compression Therapy

Medikabazaar provides different types of venous solutions, reaching the remotest corners of the country by utilising its robust, comprehensive and extensive supply chain

Varicose vein is part of the chronic venous disease spectrum, and it affects approximately 10 per cent to 30 per cent of the general population, with higher prevalence in women. Risk factors for varicose vein can be hormonal, lifestyle, inherited, and acquired; some of those are, prolonged standing, obesity, family history, age, and pregnancy.

Venous disease most often begins with discomfort in the legs, progressing gradually to varicose veins, edema, skin hyperpigmentation (discoloration), and ulcers. It is sometimes complicated by deep or superficial vein thrombosis, which is when a clot forms in a blood vessel and obstructs it. Various risk factors can be linked to venous disease onset and progression; some of these are related to lifestyle and can be addressed. Venous disease is one of the most common diseases affecting up to 60 per cent of adults over the age of 50.

MEDIKABAZAAR brings a wide selection of products for Vascular Compression Therapy and has high end solutions like laser treatment for varicose veins. Vascular Compression Therapy products are designed to reduce the risk of blood clots associated with deep vein thrombosis (DVT). The Vaso Press Digital Mini provides evidence of compliance that the clinician can use to ensure their patients receive the recommended therapy to reduce their risk for DVT and potentially make further treatment decisions.

Another Superior product by renowned Korean manufacturers, Wontech exclusively at Medikabazaar.com. Veincare can work for long hours, which allows for complete and thorough treatment. The laser equipment is water-specific, and targets water as the chromosphere to absorb the laser energy.

Veincare can efficiently cure problems such as leg heaviness, collateral and reticular veins and that too quickly, and by keeping patient comfortable throughout the procedure. Medikabazaar provides different types of venous solutions, reaching the remotest corners of the country by utilising its robust, comprehensive and extensive supply chain, thus contributing in the treatment of varicose veins and thrombosis and thus improving the patient's life.

The training in ultrasound techniques will become part of the core training of every Anaesthesiologists

Trivitron Healthcare believes that ultrasound can provide the new perspective to Anesthesiologist by helping in the performance of previously blind procedures and allowing discovery of many hidden spaces to uncover their mysteries

New technologies are greatly improving the standards of the products in fast pace. Trivitron as a medical technology company providing affordable healthcare solutions weaves a fascinating thread of inspiration to many healthcare providers. Having solid expertise in research and development, Trivitron has always strived to come up with modern technologies. One such advancement in emerging technology is related to Anaesthesia in Ultrasound. These include advances in scanning schemes, transducers, strain imaging, contrast agents, etc.

Ultrasound technology is rapidly emerging science and the field of anaesthesia has not remained un-touched by its enormous applications. It is playing a vital role in regional anaesthesia for nerve blocks, in vascular access and as a transoesophageal echocardiography tool for viewing blood flows and cardiac imaging. It has special

features to assess the depth of epidural space in cases of difficult anatomy or in an otherwise high-risk patient where interventional procedure is required. As the ultrasound guidance is becoming standard practice of future, anaesthesiologists need to develop a thorough understanding of this technology and & practical skills by training themselves.

The technology of ultrasound in medicine has evolved exponentially over the years. Modern ultrasound machines are more compact & portable with better resolution and enhanced tissue penetration making it a handy tool for identification and desired intervention in various body structures. Anaesthesiologists have been performing diverse interventional procedures using anatomical landmarks for years with variable success rates, risks and consequences of complications. The ultrasound imaging can play a major role in the field of critical care, pain anaesthesiology and to perform with precision and reduce complications. Ultrasound has proved to offer an excellent guidance for difficult venous access, epidural space identification, delineating nerve plexuses for chronic pain nerve blocks, in transoesophageal echocardiography or recently in vehement use for regional anaesthesia. However, the use of ultrasound in daily clinical practice will not only require high precision machines but also a high degree of training of anaesthesia users. The training in ultrasound techniques in near future will become part of the core training of every Anaesthesiologists, just as laparoscopic studies is for surgeons. Anaesthesiologists need to acquire thorough knowledge of both ultrasound technology and skills to visualise various structures intended to be manipulated. It is estimated that ultrasound imaging will become an important component of anaesthesia machine.

Ultrasound assisted neuraxial technique and real-time ultrasound guided neuraxial technique are the most effective techniques to aid in neuraxial blocks using Ultrasound. These help in identification of estimating epidural space depth, landmarks and midline structures and facilitating epidural catheter insertion.

Ultrasound is a unique tool which enables optimisation of perioperative management to the Anesthesiologist with diagnostic and monitoring capabilities. Indeed, ultrasound has a vital role in problem-based management of various emergencies related to anaesthesia such as hypotension, dyspnea, hypoxia and cardiopulmonary arrest.

Procedural ultrasound applications in the field of Anesthesiology can improve the quality of care. Trivitron Healthcare believes that ultrasound can provide the new perspective to Anesthesiologist by helping in the performance of previously blind procedures and allowing discovery of many hidden spaces to uncover their mysteries. With the upcoming technology, there will be a bridge to the gap in the traditional method of medical practice.

Is menstrual cup recommended for UTI patients?

Jyoti Kumavat, Officer-Digital Marketing, Ami Polymer Pvt Ltd talks about UTIs and menstrual cups

Ouch! UTIs can cause such discomfort that no one can forget. They're common, annoying and they can be hard to kill. Many of us have been there. An estimate of 1 in 3 adult experiences UTI annually, while the rest will experience UTI at least once in their lifetime.

What is UTI?

A Urinary Tract Infection (also called a "UTI") can be any infection that occurs along the urinary tract. It happens when bacteria get into the urinary system and overgrow. It results in redness, pain, and swelling in the urinary tract. One can sense burning pain while peeing.

In order to avoid UTI, one must take proper care of their vaginal hygiene. Among all menstrual products, menstrual cups are considered as a safest option. The risks of getting an infection is minimal and mostly they're all preventable.

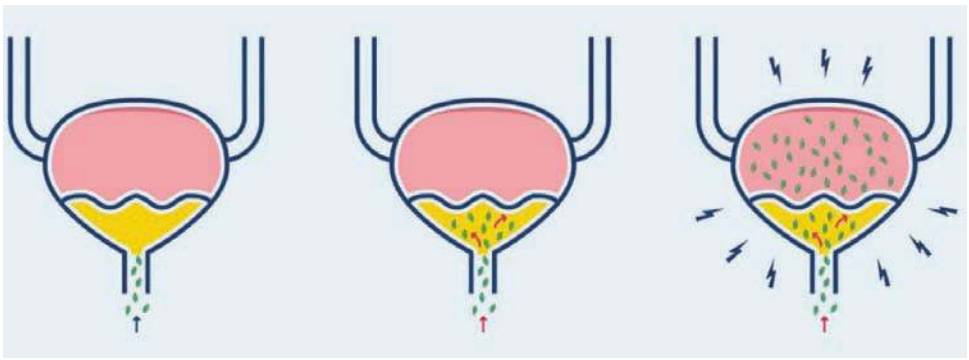
Symptoms of UTI:

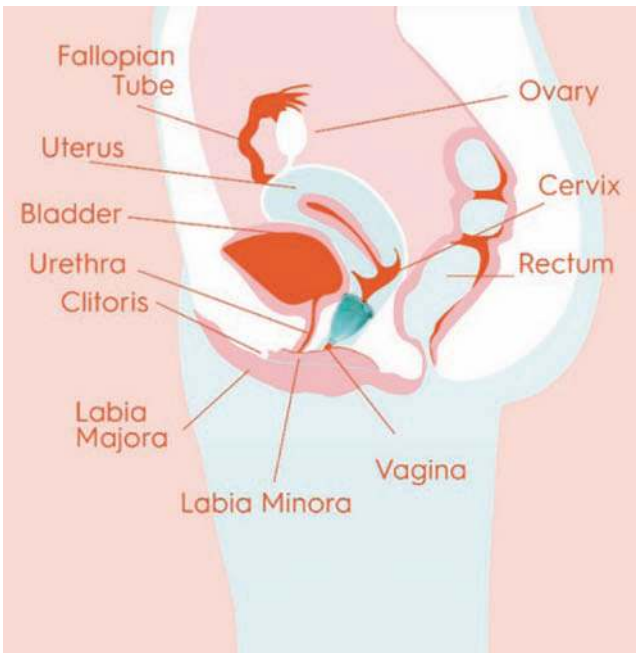
- Cloudy or dark urine.
- Blood in urine.
- Pain in pelvis area.
- Burning sensation while urinating.
- Urine has strong odour
- Increased urgency to urinate.

Menstrual cups and female anatomy

Menstrual cups are a growing in demand choice for environmentally conscious period care. They seem to be very different to those who have only used traditional period products.

The vagina and female urinary system are very closely related but are completely separate. A menstrual cup in the vagina cannot interfere with urination, but front wall of the vagina is intimately associated with the bladder. Therefore, a poorly or wrong sized placed menstrual cup can result in bladder pressure symptoms. Try reinserting the cup a little higher or try a smaller size if you experience this.





Getting familiar with anatomy and feeling comfortable inserting the cup is key. After inserting the cup if you aren't confident that you have it fully sealed, try again. With practice, one will gain confidence and feel like and expert in no time.

Can menstrual cup cause UTI?

No, a menstrual cup does not cause UTI. If it happens, it's probably because it hasn't been inserted properly or that the hands were unclean while inserting. It is important that you sterilise the cup before and after use. If the menstrual cup is not sterilised it can cause UTI. So, you must boil the cup for 3-5 minutes, before using it and repeat the same after your periods are over. One must take utmost care of your lower part as well as the cup, to avoid not only UTI but any other disease. One must avoid using a menstrual cup if you are allergic to silicone/TPE.

Does Imasafe™ recommends using a menstrual cup during UTI?

UTIs are very common. But no, it is not advisable to use a menstrual cup during UTI. But once the infection is tackled, one can use the menstrual cup with proper guidelines.

If there are recurrent UTIs, we advise to head straight to doctor and consult him on using a menstrual cup.

In order to avoid UTI, one must take proper care of their vaginal hygiene. Among all menstrual products, menstrual cups are considered as a safest option. The risks of getting an infection is minimal and mostly they're all preventable

Author:
Jyoti Kumavat
Officer – Digital Marketing
Jyoti.k@amipolymer.com
Ami Polymer Pvt Ltd.

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