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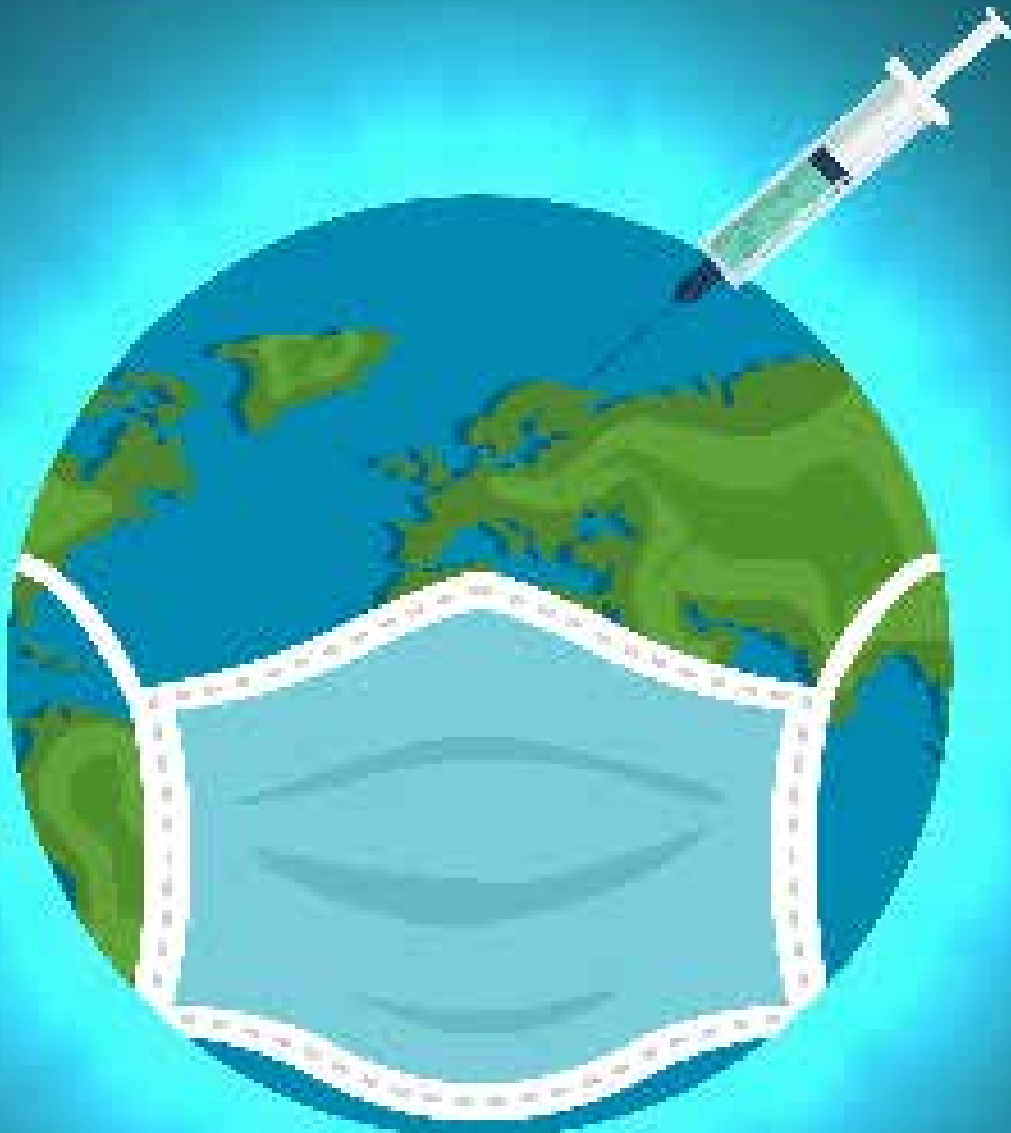
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**An Informed
Decision**

by Dr. Alhad Mulkalwar

**Innovative journey of a
multidimensional medical practitioner**

by Dr. Jagdish Chaturvedi

**Hybrid
Immunity**

by Dr. Geetika Ahuja

EXECUTIVE OPINION



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“*Pandemic has taught lessons for the future with a rising wakeup call.*”

There is a need to develop a resilient healthcare delivery system and implement it at the earliest. We can always learn in addition to dealing with the pandemic from the experiences of other countries.”

Lessons of Pandemic to take us to Endemic

Every adversity teaches us a lesson. So is the present pandemic which started in early 2020 and it has made us a lot to think about. Health was never a priority for planners, but this pandemic has given the boost that healthcare has become now top priority for leaders, bureaucrats, health planners and even citizens. A new thinking about healthcare has emerged. Government has launched a digital health mission, national health authority which facilitates additional hospital beds by planning a medical college in each district which would not only create hospital beds, but also trained manpower who are also needed badly for healthcare. During pandemic we created lots of ad hoc temporary hospitals to handle Covid patients. We are having one bed per thousand population while WHO recommends 3.5 beds per thousand population. There is a dire need for health workers in public and primary health care. Our 70% rural population gets the care from only 30% of the healthcare workers in the country.

The resources as required have not been allocated to healthcare in the last seven decades by successive governments. India spent 1.8% GDP on healthcare in 2020-21 while it was 1-1.5% in previous years while the USA spent 16.9%. There is no doubt we did not plan well at macro and micro level. The health is on concurrent list, but Indian states during the pandemic didn't chalked out calculative steps to cater to the burgeoning need of oxygen and the result was the huge death toll of patients who could have been saved. It is being done now at breakneck speed; a lesson learnt very hard way. The Prime Minister of India has declared that 4000 more oxygen plants would be put up shortly in the existing 1000 facilities. Imported oxygen by using air force planes is a costly proposition. Pandemic has taught lessons for the future with a rising wakeup call.

There is a need to develop a resilient healthcare delivery system and implement it at the earliest. We can always learn in addition to dealing with the pandemic from the experiences of other countries. Many issues are of management which the medical fraternity needs to comply with at the earliest. Medical fraternity deployed to administer at micro level should be trained in management and create erstwhile Indian Medical Services cadre to take care of healthcare facilities at macro level. There is a need to clean up the healthcare system from each angle and provide better facilities to healthcare workers. The aim is to give the best healthcare to its citizens at optimum cost. Let us not only discuss but provide Universal health care.

Government has launched healthcare devices and equipment parks, providing support for manufacturing many devices which were imported earlier and now we are exporting to other countries. India has manufactured a number of vaccines for COVID-19 in record time which are even exported now. There are a lot of behaviour changes as we have adapted to virtual training, conferences and healthcare delivery systems. Teleconsultation and telemedicine have grown in a big way for the benefit of the citizens. The legal issues have been resolved which were lingering on for many years. Drones are transporting vaccines to the far-flung areas which was never thought to be possible because of security reasons. All these issues have been dealt with during the pandemic and we are preparing ourselves after almost one and half year to convert the pandemic into endemic.

The learning has been costly in terms of loss of human life and financial costs. Pandemic turning into endemic seems to be at the anvil, but we cannot become complacent till the majority of the population are vaccinated and infection rate has considerably reduced. We are still at the door of the third wave which is to be contained and our basic protocols of spread of infection like mask,

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PERSONA

Innovative journey of a multidimensional medical practitioner

Dr. Jagdish Chaturvedi is an ENT surgeon, stand up comedian and CEO of HiiH Innovations Pvt. Ltd. He is associated with Fortis Hospital Bengaluru. He has co-invented and developed 18 affordable medical devices. He recently joined the Armed Force Medical College's Diamond Jubilee celebration as a speaker.

Dr. Debleena Bhattacharya, Associate Editor of InnoHEALTH magazine, interviews this dynamic persona and has garnered his viewpoints on the crux of balancing his professional and personal endeavour

Q1. Being a surgeon, innovator and also a stand up comedian represents three different aspects of the same person. What has inspired you to be a part of all of them with equal enthusiasm?

A. Yeah, so I think for me, they are not different things. I have had a lifestyle since, since you know a child so even when I was a kid I think almost from the age of seven years. I have always been into theater and doing plays for all my life and a lot of us do that we are all a part of a theta club or a dance club or some sports. The only difference is by around eight or nine or 10. When we are exams and education, takes the priorities. These things take the backseat. The only thing that I did is I continued them all the way into my clinical practice time. So through my med college as well as my post graduation college. I used to be constantly involved in theater. So for me, these three things being a being a surgeon was primary always wanted to be a doctor so I think that was the career choice that I took. But being an innovator and a stand up comedian were evolutionary outcomes of the circumstances I was, I was facing. So, for me as a doctor I feel for a doctor to invent is an extension of what a doctor should do, because while I was seeing patients, there were many times where I was not able to offer any good solution to the patients, and being the front end, you know, talking to the patient and not being able to offer solutions like for example we are examining people with throat cancer rural areas were not able to see, you're not

able to biopsy you're not able to examine. And then we have to say that you know



this is all that we can do when I was very not comfortable saying something like that. So I felt as a doctor, you don't only have to see patients or contribute to research, but he's also enable. And what I did in trying to invent early on during my post graduation itself was merely just an extension of what I felt I should do as a doctor because I was unable to provide the best care, but as my clinical practice grew theatre started taking a bit of a, you

know, hit because Pater requires many months of rehearsals and a huge team, and a lot of commitment, while it was fine till I was studying because your academic calendar is not very unpredictable. But when I started practicing as a private practicing doctor. You can have patients anytime in the day, you can have surgeries emergencies anytime in the day, and I was unable to make time for these rehearsals, and I ended up being that actor who would commit but not be there for the rest of the whole team suffers. And I would get the main roles, but I would not do all of these rehearsals and then you know, it was almost blacklisted from any theater groups. So stand up comedy at that point of time in 2015 was growing to be a field where you get to be on stage, you get to be someone you get to do comedy or you get to play a character but stand up comedy interestingly takes away the need for rehearsals with a group, because the stand up comedy comedy is a solo job. Do you need a team, but you don't need to rehearse with the team. You know, like theatre demands, you can write it in your own time, you can practice it in your own time, you can perform it and you can improve your art, and that suited well with my clinical role, and the innovation arm that was growing, and that's why being a surgeon innovator and a stand up comedian ended up being somewhat an evolutionary balance that I had to do to, to be able to keep my passion alive and as well be an effective doctor and a holistic doctor.

Q2. After the COVID-19 phase, is there any change in the scenario of stand up comedians?

A. Yes, actually so COVID-19. When the pandemic started, it was a big hit for live shows. I was almost doing about an average 10 to 12 shows a month, and largely corporate shows current medical conferences, college shows and, and also for for schools. So, when the pandemic hit all the live shows completely got stopped and then we were to adapt to a newer form of comedy which is what you will. Now what happened is the dynamics changed drastically. Because when you are performing live your competition is only the comedians who are in that city. When you are performing virtually, you are competing with every comedian in the world because anybody can also perform live at the same time. So certainly for for medical conferences or for organizers, their options widened, but at the same time the options widened for the audience also because they could only go and see shows that were there in the city now they can attend any community in any way. That is one aspect that changed a lot of the dynamics for stand up comedy The second aspect was to perform virtually, which is very difficult in a field of comedy because, live audience cannot mute itself, where a live audience cannot suddenly disappear. And then the live audience is all in one room you can control the room you can control the energy of that room. You can build the energy in that room here everyone is sitting in their own independent rooms where there are different energies, there are different distractions, and they can get a call, they can mute, they can disappear and and that took some time especially for many comedians. Stop doing stand up comedy, because of the pandemic because they could not adjust to, which will show us. For me, on the other hand coming from a theater background, and having a lot of experience with people, where I was able to somehow figure out some nuances to make that work. And in fact, I started doing more virtual shows more virtual stand up comedy than I was doing live, because now there is no travel element, and you can do multiple shows in a day, like I remember at one day I did, I did about nine shows in a day. And that used to be something that I would probably do in a month, because it's just from one zoom link to the other or a Microsoft team

link to other and with a gap of one or two hours, and you have a new audience on your screen. And, and in this pandemic I've done over 200 shows just virtually, though it does not give you the feeling of an actual live audience, but I think now we're able to get as close as possible because now we know what to do, what to say what to ensure that the audience gives you know the same flavor. And if you, you know see any of the virtual stand up comedy's that I've conducted recently. They are just as good as live in terms of the reactions and laughs laughs clubs and closes with the only thing is that you're not there in one room and you still have to see each other's you know faces, next to each other. But having said that, I think it has helped artists grow and artists who could hustle and survive the pandemic figure out ways to survive. It also eliminated the week, so the survival of the fittest holds true even for comedians. And now I think we have better comedians to have a lot of content and they can make people laugh, whether they're in front of them are very far away as well.

Q3. From an Indian perspective what are hurdles you have faced while following passion and profession?

A. Yeah honestly I did not really face many hurdles from this balancing act, especially from the from my family. So my father's a psychiatrist mother's a teacher and my father has also been an actor while doing his medicine. So, art has always been encouraged. I grew up in Bangalore and Bangalore has very strong theatre roots, especially at school level. Most people from Bangalore are usually a part of some of the other theatre or dance group even at a professional level. And I was just like everyone else. So, for me to be studying and following my passion, really has never been a big hurdle for my parents they were not the kind you said that you can follow your passion later focus on your studies. I think when we tried that though at some important aspects of our studying life, my performance came down whenever I would not take part in certain extracurricular activities and I think my parents were soon to realize that that's an important part of my well being, both mentally as well as in my outcomes. So from my immediate family never have had any hurdles. When I, as a professional there were some hurdles but that didn't seem to bother me because it's

generally when you are an artist you used to criticism much earlier on, and you used to improvising also a lot, so, even though I had colleagues or professors or teachers who would say things like, you're a surgeon or you're inventing you wasted a medical seat because they assume that inventing is a totally different thing and being a doctor is a totally different thing. So they feel that okay if you're inventing you stop becoming a doctor or, if you're doing comedy, my colleagues would say, yeah you're, as long as you're doing that it's fine as theatre has got some elegance to it. But you're doing comedy to "joker ke pass kaun patient ayega" who will come to a joker as a patient. What is the perspective there so I got to face that early on, I don't get that at all anymore. In fact, I get the same doctors now wanting to invent and also same colleagues wanting to try out comedy, but early on I did have that, because whenever you do something offbeat whenever you do something that is not the norm people who have been hustling with those same questions in their mind but they have chosen, their profession will also question you because that's probably why they didn't do what they wanted. So they asked you also why are you doing like this but but for someone like me is you have not, not a topper I don't have very high stakes, an average kid, and I try a lot I fail a lot, and I cope up a lot. So for me it's not very disturbing to hear things like this in fact it kind of gives me a direction that okay if I'm going off beat. That means there will be less competition here and I'll be able to create a space for myself. And I know when I look back at it I asked my patients. Why do you come to a joker? And my patients say that, serving us when you did comedy and we connected to a joke. We feel we've connected with you at a human level and you're less likely to cheat us otherwise this image of doctors, especially in the corporate world that you don't want to take you two surgeries and want to take your money. We feel that you're probably not the kind of person because we've already connected before hand. And that's a very interesting insight because my patient float almost doubled or tripled. As some of my comedy picked up and not only that, post my comedy sessions people would line up I thought they're taking selfies, and then until they take out the CT scans and start showing me their sinuses, and my surgeries also increased. And similarly with the medical community

chance to work in many other fields, even though I'm an ENT but my inventions and the inventions that have been supported across various clinical fields so I think holistically, these hurdles have made me probably a doctor with wider knowledge and experience, and an artist, with wider knowledge and experience.

Q4. The recent pandemic has taught us a lot. Kindly share any anecdotes that you would love to share with our readers that have motivated your thoughts.

A. Yeah, so the recent pandemic. One of the things that it was doing to me as a doctor was that people remotely wanted to see care, but being in a surgical field it is very hard to provide definite of care. And, like I had a patient from Raipur who wanted to travel to Bangalore for a consultation, but because of the pandemic the patient could not. And I was not able to do anything beyond the video call and patient had issues in the ear, but I could not see inside the ear so I was trying to guess and wasn't sure whether it will worsen and all of that. And that made me think that we need to find a way to make tele examination happen now because tele consultation may work very well for things like radiology pathology or many medicine fields where they are chronic non communicable diseases, where you can do a set of lab lab tests, you can get basic parameters like pulse rate, BP, temperature. Many of these devices are there at homes of people even oxygen saturation for that matter so a lot of these parameters are easily accessible so for those fields that works but for surgical fields like mine. If you do not see inside the ear, nose and throat. There is not much that you can do in your diagnosis, and in your treatment so now what we have done and that that is what the pandemic has taught us is that we have now developed a technology, where we are now able to remotely carry out examination so I just recently saw the same patient from Raipur by sending a device to their house and they were able to place that device into the ear they were able to place a device into their nose in their oral cavity, I could see the majors very clearly sitting here in Bangalore on my computer, and I was able to make a diagnosis and treatment for them. And are we willing looking at doing this in a larger way. But that's definitely something that the pandemic

has taught and has motivated, motivated me and my team to think about living with the current situations where patients are scared to come to the hospital. Patients may not be even permitted to travel many times, and vulnerable patients like kids, older people may not find it safe to visit contagious areas like hospitals, and for a surgeon if you're not able to examine you will not be able to treat them. And I think tele examination is going to be the future for a lot of surgical fields to be able to do the workup entirely offline and see the patient directly in the pre operative area, operate the patient send them back and then again follow up remotely. And that's a big realization and we've been able to motivate ourselves and do something about it

And also workup for surgery so everyone's not always immediately fit. But if you do the right diagnosis and right follow ups. You can work up the patient, you can have better documentation of their findings from medical, legal perspectives. Also, and you can directly plan the surgery and call the patient only for the least exposure during the surgery.

Q5. Being an innovator if you can reminisce about any 'Juggad technology' used for any of your innovations. How was the experience?

A. Yeah, so see 'Juggad' is a part of the process of making an actual product. Juggad is what we would call in an innovation lingo, we would call it the first prototype or an alpha prototype or a proof of concept. Juggad is not at any point of time of final product but Juggad is a quick fix, where you prove your concept and show that it works. So it may not have the shape and form, it may be using some existing products or components are some quick means that you have made, and you're able to achieve the outcome. So I think we do Juggad every invention that I have worked on. Our first step is to Juggad and that's called a proof of concept was to create something using existing tools, without spending much money without spending much time and see whether this is working we don't try this on patients but we try the concept, whether it is able to give a certain outcome, whether it's a mechanical, or the device that is producing certain pressure or producing certain temperature or it is it is maneuvering in certain ways, those kinds of things. I've

done my job or my first innovation, where I was not experienced in inventing, and I was not trained in any of the trainings that I've got I've been trained by Stanford University through India Stanford partnership called Stanford India by design, we now do a lot of this Juggad very formally, but earlier my first experience with Juggad was when I was trying to make a portable laryngoscope I wanted to see inside the throat, but I wanted to see it portably. And this was back in 2008, so at that point of time we had digital cameras handheld cameras like your Sony Coolpix or any of those, phones will not that advanced as they are today. So my first Juggad was basically taping laryngoscope, video laryngoscope through the lens of the camera and seeing whether the same image is coming onto the screen and by taking another light source, like a portable light source and fixing it and I was able to perform endoscopies using that. Because what's going inside the patient is still the laryngoscope and the recording system was a juggad and I think, when you do the juggad when you make that first prototype that's when you start learning about what it needs to be in terms of the improved product it tells you a lot about what you're doing right and what needs improvement and it is the right way to invent, it's not like you have to get on a drawing board and think of the final perfect product and only make that you have to go through these iterations of making proof of concepts in a refined prototype than an even more refined prototype and you have to keep testing in between till you're able to fix all the errors, make it a safe device and then take it for clinical trials. So I think, as an innovator I feel juggad and developing technology is a very integral first step for any innovation.

Q6. Can you give a brief description of your innovations and how it has benefitted community/patients. experience?

A. Yeah so but before that I would like to make it clear that not every invention I've worked on has been successful. Initially I used to say I have developed three products or four products, and my teacher and guru Dr Ravi Nair who kind of coached me into innovation said job if you're not getting the right picture. I said, But sir, I want to develop for products that are working, he's like yeah but how many

did you try to work on, and these four are the only ones that have survived. You are giving the message that any device you develop a successful. And then I started coming up with the statement where I would say, I worked on 12 devices, and five are in the market. And today I worked on about 20 devices in 10 are in the market, to show that there is a 50% failure. When you come to inventions, sort of the 10 devices or 10 technologies that have developed that are in the market. If I have to list some of them, then the first one of course is the ENT and endoscopy device that I was talking about in the previous answer. And this device was developed in 2008. But it took us a lot of time to refine it and bring it to the market. In fact, it took almost until 2014 for a large medical device company called Medtronic to license out the device and today it is what is called as an Shruti eye-ear program the device is called ENTraview so Shruti eye-ear is there screening device that it is now used for and I believe, close to about few I think 500,000 or 600,000 patients in rural parts of India have been screened. With the ENTraview, and many hundreds of health workers have got jobs through the screening platform. And so that is definitely one of the early technologies and that has reached massive number of people in terms of impact. The other couple of devices that I am an inventor of, but as an inventor what I would do is I would find the right engineering and design teams and then spin off startup companies and then remain a clinical advisor so, with that, there is a device called SAANS, have you heard of you may have heard of it it's, as it gets a lot of media coverage it's a mechanical CPAP device so one of the original inventors, along with a team of I think 12 inventors, who are part of that technology but I think SAANS and SAANS pro have really impacted. Not only pediatric, transportation, while maintaining the positive air pressure of the lungs, but also in COVID it help patients who are having dropping oxygen saturations and providing them with the right pressures and there's another device called pap care, which we also have a US based and four and one of the original and mentors, but there's another team that's developing it and has brought it to commercialization. This reduces a very crucial problem of ventilator associated pneumonia. By ensuring that oral oral pharyngeal secretions and subplot



executions are automatically cleared out without much neck movement without much need for nursing intervention so that less of the aspiration, less of the secretions aspirate into the lungs and cause pneumonia. Because the number of patients who are on ventilators they have a very high chance of getting into a ventilator. So the other devices in the empty space that we've made is a simple one is a nasal foreign body removal which is commercially available is already there in many medical colleges and hospitals and rural areas, which is a single simple handheld affordable device to remove anything impacted in the child nose from a non end expert to any general practitioner Medical doctor, pediatrician who gets a child with the foreign body in the nose, where they don't have any tool, they don't have to use makeshift tools now we have a dedicated tool with a light source with a handle with the grip and with a unique mechanical design that can remove it in the first attempt. We have doctors putting videos of their first attempt removals on YouTube and many children are now avoided from having to undergo surgeries undergo anesthesia undergo endoscopic procedures, or have risk of aspiration into the lungs, because of the first point of care, the foreign bodies can be removed accurately. Some of the other devices which are used very actively have developed a balloon sinuplasty system. Balloon sinuplasty system are not novel devices, they already exist, but they're not so much in India because the cost the Western technologies, when they develop products, they price it based on their buyers. Most of the times, people who pay for these technologies

are insurance companies, so they are exorbitantly high priced India as a out of pocket paying market. So, it didn't make sense when some of these balloons sinuplasty devices came into India, namely Johnson and Johnson's acclarant system was charged almost three times more than a very thorough fest procedure, which you would do for sinuses so it doesn't make sense your patient will be like to put a balloon in my sinuses and, and do those procedures repeatedly, I might as well pay one third and get a get a definitive fest surgery. And for that reason didn't work but we were able to reverse the economic economics here by making the balloon sinuplasty device, less than one third the cost of the first surgery, so that in the opd, or as an office procedure people with early sinusitis can get a balloon dilation and reverse their sinus issues. And if they still, not recovering all the medications are not helping or there are other anatomical complications and they can undergo fest surgery but at least we avoid unnecessary fests in a large number of people and we avoid progression of disease, one in eight Indian suffer from sinusitis, and many of them can be provided non invasive minimally invasive very quick management earlier on. Similarly, there is this, pressing problem of tinnitus and eustachian tube issues very common in India because of the turbinate enlargements and blockages of the Eustachian tube and we figured we have developed a balloon that can dilate the eustachian tubes and do both these procedures quite actively and it's always overwhelming to use your own invention in your own practice that benefits your own patients, some of the others that we licensed out very quickly, were thoracocentesis devices, abdominal paracentesis device, accurate meso gastric insertion tube, taken over by a company called Macman health in Delhi, and they are now distributing and manufacturing it in India and internationally. We also developed a liver biopsy device which is now developed under this company called India labs product, product is called bioscoop and that claims to do ultrasound based needle aspiration biopsy without causing any bleeding, which is a big problem because when you have liver disease, you're interpreting reading is very high when you take to cut biopsies. These are some of the few devices that has reached the people over time.

Robust immunity assures strong and healthy Nation

■ Ms. Ishi Khosla

Having spent the last 30 years focusing on the functional aspects of food in treating chronic health problems that we have faced, I have to say that it is for the first time in my professional experience that the word 'I, yes, the Almighty immunity has been spoken of at such a global scale.

Immunity is being sold by every brand, every food label and even toilet cleaners are being tagged with immune benefits.

This was possibly inevitable & fast coming- the aggressive pace at which our food production & consumption have grown & changed. It is only natural that in the times of a health crisis, the entire world is pausing to, in fact, reflecting on what we are actually putting "inside our bodies".

Pick up any prescription of a patient fighting COVID-19 today and you will see what I am talking about in bold ink - Vitamins D, C + Zinc and Magnesium even probiotics - some of these elements have become the salient factors in fighting the pandemic across the world. A review & meta-analysis published in the Frontier of public health this year showed an exceptionally high mortality among patients in ICU who have Vitamin D levels less than 20 ng/ ml . Evidence indicates that vitamin D helps by preventing the cytokine storm and subsequent acute respiratory distress syndrome (ARDS) which is commonly the cause of mortality. In addition a low Vitamin-D level was associated with an 80 percent higher risk of COVID-19 infection compared to those with normal levels.

It was already estimated in the year 2011, that around two billion people in the world are deficient in one or more micronutrients. A review & meta analysis done in Singapore published in Nutrients in May 2021 clearly states that absence of micronutrient deficiency is Strong



& better outcomes among COVID-19 patients and it offers a cost effective preventive & therapeutic approach for the pandemic. Several programmes have been launched over the years in India to improve nutrition and health status of the population; however, a large portion of the population is still affected by micronutrient deficiency. When linked

with food allergies, the connection becomes even clearer - to give you all an example from my area of expertise wheatrelated disorders like Celiac Disease which have gone up by Five Fold since 1974 (that's roughly in the last 50 years) (Annals of Medicine) such diseases are associated with multiple micronutrient deficiencies due to malabsorption, high

inflammation and lower immunity; most common nutritional deficiencies include iron, calcium, folate, Vitamin B-12. Ample research has also shown that iron deficiency anaemia can affect our immune system – the body's natural defence system.

This increases our vulnerability to infection. But it has taken a global health catastrophe to shine light on this underlying issue that is affecting us in more ways than we know and there's never been a better time in history to establish the importance of food and nutrition in bridging the gap when it comes to being future-ready as a country to fight for better health.

If we zone in to the latest research we need to recognise the fact that our gut has a mind of its own with the underlying microbiome. More than 70% of our immune system resides in our gut, so it is obvious that for maintaining a resilient immune system, we need to have the right gut composition of pro and prebiotics.

The focus has been to constantly reduce systemic chronic & acute inflammation through anti-inflammatory agents like Ginger, Turmeric, Giloy, Tulsi, Honey and other Phytonutrients available in brightly coloured fruits and vegetables and healthy fats like Omega-3 and medium chain triglycerides in virgin coconut oil. By simply cutting down pro-inflammatory agents from our diets like chemical additives, trans fats and allergens plus reducing sugars and high glycemic carbohydrates (most cereals & refined

carbohydrates) we can really make a lot of difference in fighting health issues.

Truth of the matter remains that prescriptive advice only makes sense in times of adversity when it's often too late, when the fight is already underway and a lot has to be done. Preventative health continues to be a buzz word in a country like ours where lifestyle related disorders are growing at a super high pace and are expected to cross 1 billion cases by 2022.

It has to start much earlier, this entire process of awareness and the responsibility lies equally in all our worlds - right from agricultural practices, soil quality to fortification, biodiversity, introduction of alternate grains & millets , manufacturing practices , waste management, positive labelling to disseminating the right information. There are so many glorious examples of best practices we can look upto to address some of the issues we are facing today. Addressing Vitamin D deficiency through food fortification in the West (and in India), supplying probiotic shots of fermented milk to citizens of Japan to fight gut infections at scale under Dr Minoru Shirota since 1935 , the innovation of FOSHU and FFC (foods & functional claims) system of labelling health claims in Japan , elimination of pro-inflammatory trans fatty acids started in Denmark, Canada and New York.

I, in my own small way, have taken the opportunity in the past to not only preach but showcase a model to manufacture and retail safe foods, high on nutrients and functional foods free of undesirable constituents like chemical additives, trans

fats using healthy ingredients, apart from this the allergen free foods including

Truth of the matter remains that prescriptive advice only makes sense in times of adversity when it's often too late, when the fight is already underway and a lot has to be done.

including gluten and dairy free, and more. Among the first of its kind food company Wholefoods started as a home kitchen outfit, expanded to have presence in some of the leading hospitals across the NCR region. It clearly established to me and my colleagues that there is an appetite for health if delivered in a sound holistic manner.

It is time for collective action, integrated thinking and innovative solutions to find ways that can actually work for the people and the planet. Coming together of all stakeholders with a shared vision will ensure that the ultimate goal of ending all forms of malnutrition and nutritional security is achieved and we need not have to wait for a pandemic to build a robust immune system.

It is the only sound investment to build a healthy population that will eventually pave the way for a healthy nation.

If we zone in to the latest research we need to recognise the fact that our gut has a mind of its own with the underlying microbiome.

Ms. Ishi Khosla is a practicing clinical nutritionist, columnist, author, a researcher and an entrepreneur. She is actively involved in clinical practice at the Centre For Dietary Counselling in Delhi and has spearheaded the launch of the first of its kind health food company "Whole Foods India". She's authored several books, including Eating at Work, The Diet Doctor, Is Wheat Killing You? and The Cholesterol Facts. She has been nominated as a member of the Programme Advisory Committee, Doordarshan Kendra; is a member of the Governing Body of Lady Irwin College, Delhi University; and is a consultant to several corporate and multinational organizations.

She has been felicitated by the President of India for work in the field of nutrition. She has also been listed among the 25 most powerful women in the country by the India Today Group.



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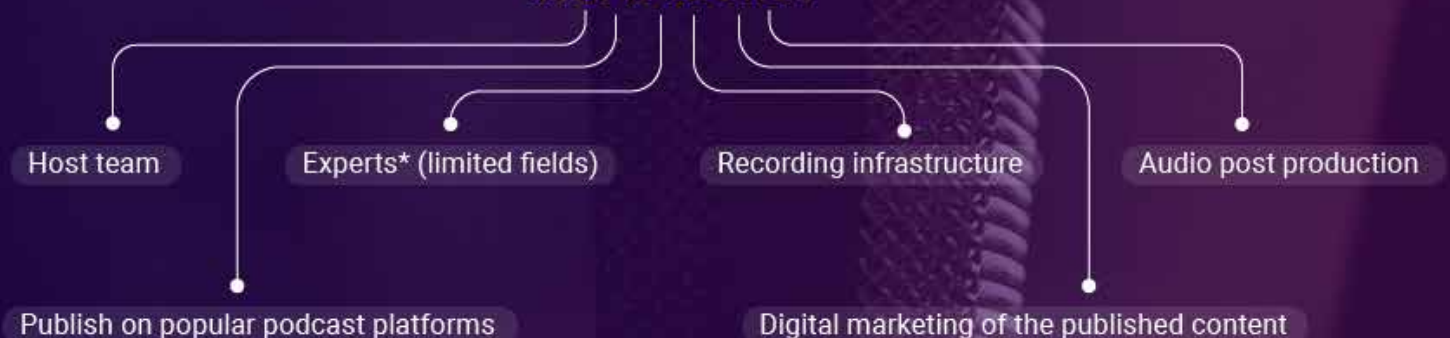
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▶ INNOVATIONS

INDIA'S FIRST CT GUIDED MINIMALLY INVASIVE NEUROSURGERY

A multi-disciplinary team of doctors at a multi-speciality quaternary care hospital, MGM Healthcare located in Chennai has successfully performed India's first CT-guided minimally invasive neurosurgery.



The team led by Prof. Dr. K Sridhar performed the surgery on a 28 years old female patient from Bangladesh who was suffering from severe torment at the scruff of her neck and head for the last 9 years. Patient's everyday life was very much hampered to the extent that she could not even take care of her 8 year old child. After going through a series of consultations, multiple scans and different treatments in some of the top healthcare institutions both in Bangladesh and India, she was referred to MGM Healthcare for further assessment and treatment.

The team at MGM conducted a high resolution 3T MRI scan with MR neurography and came out with a diagnosis that the pain was emerging from the left cervical C2 Dorsal root ganglion,

high up in the neck. Once the scans clearly displayed the underlying issue, the sole treatment option administered was to perform a surgery which would destroy the pain fibers of the ganglion. Due to the sensitive location of the ganglion, in the course of planning the surgery, the team had to be very cautious so as to avoid the major risks of paralysis or death. The team resorted to undertake a minimally invasive intervention instead of an open surgery. The highly experienced team of interventional radiologists was roped in to assist the CT-guided radiofrequency ablation procedure which is definitely more precise and accurate with significantly reduced risks. In the past the team has performed many radiofrequency procedures on other organs of the body but undertaking a radiofrequency ablation surgery for C2 dorsal root ganglion under

CT guidance is the first of its kind in India.

The surgery was a success as there were zero complications. The patient is expected to lead a normal and a healthy life there after.

SOURCE : www.business-standard.com



CONTACTLESS THERMAL SCANNERS ROLLED OUT TO AID FIGHT AGAINST COVID-19



alongwith deep learning to combine both facial recognition and thermal screening to detect high body temperatures in an individual as well as those individuals who violate safety protocols like the wearing of a mask.

This product has been founded by a team of engineers from IIT Bombay and is designed and fabricated in India.

These contactless and unmanned thermal scanning kiosks will have feature like temperature check, face mask detection, auto hand sanitisation and access/attendance management.

The USP of this product is that along with the above said features it will also screen blood oxygen, pulse and respiration rate of the user. There is absolutely no requisite of a human observation or intervention. There are certain places which need the placement of these hi-tech kiosks like restaurants, housing societies, banks, companies, manufacturing plants,

schools, malls, hospitals, airports and corporate offices as they require effective screening solutions to contain the spread of COVID-19. The makers of this product have been able to successfully integrate advanced sensors and facial recognition.

The screening time of the kiosk is 1 second and the operation range stands between 15-42°C with an accuracy of +/- 0.2°C. The thermal scanners are priced between INR 60,000 TO 1.25 lacs.

SOURCE : economictimes.indiatimes.com



In times of this global pandemic it has become imperative to check every individual for high temperature and flu-like symptoms. To aid in this detection of high temperature, a healthcare start-up named ARVI has launched a contactless thermal scanning kiosk which is based on Artificial intelligence technology

SUPERMASK UNVEILED FOR A COVID FREE WORLD

In this time of pandemic it is imperative to wear a mask literally at all times till full proof vaccine is developed. Working in this direction is a Swiss Hygiene Company, Livinguard Technologies which has developed a mask with the aim to provide a covid free world.



coronavirus SARS-COV-2. The company felt it has responsibility to protect people as they return to a new normal and live their daily lives and so they wanted to produce something more effective than a mere protective barrier mask. The team kept redesigning, kept testing the masks to check for efficacy against the COVID-19 virus.

The mask has three layers which gives five layers of protection. The mask's outer layer made of fabric has Livinguard's Tripellent Technology with three levels of protection. Then there is the Livinguard anti-viral technology which is coated on both sides of the fabric as well as the same Livinguard anti-viral technology is embedded into the fibres of the fabric. When a virus comes into contact with this fabric, its capsid which is a protein envelope is destroyed causing an explosion of the virus. So basically the technology is based on the principle that the fabric surface of the mask is empowered with a strong

positive charge and when the microbes (microbial cell) which are negatively charged come in contact with the fabric, it leads to permanent destruction of the micro-organism. The fabric has 36 billion positive charges per square cm and continues to work in this way without any chemical leaching out of it and also does not get affected by washing. The mask can be washed upto 30 times keeping its original properties intact and if used daily and washed weekly with normal usage, it can be used for 6 months. The inside fabric layer of the mask also has this anti-viral technology which ensures that both these layers destroy 99.9% of the COVID-19 virus as proven by the University of Berlin. All these technologies together prevent the user from inhaling the virus and those around them from exhaling the virus. The mask is proven to be non-toxic, safe for use and is priced between INR 1490-1990 depending on the type of mask a person opts for.

The team conducted more than 65,000 experiments and filed for more than 100 patents before they got this revolutionary mask right with a globally patented technology. The mask is a super mask as it can directly inactivate viruses and bacteria including 99.9% of the novel



The company also plans to soon launch a sports mask version for sports enthusiasts and small size for kids above the age of seven. Presently three versions of the mask are available in the likes of Street, Pro and Ultra with increasing levels of protection in medium and large sizes and Bombay blue colour. Soon three more new colours masks will be introduced. The company has its presence in China, Japan, Germany, Singapore, Middle East and India. The mask is mostly made from cotton hence it is eco-friendly and sustainable. It is washable and reusable to about 210 times without compromising

on the quality and efficacy. The mask is also odour-free and dries out quickly with low humidity. A research done by the team shows that if a million people use one reusable Livinguard mask 210 times then we can save 36,000 tonnes of waste and curtail the mask than a regular mask because a person would need 210 masks to compare with one of Livinguard's mask. Science leaders across the globe are terming this super mask as a game changer in the management of COVID-19 spread.

SOURCE : www.newindianexpress.com

AKNAMED ACQUIRED BY PHARMEASY

'AKNAMED', initially founded by Saurabh Pandey and Mahadevan Narayanmoni in 2018, a cloud-based hospital supply chain management start-up based in Bengaluru, India has recently been bought by online pharmacy Pharmeasay in a deal worth \$180-190 million. Aknamed has done well

in the recent past showing it's monthly income growing at a rate of 10 times by the end of the previous financial year. Aknamed offers procurement solutions to more than 1200 hospitals and its clients include Columbia Asia, Narayan Health and Manipal Clinics. In May

2021, Vardhman Health was acquired by Aknamed in a \$35 million deal.

SOURCE : economictimes.indiatimes.com

IN LESS THAN 60 DAYS MORE THAN 50,000 NURSES TRAINED ACROSS INDIA TO DEAL WITH COVID-19



demonstration-based and immediately applicable training in the areas of infection control and prevention in COVID-19 hospitals. It also taught the use of personal protective equipment (PPE) and how personal care should be taken by the medical staff. Training is the need of the hour as our healthcare workforce is well versed with their professional duties and roles but they do not have the experience to deal with a pandemic that they can

draw on now. While the healthcare worker is trained for PPE in their courses but they have never used them in their workplaces. This pandemic has taught us that with each new disease comes a new fighting plan and definitely skilled healthcare workforce is the key to fight and win against such a problem. Thus our nurses need to be upskilled in time for taking such action.

Generation India, Columbia Asia

Italy being the epicentre of covid outbreak in Europe and became the first country to launch an initiative in training it's healthcare workers in the area of COVID-19 and taking inspiration from them such a step is being taken by India. GENERATION INDIA, an NGO organised a two month long online training programme for capacity building of frontline healthcare professionals under which it has successfully trained more than 50,000 nurses from various hospitals across India.

The duration of the programme was of four hours and it offered practical,



Hospital, UNESCO, Learnet Skills Limited and ABP News joined hands to prepare, launch and roll out this training programme. Hosmac India Private Limited from the healthcare industry and the Nursing Association of India is the certification agency for the same. Contribution for this endeavour also comes from Delhi Nursing Council,

National Skill Development Corporation, Indian Professional Nurses Association and Andhra Pradesh State Skill Development Corporation. Generation India is sharing its product with multiple sources like healthcare industry association, nursing associations, state run public healthcare facilities and individual hospitals, nursing homes and clinics to

make it available to even a larger number of nurses. Trained workforce is surely an asset to our country and will ensure more efficient management of COVID-19 throughout the country.

SOURCE : www.eastmojo.com

‘HYDRACUP’ TO TACKLE DEHYDRATION IN CARE HOMES



Dehydration is seen to be huge problem within the elderly population which definitely needs attention. In UK as per statistics nearly one in four persons will be above the age of 65 by the year 2050, making it a global phenomenon. In UK more than 40,000 elderly people die needlessly every year from the effects of dehydration within care. The common effects of dehydration include weakness, dizziness, low blood pressure all of which increase the risk of falls that happen to the elder population which turns out to be one of the most frequent and serious injuries amongst the elderly. Also the number of deaths resulting from low hydration levels is shocking. Even mild dehydration level of 1-3% (fluid loss) can impair energy levels leading to major reductions in memory and brain performance. This shows that dehydration amongst the elderly cannot be taken lightly and it needs immediate attention.

In this light Aquarate Limited has stated its mission to reduce hydration-related issues and related preventable deaths and thus has introduced their smart cup known as HYDRACUP to improve the quality of care for loved ones. Hydracup happens to be the world’s first automated hydration tracking system.

In this pandemic the healthcare workers are already stressed and there is immense amount of added pressure on them apart from paperwork and reporting still care of elderly cannot be compromised owing to the situation. So in this scenario hydracups will prove to be very beneficial for monitoring adequate fluid intake sip by sip by the elderly. The hydracup technology integrates with a multitude of care plans and patient softwares so all the data is stored in one place. Presently Hydracup is the only smart cup in the market that can produce accurate data which integrates into care systems, saves

time of the caregivers and is high in quality. Apart from discreetly tracking down an individual’s fluid intake by automatically measuring the volume of the liquid, the smart cup also allows one to see patterns and trends in a person’s drinking habits at the click of a button.

The use of hydracups is expected to reduce dehydration in the users thereby bringing in an overall improvement in their health by improving their moods, reducing the disrupted sleep patterns and stimulating their appetite. It is also expected to reduce preventable hospital re-admissions.

SOURCE : www.healthvision.in

Compiled by:
Dr. Avnatika Batish, working as the Director Strategy and Healthcare at International Health Emergency Learning and Preparedness. She is also a guest faculty for MBA (HR) and MBA Healthcare Management at various B-Schools and is a soft skills trainer.

► WELL BEING

Goals are the road maps that guides and shows the possibilities in life

■ Preeti



Sunita, now a twenty two year old girl, had Cerebral Palsy from birth and it has delayed her development. The condition where an impaired muscle coordination causes damage to the brain before or at birth. She hails from Mandi Adapur, Hisar and belongs to a financially well off family. Being a handicapped person, the hardship that she and her family has to go through in her orthodox upbringing leads to disappointments, miseries and frustrations.

Without assistance she could hardly sit or stand independently. She found difficulties in using her hands to eat, play or write. She also suffered Apraxia and Dysarthria which

causes damage to the parts of the brain related to speaking and hence her speeches are also distorted. She has a motor speech disorder in which the muscles of the mouth, face or respiratory system may become weak or have difficulty in moving.

She aspired to lead a normal life during her growing years as she couldn't comprehend the fact that she is a special child and differently abled than other children of her age.

As the years passed by, she realized that she had to deal with her disability. With no options available, Sunita decided not to be dictated by her fate but to live life on her terms. She had

a strong desire to learn life lessons and be independent.

With the passage of time and her efforts in regular physical therapies along with the help of devices she was able to stand upright with wall support at the initial phase. With regular training, initially she was provided with a standing frame and Ankle Foot Orthoses.

She was able to stand upright with wall support at initial phase



The next goal was to make her walk with support, for which a reverse walker was suggested, which with time she had successfully managed to do.

For the past twelve years she has been attending special classes at home and presently understands materials, food, family, relatives, physical changes, daily routine work and activities in a prompt manner.

With her continuous efforts and

undulating support from her family she was able to carve a niche for herself that gave her the confidence to alter her weakness into her strength.

Her mother brimming with pride shared for her daughter's efforts described her painful striving in walking and understanding things.

From her initial days she had come a long way and now she is confident that her daughter will conquer more challenges thus creating more milestones.

Government institutions should always look for more deserving children and support them under disabled support programs because every child is special.

Initiatives taken by us will help the children overcome their fears.

Preeti is a research scholar pursuing her PhD from Hisar, Haryana.

With her continuous efforts and undulating support from her family she was able to carve a niche for herself

Cannabinoids and Cannabis Fascination

■ Dr. Jagjeet Singh Gill



When we talk about cannabinoids we often get to see that most of the people are aware that THC and CBD are present in abundant form and have good medicinal value of cannabis. Along with these two major cannabinoids are there and many other important cannabinoids like

- Cannabigerol (CBG),
- Cannabinol (CBN),
- Tetrahydrocannabivarin (THCV),
- Cannabichromene (CBC),
- Cannabidivarin (CBDV),
- Cannabigerivarin (CBGV).

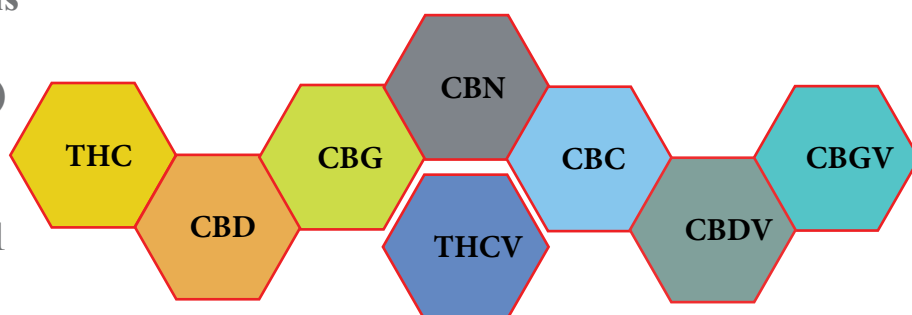
Cannabis plants have a history of medicinal/therapeutic use dating back thousands of years in many cultures in Asia, Europe, and Africa. In ancient times, many physicians around the world used to mix cannabis into medicines to treat pain and many other disorders.

In the 19th century, cannabis was introduced in western medicine for therapeutic uses. Many researchers show that cannabis can reduce nausea and vomiting during chemotherapy,

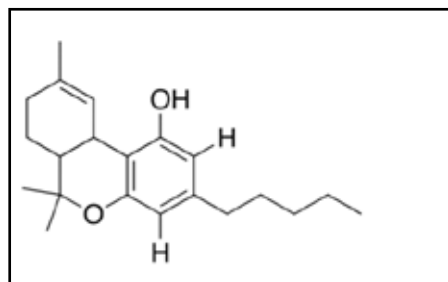
reduce chronic pain and muscle spasms and improve the appetite in people with HIV/AIDS.

In 2020, the United Nations commission on narcotic drugs (CND) removed all forms for cannabis from schedule IV of the 1961 Single Convention on Narcotic Drugs where cannabis got due recognition for its medical value by the United Nations commission.

The United Nations commission on narcotic drugs (CND) removed all forms for cannabis from schedule IV of the 1961 Single Convention on Narcotic Drugs

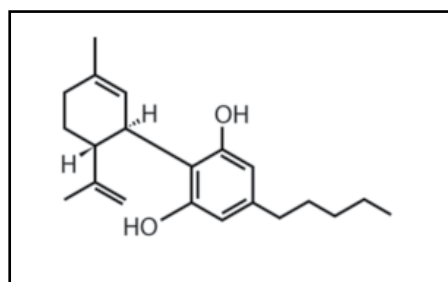


The following list includes information about some of the most widely researched cannabinoids and their medicinal association for the symptoms:



THC (tetrahydrocannabinol)

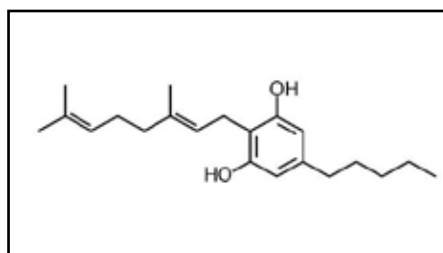
- Pain desensitizer
- Anti inflammatory
- Itch reliever
- Antioxidant
- Neuroprotective
- Bronchodilator
- Mood regulator
- Appetite stimulant
- Sedative
- Antispasmodic
- Pain reliever



CBD (cannabidiol)

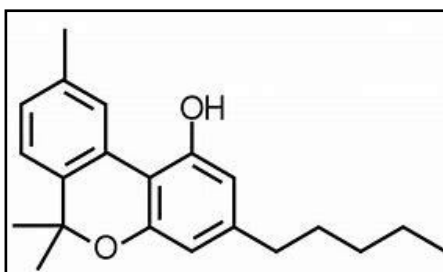
- Pain desensitizer
- Anti anxiety
- Pain reliever
- Antidepressant
- Immunosuppressant
- Neuroprotective

- Antipsychotic
- Antioxidant
- Anti inflammatory



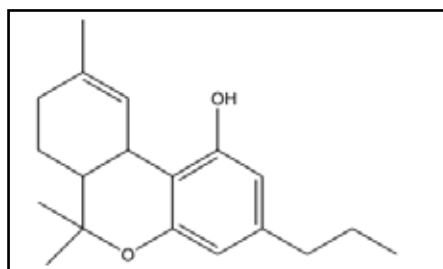
CBG (Cannabigerol)

- Pain reliever
- Anti inflammatory
- Muscle relaxant
- Antiarrhythmic
- Antifungal
- Anticarcinogenic
- Antidepressant
- Antihypertensive



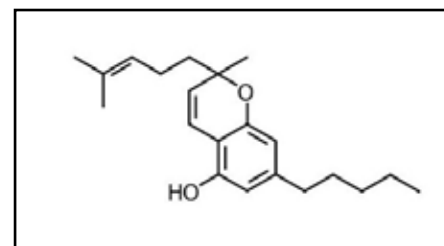
CBN (Cannabinol)

- Sedative
- Anticonvulsant
- Anti inflammatory
- Antibiotic
- Anti MRSA



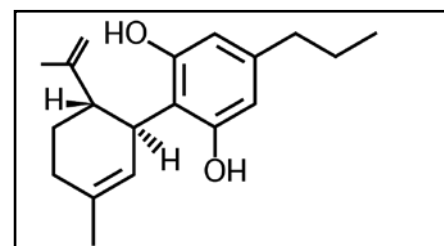
CBC (Cannabichromene)

- Anti inflammatory
- Pain desensitizer
- Pain reliever



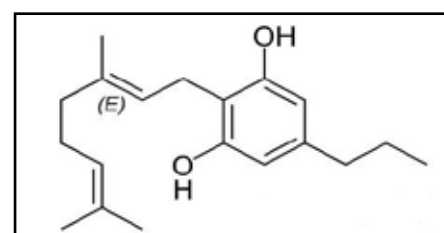
CBDV (Cannabidivarin)

- Antiemetic
- Anticonvulsant



CBGV (Cannabigerivarin)

- Anti inflammatory
- Anticarcinogenic
- Pain reliever



When we talk about cannabinoids we often get to see that most of the people are aware about THC (tetrahydrocannabinol) and CBD (cannabidiol) which are present in abundant form and have good medicinal value of cannabis.

Dr. Jagjeet Singh Gill works as Quality Assurance Associate Expert in Canada. He has earlier served as Assistant Professor at Chandigarh University and Sant Baba Bhag Singh University.

Adding Humour in Hospital Treatment: Importance of Medical Clowns In Healthcare

■ Aileen J



Medical clowns play a vital role among paediatric and adult patients. Healing by the use of humour is considered as therapeutic value both in alternative medicine and conventional medicine in hospitals all over the world. “Medical Clowns”, also known as “Clown Doctors”, conduct frequent rounds to these patients and aids them in alleviating the fear of hospitalisation, which in turn refines their curative process. This is considered to be an advanced therapy in the medical field of the healing process for the patients,

which was formally established by Michael Christensen, co-founder of the New York-based Big Apple Circus in the year 1986.

The recent review of the meta-analysis literature regarding the “clown therapy” consolidated their relevance and portrayed the approaches made in diminishing the uneasiness and stressors faced by the children, the inevitable mental pressure on the patients undergoing surgery, and also among children who have undergone agonizing procedures in the Emergency Department.

In addition, some physicians have anecdotally reported that the involvement of medical clowns in the rehabilitative process has brought in a vast improvement in patients, parents, staff, and everyone associated with this bubble of care. Laughter is the best plan of care in medicine. This concept is currently inculcated in the hospital practices as newer researches pinpoint that “clown therapy” lowers stress and anxiety in children and their parents.

physicians have anecdotally reported that the involvement of medical clowns in the rehabilitative process has brought in a vast improvement in patients, parents, staff, and everyone associated with this bubble of care.

PERSONA

INNOVATIONS

WELL-BEING

IN FOCUS

RESEARCH

NEWSCOPE

Israeli Medical Clown Visited Ramaiah Memorial Hospital, Bangalore

An Israeli Medical Clown named Nir Raz from Schneider Children's Medical Center, Israel had visited Ramaiah Memorial Hospital, Bangalore, and conducted a workshop for the MD Paediatric students, Paediatric Dentistry Consultants, and PG Paediatric Dentistry students, Professors of Paediatric Department, Hospital Administration staff and students of the Ramaiah institute, hence conceiving "Medical Clowning" a portal of entry to adopt in healthcare organizations.

He enlightened about the concept of healing through laughter & humour. His visit to the Paediatric Ward at the Ramaiah Medical College Hospital brought in smiles to children through his fun-filled interaction with the paediatric patients.

While speaking to the Consulate General of Israel to South India, Ms. Dana Kursh, gave the insight about the leadership of the faculty, Doctors, Nurses, and staff showed its an inspiration on how important aspects can be introduced to render smiles and laughter to sick children and adults. In addition, he also stated that adopting futuristic goals for medical tourism between India and Israel will be done by shuffling the health care teams through MASHAV to have an international collaboration where they are trained and to broadcast this concept on how the therapy can be applied as medical means for healing patients to unmask their "healthy and smiling faces".

The event was co-hosted and organized by the Consulate General of Israel to South India together with the Ramaiah University of Applied Sciences in collaboration with the Paediatric Department of the Ramaiah Medical College Hospital.

Mr. Nir Raz is a Medical Clown, Director, Group Conductor, and Stage Artist, who has been employed for twenty years in the theatre, group facilitation, and improvisation. He is also the Founder and Co-founder of the Institute of Psychotherapy in Playback Theatre.

In Israel, medical clowns undergo two-year training in medical procedures, communication skills, games, magic tricks, and more. After their graduation,

they are employed by the hospitals, as an intrinsic side of the medical staff. "The view ahead is not only confined to make the children laugh but also to give them a sense of discipline and influence over their precious lives, support them in battling with their emotions of powerlessness due to hospitalization. As defined by Mr. Nir Raz it also help in explaining the complex medical conditions in a humorous way that young children can relate.

In Israel, Medical Clowning has developed into an authorized workout that is no more to be laughed at. These Magician Doctors boost their confidence and rejuvenates children in hospital wards and are present during the surgeries. One Israeli study revealed that the presence of clowns benefits a woman's likelihood of getting pregnant during IVF fertility treatment from 20.2% to 36.4%. Studies showed that the accomplishment of medical clowning has been disseminated all over the world and numerous humanitarian managements back up this humorous healing process.

Clown Therapy and Health:

The notion of clown care is in trends these days as many physicians and researchers have made allegations on laughter and humour benefits on health for centuries. A study conducted by Norman cousins in 1979, the study validated the favours of humour in healthcare by resuming ankylosing spondylitis patients using self-imposed remedy focusing on daily laughter and vitamin C . Moreover the healthcare industry began to get gradually legitimate the healing potential of humour and make specific reactions channeled with humour in 2004. This conceived a legal formulation in the form of clown therapy and licensed its authoritative access to the hospitals. The hospital environment is distinctive from the home environment; disease and loss are the shadows of the hospital environment interfering with the full scope of feelings. It has been said that a person laughs about 15 times a day and that figure can get to zero in hospitals. Hospitalization causes distress and anxiety apart from that it may be traumatic, especially for hospitalized children. It is also considered an adverse event in their lives. Anxiety among parents and caretakers is also most common during hospital stays. This is caused due to the very thought of the children patient

conditions and the pain

Clown doctors also use medical devices or teddy bear that is found in a patient room and utilize it as a dramatic device to add humour to children.

suffered by them during their treatment, so to reduce their anxiety and stress clown care is introduced. Clowns and their senses of humour have entertained human beings for centuries. In treating paediatric patients, humour plays a very important role it should be a must in the hospital setting as researchers believe that humour can be combined with the treatment for well-being.

Clown Doctor Appearance:

Clown doctors have their outfits to match their identity, each clown doctor has an individual and designed white medical coat. This makes them part of the clinical team and also makes the white coat less terrifying for the patients. Besides, the clown doctor's clinical concept has the objective of assisting children to cope with daily clinical practice and to assist children with their new condition and the scary clinical language and procedures. To assist them in this situation, Clown doctors carry an array of props their "doctor's bags" and in their side pockets (e.g., soft toys, whistles made using syringes, puppets, phones made using stethoscopes, musical instruments of various types, magic show items and so on. Clown doctors also use medical devices or teddy bear that is found in a patient room and utilize it as a dramatic device to add humour to children. The main identity of clown doctors is a red nose that is also called "the smallest mask in the world". This is the main unique feature found among clown doctors that truly adds essence to their benevolent role. The red nose or make-up mask of the clown, like a sensational character or role, is both insightful and rejuvenating, empowering the statement of what lies covered beneath our real-life roles. A clown doctor chooses characters that are attractive to children and that is easily related to children's life. This gives a channel to start interaction with sick patients and to bring out their emotions.

Children usually open up to the clown doctors regarding their pain and feelings.

Abilities Required for a Clown Doctor:

Clown doctors must possess a good sense of humour, be compassionate and be cheerful clowns. Clown doctors must be good listeners and be able to listen empathically to the emotional state of people in the hospital. They also should adapt to the situation and immerse themselves in the emotional level of the patient and their families. Second important ability is represented by the playing around abilities (e.g., slapstick, jugglery, mime, and so on. In summing up Clown Doctor required being artistic skills and also possessing psychological skills to interact with others.

Impact of Clown Care in Quality and Patient Safety

Clown care is an added benefit to healthcare. In a study the results of the study revealed the patient outcomes improve, the hospital staff work is efficient in the presence of medical clown and even reduces hospital costs. The decreased in cost is mainly from the reduced need for sedation and anaesthesia before and during procedures like radio imaging or radiotherapy – in both paediatric patients and adults. Clown doctors' cost is less when compared with the total cost of using an anaesthesiologist and the drugs required to sedate the patient for this kind of procedure. Clown interventions are proved to induce positive emotions, they will directly impact the patient's well-being and reduces psychological symptoms and emotional reactivity. It will aid in treating patients with anxiety and fear related to medical treatment. Clown doctors are also well accepted by patients relatives and healthcare staff and their presence appear to be useful in creating a lighter atmosphere in the health setting.

The process of “hospital clowning” works in four different levels of impact –



1. **Psychological level** – the immune system is modulated with the release of endorphins
2. **Emotional level** – where laughing substitutes negative emotions with positive feelings
3. **Cognitive level** – it distracts the mood of the person or changes the patient from his situation, where levels of thoughts are gathered and new ways of learning to express oneself are identified.
4. **Social level** –connection is created between clowns and children/patients by laughing and thus, increasing further trust and interaction between them.

Medical Clown in COVID-19 Ward:

COVID-19 pandemic brought a challenging situation in the hospital setting in managing fear and emotional distress. In Israeli hospitals, medical clowns were working in regular shifts in hospitals during the coronavirus outbreak, and directly interacting with COVID-19 patients. Medical Clowns decorated their PPE with stickers and created a unique covid clowning dress

code. They attached a red nose on the N95 mask behind the plastic face shield, which added smiles to the patients and staff. The major challenge during the covid pandemic was to build intimacy with the patient while staying at least 2 meters away, wearing a mask. The medical clowns had to speak loud and also ensure physical gestures to add humoUr amidst covid panic and anxiety. Lessons learned from COVID-19 is an opportunity for the healthcare organizations to reconsider the role of medical clowns to support the vulnerable groups in holistic well-being, especially children in hospitals, medical staff, and the elderly in the healthcare setting.

Aileen J, is an Assistant Professor at Ramaiah University of Applied Sciences, Faculty of Life and Allied Health Sciences, Bangalore. She is a young researcher and her current research interests include patient safety, hospital environment, and utilization of equipment in hospitals.

Clown interventions are proved to induce positive emotions, they will directly impact the patient's well-being and reduces psychological symptoms and emotional reactivity.

IN FOCUS

An Informed Decision - Responsibility of One Towards Oneself

■ Dr. Alhad Mulkalwar



Pursuing a career in Medical Sciences in India requires the student to undertake M.B.B.S, a five year long rigorous and comprehensive course which transforms them into young healthcare professionals of tomorrow. However, a significant aspect missing from almost all the components is the students' approach, curriculum, teaching, etc, alongwith a guidance for different career avenues within and beyond the domain of healthcare, which one could pursue after their graduation. An enlightenment

on the measures we, as members of the medical fraternity, can adopt so as to better enlighten students, who are at different stages of their graduation journey, about the different career avenues for them, in order to make a responsible decision about their future.

For young undergraduate students, stepping into the campus of their medical colleges infuses them with a sense of pride and excitement. The days and nights of hard work gone into preparing themselves

for the National Eligibility cum Entrance Exam (N.E.E.T) have finally paved their way to the journey of becoming doctors. Well, that's what we all dreamt of as an above average student in school and that's what we intend to do in the five years we spend there. The medical curriculum of India is globally renowned to be one of the most robust and comprehensive ones. Apart from imparting vast loads of knowledge to the students somewhere we have forgotten to impart the wisdom they need to make tough choices ahead?

From a career in medical research to joining the armed forces, the opportunities are immense and we are only limited by our hesitation to explore them beyond the conventional approach of our formative training years.



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The seeds of this issue are sown right in the early days of our secondary education. The teachers and the ability of the student to identify his/her preferred career choice are the factors that significantly influence the career decision and aspirations of students. However, anyone with an ability to study long hours and have interest for biology over other subjects is prophesied by the parents, teachers and colleagues to enter the profession of medical sciences, or sometimes even the fact that the parents own a private hospital set up, is an incentive enough for children to pursue this career option. Are these criteria adequate for a young, naive mind to make such a huge life decision? Can a mere inclination towards biology or dislike for mathematics make one competent enough to understand whether one would prefer a career in healthcare? The crucial career path of each professional should be well in various fields when making career choices, and if yes, can the school administration help in enabling such

a collaboration? Events such as career camps should be organized at the school level; or at least one interactive session a week about different career paths can be conducted for secondary and higher secondary school students, helping them navigate through the same.

The significance of “meticulous formative early years” in all domains of education is highly underrated. As soon as the students enter their medical colleges, they perceive the curriculum to be one which aims to inculcate in them the aptitude of a good healthcare professional. Secondly, they believe it would make them knowledgeable enough to score well in the NEET-Post Graduate (P.G.) exam, which would enable them secure a seat in the specialty and institute of their choice. However, I believe that merely a good education and good score in the entrance exams is not the main aim of MBBS. We often miss out on the most crucial aspect – exploration! Why do we assume that NEET-PG is the

only exam an MBBS graduate is eligible for? While a good education will enable one to score well in the entrance exam, how would one acquire the wisdom of what area one should choose to specialize in? Graduating in medical sciences opens a vast array of opportunities and having a closed mind to those different possibilities and the sheer lack of knowledge about their existence is a major hurdle in making the best of M.B.B.S. The merit list rank and prestige associated with a field are insignificant criteria that unfortunately end up influencing this decision in most cases.

In the very first week of the semester, before the lectures begin, if the faculty members of respective departments would give an overview of all the different avenues for a career in that subject, it would ignite a sense of passion and excitement in the students, while also understanding the significance and contribution of the subject to the field.

An overview of all the different avenues for a career in that subject, it would ignite a sense of passion and excitement in the students

A small step like urging students to report and publish rare cases they encounter during their clinical postings would give them the incentive to dive deeper into all different aspects of the case and the specialty, thus providing a glimpse of what the field has to offer. If included in the medical curriculum, small initiatives such as educational orientation tours to the college's animal house or being a part of a drug trial could get one excited to specialize in Pharmacology and Drug Development. Participation in workshops and drives like those of Cardiopulmonary resuscitation (CPR) and Trauma Management could make students want to pursue Critical Care Medicine or Trauma Surgery and participation in Mock Health Parliaments could make one consider a career in Community Medicine and Organizations like the World Health Organization. An experience of participating in symposia and seminars could raise interest in subjects with significant academic aspects like Physiology, while involving a student in a single interesting case could make one consider the less preferred branches like Forensic Medicine and Toxicology. One must remember that the aim of MBBS is not to transform students into masters of all specialties; instead, it is to give a sneak-peak into what each specialty has to offer, and simultaneously build a good personality and develop an ethical approach to life. Inspiration can come from literally anywhere, and once it strikes, the impact can be life-altering. While the compulsory rotational internship does provide a small glimpse into this area, it is neither sufficient, nor can one devote the appropriate amount of time for this, owing to the pressure of preparation for the entrance exams. The recently introduced Competency Based Medical Education curriculum and NEET examination give a glimmer of hope in this context and its impact remains to be seen.

The scope of graduation in medical sciences extends beyond the domain of healthcare. Students could also have a career in Bioethics and Medical Law; they simply need to immerse themselves in the bioethics' way of thinking, writing, or attend conferences from this field. Administrative experience, such as that of being a part of the student council, might inculcate the desire to pursue a career in the Indian Administrative Services, whereas participation in Model United Nations could prompt one to take up a career in diplomacy. The COVID-19 pandemic has highlighted the importance of Hospital Management, stimulating more students to consider a career in the same. It has also led our policy makers to understand the importance of background knowledge in health sciences for taking

administrative decisions in the healthcare sector, giving an additional push towards the creation of Indian Medical Services, to apply for which a bachelor's degree in medical sciences (M.B.B.S) would be a mandatory requirement. Indulging in literary activities could open doors in careers like Medical Journalism. From a career in medical research to joining the armed forces, the opportunities are immense and we are only limited by our hesitation to explore them beyond the conventional approach of our formative training years. Understanding the need for it, if the curriculum could itself incorporate these aspects, young medical graduates would be in a better position to make Informed Decisions regarding their future, and in turn, serve the society in a much better way.



An enlightenment on the measures we, as members of the medical fraternity, can adopt so as to better enlighten students

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Future of Pathologists - Is it bright or dark?

■ Dr. Shubha.H.V

It was the ongoing phase of COVID-19 first wave, when I had to quit my job due to inevitable circumstances. Every person I inquired about the cause for leaving the job acknowledged that privilege played a huge role in their ability to do so. Sometimes I felt terrified to talk about leaving my job without something else lined up. I was also told by many that it is hard to get another job in the current COVID situation. I was in my comfort zone with my near and dear colleagues in a well-established medical college for almost three years and had never thought of quitting the job. But I have made the

decisionTO QUIT!!!!!!

Initially, I enjoyed the ample time I have to rediscover myself, reevaluate my priorities and spend time with family. I neither had to get up early in the morning nor hurry up in the kitchen finishing my chores. The whole day and night was mine. I felt happy and free. As an active person, I couldn't sit idle at all. I did whatever pleased me and always looked for it for so many years. I started my home gardening, nurtured my indoor plants, harvested a few microgreens, made crafts for my son, and involved him in various school

activities. My mental peace escalated in a short span of time. However, it did not last for long.

But the supreme consideration is always the man. The machine cannot tend to atrophied the limbs of men.



A web of weird thoughts entangled my peaceful mind. Losing the job was like having my identity stolen, having put an end to my goals. It is rightly said that-

“If you don’t have a job, you don’t have a fear of losing it. You fear having to get one.”

I started enquiring about job vacancies everywhere. I gave many interviews too but couldn’t manage to get one. Every lab I visited was just run by a technician with no true pathologists. It was then I realized how difficult it was to find a right job for myself. I asked to myself:

Are technicians replacing the pathologists?

I was in a tornado of confusion engulfing my inner peace. I felt shattered waiting for many months without a job. The dusk was setting in and I sat down with a cup of coffee. Meanwhile, taking it sip by sip, I just googled a few articles. I came across an interesting interview given by Dr. Harsh Mohan, a pioneer in pathology. He had stated that-**“Increasing number of women are entering pathology to the extent that in the not too distant future it may be rare to find a male pathologist in India!”**

A study predicted that by 2030, the number of active pathologists may drop by 30% compared to 2010 levels. Already in some parts of the globe, the lack of pathologists is shocking.

Are pathologists becoming scarce assets?

Later in the evening, my colleague called me up and our conversation ended up with a question again- “Have you not found any job yet?” I felt as if someone pelted a stone into my sea of silence. I answered in a low tone- “No”. Then she talked about the PG seats in pathology remaining vacant in medical colleges and how technology is taking over everywhere. A deep silence fell following our conversation.

I wondered if “digitalization and artificial intelligence are replacing pathologiststoo?”



I glanced at the clock. It was 9.00 p.m. We sat down for dinner. While my husband was having dinner, I constantly kept telling him about the day’s events. He just kept muttering “Okay’s” and “Hmm’s”. All of a sudden he asked- Did you get any interview call? I shook my head and walked away with a heavy heart.

I had now decided to come out of all my confusions and put an end to my insecurities. I sat down and started analyzing each minute question.

“Questions create confusion initially and end confusion eventually. Without a good question, a good answer has no place to go.”

I am proud to be a pathologist. It has offered me a career that has been interesting, exciting and surprising at times too. My profession has given me a much more balanced life. It’s absolutely fine to sit back for hours nudging the slides under a microscope to arrive at a correct diagnosis. I strongly believe that -

“Report delayed is treatment denied”.

Even though we work silently behind the main scenes in a hospital, our contribution is indispensable. According to a survey, around 70% of treatment decisions are based on lab results. This statistics alone proves the importance of pathologists in a patient’s life. “Without laboratories, men of science are soldiers without arms.” So let’s motivate our younger generations to opt out for pathology if they believe in a **healthy, happy world where diseases are diagnosed correctly and on time. Let us not become limited assets anymore.....**

“Pathology is for you, Pathology is for us, Pathology is for everyone.”

The female dominance in pathology is probably true. A woman’s natural role is to be a pillar of the family. So what’s wrong in more women opting out for a subject which gives her a well-planned day with almost fixed hours of working and no night calls. Someone has rightly said that **“Don’t get so busy making a living that you forget to make a life.”**

Coming to the point of technicians replacing us, they definitely can't. If the work of a pathologist is done by a technician, the clinicopathological correlation could become a lost art. They can neither contribute to collaborate in decision making at diagnosis nor can they sign out the reports.

As far as the concept of digitalization in pathology is concerned, no doubt it has made our work less cumbersome. It has made the speciality more efficient, accurate and has reduced its subjectivity. But the supreme consideration is always the man. The machine cannot tend to atrophied the limbs of men. "Technology is all about how we seek and not what we seek."

As I tried answering each of my questions, my phone rang up. Yes.....it was my interview call !!! A week after the call, I

joined my job in a whole new corporate set up very different from my medical

A study predicted that by 2030, the number of active pathologists may drop by 30% compared to 2010 levels

college. I slowly got accustomed to the new place, new people and new work. I also got an opportunity to learn a lot of new things too. So it doesn't matter how slowly you go as long as you do not stop.

"Don't be afraid of change. You may end up losing something good, but you will probably end up gaining something better."

Today I say it confidently that: A **PATHOLOGIST'S FUTURE IS BRIGHT INDEED!!**

Dr. Shubha. H.V is a pathologist working as Lab head in SRL diagnostics, Fortis hospital, Rajajinagar, Bangalore

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The graphic features the InnoHEALTH logo at the top right. The central text reads: "Join the InnoHEALTH community on Clubhouse". Below this, it says "Join the group and participate in live discussions related to healthcare innovations focused on improving the quality of healthcare and optimising the cost of healthcare delivery." A URL is provided: <https://bit.ly/clubhouse-innohealth>. The background is a stylized illustration of a large smartphone with a QR code and "Scan to Join" button. Several people are shown interacting with the phone: one sitting on top, one on the left with a headset, one on the right with a phone, and one at the bottom with a laptop. The overall color scheme is yellow and blue.

Cyber attacks and its consequences in healthcare industry

■ Dr. Debleena Bhattacharya



With the advancement of technology the increase of threats have also quadrupled. The cyber crime and the threats of medical data of the patients has caused so many problems. The healthcare fraternity is busy catering to the sanctity of human health so they are often unaware of the recent cyber attacks. Though some hospitals have installed software and the specialised people to help them avoid such threats still it is a problem as so many healthdatas are compromised. The attacks can cause enormous damage to the healthcare sector in the form of power

failure, software disruption etc.

The healthcare sector is always in need of constant supply of power and software availability to run so many sophisticated and life saving devices. If there is a power cut then there will be a risk for so many patients who are surviving on life-support systems. In the recent study on hospitals in the U.S, it was found that multiple cyber attacks have paralyzed the healthcare care system as there were delays in medical care, surgeries were suspended and it cost the hospitals a million dollars.

The cyber attacks cause loss to the medical hospitals in the form of damage to the reputation of the hospitals and the trust of the customers availing their services invariably leading to the decline in sales. According to recent data, the cybersecurity breach has affected the world economy by more than 1 trillion dollars or more precisely one percent of the global GDP and a loss to around 600 billion dollars. The medical datas are important because they often contain sensitive identifiable information of an individual that is valuable in black market.



The hospitals need the computers to run many tasks such as maintaining patients records, live monitoring, x-rays, operations etc. They are helpful for configuring lab-tools, monitoring the blood pressure and heart rate etc. Around 95% of cyber attacks are caused by human-error.

The leakage of information will lead to the threat of immediate crisis to public health such as the epidemic of AIDS, enduring problems of injuries and chronic illness that are often hidden by the people in order to continue their financial help.

WHO has already addressed the major threats in healthcare sectors:

- Air pollution and also climate change
- Air pollution and also climate change
- Spread of Noncommunicable diseases (NCDs)
- Global spread of influenza
- Fragile and Vulnerable environment
- Increase of Antimicrobial resistance
- Depleting primary healthcare
- Rise of high threat pathogens

There are ways to remove these problems from the healthcare industry in order to safeguard the lives of so many people.

We can avoid these threats with the following ways:

- Intermittent monitoring of Cyber

security Risk

- The rapid use of mobile device management to avoid crisis

recent pandemic has also aggravated the situation where thousands of personal information is linked with the

The healthcare sector is always in need of constant supply of power and software availability to run so many sophisticated and life saving devices. If there is a power cut then there will be a risk for so many patients who are surviving on life-support systems.

- The authentication should be made multi-factor to curtail risk
- Incorporation of identity and access management should be strictly maintained Security should be validated with Internet of Things (IoT)

adhaar card and the same is used for vaccination purposes invariably risking the information of individuals.

Government should give assurance and a note of conformity that these datas are not leaked for economic gains.

Around 95% of cyber attacks are caused by human-error.

- Device Encryption
- The medical team should be trained for the security breaches

There are websites which show the daily cyber attacks done to various countries.

In order to safeguard the lives of so many people the healthcare datas needs to be preserved in a robust manner and the

Dr. Debleena Bhattacharya is the Associate Editor of Inno-HEALTH magazine and working as an Assistant Professor in Marwadi University, Gujarat. Her area of interest lies in Environmental Biotechnology focusing on waste water treatment.

Using Bibliotherapy to Manage Anxiety

■ Lena Peterson



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An anxiety is a normal emotion that is part of the body's response to stress. It often manifests in the feelings of tension, worried thoughts, and physiological effects such as changes in blood pressure. In disproportionate levels, however, anxiety can progress into a medical disorder which manifests as excessive fear, apprehension, nervousness, and worry — affecting day-to-day life. And according to Columbia University's Mailman School of Public Health, the

global prevalence of anxiety during the COVID-19 pandemic rose to 21%.

There are different potential reasons for this increase, such as job loss, workplace or school closures, and restrictions over gatherings. Grief may have played a significant role in anxiety spikes as well. In an article called 'Grief – A Healthy Emotional Response to Loss,' writer Anika Bhasin discussed how sudden, traumatic losses can lead to a lost sense of control

as well; without certainty over the future, anxiety is likely to emerge alongside feelings of shock, sadness, anger, and guilt.

The limited opportunities for mental health check-ups have led many people to educate themselves on managing anxiety at home. Bibliotherapy — the practice of reading books for mental health — is one solution that is probably as old as storytelling itself.

HOW READING CAN MANAGE ANXIETY

In our fast-paced world, anxiety and stress issues are extremely pervasive. As bestselling author Max Lucado writes in his book *Anxious for Nothing*, "the news about our anxiety is enough to make us anxious." We hear stories about people seriously struggling with anxiety,

who find it especially hard to overcome their worries.

So how can reading help? For one, reading keeps your brain healthy. Unlike film or television, reading requires more active engagement from the brain. Different

regions work together to build a new world inside our heads, and this brain workout improves memory, concentration, and mood. The habit of reading books regularly also combats conditions like dementia.

Another benefit of reading is that fiction often allows us to escape our reality. Readers turn to books to process anxieties and fears. When we read, we connect with characters who face similar obstacles and represent shared feelings; their experiences show us how normal our emotions are, and we feel less isolated in the process.

Surprisingly, many people find comfort in post-apocalyptic fiction — which is set in worlds affected by global catastrophes — as they recreate the atmosphere of an irrevocably-changed world, but also remind us of the human capacity to rebound, adapt, and thrive.

Stories have long been used to impart deep

insights to us about living, and remain powerful vehicles for morals, lessons, and wisdom. In psychology, stories offer a universal type of therapy because it can work across ages, cultures, and mental illnesses. Although books alone cannot treat anxiety, they can definitely help in the process of recovery.

In disproportionate levels, however, anxiety can progress into a medical disorder which manifests as excessive fear, apprehension, nervousness, and worry — affecting day-to-day life.

GIVING BIBLIOTHERAPY A TRY

Researchers from the United Arab Emirates University found that there are three categories of books that work well for therapeutic reading. Classical repertoire focuses on creative works like novels, poetry, and fiction to improve patient conditions through the process of identification. Then, there are also psychological works, which are more clinical; these provide more information about specific disorders and aim to assist

readers.

The third category is self-help. These books augment tips for cognitive development, and offer precise methodologies or inspiration to treat mental health disorders. *Forest Bathing: How Trees Can Help You Find Health and Happiness*, for example, teaches readers about the benefits of ‘forest medicine’. By spending more time around trees, humans can reduce stress, boost their immune system,

and improve overall feelings of wellbeing.

Through these three categories, bibliotherapy offers a respite from anxiety. However, it’s important to note that they are only effective if the patient enjoys reading. Patients who are unable to distinguish reality from fantasy, or have limited intellectual ability and attention span would likely benefit more from other types of therapy.

Bibliotherapy — the practice of reading books for mental health — is one solution that is probably as old as storytelling itself.

Lena Peterson is a freelance writer and researcher. As a mental health advocate she augments topics on psychology and wellness, as she believes these are important for each person’s overall well-being.

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RESEARCH

Is Hybrid Immunity the finale for COVID-19

■ Dr. Geetika Ahuja



Change is the law of nature, and SARS-CoV-2 is no exception. Since January 2020, WHO has been monitoring and analyzing the evolution of SARS-CoV-2. Variants are classified as Variants of Interest (VOI) and Variants of Concern (VOC) depending on virulence and transmissibility. The most prevalent are Alpha (B.1.1.7), Beta (B.1.351), Gamma (P.1) and the infamous Delta (B.1.617.2). Furthermore, Variants Under Monitoring (VUM) have been recognized which are suspected to affect virus's characteristics with an indication of posing a future risk. With changes in the variants' properties, sky rocketing numbers of COVID positive cases along with the boom in vaccination, adaptive immunity is now of global

interest. Adaptive immune response or immunological memory is imperative for clearing the viral load off the body as well as protection against re-infection. These responses however differ for natural immunity through infection and vaccine generated immunity. Cluster of differentiation is represented here as a CD. These are further elucidated as CD⁴ (cluster of differentiation 4) which is a glycoprotein that serves as a co-receptor for the T-cell receptor (TCR), and CD⁸⁺ T cells (often called cytotoxic T lymphocytes, or CTLs) as they are very important for immune defence against intracellular pathogens, including viruses and bacteria, and for tumour surveillance. In general, several factors contribute to the body's overall immune response,

such as cellular system (B cells, T cells, CD⁴⁺ T cells, CD⁸⁺ T cells, macrophages etc.), physical barriers, environmental influences like immunocompromising medications, co-morbidities, age, and most importantly infection with an immune escape viral variant, particularly a variation in the spike protein.

There have been common concerns all over the world regarding the same (i) how long does immunological protection last after being infected with SARS-CoV-2? (ii) would new variants pose a chance of re-infection? (iii) how long does the protective effect of vaccination last? (iv) does a recovered person need vaccination?

IMMUNITY STATUS POST NATURAL INFECTION

Post COVID-19 infection, levels of immunity vary between 93% and 100% over 7-8 months in areas where VOCs were widespread. An immunological memory cell study was conducted in a recent research of Dan et al., 2021 where 254 samples were taken from 188 COVID-19 cases, including 43 samples at 6-8 months after infection. Over a period of 8 months, antibodies (Abs) against SARS-CoV-2 spike and receptor-binding domain (RBD) declined moderately over 8 months. There was a significant increase in the memory B-cells against SARS-CoV-2 spike between 1 month and 8 months after infection. However, memory CD⁸⁺ T cells and memory CD⁴⁺ T cells gradually decreased in 6 to 8 months. Among the antibodies response during the same time period, spike Immunoglobulin G (IgG), Receptor Binding Domain (RBD) IgG, and neutralizing Ab titers declined, while spike IgA was consistently present. The memory B-cells responded variably. Large titers of IgG were detected, minimum quantity of IgA memory B-cells, and a short-lived population of IgM memory B-cells. Large majority of memory CD⁸⁺ T cells and memory CD⁴⁺ T cells were

detected a month after infection. While the population of CD⁸⁺ T cells decreased by ~50% at the end of the 6-8 months period, CD⁴⁺ T cells remained high (~93%) by 6-8 months. Among the antibodies response during the same time period, spike Immunoglobulin G (IgG), Receptor Binding Domain (RBD) IgG, and neutralizing Ab titers declined, while spike IgA was consistently present. The memory B-cells responded variably. Large titers of IgG were detected, minimum quantity of IgA memory B-cells, and a short-lived population of IgM memory B-cells. Large majority of memory CD⁸⁺ T cells and memory CD⁴⁺ T cells were detected a month after infection. While the population of CD⁸⁺ T cells decreased by ~50% at the end of the 6-8 months period, CD⁴⁺ T cells remained high (~93%) by 6-8 months. SARS-CoV-2 spike-specific memory CD⁴⁺ TH cells with the specialized capacity to help B-cells produce Abs were also active.

In spite of the memory cells and neutralizing Ab responses, there have been cases of SARS-CoV-2 reinfection. Whether these were due to a different strain or waning immunity remains

questionable. It is clear, though, that encounter with a variable spike protein reduces the potency of engendered Abs, suggesting diminished but not abolished immunity due to changes in neutralizing Ab epitopes in spike.



IMMUNITY STATUS POST VACCINATION

In fact, the specific epitopic region of the spike proteins is the basis for development of all currently licensed vaccines, as it is the target for neutralizing Abs. These vaccines have demonstrated induction of Ab levels of similar or higher magnitude as compared to convalescent individuals.

Mutations in key neutralizing Ab spike epitopes which benefit the virus to evade Ab recognition, can be a threat for vaccine efficacy. This was observed when vaccines based on the original Wuhan SARS-

CoV-2 spike, proved less effective against the rapidly spreading delta variant. Exceptions where effective blocking of infection was observed was reasoned to higher magnitude of Ab titers. Even if some classes of Abs lose reactivity, the overall anti-S Ab response, including the RBD, is polyclonal and consists of Abs that also recognize the VOCs. However, in some cases, infection with the delta variant was effectively blocked, which was due to higher magnitude of Ab titers. Although there is loss of reactivity of some classes of Abs, there is a substantial

polyclonal response of anti-spike Ab and the RBD, which helps the Abs to recognize VOCs.

As for SARS-CoV-2 and other infections, vaccine-induced Abs weaken with time. However, owing to the memory B-cells which rapidly clone and differentiate into Ab-secreting plasma cells upon re-exposure, mRNA vaccine induced Abs were detected more than 6 months after vaccination.

In spite of the memory cells and neutralizing Ab responses, there have been cases of SARS-CoV-2 reinfection. Whether these were due to a different strain or waning immunity remains questionable.

As an evolving strategy, SARS-CoV-2 changes its spike proteins to enable survival in new hosts, and so does our immune system. Diversity of memory B-cells could be the survival instinct of the immune system, ready to combat the various viral variants, which may emerge in the future.

IMMUNITY STATUS POST INFECTION AND VACCINATION

Immune response is magnified in individuals who after recovering from COVID-19, acquire natural immunity and a further boost with vaccination. This amalgam of immunities is termed as Hybrid Vigor Immunity or simply, “Hybrid Immunity” as described by research paper of Crotty 2021. Because of the robustness of hybrid immunity, some scientists are using the term “Superhuman Immunity” or “Bulletproof Immunity”.

Physiologically, both B cell and T cell components contribute to hybrid immunity. Studies demonstrated robust neutralizing Ab responses against natural infection with beta and the ancestral Wuhan strain. In addition, vaccination of individuals previously infected with non-beta SARS-CoV-2 demonstrated neutralizing Abs against beta. These unanticipated immune responses were ~100 times higher than infection alone and 25 times higher than after vaccination alone - even though neither the vaccine nor the infection involved the beta spike protein.

This pronounced neutralizing breadth occurs because of memory B-cells. As is known, the major function of memory B cells is to produce identical Abs upon reinfection with the same virus. Another very important function is to encode a library of Ab mutations. As an evolving strategy, SARS-CoV-2 changes its spike proteins to enable survival in new hosts, and so does our immune system. Diversity of memory B-cells could be the survival instinct of the immune system, ready to combat the various viral variants, which

may emerge in the future. This works by neutralizing VOCs through production of a large population of Abs by memory B cells. After one episode of Ab mass production, the quality and scope of these memory B cells increases. Therefore, memory B cells generated after infection, plus those generated after vaccination, cumulate their experiences to generate a diverse and much stronger immune response.

Another player in the immunological memory game are the T cells. TH/ CD⁴⁺ T cells instruct germinal centers, which are the B-cell activation zones, to generate diverse B cells in response to infection or vaccination. Moreover, memory B cells are quiescent cells and upon stimulus, TH cells drive them to produce Abs specific to the viral variant. Studies have in fact demonstrated a 5-10 fold increase in memory B cells, and a fairly high magnitude of Ab titers during hybrid immunity as compared to natural or vaccine generated.

T cells are imperative for immunological memory as most T cell epitopes are not mutated in VOCs, thus contributing to enhanced breadth of the immune response. Broadly, natural as well as vaccine-generated immunity weakens the neutralizing Ab activity against most VOCs. This could be due to selection pressure of SARS-CoV-2 which constantly mutates to survive and evade immunities.

Another explanation for the development of Superhuman Immunity is that it gets the best of both worlds. SARS-CoV-2

possesses 25 different viral proteins, generating natural immunity against non-spike proteins. On the other hand, most of the COVID-19 vaccines consist of a single antigen, spike, generating spike-specific immunity after vaccination. Thus, when both immune responses synergize, memory T cells, CD⁴⁺ T cells and CD⁸⁺ T cells produce a heightened response.

Overall, hybrid immunity to SARS-CoV-2 substantially enhances the immune response and confers strong resistance against VOCs and possibly VUMs. This phenomenon is in fact being viewed as light at the end of the dark tunnel. Speculations are that development of hybrid immunity, along with massive vaccination drives around the world could put an end to, or at least halt the COVID-19 pandemic for a significant amount of time. If nature is kind or we are able to further scientific developments, we might just encounter SARS-CoV-2 as a seasonal flu and lives will return to “Normal” as the pre-pandemic-era.

Dr. Geetika Ahuja is a cereal carbohydrate specialist with R&D experience in genetic and biochemical alterations in cereal grain digestibility and its nutritional implications. She has been awarded with several prestigious international awards and scholarships; has won accolades at Life & Health Science Conferences; and has various international publications to her credit. She has contributed as Research Associate in the Biothreat Mitigation Project at CBRN Defence, DRDO; and is currently a Senior Scientific Consultant at Gel Kraft Healthcare Pvt Ltd.

Another explanation for the development of Superhuman Immunity is that it gets the best of both worlds. SARS-CoV-2 possesses 25 different viral proteins, generating natural immunity against non-spike proteins.

The New Era of Genomics

■ Dr. Ayushi Chaturvedi & Ms. Nikita Sabherwal

The burden of disease is escalating with every passing day and the inculcation of new technologies is promulgated for the diagnosis and treatment of various diseases. Genomic technologies are witnessing high demand from pharmaceutical and biotechnology companies owing to the increasing number of genetic research studies. The global genomics market is projected to reach USD 54.4 billion by 2025 from USD

22.7 billion in 2020, at a CAGR of 19.0% during the forecast period of 2021-2025. Genomic sequencing is rapidly transitioning into clinical practice, and implemented into healthcare systems with support of substantial government investment, totalling over USD 4 billion, in at least 14 countries. Because of the rise of COVID-19 illness, the genomics market has gained steam thanks to huge government backing in 2021. Industrial

and government sectors are working closely in coordination and are investing in advanced research projects to monitor the genome sequence of the novel coronavirus disease to develop COVID-19 vaccines. From conventional treatment methods, the healthcare environment is gradually shifting towards newer technologies such as precision medicine, CRISPR etc.



GLOBAL OPPORTUNITIES

The acceptance of genome editing/genome engineering in genomics, which is utilised for cell line engineering, genetic engineering, diagnostics, and medicines, is a major driver. Genome editing, for example, is used in plant target gene modification and the eradication of vector-borne diseases such as yellow fever, dengue, Zika, West Nile, Schistosomiasis,

Leishmaniasis, and Lyme disease. The solutions to the removal of these diseases attract a significant amount of investment in the agricultural and healthcare sectors. The current global pandemic has created considerable opportunities for the domestic market players operating within the space. The market has witnessed multiple product launches in 2020

thanks to an increase in competition for the event of genomic testing solutions for Coronavirus-19 (COVID-19). Manufacturers operating during this market witnessed high rates as health and well-being continues to get major attention in COVID-19 pandemic.

GLOBAL MARKET CHALLENGES

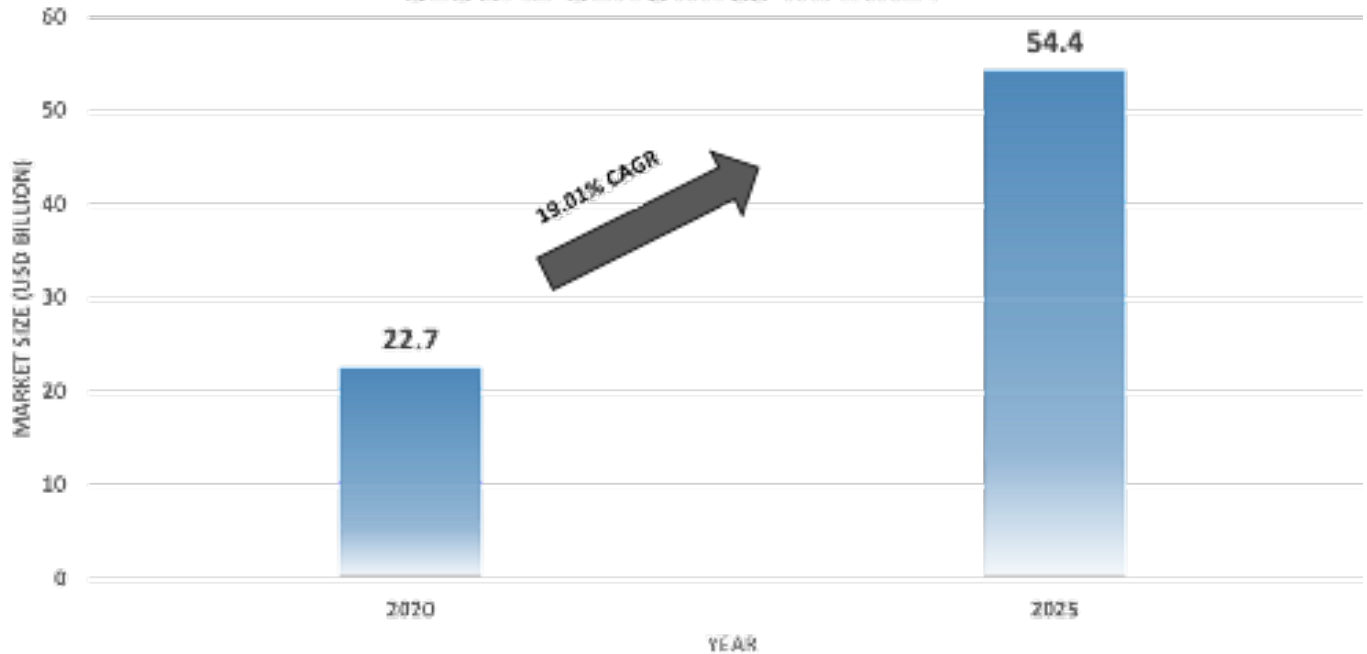
Data from genomics can be used for a variety of purposes, including pharmacogenomics, diagnostics, and toxicogenomics. However, the analysis of huge volumes of data generated in genomics research is a major challenge. It is vital to recruit skilled professionals to analyse and interpret the outcomes of genome sequencing data due to the intricacies involved and the requirement

for in-depth understanding in the field of genomics. But the major challenge is the shortage of trained professionals. There are very selective courses for genomics worldwide. In many countries there is no separate education program designed for the training of medical genetic professionals. The other challenge is security of Genomics data. Many research suggest that providing

Direct to Consumer (DTC) genetic testing could jeopardise privacy and data security, perhaps causing societal harm to consumers. Genomics market has data privacy breaches so in some countries there are stringent regulations to enter the market. Organizations find it tough to enter because each country has its own set of regulations.

The market has witnessed multiple product launches in 2020 thanks to an increase in competition for the event of genomic testing solutions for Coronavirus-19 (COVID-19).

GLOBAL GENOMICS MARKET



New Technologies in use

Polymerase chain reaction (PCR)

This is one of the most used technologies. Polymerase chain reaction (PCR) is a laboratory technique which is used to amplify DNA sequences. The method involves using short DNA sequences called primers to select the portion of the genome to be amplified. One of the most extensively used diagnostic techniques for detecting pathogens, particularly viruses, that cause diseases including Ebola, African swine fever and foot-and-mouth disease is polymerase chain reaction (PCR). This technology is widely used during the COVID-19 pandemic. Small amounts of RNA from specimens are amplified into deoxyribonucleic acid (DNA), which is duplicated until Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is detectable if present, using PCR technique. Since its approval in February 2020, the PCR test has been the gold standard for diagnosing COVID-19. It's precise and dependable.

Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR)

"CRISPR" represents groups of short palindrome repeats at regular intervals. It has a unique DNA region with two distinct

characteristics: a repeating nucleotide sequence and a spacer. The repeating nucleotide sequence, a component of DNA, is distributed throughout the CRISPR. The spacer is sandwiched between DNA fragments between these repetitive sequences.

CRISPR technology has the potential to be a simple yet effective genome editing tool. It allows scientists to easily alter DNA sequences and gene functions. It has a wide range of possible applications, including the correction of genetic abnormalities, disease therapy, disease prevention and the improvement of crops. CRISPR technology is based on bacteria and archaea's innate defence mechanisms (in the field of single-cell microorganisms). To protect themselves from viruses and other external objects, these organisms use CRISPR-derived RNA and multiple CRISPR associated (Cas) proteins (including Cas9). They mostly work by severing and destroying the DNA of alien invaders. Genetic alteration or "editing" is permitted when these components are transferred to other, more complicated species.

CRISPR technology has been successfully employed to generate quick diagnostic tests for COVID-19, obtaining its first FDA approval (MD, USA) in the process. Multiple companies are racing to fill the ever-widening gap in the market caused

by reagents for PCR-based COVID-19 tests running out and shrinking testing capacity as research continues for such tests to be developed for wider clinical use. Scientists have looked to CRISPR as a potential therapy in other areas, using its tailored enzymatic activity to break SARS-CoV-2 RNA and limit viral replication.

Precision Medicine

Precision medicine is an emerging approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person. This approach will allow doctors and researchers to predict more accurately which treatment and prevention strategies for a particular disease will work in which groups of people. For example, a person who needs a blood transfusion is not given blood from a randomly selected donor; instead, the donor's blood type is matched to the recipient to reduce the risk of complications.

During the pandemic precision medicine has demonstrated to be effective in treating a variety of other ailments. Researchers created the Human Salivary Proteome Wiki in a recent study, which allows them to evaluate saliva samples for symptoms of infectious viruses.

CRISPR technology has the potential to be a simple yet effective genome editing tool. It allows scientists to easily alter DNA sequences and gene functions.

INITIATIVES TAKEN BY GOVERNMENT OF INDIA



On January 3, 2020, the Department of Biotechnology (DBT) launched the ambitious “Genome India Project” (GIP). The goal of the GIP is to collect 10,000 genetic samples from Indian residents in order to create a reference genome. This programme represents India’s success in gene treatments and precision medicine, as well as its shift toward next-generation medicine, which allows for more customisation, safety, and early diagnosis. This programme would help establish the groundwork for individualised healthcare for a huge portion of the world’s

population. This project is coordinated by the Indian Institute of Science’s Centre for Brain Research in Bengaluru, which serves as the central coordinator for a cooperation of 20 premier institutions, each of which collects samples and conducts its own research. The Indian Institute of Science (IISc) in Bengaluru, as well as various Indian Institutes of Technology (IIT) are among the institutions engaged. For the study, data will be collected from participants via a simple blood test, and the information will be stored in biobanks

by investigators in hospitals. This programme represents India’s success in gene treatments and precision medicine, as well as its shift toward next-generation medicine, which allows for more customisation, safety, and early diagnosis. This programme would help establish the groundwork for individualised healthcare for a huge portion of the world’s population. New technologies are coming up day by day and with government efforts and investment. The Genomics market will be one of the leading markets in the near future.

Precision medicine is an emerging approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person

Dr. Ayushi Chaturvedi has done her graduation in dentistry and is currently pursuing PGDHM in Healthcare IT from IIHMR Delhi. Her areas of interest are: Health Informatics, Business Analytics and consultancy. She has also worked as an HR volunteer in Udayan Care, New Delhi.

Ms. Nikita Sabherwal is Healthcare Quality and Hospital Administration Professional. She is Associate Professor & Associate Dean (Training) in IIHMR Delhi. Ms. Sabherwal has worked with various top corporate chains of healthcare. She is also an empanelled NABH assessor and JCI trained.

Role of (UX) Design in Preventive Healthcare Technology

■ Bansi Mehta

Traditional healthcare has always been patient-centric. What does that mean? A patient is defined as “a person receiving or registered to receive medical treatment.” While the patient-centric functioning may have been perfect for a fee-for-service economic model, the world is rapidly moving towards a value-

based model that focuses on preventive medicine.

This value-based model shall see a majority of healthcare providers being rewarded not for the number of procedures performed or patient appointments, but the health outcomes of the people under their care.

Thus, the ultimate goal is to shift from just treating conditions to ensuring overall wellness. This value-based preventive medicine model is pushing for a reduction in the need for care and making that a measure of success.

UX DESIGN: EMPOWERING PROACTIVE HEALTHCARE

TOP DIGITAL HEALTH TOOLS HELP PATIENTS MANAGE BASIC TASKS



User experience (UX) design has been driving the healthcare technology sector towards bold changes in the past few years. This has happened in conjunction with the rapid

spread of technology that outlines how, when and where healthcare services should be delivered.

This healthcare delivery approach is more consumer-centric than ever, with people

asking for care that works best for them, and pushing for personalized plans. Here’s an overview of how people are making use of digital healthcare tools to manage their basic tasks -

The patient-centric functioning may have been perfect for a fee-for-service economic model, the world is rapidly moving towards a value-based model that focuses on preventive medicine.

WHAT IS PROACTIVE HEALTHCARE?

In 2017, Stanford Medicine partnered with Apple to launch the digital health study. This study made use of the Apple Watch to screen for irregular heart rhythms in 400,000 participants. Its goal was to learn if the watch could detect atrial fibrillation, a heart condition causing 130,000 deaths and 750,000 hospitalizations in the United States each year. It often remained undiagnosed because many people never experience

symptoms; it can increase the risk of stroke and heart failure.

The algorithm in the Apple Watch was revealed to successfully identify atrial fibrillation. Additionally, it also showcased user engagement that can be enhanced with the use of digital health alerts. A survey of participants who received an irregular-pulse notification showed that 76% contacted either the

telehealth provider or a non-study provider, suggesting that many actively sought medical attention as a result of an irregularity identified by their Apple Watch

This is a fine example of a person-first healthcare system, also called a proactive healthcare system. It proactively analyzes data to identify people at risk and takes the right steps to intervene and provide support and sustain wellness.

HOW CAN UX CONTRIBUTE TO DESIGNING PROACTIVE HEALTHCARE?

A people-first healthcare system is one that mindfully engages them to identify the best care based on their personal health status. For a healthcare system to transform into a people-enabled system, the key motivations and expectations of users must be at the forefront of its design. People are now proactively asking for healthcare tools that work best for them, creating an intensive demand for personalized options.

Here are three ways in which UX design can take things forward –

1. Designing personalized tools that put users in charge

Most healthcare apps until now were centered on solving an explicit problem.

A user complains of symptoms?

Help them book a doctor's appointment.

A user's insurance premium is due?

Provide easy payment options.

However preventive healthcare primarily focuses on wellness, dealing with situations wherein the user is yet to encounter a problem. Therefore, proactive healthcare tools have to be designed in a way to get users interested in activities that would prevent them from having the explicit problems mentioned before.

The World Health Organization estimates that 50% of the global burden of disease is chronic illness. Health management devices such as fitness trackers or blood sugar monitors help people become active partners in managing their condition, rather than remain passive recipients of

treatment. Fitbit's achievement badges are among the best examples of technology in healthcare, which rewards the user for having accomplished a set of fitness goal, encouraging them to keep working on their health.

Regular and timely communication between health systems and patients is a standout feature of proactive healthcare design and is prominent among healthcare technology trends. It is a feature that has transformed the patient experience. For instance, cancer patients who completed treatment over a year ago and are overdue for screening can be reminded of the same via a highly targeted outreach. This early intervention plays an important role in identifying any relapses and ensuring timely treatment.

2. Tracking population and individual health trends

Preventing the onset of illness is the holy grail of sustainable healthcare transformation and UX design plays an important role in its facilitation. There are 2 primary types of healthcare tools –

- **Proactive solutions**, which identify at-risk people by running known algorithms to track social determinants of health (SDOH) such as tobacco or alcohol consumption, sedentary lifestyle, or lack of nutrition, etc. Preventive action is then applied before the manifestation of symptoms, let alone illness. By integrating non-clinical factors and incorporating SDOH data into workflows, the gaps in patient management can be closed. For example, care providers can be the

patients residing in remote food deserts and have the ability to provide them with a nutritional food delivery service.

- **Predictive solutions**, which make use of healthcare AI technology or machine learning data algorithms for not only predicting and classifying risks, but also intervene at the right stage. For predictive healthcare solutions to work requires data from across the healthcare system. It also has to be aggregated, centralized, and analyzed to provide care managers with a 360-degree view of the population's health and suggest actionable insights. In the recent pandemic, predictive solutions were deployed to virtually screen and identify people at risk of COVID-19 to determine the most urgent set of vaccine recipients. Another example of upcoming healthcare technology companies is Benevolent AI, which uses the deep learning to produce a better target selection and provide previously undiscovered insights, thus getting the right treatment to the right patients at the right time.

Health management devices such as fitness trackers or blood sugar monitors help people become active partners in managing their condition, rather than remain passive recipients of treatment.

GIVING USERS CONFIDENCE WITH MANAGING THEIR HEALTH DATA

Privacy and security have always been considered as important concerns in digital experiences across any industry, more so in the case of healthcare. According to a survey conducted for Cyber crime and privacy breach, only 25% of consumers surveyed believe most companies handle their sensitive personal data responsibly but 85% of them say cyber security and privacy breach are among the biggest risks facing society. Well-designed apps are those that reinforce the concepts of privacy and security through functionality, navigation, and content. Two-factor authentication and end-to-end encryption work well, but users should also be made aware of background details such as cookies and data capturing to reinforce trust in privacy and security. Conversely, there are also times where users may want to share access with other trusted members among their family, friends, or caregivers. A great user experience around privacy and security is one that enables users to let in the right people along with keeping out the wrong

ones; and letting users make that choice themselves.

Today, virtually every sector has gone the digital way, curating well-designed experiences to better engage and be more responsive and responsible towards their customers. The impact of technology on healthcare is undeniable. Flyers get a text in advance informing them of flight delays, and next-day delivery at a preferred time and location is commonplace among eCommerce giants. A common thread running through these strategies is the focus on user-centric design, engaging their consumers proactively, and keeping them at the centre of their decision-making.

While the healthcare technology industry has been lagging on this front, it is now taking steps in the right direction, designing proactive systems to diagnose diseases in early stages to optimize treatment outcomes, helping people stay fit, and deploy digital tools to encourage self-management of

health and lifestyle behaviours to prevent disease and illness.

Well-designed apps are those that reinforce the concepts of privacy and security through functionality, navigation, and content.

Bansi Mehta believes that UX for workforces should be tailored to meet the needs of employees, managers, and business owners. She has led the design of many healthcare products, applications, and tools with respect to user-centric design. She has pioneered the need for research-led design within organizations.

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▶ NEWSCOPE

LATEST NEWS IN HEALTH CARE

GSK LAUNCHES HEALTH INNOVATION STUDIO

■ Parthvee Jain

GSK presents an opportunity for startups working in oral health, women's health and wellness or in mental resilience. Startups who qualify to be onboarded with GSK on the programme will receive guidance and be offered market opportunities and partnerships.



The Re/Wire Health Studio will invite emerging health and tech companies to work with GSK's consumer division on diagnostic solutions with the aim of developing better health experiences.

Startups who partner with GSK on the programme will receive guidance and be offered market opportunities and partnerships.

The studio will focus on three core areas of health – oral health, women's health and wellness, and mental resilience.

Nick Tate, vice-president at GSK and head of GSK Next, said: "We're seeing huge disruption and partnership opportunities in the consumer health space and we're excited about fusing the trusted science and scale of GSK Consumer Healthcare with brilliant new thinkers and makers across everyday health."

The studio will select six startups to work with, who will have access to R/GA's services and strategists, technologists, designers and consultants to help them develop their businesses. Startups must be prepared to launch in the US with a minimum viable product or service in development or in-market.

SOURCE : www.research-live.com

PFIZER MAKES BIG MOVE IN BLOOD CANCERS WITH \$2.3BN TRILLIUM ACQUISITION

The story of blood cancer goes way back in time. Even the fossil records showed evidence of the effects of blood cancer, and an illness like leukemia was observed by the ancient Greeks. However, the clinical diagnoses began only after the time when the first description of lymphoma was published in 1832. Since then research has been going on to better understand the ailment. However, though we have come a long way in our approach and treatments, our ability to treat them still needs a long way to establish a foundation. The step taken by Pfizer could prove to be an excellent support for growth opportunities for the treatment of blood cancers by applying a novel approach to cancer immunotherapy.



Pfizer has made clear that it's willing to open its checkbook to support growth opportunities, and on Monday the pharmaceutical giant unveiled its latest such deal: a \$2.3 billion agreement to acquire clinical-stage Trillium Therapeutics, a biotech taking a novel approach to cancer immunotherapy.

Trillium is developing drugs that target

CD47, a protein that sends out a signal that macrophages, a pathogen-chomping immune cell, reads as "don't eat me." Blocking this signal enables macrophages to see cancer cells as targets. Several companies, large and small, are developing drugs that also work in this manner but Andy Schmeltz, oncology global president for Pfizer, said that Trillium's molecules have the potential to be safer and more

effective than others in this emerging class.z

"While we're not first, from the way it looks today, we are very bullish on the best-in-class opportunity," he said, speaking on a conference call on Monday, Aug 23, 2021.

According to terms of the acquisition agreement, Pfizer will pay \$18.50 for each

share of Trillium that it doesn't already own. That's a more than 200% premium to the stock's \$6.09 closing price last Friday. But that purchase price is still less than the \$20.96 per share peak the company has reached in the past year. In the past month, shares of the biotech have been trading much closer to their 52-week low—well below the \$10.88 per share price Pfizer paid last year when it made a \$25 million equity investment in Trillium. Trillium, which splits its operations between Mississauga, Ontario, and Cambridge, Massachusetts, has two CD47-targeting drugs in early clinical development. TTI-622 and TTI-621 are both fusion proteins designed to block CD47. But blocking the “don't eat me” signal is just half the battle. The Trillium molecules also engage a receptor on macrophages that triggers an “eat me” signal. Schmeltz said these drugs have demonstrated early promise in blood cancers, whose cells express CD47 proteins in substantial amounts. He added that these drugs are also showing potential for use in solid tumors, which have been a harder target for immunotherapies.

In April, Trillium reported preliminary data from a 43-patient Phase 1b/2 study testing both of its molecules. In patients whose lymphoma had relapsed or has been resistant to treatment, the overall response rate to TTI-622 was 33%. That response was observed across multiple types of lymphomas. In updated data through late July, the durability and

efficacy of the treatment continued with a response rate of 30%. For TTI-621, the first cut of data in April showed that the overall response rate in relapsed or refractory T cell and B cell lymphomas was 18% to 29%. Pfizer did not report updated July data for that molecule.

In addition to efficacy and durability, the Trillium molecules are also hitting key safety measures. One of the challenges for drugs that block CD47 is that this protein is also found on red blood cells, so these oxygen-carrying cells of the blood can also be targeted. When that happens, patients develop anemia. Jeff Settleman, Pfizer's oncology chief scientific officer, said both TTI-622 and TTI-621 have shown minimal binding to red blood cells. Those results suggest the Trillium molecules could reduce the risk of anemia compared to other CD47-targeting drugs, while improving the therapeutic index—how much of a drug can be used to provide benefit before toxicity gets too high.

“We believe it will be possible to deliver a lower, but still effective, dose of these molecules,” Settleman said.

Settleman added the Trillium molecules hold potential as monotherapies or as part of drug combinations with currently approved Pfizer drugs and candidates still in the pipeline. Other companies have similar ideas. CD47 has become an attractive target as companies look to expand beyond checkpoint inhibitors, a class of immunotherapies that block PD1

or PD-L1.

Gilead Sciences is the furthest along of CD47-targeting companies with magrolimab, an antibody that the company added to its pipeline last year via its \$4.9 billion acquisition of Menlo Park, California-based Forty Seven. Magrolimab is currently in late-stage clinical development for myelodysplastic syndrome and acute myeloid leukemia. Others in the chase with CD47-blocking drugs include AbbVie, which is partnered with I-Mab. That Shanghai-based biotech's drug, also an antibody, is in early clinical development.

Pfizer has been swinging deals to bolster its cancer drug pipeline. A month ago, the New York-based pharma giant announced a \$1 billion commitment to clinical-stage Arvinas in an alliance focused on the development and commercialization of that company's lead drug in breast cancer. Arvinas is developing drugs based on targeted protein degradation, which harnesses a cellular process for disposing of old proteins as a way of getting rid of proteins that cause disease.

The Trillium acquisition will require the approval of two-thirds of that company's shareholders, as well as regulatory approvals in the U.S. and Canada.

SOURCE : www.medcitynews.com

FDA APPROVES FIRST DRUG FOR SEVERE ITCHING IN CHRONIC KIDNEY DISEASE PATIENTS

Pruritus is a common and distressing symptom in patients with chronic kidney disease. The most recent epidemiologic data have suggested that approximately 40% of patients with end-stage renal disease experience moderate to severe pruritus and that uremic pruritus (UP) has a major clinical impact, being associated strongly with poor quality of life, impaired sleep, depression, and increased mortality. FDA has given relief to patients by approving the first ever drug for severe itching in chronic kidney disease patients.

Many chronic kidney disease patients who receive hemodialysis experience severe itching afterward. The exact cause of this condition, called pruritus, isn't known but it can significantly diminish quality of life. Patients now have their first FDA-approved therapy, an injectable drug developed by Cara Therapeutics.

The FDA's decision clears the way for the drug, difelikefalin, to be used as a treatment for adults undergoing dialysis who experience moderate-to-severe pruritus. Stamford, Connecticut-based Cara will commercialize its new drug under the name “Korsuva.”

According to the National Kidney

Foundation, more than 500,000 people in the U.S. receive dialysis to replace kidney function. An estimated 60% of them have pruritus; in 40% of dialysis patients, the condition is moderate to severe, said Eric Vandal, the company's senior vice president, commercial, speaking on a conference call.



Pruritus has traditionally been managed by steroids, antihistamines, and other drugs that are used off-label. Korsuva is a peptide that targets kappa opioid receptors in the peripheral nervous system and on immune cells. In its regulatory filings, Cara says these receptors regulate the release of substances that cause itching.

The drug does not target mu opioid receptors, which trigger the feelings of euphoria that can lead to addiction.

The FDA's approval of Korsuva was based on the results of two placebo-controlled Phase 3 studies. Combined, the studies evaluated the drug in 424 patients dosed three times weekly compared to 424 subjects given a placebo. The main goal was to measure a change according to a scale used to assess itching severity. In the first trial, a 4-point or greater improvement in itching score was reported in 40% of patients in the treatment group compared

to 21% of those given a placebo. In trial 2, the 4-point or greater mark was achieved by 37% of those dosed with the Cara drug compared to 26% of those given a placebo.

Korsuva was well tolerated by patients. The most common adverse reactions included diarrhea, dizziness, nausea, headache, and sleepiness. Though the drug targets a type of opioid receptor, it is not a scheduled substance. According to the prescribing information, Korsuva is administered as an injection into the venous line of a dialysis circuit at the end of each hemodialysis treatment. Cara will commercialize Korsuva under a partnership with Vifor Pharma.

For many years, pruritus was an elusive drug target. That's starting to change. Last month, Albireo Pharma received the FDA nod for Bylvay, a small molecule that's the first drug approved for treating pruritus in patients born with progressive

familial intrahepatic cholestasis, a rare genetic liver disorder. The Cara pipeline remains oriented around Korsuva. The injectable version is currently under review as a potential treatment for acute post-operative pain and the management of post-operative nausea and vomiting. Meanwhile, the company is also making progress with an oral version of the drug being evaluated in separate Phase 2 studies for chronic kidney disease-associated pruritus; the liver disease primary biliary cholangitis; and notalgia paresthetica, a nerve disorder that causes itchy skin on the upper back.

Not all of Cara's efforts have been successful. In April, the company reported that oral Korsuva failed a Phase 2 study in pruritus associated with the skin disorder atopic dermatitis.

SOURCE : www.medcitynews.com

AI BLOOD TESTING TECHNOLOGY DEVELOPED TO DETECT LUNG CANCERS

Lung cancer is one of the pervasive diseases that is generally diagnosed at later stages and has a global mortality estimation of 2.21 million cases in 2020 as per WHO. Most solitary Pulmonary Nodules (PNs) are detected incidentally by chest radiography and CT scans that were ordered to investigate other diseases. Approximately 150,000 solitary PNs are detected annually in the United States of America. The blood test's purpose is to determine whether patients with lung nodules who have a low or moderate risk of lung cancer are likely to have developed harmless or malignant tumors. The advances in computing combined with an increase in the amount of data collected has enabled the application of AI to develop an AI enabled technology to detect these lung cancers.

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A research team from Johns Hopkins Kimmel Cancer Center found that the AI blood testing solution was able to detect over 90% of lung cancers in samples from nearly 800 individuals with and without cancer.

The research findings have been published in Nature Communications.

Known as DELFI (DNA evaluation of fragments for early interception), the test is designed to detect unique patterns in the fragmentation of DNA shed from cancer cells circulating in the bloodstream.

Researchers applied the DELFI technology to blood samples taken from 796 individuals in Denmark, the Netherlands, and the USA. They determined that the DELFI approach accurately distinguished between patients with and without lung cancer.

Investigators combined the test with an analysis of clinical risk factors, a protein marker, and computed tomography image. They found that DELFI helped to detect 94% of patients with cancer across stages and subtypes, including 91% of patients with earlier or less invasive stage I/II cancers and 96% of patients with more advanced stage III/IV cancers.

According to the World Health Organization, lung cancer is the biggest killer, causing 1.8 million deaths in 2020. Despite this, however, the researchers explained that many people at risk of lung cancers do not undergo recommended low-dose computed tomography screening. Victor E Velculescu, M.D., Ph.D., Professor of Oncology and Co-director of the Cancer Genetics and Epigenetics Program at the Johns Hopkins Kimmel Cancer Center, said that this could be due to a number of reasons,

including concerns of potential harm from investigation, false positive imaging results, radiation exposure, or worries about complications from invasive procedures.

Lead author Dimitrios Mathios, a postdoctoral fellow at the Johns Hopkins Kimmel Cancer Center, said: "It is clear that there is an urgent, unmet clinical need for development of alternative, non-invasive approaches to improve cancer screening for high-risk individuals and, ultimately, the general population.

"We believe that a blood test, or 'liquid biopsy,' for lung cancer could be a good way to enhance screening efforts, because it would be easy to do, broadly accessible, and cost effective."

high-risk individuals and, ultimately, the general population.

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How does it work?

The DELFI technology uses a blood test to indirectly measure the way DNA is packaged inside the nucleus of a cell by studying the size and amount of cell-free DNA present in the circulation from different regions across the genome.

Healthy cells package DNA by organising different regions of the genome into various compartments. The nuclei of cancer cells, by contrast, are more disorganised, with items from across the genome thrown in at random. When cancer cells die, they release DNA in a chaotic manner into the bloodstream.

DELFI helps to identify the presence of cancer using machine learning, a type of artificial intelligence, to examine millions

of cell-free DNA fragments for abnormal patterns, including the size and amount of DNA in different genomic regions. This approach provides a view of cell-free DNA referred to as the ‘fragmentome’. The DELFI approach only requires low-coverage sequencing of the genome, enabling this technology to be cost-effective in a screening setting, the researchers say.

Working with researchers in Denmark and the Netherlands, the Johns Hopkins investigators first performed genome sequencing of cell-free DNA in blood samples from 365 individuals participating in a seven-year Danish study called LUCAS. The majority of participants were at high risk for lung cancer and had smoking-related symptoms, such as a cough or difficulty breathing. The DELFI testing approach found that patients who were later determined to have cancer had widespread variation in their fragmentome profiles, while patients found not to have cancer had consistent fragmentome profiles. Subsequently, researchers validated the DELFI technology using a different population of 385 individuals without cancer and 46 individuals with cancer. Overall, the approach detected over 90%

of patients with lung cancer, including those with early and advanced stages, and with different subtypes.

Potential for a liquid biopsy test

Study author Rob Scharpf, Ph.D., Associate Professor of Oncology at the Johns Hopkins Kimmel Cancer Center, said: “DNA fragmentation patterns provide a remarkable fingerprint for early detection of cancer that we believe could be the basis of a widely available liquid biopsy test for patients with lung cancer.”

A first-of-a-kind national clinical trial called DELFI-L101, sponsored by the Johns Hopkins University spin-out Delfi Diagnostics, is evaluating a test based on the DELFI technology in 1,700 participants in the US, including healthy participants, individuals with lung cancers and individuals with other cancers. The group plans to further study DELFI in other types of cancers.

SOURCE : www.healtheuropa.eu

UNION HEALTH MINISTRY ANNOUNCES NEW COVID-19 VACCINE TRACKER: WHAT WE KNOW SO FAR

The public health efforts of our nation is strongly supported by its R&D capacity for developing vaccines against COVID-19 that aims to vaccinate all eligible Indians by the end of this year but the drive needs to pick up a consistent pace to meet the target. According to data, more than half of India’s eligible population have received at least one dose of a COVID-19 vaccine. By announcing a new vaccine tracker the Union health ministry has taken a step to keep a track and make sure the world’s biggest vaccine drive is successfully completed in time.

The Union ministry of health and family welfare, during a regular press briefing on efforts against the Covid-19 pandemic, announced a new vaccine tracker is being developed in India that would contain week-by-week data and update on vaccine doses administered.

Union health secretary Rajesh Bhushan made the announcement and director-general of the Indian Council of Medical Research Dr Balram Bhargava said that the tracker would be available on the ministry’s official website in a “few days’ time.”

“As the health secretary (Bhushan) has said, we have tried to develop [the] India

Covid-19 vaccine tracker,” Dr Bhargava said. He added that the tracker has been done for having data synergy between CO-Win portal, the Union health ministry’s Covid-19 portal and the ICMR’s national Covid-19 testing database. “These data have been synergised based on the ICMR identification number and on the basis of mobile numbers and we have been able to get a vaccine tracker which is going to be online very soon in the ministry of health’s website,” he further said.

Here is what we know so far about the Covid-19 vaccine tracker being developed, which Bhushan called an “ambitious intervention.”

- The vaccine tracker would show the

vaccinations done and along with evidence and data, would also be a scientific system for monitoring breakthrough infections,said Rajesh Bhushan, while announcing the tracker.

- Data from the Union ministry of health and family welfare’s Covid-19 portal, CO-Win digital platform for vaccinations and also the testing data from the ICMR would be synergised.

- ICMR’s identification number and the mobile number have been used in synergising the data between the three portals.

- The tracker will also have data on weekly data on Covid-19 vaccinations,



• Briefing on the protective effect of vaccines against deaths, Dr Bhargava said that based on data from April 18, 2021 to August 15, 2021, vaccines were found to be 96.6% effective in preventing mortality after one dose and 97.5% effective after two doses.

• Weekly data for the number of doses administered, beneficiaries inoculated and the number of deaths after receiving one or both doses and the same data for different age groups would also be available.

• The ICMR chief also said that the number of deaths among people who were not vaccinated was higher than those vaccinated with at least one dose of the vaccine.

Meanwhile, more than 716 million vaccine doses, including the 8,651,701 doses in the last 24 hours, have been administered in the country as of 7am on the day (Sept 9, 2021), the Union health ministry said.

SOURCE : www.hindustantimes.com

CANCER DIAGNOSIS, TREATMENT COSTS MAY REDUCE SIGNIFICANTLY IF UK TRIAL IS SUCCESSFUL

The most worrying aspect of cancer care in India is the high out-of-pocket expenditure (OOP). OOPs are defined as direct payments made by individuals to healthcare providers at the time of service use. If this UK trial is successful, it will definitely be a turning point in the cancer diagnostics industry.

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The National Health Service (NHS), Britain's state-run organisation, has launched the world's biggest trial of Grail Inc's flagship Galleri blood test, which could detect over 50 cancers even before symptoms appear in a person. The trial, if successful, could substantially reduce the cost of cancer detection and treatment in countries including India.

Carried out as a "quick and simple blood test," says NHS chief executive Amanda Pritchard, "This could mark the beginning of a revolution in cancer detection and treatment here and around the world." "By finding cancer before signs and symptoms even appear, we have the best chance of treating it and we can give people the best possible chance of survival," Pritchard said. "What it means

to India and even to the rest of the world is that the investigations being performed will have a precursor to them, so their cost will come down considerably for investigations themselves," said Dr Mamta Rao, Consultant Radiologist in the UK, practising in the UK for over 20 years.

Dr Rao said, "Early detection of lesions will mean quicker treatment bringing the costs further down." Harriet Buckingham, a photographer living in England who was first told about her breast cancer in 2013, said the trial would have made a world of difference for her had her cancer detected early. "By the time I found my lump, cancer had travelled to my lymph nodes. Had my cancer been detected earlier my treatment would have been less scary perhaps," said Harriet, who has now fully recovered.

The International Agency for Research on Cancer (IARC) estimates that, while in 2018 there were 17 million new cancer cases and 9.5 million cancer deaths worldwide. "By 2040, the global burden is expected to grow to 27.5 million new cancer cases and 16.3 million cancer

deaths."

Meanwhile, the National Cancer Registry programme in India estimates that "one in 68 males to have lung cancer, 1 in 29 females to have breast cancer and [overall] 1 in 9 Indians will develop cancer during their lifetime". The trial results are likely to work wonders for certain cancers where even screening programmes are not available such as those in head, neck, bowel, lung, pancreatic and throat areas. Talking about its special significance in the cancer landscape of India Dr Preetha Arvind, who is an oncologist working with the NHS, said, "This test endeavours to pick up earlier cancers that would not be detected routinely."

"Screening programmes pick up only certain types of tumours but this one could possibly detect cancers that don't have screening programmes."

"In India, the top five cancers in men are oral cavity, lung, stomach, colorectal and oesophagus and in women, it is the breast, oral cavity, cervix, lung and gastric cancers."



“Oral cavity, stomach and gastric are some of the cancers that don’t yet have any screening programmes. Therefore, a blood test like this could be a gamechanger,” Dr Preeta Arvind said. The NHS-Galleri blood test is a Randomised Control Trial (RCT), where half the participants will have their blood sample screened with the Galleri test right away. The other half will have their sample stored and may be tested

in the future. This will allow scientists to compare the stage at which cancer is detected between the two groups.

The science rests on finding chemical changes in fragments of genetic code-cell-free DNA (cfDNA) that leak from tumours into the bloodstream. Initial results of the study are expected by 2023 and, if successful, the NHS in England

plans to extend the rollout to a further 1 million people in 2024 and 2025. If all goes according to plans the tests will likely be available by 2026, said Dr Mamta Rao.

SOURCE : www.msn.com/en-in/health

Compiled by:
Parthvee Jain, Editor
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▶ BOOK REVIEW

Reviewed by Sachin Gaur, Executive editor for InnoHEALTH Magazine

I was recently involved in organising a workshop on AlphaFold and RosettaFold projects after the papers were published in Nature and Science on July 15 2021. The obvious start for such a topic is Wikipedia. When I was on the Wikipedia page of AlphaFold, I stumbled upon a comment made by Nobel Laureate Venky Ramakrishnan on the impact of AlphaFold that intrigued me to his book that I am writing the review for today.

Since I don't come from the background of Biotechnology, I am always eager to have some basic knowledge on the field and never hesitate to select books which enable a lay person like me to appreciate the advances in the field.

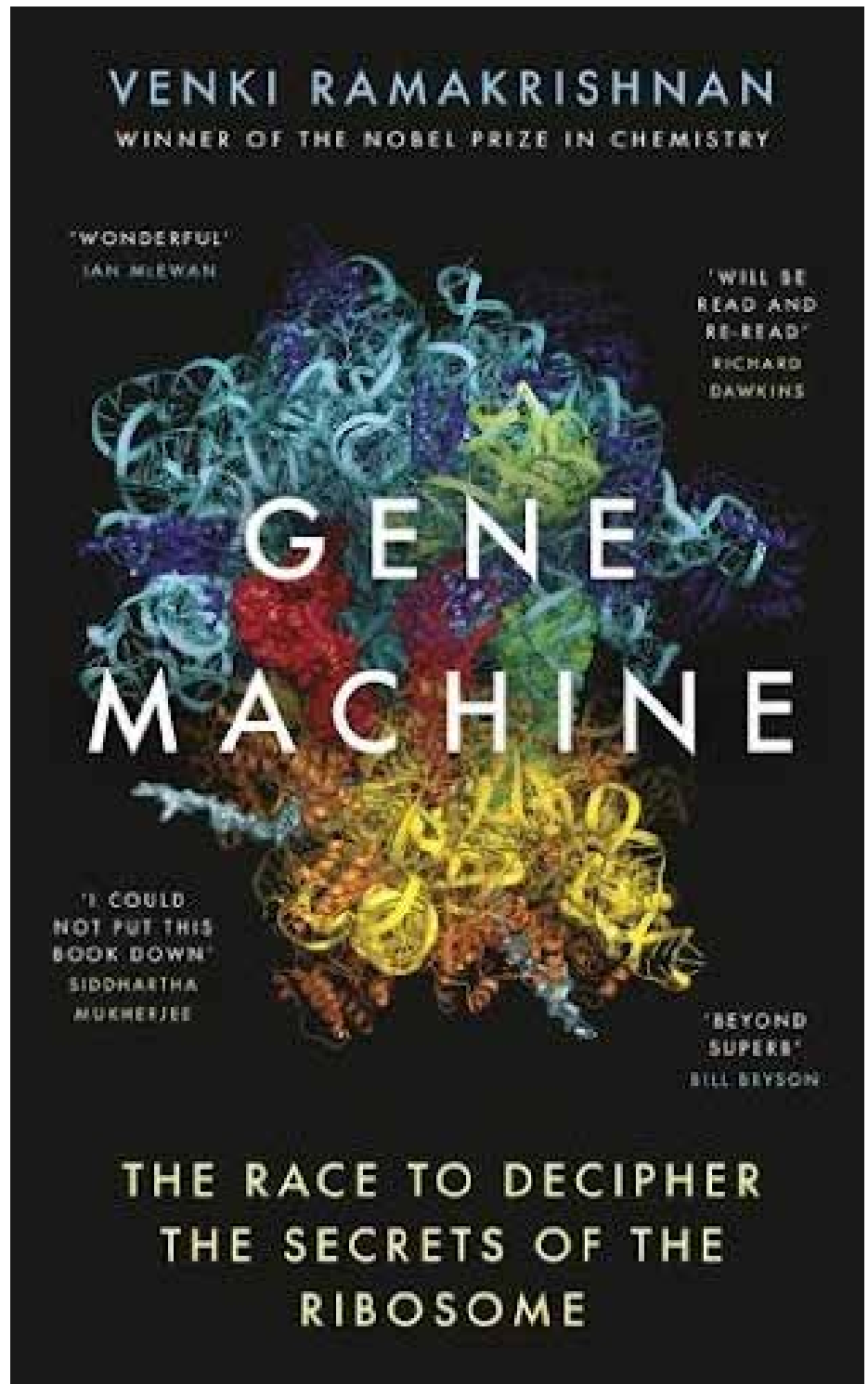
The best part of this book is that the author has exposed the reader to his own vulnerabilities in life by depicting himself as an ordinary researcher who happens to face many rejections and make choices which only add up in the hindsight. The book is a great pick for young researchers in the field and it may give them hope. The book also shows how good science is about collaboration and competition at the same time.

Since earlier this year I also read the few more books by Walter Issacson on Jeniffer Doudna's CRISPR Discovery and the DNA book by James Watson. I could relate to the book much better and also find the characters mentioned

in other books present in the Gene Machine as the author has crossed paths with them multiple times.

Overall a fun read and inspiring. It gave me an inspiration to write to

Venky and it was a big fan moment to receive answers to my emails in a matter of minutes.



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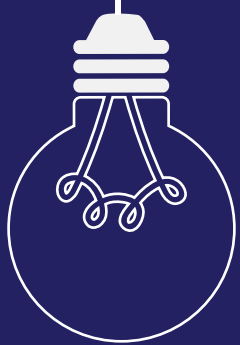
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