Chandigarh Declaration

on Affordable Healthcare:

CIBioD Action Report

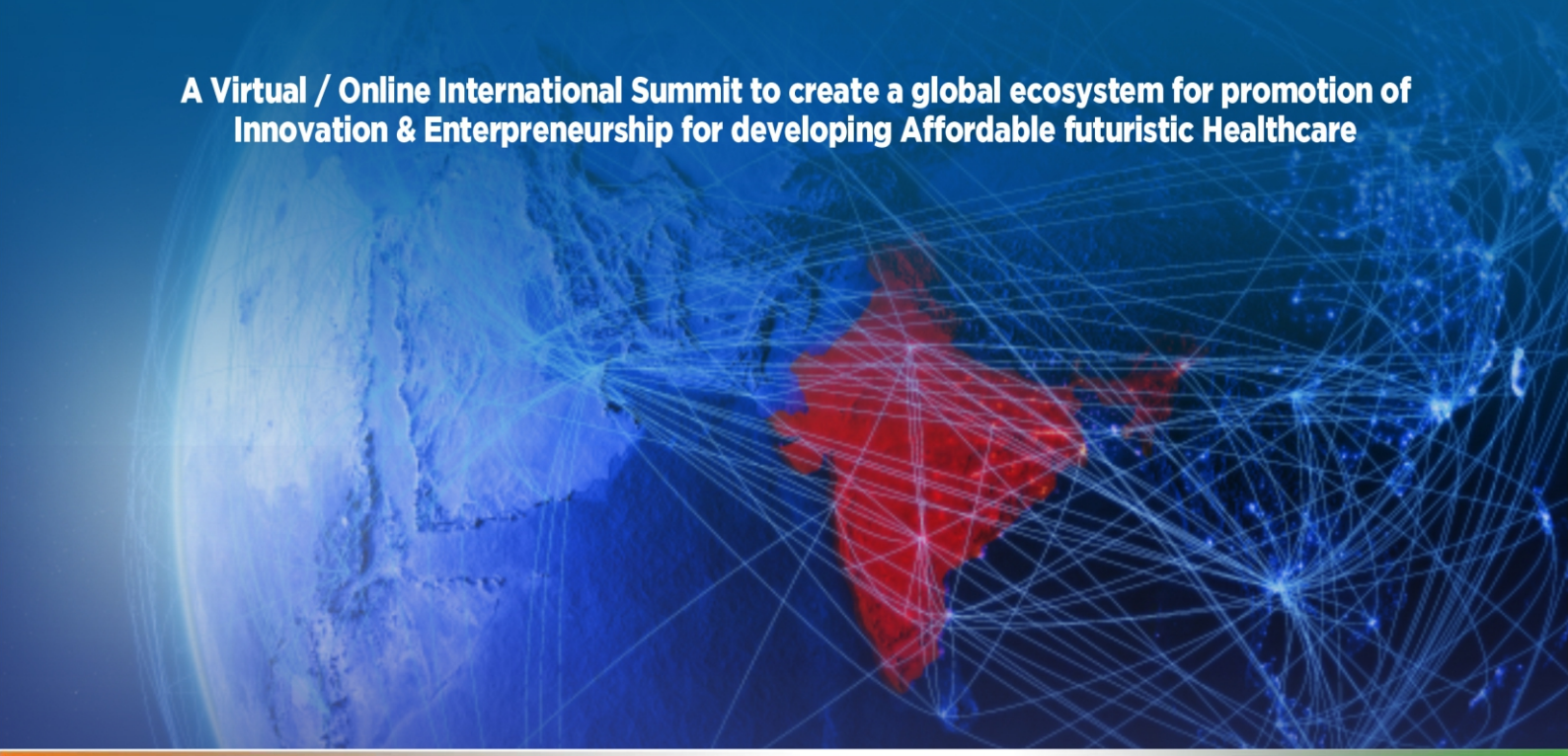
A Virtual/Online International Summit on

Manufacturing Healthy India

[Promoting Innovation and Entrepreneurship in Medical Devices]

November 26-27, 2020

A Virtual / Online International Summit to create a global ecosystem for promotion of Innovation & Enterpreneurship for developing Affordable futuristic Healthcare



CIBioD

ICMR - Center for Innovation & Bio-Design
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Chandigarh Declaration on Affordable Healthcare: CIBioD Action Report

Discussion During
International Summit on Atmanirbhar Bharat:
India as Manufacturing Hub
(Promoting Innovation and Entrepreneurship in Medical Devices)

November 26 -27, 2020

Coordinator : Dr. Varinder Garg, Principal Investigator, ICMR-CIBioD

Co-Coordinators : Dr. Harish Kumar, Co-Principal Investigator, ICMR-CIBioD
Dr. Surinder Rana, Co-Principal Investigator, ICMR-CIBioD

Dr. Varinder Garg

MBBS, MD (Radiology)
PI, ICMR-CIBioD,
OSD to Union Health Minister & President
PGIMER, Chandigarh

From Principal Investigator's Desk

It's my privilege to host this international summit on "Atmanirbhar Bharat - India as a Manufacturing Hub" focused on promoting Innovation and Entrepreneurship in Medical Devices and Tele Health. Our aim is to identify the various bottlenecks in the healthcare delivery and Medtech industry in India. India can be a global powerhouse for medical devices & equipment research, development and manufacturing by the virtue of its large technical base. It's our dream to promote the Indian clinicians and technocrats to collaborate for joint research. This summit not only identified the bottlenecks but also did the brain storming for the appropriate sustainable models to promote the research to make India a healthcare devices manufacturing hub. Our focus is to strategize out of box solutions to overcome the shortfalls and to channelise our expertise to make the healthcare affordable for each and everyone.
Let's synchronize our energies and efforts for fulfillment of our idea of optimum well being for all.

"सर्वे भवन्तु सुखिनः सर्वे सन्तु निरामयाः।
सर्वे भद्राणि पश्यन्तु मा कश्चिद्दुःखभाग् भवेत्।।"

"sarve bhavantu sukhinah sarve santu niramayah|
sarve bhadrani pasyantu ma kascidduhkhabhag bhavet||"

"May all be happy; May all be free from infirmities; May all see good; May none partake suffering."
This is our guiding principle and this summit is a baby step in our journey to attain this goal.

वरिंदर गर्ग

Dr. Varinder Garg
MBBS, MD (Radiology),
OSD to Union Minister and President PGIMER,
Principal Investigator CIBioD, PGIMER, Chandigarh

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About Virtual Summit

"A Virtual/Online International Summit on Atmanirbhar Bharat – India as a Manufacturing Hub on 26th -27th Nov 2020"

The Virtual/Online International Summit was organized by CIBioD on **"Atmanirbhar Bharat-India as a Manufacturing Hub"** which was focused on promoting Innovation and Entrepreneurship in Medical Devices and Tele Health and discussed about potential of India as a Manufacturing Hub.

'ICMR Centre for Innovation and Bio-Design (CIBioD)' located in **Post-Graduate Institute of Medical Education and Research (PGIMER), Chandigarh (India)**, is a platform to Incubate, Prototype, Commercialize Novel Ideas in Healthcare which are both affordable and scalable. It aims to promote innovation by creating conducive ecosystem with involvement of multiple premier technology institutes in collaboration with PGIMER with goals like **Devising indigenous technologies, instruments and devices for affordable health care; Designing, development and deployment of indigenous medical devices; Establishing solutions and approaches for various prevalent medical problems.**

Objectives:

- Promotion of Disruptive Innovations in Field of Medical Devices
- Bringing All the Stakeholders on Common Platform for Brainstorming to Make India Manufacturing Hub for Medical Devices and Equipment
- Making Healthcare Delivery System Affordable and Accessible through Scalable and Sustainable New Technologies
- Enable to envisage and implement different Use Cases in Health and Agriculture
- Familiarize the participants with the standardization efforts such as in oneM2M standard

Highlights:

- The Virtual/Online International Summit witnessed large no of participation with around 2700+ participants both India & world
- 65+ esteemed speakers across the world from countries like UK, USA, Singapore, Taiwan and more
- The summit also witnessed the participation of 50+ universities both national and international

EXECUTIVE SUMMARY

The aim of International Summit on Atmanirbhar Bharat – India as a Manufacturing Hub (Promoting Innovation and Entrepreneurship in Medical Devices) was to project India as a major medical equipment manufacturing hub, making healthcare delivery affordable and sustainable and to standardize the medical devices and equipment. During two-days, there were deep insights into several issues and challenges related to Indigenous and affordable health care. There were 54 delightful talks and presentations by eminent personalities from world-wide who gave an excellent coverage on present scenario of economic growth in India and insights on existing available and futuristic solutions related to health care. All interactions were inspiring and stimulating.

'Aatmanirbhar Bharat' would also promote the ecosystem for entrepreneurship in this field in India.
The summit acted as an eye opener on the Aatmanirbhar Bharat front in the field of medical devices and medical innovation. Many brain storming sessions from testing to intellectual property rights with respect to biomedical devices were discussed in the summit. Research for this is highly interdisciplinary and there is need a team of clinicians working closely with scientists, engineers and entrepreneurs to make this a success. Speakers shed light on the innovative processes and practices of tele-medicine also. The summit concluded on a high and positive note via fruitful discussions on various initiatives by CIBioD in the field of biomedical devices. The event witnessed large participation from world-wide and high level of interest taken by audience truly reflects the importance of innovative and affordable healthcare.

Overall recommendations that emanated were:

- Efforts are needed in making diagnostics and affordable healthcare available to every section of society. Setting up a vibrant ecosystem with innovation and research and enable an environment that fosters collaboration between public and private sectors and shares success in more inclusive manner.
- Medical devices that promote health, cure diseases and provide diagnostics, all should be encouraged to be developed in India keeping in view the compliance to safety standards with the development and setting up of more MedTech centers across India.
- Population health management digital system supporting individual centric health and participative healthcare, should be encouraged.
- Affordable and user-friendly monitoring instruments and software applications (BP, Blood sugar, Oxygen level, smartphone applications) need to be developed.
- Herbal products and dietary products derived from plants make for an excellent addition to India's Atmanirbhar initiative. The use of local plants for medicinal purposes should be investigated and encouraged.
- Need to improve platforms for access to emergency specialist and consultation services in remote areas using video conferencing and reporting mechanisms of cloud software.
- Artificial Intelligence (AI) and Machine Learning (ML) techniques can be used for diagnostics, health service optimization, proactive public health, treatment protocols delivery and standardization. Governments should invest in AI/ML for preventive care.
- There is requirement for adoption of Reference Architecture Model Industry 4.0 (RAMI 4.0) Mechanical, Electrical and communication standards between all vendors.

The importance of dissemination of research in local languages for wider dissemination to the end user was emphasized. Knowledge about medical device patenting should be propagated and the issues in patenting and Intellectual Property should be disseminated.

SCHEDULE

Day- 1 (Thursday, 26 November 2020)		
9.00 AM – 10.00 AM		
Inaugural Ceremony		
Venue: CIBioD, PGIMER, Chandigarh	**Dr. Vinod Kumar** Vice Chancellor, JUIT, Himachal Pradesh	Welcome Address
	Dr. Varinder Garg PI, ICMR-CIBioD; PCMS-I, OSD to Union Health Minister, PGIMER, Chandigarh	About CIBioD and Summit Theme
	Shri. Som Prakash I.A.S (Retd) Minister of State for Commerce & Industry, Government of India	Chief Guest and Inaugural Address
	Sh. Ram Lal Ji Akhil Bhartiya Sah-Sampark Pramukh, RSS	Guest of Honour Address
	Ugo Astuto Ambassador of European Union to India	Guest of Honour Address
	Dr. NirmalJeet Singh Kalsi, IAS(Retd), Former Additional Chief Secretary, Punjab	Invited Guest
	Dr. Ajay Kumar Gupta Chairman & HoD, BLK Institute of Digestive & Liver Diseases	Presiding Guest
	Dr. Jagat Ram Director, PGIMER, Chandigarh	Awardee **"CIBioD LifeTime Achievement Award"**
	Dr. Harish Kumar Professor, UIET Panjab University, Chandigarh	Vote of Thanks
10.15 AM – 11.30 AM	**Session I:** Disruptive Innovation & Entrepreneurship; Describing the Future of healthcare and Emerging Trends in Healthcare Technology	
Presiding Guest: Dr. NS Kalsi, IAS(Retd), Former Additional Chief Secretary, Punjab		
10.15 AM – 10.35 AM	**Dr. Anil Wali** Managing Director Foundation for Innovation & Technology Transfer, IIT Delhi	Keynote Speaker
10.35 AM – 11.15 AM	**Dr. NirmalJeet Singh Kalsi** IAS(Retd), Former Additional Chief Secretary, Punjab	Keynote Speaker and Presidential Remarks
11.15 AM – 11.20 AM	**Dr. Raja Ramchandran** PGIMER, Chandigarh	Introduction to Awardee
11.20 AM – 11.30 AM	**Dr. Sarit Kumar Das** Director, IIT Ropar	Awardee **"CIBioD Best Innovation Leadership Award"**
11.45 AM – 1.00 PM	**Session II**: Digital Health Technology Vision 2025: How to Amplify Digital Interventions in post COVID-19 era?	
Presiding Guest: Dr. Vinod Kumar, Vice Chancellor, JUIT		
11.45 AM – 12.00 PM	**Dr. Panicos Kyriacou** Director & Professor, Centre for Biomedical Engineering, City University of London	Keynote Speaker
12.00 PM – 12.15 PM	**Dr. Krishnan** Professor, Electrical & Computer Engg., Co-Director, Institute for Biomedical Engineering, Ryerson University, Canada	Keynote Speaker
12.15 PM – 12.35 PM	**Dr. Yogender Malik** Member NMC, Ethics and Medical Registration	Invited Guest

SCHEDULE

12.35 PM – 12.45 PM	**Dr. Vinod Kumar** Vice Chancellor, JUIT	Presidential Remarks
12. 45 PM – 12.50 PM	**Dr. Rajesh Gupta** PGIMER, Chandigarh	Introduction to Awardee
12.50 PM – 1.00 PM	**Dr. Lalit Awasthi** Director, NIT Jalandhar	Awardee **"CIBioD MedTech Innovation Promotion Award"**
2.00 PM – 3.15 PM	**Session III**: Standardisation: An Important key of Industrial Evolution 4.0	
Presiding Guest: Dr. Rajneesh Arora, Former Vice-Chancellor, Punjab Technical University		
2. 00 PM – 2.30 PM	**B. K Rana** CEO, Quality & Accreditation Institute (QAI), Former Director, NABH, Quality Council of India	Keynote Speaker
2.30 PM – 2.50 PM	**Avijit Bansal** Co-founder and CEO, Windmill Health & Visiting Faculty, School of International Biodesign, AIIMS, New Delhi	Keynote Speaker
2.50 PM – 3.00 PM	**Dr. Rajneesh Arora** Former Vice-Chancellor, Punjab Technical University	Presidential Remarks
3.00 PM – 3.05 PM	**Dr. Aman Sharma** PGIMER, Chandigarh	Introduction to Awardee
3.05 PM – 3.15 PM	**Dr. Sameer Shah** Founder, CEWA Diagnostics, Pune	Awardee **"CIBioD Social Healthcare Entrepreneur of the Year"**
3.30 PM – 4.45 PM	**Session IV**: Medical Device Testing and Calibration : Assessment & Regulation	
Presiding Guest: Sh. Sarvesh Kaushal, IAS (Retd), Former Chief Secretary, Punjab		
3.30 PM – 3.45 PM	**Dr. Madhusudan Joshi** Head of ICAT	Keynote Speaker
3.45 PM – 4.00 PM	**Venkataram Anant Bhagvati,** Advisor, Medical Devices & IVD, ICAT, Manesar	Keynote Speaker
4.00 PM – 4.15 PM	**Dr. Ajeet Kaushik** Florida Polytech University, Florida, USA	Invited Guest
4.15 PM – 4.25 PM	**Dr. Shankar Prinja** Additional Professor of Health Economic, School of Public Health, PGIMER	Invited Guest
4.25 PM – 4.35 PM	**Sh. Sarvesh Kaushal** IAS (Retd), Former Chief Secretary, Punjab	Presidential Remarks
4.35 PM – 4.40 PM	**Dr. Yashpal** PGIMER, Chandigarh	Introduction to Awardee
4.40 PM – 4.45 PM	**Sh. Yashraj Bhardwaj** Co-Founder, Zenith Vipers Group	Awardee **"CIBioD Young MedTech Entrepreneur of the Year"**
Day- 2 (Friday, 27 November 2020)		
9.00 AM – 10.15 AM	**Session V:** Bharat - Future Global Manufacturing Hub of Medical Devices: Challenges & Strengths	
Presiding Guest: Dr. Madan Krishnan, Vice President & MD, Medtronic India		
9.00 AM – 9.15 AM	**Dr. Vinod Kumar** Vice Chancellor, Jaypee University	Keynote Speaker
9. 15 AM – 9.30 AM	**Dr. Jitendra Sharma** CEO & MD, Andhra Med Tech Zone (AMTZ), Vizag, India	Keynote Speaker
9.30 AM – 9.45 AM	**Prof. Ramesh Loganatham** Professor Co-Innovation/Outreach, IIIT Hyderabad	Invited Guest
9.45 AM – 9.55 AM	**Mr. Madan Krishnan** Vice President & MD, Medtronic India	Presidential Remarks
9.55 AM – 10.05 AM	**Dr. Shailini Gander** PGIMER, Chandigarh	Introduction to Awardee

SCHEDULE

10.05 AM – 10.15 AM	**Sh. Ramdev Krishnan**, Tata Communication **Sh. Amar Sable**, Healthy Globe **Sh. Sushil Rana**, RMS India **Dr. Rohit Garg**, Laparoscopic and Bariatric Surgeon	Awardees **"CIBioD Best Social Impact Innovation"**
10.30 AM – 11.45 AM	**Session VI:** Role of Good Agricultural Practices in Health Promotion: Reduction of non-Biodegradable Chemical Entry in Food Chain	
Presiding Guest: Sh. Rakesh Sinha, Member of Rajya Sabha, Govt. of India		
10.15 AM – 10.35 AM	**Dr. B. Dinesh** Scientist-G, ICMR-NIN, Hyderabad	Keynote Speaker
10.35 AM – 11.00 AM	**Dr. Dinesh Goyal** Professor of Biotechnology, Former Executive Director, STEP, Thapar Institute of Engineering & Technology	Keynote Speaker
11.00 AM – 11.20 AM	**Sh. Rakesh Sinha** Member of Rajya Sabha, Govt. of India	Presidential Remarks
11.20 AM – 11.30 AM	**Dr. Bimal Anjum** DAV, Sector 10, Chandigarh	Introduction to Awardee
11.30 AM – 11.45 AM	**Ms. Shimona Kanwar** Journalist, Times of India **Sh. Vikas Dandekar** Editor, ET Times CIBioD	Awardee **"CIBioD Innovation Promotion Journalist of the Year"** Awardee **"CIBioD LifeTime Achievement Award for Innovation Promotion"**
12.00 PM – 1.15 PM	**Session VII**: AI & ML in Healthcare: Synergy for Accuracy & Sustainability	
Presiding Guest: Dr. Chander Shekhar, Head, Innovation & Translation Research & IPR Division, ICMR		
12.00 PM – 12.15 PM	**Dr. Deepak Garg** Director, LeadingIndia.ai and Director, NVIDIA-AI Research Lab, Bennett University	Keynote Speaker
12.15 PM – 12.30 PM	**Dr. Rahul Garg** Innovation, Strategy and Clinical Advisor, Reinsurance Corporation of America	Keynote Speaker
12.30 PM – 12.50 PM	**Dr. Chander Shekhar** Head, Innovation & Translation Research & IPR Division, ICMR	Presidential Remarks
12. 50 PM – 1.00 PM	**Dr. Shivani Singh** GCG-11, Chandigarh	Introduction to Awardee
1.00 PM – 1.15 PM	**Dr. Anita Kaushal** Principal- GCG Sector-11, Chandigarh **Asian Institute of Gastroenterology, Hyerdabad**	Awardee **"CIBioD Best Innovation Promotion in Academics"** Awardee **"CIBioD Best Affordable Healthcare Innovation"**
2.15 PM – 3.30 PM	**Session VIII**: Use Case Study: Why & How Telemedicine will Outlast the Pandemic?	
Presiding Guest: Dr. JS Bamrah, Chairman, British Association of Physicians of Indian Origin		
2.00 PM – 2.10 PM	**Dr. Sanjay Sood** Associate Director & Head, Health Informatics, Centre for Development of Advanced Computing (CDAC)	Keynote Speaker
2. 10 PM – 2.20 PM	**Sushil Rana** Vice President (R&D), RMS-India	Keynote Speaker

SCHEDULE

2.20 PM – 2.50 PM	**Sh. Pavan Chaudhary** Chairman & DG, MTaI (Moderator) _____ **Mr. Vaibhav Tewari** Chief Operating Officer, Portea Medical _____ **Dr. Odd Sandbekkhaug** CEO & Co-founder Infiniwell.ai, Norway _____ **Sh. Hitpreet Kang** Global Head Strategy and Sales, Clarity Medical _____ **Sh. Gautam Khanna** CEO , Hinduja Hospital, Mumbai	Invited Guests for Panel Discussion
2.50 PM – 3.00 PM	**Dr. KK Talwar** Former Director, PGIMER	Special Guest
3.00 PM – 3.15 PM	**Dr. JS Bamrah** Chairman, British Association of Physicians of Indian Origin	Presidential Remarks
3.15 PM – 3.20 PM	**Dr. Mandeep Singh** Thapar University	Introduction to Awardee
3.20 PM – 3.30 PM	**Vanvasi Kalyan Ashram** and **We for We**	Awardees **"CIBioD Social Leadership for Making Healthcare Affordable"**
3.45 PM – 5.00 PM		
IPR & Commercialization - Lessons for an Innovator and Valedictory Session		
3.45 PM – 4.00 PM	**Sh. V.Muraleedharan** Minister of State for External Affairs, Govt. of India	Chief Guest and Valedictory Address
4.00 PM – 4.10 PM	**Dr. Chieh-Hsiao Chen** Chief Medical Officer & Founder, iXensor Inc. CEO, Brain Navi Biotechnology Co. Lt	Keynote Speaker
4.10 PM – 4.20 PM	**Mr. Vikas Asawat** Patent and Trademark Attorney	Keynote Speaker
4. 20 PM – 4.40 PM	**Dr. Ajay Kumar** Chairman & HoD, BLK Institute of Digestive & Liver Diseases	Presidential Remarks
4.40 PM – 4.45 PM	**Dr. Prakamya Gupta** ICMR	Introduction to Awardees
4.45 PM - 5.00 PM	**Ms. Jaya Bhardwaj** Principal, DAV School, Panchkula and **Sh. SPS Oberoi** Chairman of Sarbat Da Bhala Charitable Trust	Awardees **"CIBioD The Healthcare Social Work Award of the year"**

Inaugural Session

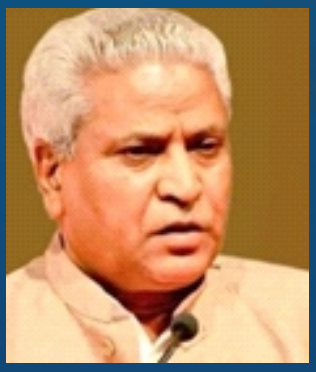
Participants: 522

Chief Guest and Inaugural Address by:

Shri. Som Prakash

I.A.S (Retd)
Minister of State for Commerce & Industry, Government of India

Sh. Som Prakash ji stated that India is going through a phase in which it can grab the opportunity to be a leader in medical device manufacturing and Aatmanirbhar Bharat would support this initiative. He also said that although the recovery rate of COVID in India is high but we need to be extremely vigilant to stop the spread of COVID in India and look forward to improve our healthcare facilities by using modern technologies. We must also be thankful to COVID warriors and healthcare personnel for not thinking about themselves and serving the nation selflessly and continuously. He also motivated and congratulated CIBioD team for organizing virtual summit.



Guest of Honour Address by:

Sh. Ram Lal Ji

Akhil Bhartiya Sah-Sampark Pramukh, RSS

Sh. Ram Lal ji spoke about how modern medicine can make a difference in the lives of people. He stated the characteristic features of Allopathy which are not found in other alternative cures are: Quick relief, Surgery and Diagnostics. Further he said that modern medical devices are very important in all these characteristic features of allopathy. He said that we need to make more efforts in making diagnostics and affordable healthcare available to every section of society, to actually make a difference. Telemedicine and biosensors-based diagnostics are very crucial in making this happen. This is because through this, we can make healthcare reach every level, even in small villages where opening of full-fledged hospitals is not feasible. This would be beneficial to entire country. He added that we need to work as a team and join people from different aspects to make this happen. He reiterated Sh. Narendra Modi's lines on teamwork that when we add the work of A and B and square it, we get extra 2AB in the final result. This is what team work and incremental efforts can do to any project he stated. In the end he said a very beautiful line that "Positivity in thinking and possibility in working are the key to make India Aatmanirbhar".

Guest of Honour Address by:

Ugo Astuto

Ambassador of European Union to India

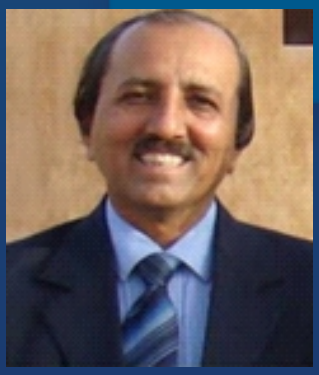
Mr. Ugo Astuto put some light on the relations between EU and India for overcoming the challenges in medical science research. He stated that COVID 19 has underlined the importance of digital and remote work in every field by integrating IT. In this sense, telemedicine has a bright future in India as well as the rest of the world. India and European Union has been collaborating since many years in this regard and this collaboration seems to be getting much stronger and more productive in and post this COVID time. He stated that we must imply the one-M2M, i.e., 1 metric that matters approach in every field of work. This would promote standardization approach throughout the globe and reduce time and effort wasted in conversions of metrics. He added that MOOCs can be based on this approach so that while they can be originating from any place, they could be relevant to a large number of audiences. In the end he said that this collaboration and One-M2M would help in safe, secure and sustainable developments of products and services which would further enhance and improve the economy of both India and European Union.

Presidential Remarks by:

Dr. Ajay Kumar

Chairman & HoD, BLK Institute of Digestive & Liver Diseases

Dr. Ajay Kumar stated that Aatmanirbhar Bharat is an initiative which aims to make India Self Reliant. For being self- dependent and a leader in global healthcare, we need to find easier and cost-effective ways of reaching medicines to millions of people simultaneously. In doing so, telemedicine and digital ways are very crucial. Research for this is highly interdisciplinary and we need a team of clinicians working closely with scientists, engineers and entrepreneurs to make this a success. This can change the landscape of medical research in India. Medical instrument manufacturing industry used to thrive in Ambala, but in absence of innovation is declining now. We need something like CIBioD, which at its heart has clinicians who are working closely with other people to get innovations in this direction. This is important because only clinicians know the requirements and caveats in devices which will be used by them. He also focused on Ayurveda and said that it is the mother of medical sciences and has a lot undiscovered which could be very helpful to modern medical sciences. There is a need of common ground in between Ayurveda, Molecular biology, immunology, pharmaceuticals and biotechnology for developing new and cutting-edge medical technologies possible. Lastly, he said that whole science and innovation is based on keeping our minds open and proving or disproving each and every possible idea.

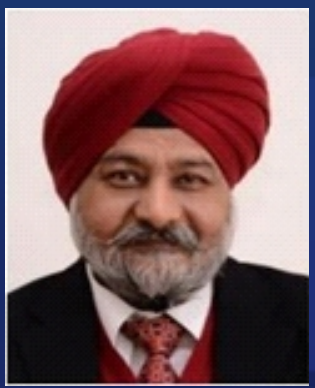


CIBioD LifeTime Achievement Award to:

Padma Shri Professor Dr. Jagat Ram
Opthalmologist & Director

PGIMER, Chandigarh, India

Dr. Jagat Ram, Director, PGI who is a leading ophthalmologist and cataract surgeon is renowned globally. He stated that the role of CIBioD in making India Aatmanirbhar in medical research and innovation space is very prominent. A lot of new technologies are bound to arise from this centre looking at the progress and projects being done over here. He said that the centre is working on 29 different projects which aim to make a difference in the society. Dr. Ram stated that we have whole hearted support for CIBioD to make new innovations for the mankind.

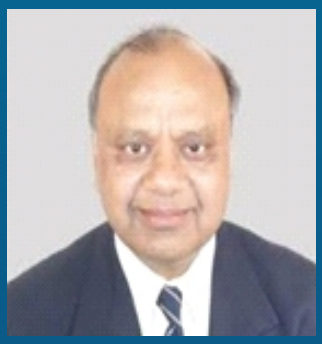


Keynote Speech by:

Dr. NirmalJeet Singh Kalsi,

IAS(Retd), Former Additional Chief Secretary, Punjab

Dr. Nirmaljeet Singh Kalsi started with how the COVID-19 has brought India in focus for universal and affordable healthcare. This pandemic has brought a change in scenario and people are shifting away their focus from China for such new developments. He stated that we also need to stop relying on China and develop new technologies for this. COVID has also brought in a paradigm shift and there is a rise of telemedicine, since people want to limit physical contact with each other. There is a widespread demand for improved and affordable universal holistic healthcare and wellness. Lastly, he said that there has been a negative impact on physical, emotional and intellectual factors during this Pandemic, but spiritual factor has seen a positive impact. India which is considered the spiritual hub of world needs to act upon this and harness this big opportunity to become a world leader in medical research and medical device supply.



Welcome Address by:

Dr Vinod Kumar

Vice Chancellor, Jaypee University of Information Technology, Himachal Pradesh

Inaugural session started on a high note. The introduction about the event was given by Prof. Dr. Vinod Kumar. He shared that the goal of this event must be on projecting India as a major medical equipment manufacturing hub, making healthcare delivery affordable and sustainable and to standardize the medical devices and equipment. This is possible by sharing the technical knowledge in affordable and sustainable medical devices by the speakers. Aatmanirbhar Bharat would also promote the ecosystem for entrepreneurship in this field in India.

About CIBioD and Summit Theme by:

Dr. Varinder Garg

PI, ICMR-CIBioD;
PCMS-I, OSD to Union Health Minister, PGIMER, Chandigarh

Dr. Varinder Garg briefed about the proceedings of the event. He announced that there are 25 talks by internationally known experts in 9 sessions during this 2-day summit and there is active participation of more than 65 experts for brainstorming and experience sharing. Expert's fields are from industry, government sector, academia and research organizations. He said that the outcome of summit is expected to create awareness about how standard based approach is important for driving disruptive development of technology and sharing of technical know- how and deliberation will result in affordable health domain in Indian and Global context. This will pave the way in adoption of technology in critical section of technology for making it affordable, sustainable and accessible.

Vote of Thanks by:

Dr. Harish Kumar

Professor
UIET Panjab University, Chandigarh

Inaugural session was ended then with the vote of thanks to all the dignitaries and the teams working in the background for the organizing of the summit.both India and European Union.

Recommendations:

- The goal is projecting India as a major medical equipment manufacturing hub, making healthcare delivery affordable and sustainable and to standardize the medical devices and equipment. This is possible by sharing the technical knowledge in affordable and sustainable medical devices by the speakers. Aatmanirbhar Bharat would also promote the ecosystem for entrepreneurship in this field in India.
- Research for this is highly interdisciplinary and we need a team of clinicians working closely with scientists, engineers and entrepreneurs to make this a success.
- Ayurveda has a lot of undiscovered potential.
- Telemedicine has a bright future in India as well as the rest of the world. We must imply the 1MTM, *i.e.*, 1 metric that matters approach in every field of work. MOOCs can be based on this approach so that while they can be originating from any place, they could be relevant to a large number of audiences.
- Efforts are needed in making diagnostics and affordable healthcare available to every section of society. Telemedicine and biosensors-based diagnostics are very crucial in making this happen.

Key Points:

Disruptive innovations have proved to be a powerful way of thinking about innovation-driven growth. Technology continues to change our lives in subtle ways. Today, a large number of devices, sensors, cloud infrastructure, data and business intelligence tools are already in use. Disruptive innovation also creates a new market by disrupting an existing market, displacing established market leaders and alliances. It has been postulated that the future doctor-patient interaction & diagnosis will occur anytime and anywhere. AI, Robotics, Nanomaterials, Internet of Things in healthcare are transforming the world. Other points to be covered are: How disruptive technologies must be matched with innovative business models displaces older systems and ways of doing things Models, antecedents and economic, social and organizational consequences, Role of IoT in Health Care and A digital future accelerated by COVID-19.

Participants: 470

Keynote Address and Presidential Remarks by:

Dr. Nirmaljeet Singh Kalsi, IAS(Retd.)

Former additional Chief secretory, Punjab

As per World Economic Forum report, they have listed 31 risks in next 18 months' post COVID world; some of them are economic, societal, geopolitical, economic and environmental. Health care and wellness sector is part of each one of these risks. Bigger trends are emerging in health care and wellness sector and for this, we would need new business models.

Key prediction includes:

- AI for healthcare and IT application is projected to reach 68.5% CAGR from 2018 to 2022.
- There will be approximately 4 million people with sight loss by 2050, caused by aging and underlying causes such as diabetes
- There will be a 39% increase in the number of people aged 65-84 years by 2032.

Shift towards prevention and holistic wellness rather than curative health include factors like physical, emotional, environmental, spiritual, financial, social, occupational and intellectual. All these are available in Indian traditional lifestyle and healthcare, so we need to put lot of effort in promoting Ayurveda health care and go for innovation and research in by creating evidence, which is required by western world. In 2025 healthcare economy of world will be equivalent to today's GDP of India and that's a huge number. Because of huge data revolution heath care spending on both global and traditional scale trends to double in every 44 months. There are 39.7 million Smartphone applications already in use and 75% of people expects to use digital health services in future. Connected/Internet of Things (IoT) enabled medical devices by 2020 would generate 150+ exabytes of healthcare data. This is a very important reason we must target this sector early on.

Components of Technology Induced Digital Disruption in HealthTech include:

- **Technology:** It includes AI/ML/powerful Neural Networks, Big Data, IoT, sensors and activators, Mobile technology, Cloud computing, Natural user interface, Ubiquitous Connectivity.
- **Trends:** Healthcare and wellness, integrated digital and physical experiences, education learning, Big data and advanced analytics

Leverage Digital: Solve new problems, improve performance, find new business model. Healthcare and Wellness Technologies for 2020.

- **Data sciences:** Using wearable data monitor to prevent health problems, improving diagnostic accuracy and efficiency, turning patient care into precision medicine, advancing pharmaceutical research to find cure.
- **Chatbots:** They help both health care professional and patients. With automated assist stepping in, the work of medical professionals has reduced manifold. Chatbot assist medical queries, medication guidance, symptom checks, nutrition.
- **Blockchain:** It has power to restructure entire digital marketing system by changing collections, fixing digital display advertising.
- **Telemedicine:** It will open doors to biomedical body parts processing, while telemedicine combined with AR diagnosis will update business in medicine.
- **Personalized digital mobile Health apps.**

A Connected Ecosystems of sensors and devices on and around individual serve function of capture and measure, identify risk, inform, make decision and take action.

Key Tech Trends Substantially Impacting Healthcare:

- Computing power has improved 1 trillion times
- All business will need to adapt from SMAC to DARQ
- Personal profiling of patients by analysing their life profile include social, personal, health and financial will change how healthcare is provided.
- Business will require reskilling of Next-gen workforce to be trained in 2020 tech trends such as augmented Reality, Virtual Reality, IoT, AI, Blockchain.
- AI products like IBM Watson will get sophisticated in 2020.
- Automation in health-tech business will ride in 3 waves (Algorithms, Augmentation, and Autonomy).
- Data privacy regulations, business will need to adapt their analytics to protect patient health information.
- For providing affordable health to citizens we need to have that system, environment innovations for health tech. There are 150 start-ups in digital health areas, 90 plus health care AI start-ups to watch. Very small numbers of Indian companies who are in these innovations space have a bigger market size.

Keynote Address by:

Dr. Anil Wali

Managing Director in Foundation for Innovation and Technology Transfer, IIT Delhi, India.

Title of his talk was "Innovation and Entrepreneurship, something that is driving all of us is creativity". He started his talk by giving example from academia that is contributing towards medical facilities. For example, contribution of north western university for development of polio vaccine, had sales of more the 7 billion dollars after some years. India is on path to become world's most populous country by 2030 but there's growing disease burden. But along with this, there are opportunities in infrastructure, partnership, innovation, invention, start-ups. $3.6 billion was invested in health-related tech firms in Europe between Jan-Sept 2019, a sixfold increase than in whole 2015. The trust and confidence that is in start-ups is tremendous because they are the one driving much of innovation space including disruptions.

Example from academics:

- Edison of Biological world "Dr Robert Langer" of MIT: A Biotechnologist, Engineer, Scientist, Inventor and Entrepreneur. He has more than 1000 patients, more than 1300 scientific articles, more than 170,000 citations and most importantly more than 2 billion lives impacted by the technologies from his laboratories, Patents licensed /sub licensed to more than 250 companies. He is also the founder of 24 start-ups.
- Commercial Translation of intra-abdominal platform (IAP) surgical system. How technology of laparoscopy developed, it's difficulty and the work done by the large team behind this innovation has to be appreciated.
- While technology is important, disruptions happen not because of technology but because of application of technology. Example: Aravind Eye Hospital of Dr GovindamVenkatswamay which runs at 33% operating profit, does 286 thousand cataract surgeries every year. It is the largest ophthalmological institute in the whole world. "The SmartCane": It is a smart stick for blind people which warns them of any upcoming obstacle within a 3-meter range. This cane costs mere 3000 rupees, but is very helpful for the blind people. IIT Delhi provided research and strategy leadership to develop this, Saksham trust provided interface with users, Phoenix Medical systems contributed expertise in design, manufacturing, testing and quality assurance and financial support was provided by "Wellcome trust".
- Innovation Ecosystem: To meet short term objective of innovation, we need a vibrant ecosystem. When we talk about innovation it's incomplete without research. Creating a culture of innovation at our institutions will help not only to leverage our strengths to face national challenges but enable an environment that fosters collaboration between public and private sectors and shares success in more inclusive manner.

Lastly, he concluded his talk by giving out examples of companies which have been founded by the Alumni of IIT Delhi and are considered global leaders in innovation like Sun Microsystems and Flipkart. He stated that if they can become global leaders in their space, why can't companies emerging in Healthcare sector in India be the same.

CIBioD Best Innovation Leadership Award to:

Prof. Dr. Sarit K Das

Director IIT Ropar

CIBioD Best Innovation award was given to Prof. Dr. Sarit K Das, Director IIT Ropar. He started by stating that Aatmanirbhar Bharat is a topic that is Spoken everywhere, but understood very little. By Aatmanirbhar Bharat we mean a self-reliant India. However, no nation in this connected world can be completely self-reliant. So, what does Aatmanirbhar Bharat mean?

Collaborations happen not to increase friendship but to get some mutual benefit. If we go to countries always asking for technologies, we would be either buyer, which is conferred to rich nations like UAE and Saudi Arabia, or we would be Beggars. But we do not want to be claimed as both. So, we develop new technologies so that world can look up to us. Definitely we would still be buying some or the other things from other countries, but they would also have to look to us for getting some technologies. This is what Aatmanirbhar Bharat would mean. CIBioD and other institutes will help in this.

He stated that there were two remarkable speeches by leaders of India. One was by PM Narendra Modi ji, in which he stated that COVID 19 vaccine from India would be governed by scientific advice and not politics. Another one was from Dr. Harshvardhan, Health minister of India, who gave a timeline and procedure of administration and supply of vaccines in India. This can be done by someone having a scientific temperament. This means that for success in our objective of Aatmanirbhar Bharat, we must have a scientific vision at top level. We must also be responsible as a citizen to every guideline by the government for the check of spread of COVID-19.

In this regard, scientists at IIT-Ropar identified some 20-25 problems during lockdown which would help nation. One Prof. from IIT-Ropar helped in making and marketing a negative pressure ambulance. He further commented that Institutes of National Importance, are not only for namesake important, but also have responsibility during national crisis. The UV based sanitizers that are used were first developed by IIT Ropar. They were even used in IPL to sanitize the Bio-bubble.

He gave a very interesting analogy that Just like diamonds in coal mine, we have solutions to problems in environment, we just need a temper to find it out. The he made a comparison between IIT and MIT and why IIT is lagging behind MIT. He stated that the Students and even faculties at entry level are equally good in MIT & IITs. Undergraduates are even better in IITs. Just the difference is of ambience. In MIT they talk about research. We talk about absurd topics like increment and discuss politics in science. Additionally, teaching makes not more than 60% of responsibility of professors. In rest they have to account in innovation. We need to improve interconnectivity between universities and organizations at different place, to make them world class and world leaders. CIBioD is an example for this. Chandigarh has ample opportunities for such ventures, being home or near to NIPER, IISER, CDAC, Panjab University, IIT Ropar etc. With this we can develop world class methods and products. He concluded by stating that this event can be a triggering point for such things so that we can create ample opportunities and be Atmanirbhar in its true sense.

Recommendations:

- Disruptive technologies must be matched with innovative business models.
- Setting up a vibrant ecosystem with innovation and research and enable an environment that fosters collaboration between public and private sectors and shares success in more inclusive manner.
- Shift towards prevention and holistic wellness rather than curative health include factors like physical, emotional, environmental, spiritual, financial, social, occupational and intellectual.
- Need to improve interconnectivity between universities and other organizations and industry.

Session II: Digital Health Technology VISION 2025: How to Amplify Digital Interventions in post COVID-19 era?

Key Points:

Past few months have changed the way we look at technology which was introduced in households irrespective of the socio-economic strata. This revolution has had a magnificent impact on the health industry as well. Major trends that will continue to emerge are smartphones, big data, virtual reality, wearables, artificial intelligence, blockchain etc. which helped to ensure the best prevention and treatment making healthcare accessible in minimal duration, through means of telemedicine, video consultation, m-health. Other points to be covered are: New models of technology enabled care from Vaccination Certificate, Infection Monitoring, Remote monitoring, Telemedicine and Nursing Robots, Population health management digital system supporting individual centric health Consumerism and participative healthcare.

Participants: 373

Keynote Speech by:

Dr. Panicos Kyriacou

Director & Professor,
Centre for Biomedical Engineering, City University of London

Dr. Panicos Kyriacou spoke on "Optical Sensors in Healthcare"
The session started with addressing the challenges in the healthcare sector role of available technologies in the healthcare sector, like early noninvasive screening of diseases. For this he presented demonstration of various device manufactured as follows:

- Technology: ZenPPG, customized sensor technology and software platforms for clinicians.
- Analysis of optical Bio signals using morphology, spectral analysis, ML and AI.
- Investigation of light tissue interaction using computer models.
- Optical sensors in neonatal monitoring in order to avoid use of MRI on small children.
- Photoplethysmography based sensors for non-invasive monitoring of tissue perfusion.
- Wearable hydration sensors
- Wearable ear sensors which can measure heart rate, breath rate and temperature using Infrared pyroelectric sensors.
- Optical sensors in colorectal Cancer based on the concept of Intra- luminal dual channel optical sensors.
- Non-invasive sensor in Traumatic Brain Injury
  Problem: ICP (Intercranial Pressure) involves various risks like haemorrhage and is quite difficult to assess.
- Solution: nICP-1 Sensor and monitor
- Blood glucose sensor: Noninvasive optical sensor for monitoring of blood glucose in diabetic patients
- Sensors in Mental heath
- Lithium sensor for Bipolar Disorder, which makes use of optical spectroscopy and Bioimpedance spectroscopy
- Interstitial fluid wearable mental health sensors
- Optical sensors for early detection of sepsis: uses fiber optic multi parameter esophageal sensor
- Continuous non-invasive cuffless and calibration for blood pressure estimation using PPG and ML

Proposal for India:

- Problem: India has high mortality rate of children under the age group of 5 years.
- Major cause: Infection
- Supply-side barriers: Lack of infrastructure, Limited space in neonatal wards, Limited availability of professionals
- Demand-side barriers – Lack of knowledge and awareness, High out of pocket cost, Delays in decision making
- Solution: First wearable for continuous monitoring of vitals and detection of babies in India, very affordable technology
- Artificial intelligence – identify patterns and create alerts for parents, midwives, medical facility
- Makes use of 5 biomarkers (temperature, respiration, heart rate, O2 saturation, motion tracking) to keep a track of babies' vitals

This technology also includes a Mobile app "Nixi-vital Signs" for remote monitoring using centralized analytics – unique and affordable, first to market, tested and lifesaving.

Session II: Digital Health Technology VISION 2025: How to Amplify Digital Interventions in post COVID-19 era?

Keynote Speech by:

Dr. Krishnan

Professor, Electrical & Computer Engg., Co-Director, Institute for Biomedical Engineering, Ryerson University, Canada

Dr. Krishnan's topic was "Wearable and Connected Healthcare (Digital Health + Signal Analysis +AI)"
The session started with a brief introduction of role of AI in healthcare and the extended uses.
The broad topics covered are as follows:

- Use of wearable in virtual healthcare
- Textile based monitoring
- Moticon wireless insole, etc.
- Virtual healthcare comprises of 6 domains: Connectivity, mobility. cloud, analytics, privacy and security
- Virtual and Connected healthcare provide us with a shift to PROACTIVE model from a REACTIVE model.

He deliberated on different devices being used, like:
VITASCOPE:

- Problem: 10 million babies need help breathing at the time of birth
- Solution: VITASCOPE: having universal attachment to any stethoscope and displays the heart rate on a digital screen.

COVIDASCOPE:

- Based on microphones
- Helpful in risk assessment and monitoring
- Includes a Cough index which receives cough signals from a cough database
- Distinguishes Covid cough from a normal cough.

AFFECTOSCOPE: Long term HRV Analysis, etc.
His talk and ideas were very motivating.

Speaker:

Dr. Yogender Malik

Member NMC, Ethics and Medical Registration

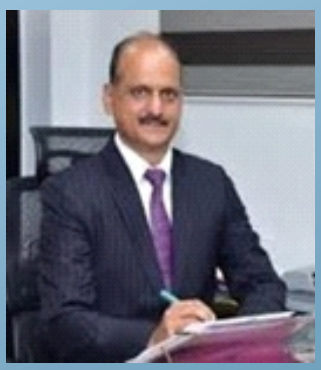
Dr. Yogender Malik, Member NMC, Ethics and Medical Registration gracefully highlighted the importance of digital health technology in current scenario and he briefed about how the same is being used in India.

Presidential Remarks by:

Dr Vinod Kumar

Vice Chancellor, Jaypee University of Information Technology, Himachal Pradesh

Dr. Vinod Kumar, Vice Chancellor, Jaypee University of Information Technology, Himachal Pradesh concluded the session by giving his presidential remarks.



CIBioD MedTech Innovation Promotion Award to

Prof. Lalit Kumar Awasthi

Director, NIT Jalandhar

CIBioD MedTech Innovation Promotion award was conferred on Prof. Lalit Kumar Awasthi, Director, NIT Jalandhar for his contributions.

Recommendations:

- New models of technology enabled care from Vaccination Certificate, Infection Monitoring, Remote monitoring, Telemedicine and Nursing Robots, need to be adopted.
- Population health management digital system supporting individual centric health and participative healthcare, should be encouraged.
- Sensor technology can be used for early noninvasive screening of diseases.
- Analysis of Bio signals can be done using morphology, spectral analysis, ML and AI.
- Need to use Virtual and Connected healthcare in order to shift to PROACTIVE model from a REACTIVE model.
- Further work on optical sensors for use in medical diagnosis such as mental health.
- Proposal for India for tackling high mortality rate of children under the age group of 5 years by using a wearable device for continuous monitoring of vitals and detection of babies in India. Device uses Artificial intelligence to identify patterns and create alerts for parents, midwives, medical facility. It makes use of 5 biomarkers (temperature, respiration, heart rate, O2 saturation, motion tracking) to keep a track of babies' vitals. It also includes a Mobile app "Nixi-vital Signs" for remote monitoring using centralized analytics – unique and affordable, first to market, tested and lifesaving.

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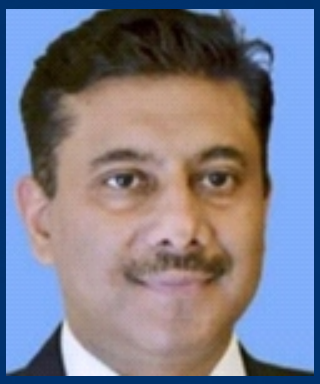
Key Points:

In the time of digitalization which is affecting all areas of industry including Healthcare. The term Industry 4.0 stands for fourth industrial revolution. This requires the interaction of technical objects with each other and integrated application of cloud based platforms. For the successful cooperation of interaction, interoperability is required. To obtain this, particular norms and standards with specifications are being set by international standardization organizations. Other points to be covered are: Role of globally harmonized standards for IoT devices: Enabling a 360 degree Healthcare view Vision and Key paradigm of Industry 4.0 Reference architecture model Industry 4.0 (RAMI 4.0) Mechanical, Electrical and communication standards between all vendors. Need for production line and process for standardization.

Participants: 205



Keynote Speech by:

Dr B.K Rana, CEO

Quality & Accreditation Institute (QAI) and former Director & CEO-In-charge of NABH, Quality Council of India.

The session had a length and breadth discussion on role of accreditation and standardization. The key points discussed were:

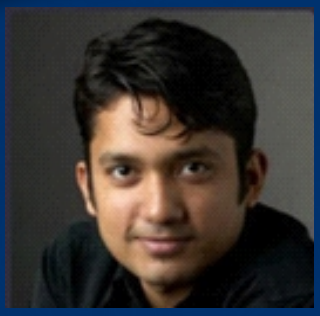
1. Standardisation of Structure processes Outcomes
2. Public recognition
3. Transparency
4. Unified approach to quality
5. Benchmarking, market shares
6. Patient safety

The Institute has worked on forming accreditation standards for Telehealth that contains 10 chapters and 239 criteria. The chapters/frameworks of the Telehealth accreditation standards highlighted by Ms. Shivi were:

1. Governance and leadership
2. Human resource management
3. Facility and risk management
4. Information management system
5. Continual quality improvement
6. Patient Assessment and care
7. Patient rights and educations
8. Medications prescriptions and safety
9. Hygiene and infection control
10. Digital health Applications

Ms. Shivi then went on to highlight the benefits of such accreditations, to the patients, doctors, and how such standardizations ensure compliance with the MCI regulations and make it ease of store and retrieve patient information when needed. She further explained that accreditation standards have been set on a continuous improvement model and were released on August 15th, 2020, the day the Prime Minister launched National Digital Health.

To conclude the keynote, Dr. B. K. Rana concluded the session by highlighting the important role that telemedicine is going to play in the future and why he thinks Telemedicine has revolutionized healthcare in the past and will continue to do so in future. He also told the audience that QAI is the first institution to make the framework/accreditation which has been approved by the international society and accepted by the governments of various states including Goa and Delhi. He also said that telemedicine will give more confidence to the patients, especially those who are not very happy coming to the hospital.



Keynote Speech by:

Dr. Avijit Bansal

CEO & Co-Founder, Windmill Health Technologies Pvt Ltd.

He began his session by sharing his experience on Diwali this year, when he resolved not to buy any Chinese goods for the celebration after seeing the situation on the border. But, to his utter surprise and bewilderment, he couldn't find non-chinese electrical lights and crackers. For him, the incident was a perfect reminder that India as a country depends largely on a hostile neighbour for a lot of items. Next, he addressed why he thinks that India should become a manufacturing hub, citing the example of how the country imports around 80% of all medical devices and why this situation needs to change. But he also briefly touched upon why India should not become a manufacturing hub as most innovations in India happen within multinational hubs/companies and there are no large Indian conglomerates working in the healthcare and medical sector.

He then spoke about the challenges in manufacturing healthcare devices and talked about the harsh reality of the country and how a large number of people are more willing to buy expensive facial-scar removing creams than life-saving antibiotics and medicines. He also brought to the fore the facts that the average Indian customer doesn't care about quality and there exists a dichotomy of quality between the same product in India and abroad. After working on a device himself, he also highlighted, in his session, the trust deficit that Indians have towards the products manufactured in the country itself. He also briefly discussed the challenges that Indian medical regulators face multiple challenges in fulfilling the tender requirements of the government since they belong to a bygone era. And that's where he precisely thinks effective standardization comes into the picture.

His keynote was very insightful as he not only talked about the Indian customers, regulators, entrepreneurs, but also about the multinational companies that influence the medical device regulations and requirements in the country. He explained how MNCs have access to very-high quality products and have assurance procedures in place, which are totally impossible for small Indian manufactures. The products, by these MNCs, are overpriced and the prices by the Indian manufacturers are much below the required levels. He also said that the 80:20 principles where the 80% of the quality is determined by 20% of the standards/requirements could be effectively applied in the standardization industry to make it more accessible for the Indian manufacturers to market their products. He further went on to add that there also needs to be measures set in place to make the Indian manufacturers aware of the reasons behind the existing standardizations. He ended the session with a very relevant example of an Indian asking for the average of the car that has travelled to space, showcasing the mindset of the average Indian that needs change.

Presidential Remarks by:

Dr Rajneesh Arora

Former Vice Chancellor, Punjab Technical University

Dr. Rajneesh took over for the presidential session. He began his address by talking about how standardization is important when it comes to delivering quality at an affordable price. He also took some time to go over and explain to the audience the term, Industry 4.0, which refers to the 4th Industrial revolution. He also talked that how each industrial revolution impact the world like first revolution in 1698 brought to us steam engines, the 2nd revolution in 1945 made possible production assembly lines, the 3rd industrial revolutions in 1990 by CNC machines took us towards automation and the 4th revolution is going on due to digitalisation, and by integration of all machines with each other. He also described how various pillars of technology like cyber security, cloud computing, mobile technologies, machine to machine learning, 3D printing, Big Data analytics, internet of things, RFID technologies, cognitive computing play a role in advancements of the healthcare sector.

He then talked about how there are as many engineers working in health as there are doctors and that many challenges in standardization are, in fact, very real. He spoke at length about how he thinks that these challenges are not a responsibility of an individual, but everyone. He also expressed how he thinks of conferences like these as platforms where professionals from different verticals come together to discuss and tackle the challenges. He also reached out to the medical fraternity, asking them to connect to him if they needed any help in their work. He concluded his remarks by re-emphasizing the point that we are all interconnected and interdependent and there need to be continuous and consistent efforts in the direction of quality at an affordable price.

CIBioD Social Healthcare Entrepreneur of the Year Award to:

Dr Sameer Kumar Shah

Founder, CEWA Diagnostics and Canpic Medical & Education Foundation, Pune

CIBioD Special Healthcare Entrepreneur of the Year award was awarded to Dr. Sameer Shah, Founder, CEWA Diagnostics, Pune, who has also received the UNESCO fellowship for his research project. Dr. Sameer Shah, while accepting the honour, talked about the importance of having a global platform for entrepreneurs and innovators so that we can tap into the potential of the talent pool our country has. This award, according to him, is a step in that regard of recognizing entrepreneurs.

Recommendations:

- Role of globally harmonized standards for IoT devices in enabling a 360 degree Healthcare view as part of Industry 4.0, was discussed.
- Need for adoption of Reference Architecture Model Industry 4.0 (RAMI 4.0) Mechanical, Electrical and communication standards between all vendors.
- Need for production line and process for standardization.
- The 80:20 principles where the 80% of the quality is determined by 20% of the standards/requirements could be effectively applied in the standardization industry to make it more accessible for the Indian manufacturers to market their products.
- Measures should be set in place to make the Indian manufacturers aware of the reasons behind the existing standardizations.
- Various pillars of technology like cyber security, cloud computing, mobile technologies, machine to machine learning, 3D printing, Big Data analytics, internet of things, RFID technologies, cognitive computing play a role in advancements of the healthcare sector.
- There need to be continuous and consistent efforts in the direction of quality at an affordable

Key Points:

Medical Device industry has been growing rapidly and constantly. With the increase in adoption of new technologies, the requirement of safety and performance also increases. Medical Device testing and calibration ensures safety, accuracy and functionality for patients as well as for the manufacturers also. Ey points covered were: Medical Grade IoT Sensors (Thermal Screening to Non- invasive monitoring) Role of calibration and accuracy in medical application. Importance of testing of medical devices before delivery to the point of use such as hospitals, clinics, pathology labs. Importance of Calibration as each item and device in a hospital, clinic or pathology lab is perfectly calibrated when it is delivered, but as it is used, it becomes susceptible to wear and tear, each time it's used, moved or bumped, the calibration gets knocked out of alignment a little bit. Impact of quality calibrated medical devices on patient health and safety, and its crucial role in determining the performance and efficiency of healthcare institutions. The impact of measurements taken from out-of-calibration instruments and key parameters for bio-medical equipment calibration.

Participants: 199

Keynote Speech by:

Dr. Madhusudan Joshi

Head of ICAT

Dr. Madhusudan Joshi, Head of International Centre for Automotive Technology spoke about medical device testing and calibration. He highlighted its importance and different use cases for implementation in various scanerios.

Keynote Speech by:

Venkataram Anant Bhagvati,

Advisor, Medical Devices & IVD, ICAT, Manesar

The title of this session was "Atmanirbharta in MedTech Testing". India imports very large quantity of medical devices. MedTech sector and health sector are a vast field where we have a small area to contribute in Atmanirbhata in MedTech Testing. Without testing and validation in medical sector you can never have make in India because it is not fully self-sufficient in medical device sector.

An overview of MedTech testing process involves:

- **Engineering Tests**- A lot of test are engineering tests like electrical safety, mechanical safety, EMC, Acoustics etc.
- **Biocompatibility and Animal Testing** – Every medical test requires three biocompatibility test such as cytotoxity sensitization and irritation standard tests.
- **Clinical trials** – Internationally it has ISO 14155, diff regulations in diff conditions.

He highlighted that they aim to achieve full self-reliance in the country. Essentially in engineering test, most of high medical value tests come under medical electrical equipment (IEC 60601-1). These include high value equipment X- ray, MRI scan , CT scan ,ventilator. The area of medical equipment runs into 1000 of crores. Moreover, in this area refurbished equipment's are also used in India which rest lives into danger. The word testing and calibration is used in a broad way. Two types of test include:

- **Conformity Assessment Testing** -This includes any type of regulatory which any new start- up has to go through
- **Calibration**

Key areas discussed are as follows:

Electrical safety: It comprises medical data having complex standards because it includes thermal mechanical usability as so on.

Electromagnetic compatibility: We all are into electromagnetic radiations. If somebody has a pacemaker and he goes to a transformer, the pacemaker may stop which is dangerous.

Medical alarming Acoustics: Sound affects environment. Alarm testing is important in today's India. But there are no companies in India which manufactures electro acoustics.

Performance testing: Medical devices like ventilator requires gas flow analyser, lung simulator. But these type of instruments are very rare.

Environmental testing: Test the devices for one or other reasons like humidity vacuum, shock and vibration.

Software: Every device needs software.

Optics: IVD has lot of components in optics.
CAE Validation: Computer Aided Engineering models. US FDA has a recognized consensus standard known as ASMEVNV40 for validation of models.

QMS: Quality management system

Risk management: Most of medical device testing involves a lot of statistics of risks

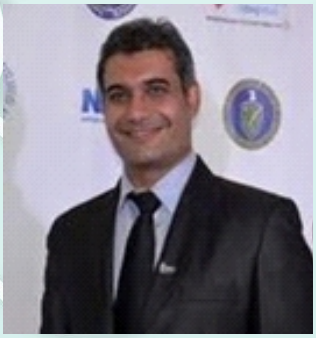
Packaging: A lot of packaging standards. EU has sterilization barrier and its evaluation which involves microbiology and mechanical engineering.

Usability: if safely used by nurses doctors.

Recurrent test: Repair test done after biocompatibility.

Some challenges were also listed like:

EU MDR and its effect on India Medtech: most depend on CE certification, EU mark used in south Asia, Africa . If India not able to meet new EU we were not able to export.
Diversity of particular Standards: Each medical device is unique. USA FDA website 6000 devices listed out of which 500 commonly used electro medical devices. The example used was Diagnostic Radiology.



Speaker:

Dr. Ajeet Kaushik

Florida Polytech University, Florida, USA

Dr. Ajit spoke on "Manipulative Nano systems for Personalized Health Wellness".

The speaker started by developments of India in biotechnology. Overpopulation of India has some pros and cons. Former says, we have a lot of manpower to do if the world is well designed, well sponsored and well-motivated. In field of biomedical science, we have to test concepts using certain devices which have to be calibrated and validated and for that we need specimens for testing.

The speaker addresses audience by mentioning his PhD in NPL where he dealt with standards. Standards are dependent on some sort of numbers or markers. In terms of biomedical science one single marker is associated with the medical history of patient, on-going disease it's impact and optimization of therapy.

He highlighted some important aspects of validation and calibration by mentioning his post doc topic on "making Nano system based sensing prototypes and promote to biomedical devices used for disease diagnosis in early stages ".

He mentioned the implication of a diagnostic system with reference of everyday problems like diabetes glucose and viral diseases. Herein, a tiny system can be formulated which everyone can borrow and would eliminate the need of going to hospitals. Here is the role of Comp science (AI, DL, ML) and hardware (IoMT, Internet of medical things) which can be used in early diagnosis with reference to each and every person. He explained his project in America "Cortisol Detection". Cortisol is the only biomarker which can quantify stress. An electrochemical sensing chip was optimized which detected psychological stress biomarker in saliva and in HIV infected patients. It involved three components namely a sensing chip, Michael foredeck system and a miniaturized electrochemical analyser.

He also focused on his patent on applied research topic "Electrochemical System for progression of virus in cellular media". He worked on this project because ELISA is a sophisticated, time taking and expensive process. His work controlled electrophysiology of cell during infection with or without therapeutics. Besides, he was able to perform this in HIV over time with infection because electrophysiology of cell changes up and down with reference to treatments.

Further, he talks about Zika virus protein. He developed a "diagnostic system for detection of Zika virus protein. He optimized and developed an electrochemical chip based on an immunoassay approach which can detect zika virus protein at Pico molar level. Why do we need to detect at Pico molecular level? he asked , because not only for early diagnostics but for low level detection of viruses we can decide whether prescribed medicine is good for the infection . His objective was to align these sensing chips with microelectronic sensors which are featured by hardware and thus we can do wireless based sensing which could be analysed at a medical centre.

Now he shifted to the coronavirus. The recent findings confirm chances of recurrence, that is it can be endemic. We have to analyse informatics smartly into this approach. He suggested an application based on AI which could predict effect of virus in terms of medical history of patients which will minimize error and with concept of IoMT , we could develop portable system which can function over low powers . Thus, this can be labelled as informatics driven approach.

Another approach in this context can be electromagnetic power. AC magnetic field produces magnetic and acoustics at the same time. This was demonstrated through delivery of nanoparticle to brain of monkey. Applying stimulation to Nano particle in brain of monkey and see how collective effect of magnetic and acoustics would affect neural function. This highlights the development of implanted deep brain system for Parkinson's disease. Lastly, he concluded his talk by without calibration nothing can come into market and nobody can manipulate these things because it under matter of rules and there is mo way to avoid this. Everything is dependent on data and informatics. User can recalibrate them and use as a reference but it may or may not be harmful.

Speaker:

Dr. Shankar Prinja

Additional Professor of Health Economic, School of Public Health, PGIMER

Dr. Shankar began his address with the question on how any health technology affects the people. He then set the stage for his session on Health Technology Assessment by highlighting the present scenario in our country and the resource scarcity we often face. He also gave a very relevant example of cervical cancer testing and what technology would be cost effective while also being clinically effective.

His delightful keynote by first taking the listeners through the history of Health Technology Assessment (HTA) and its major milestones, including the 12th 5-Year plan and the National Health Policy (which came in 2017) and the board of "Health Technology Assessment in India" (HTAIn).

To make the listeners familiar with his area of work, he explained what the term Health Technology Assessments (or HTAs) entails and what all issues and concerns any good health technology assessment should cover. He also discussed and explained the importance of HTA and why any assessment of this kind needs to be systematic, transparent and ethical. He also helped the audience understand, in the next part of his talk, what HTA caters to and how it affects Government Agencies & Parliament, Health Care professionals, Hospital &Healthcare Administrators, Private Sector Insurance, Manufacturing Industry and Patients, Carers & General Public.

The next part of his talk focused on the composition of the HTAIn, which primarily consists of the Board, the Secretariat, the Regional Resource Hubs and Technical Partners. He then gave an overview of how decision making in HTAIn works and how institutions, ministries and authorities decide on which health technology/device is to be used. He spoke briefly about how the secretariat receives the information from the authority and then passes/allocated the topic to a regional resource hub and the rigour of evaluations that take place at the resource hubs and technical partner institutions once it has been allocated a topic.

Next, he gave the audience an overview of the spectrum of topics that the HTA deals with, which could range from a new drug introduction to the evaluation of technical and operational feasibility and regulations regarding the pricing. During the discussion, he also explained how HTA serves as a measure for deciding the amount that could be claimed for a device use.

The next part of Dr.Prinja's session focused on the applications of HTA and how it influences policy making at the highest level. He also highlighted the example of VIA (Visual Inspection by Acetic Acid) for cervical cancer screening once every five years is the most cost- effective option for our nation. He also briefly touched upon the free HCV treatment available in Punjab, which became inaccessible due to non-availability of Genotyping facility and how a new drug influenced the HCV subtype with cirrhosis. The HTA also involved the use of auto- disposable syringes and how evidence showed they were the best for the country. He also then described his work about the pricing and procurement of syringes and how it influenced the number of HCV patients being treated.

The final leg of his keynote was a glimpse of the HTAB Bill which allows HTA to be used for a wide variety of technologies and how, although the HTA is very effective, there are a series of challenges that come with the process.

Presidential Remarks by:

Sh. Sarvesh Kaushal

IAS (Retd), Former Chief Secretary, Punjab

Mr. Kaushal delivered the presidential remarks. He began by thanking all the keynote speakers and then acknowledged how we have the talent, the drive, the passion and all the country needs is a platform which can take us forward in the Healthcare Sector and make it affordable for each Indian. Mr. Kaushal also discussed the government's mission of "Atmanirbhar Bharat", and how India utilized the pandemic to begin the biggest manufacturers of face masks, while also saying that he is hopeful that we (India) will contribute in the same way to the production of the vaccine.

He also mentioned that he was very thrilled to meet Yashraj Bhardwaj, the twenty-year- old entrepreneur and reflected on how he had a long past and a short future and how India needs more entrepreneurs like Yashraj Bhardwaj, who have, on the contrary, a short past and long future. Finally, he expressed how he wants India to become self-reliant, have the highest number of patent applications and be a leader in the pharmaceutical sector. He closed the session by wishing everyone all the best for the future.

CIBioD Young MedTech Entrepreneur of the Year to

Sh. Yashraj Bhardwaj

Co-Founder, Zenith Vipers Group

CIBioD Young MedTech Entrepreneur of the Year award was awarded to Sh. Yashraj Bhardwaj, the co-founder of Zenith Vipers Group and a 20-year old entrepreneur who has worked on more than 30 research projects and holds around 15 patents. The young researcher, while accepting the honour, thanked the organizers and stressed on the importance of the Atmanirbhar Bharat.

Recommendations:

- Calibration and testing of medical devices like medical Grade IoT Sensors (Thermal Screening to Non-invasive monitoring) is extremely important before delivery to the point of use such as hospitals, clinics, pathology labs. The impact of quality calibrated medical devices on patient health and safety, and its crucial role in determining the performance and efficiency of healthcare institutions and key parameters for bio-medical equipment calibration need to be investigated.
- Most MedTech depends on CE certification, EU mark used in South Asia, Africa. India needs to meet EU mark standards to be able to export.
- There is a challenge of diversity of particular standards for each unique medical device.
- Need to develop informatics driven approaches which are portable and can function with low power.
- Familiarization with HTA and why any assessment of this kind needs to be systematic, transparent and ethical

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Key Points:

India being a future hub for economic growth as more young and trained population is available for new ventures at all technological innovations and investments. Key points to be covered are: Advanced manufacturing unit's deployment and Skill development for the younger generation for future growth. Availability of natural resources in ample amount for establishing high level manufacturing units for biotechnology, healthcare and biomedical sectors, More population provides more consumers to the industries for their several kind of products, Some problems also need to be addressed such as infrastructure, roads, electricity are deferring the foreign investors to invest in India upto some extent. Other problems like crime rate, policy problems, focus areas, red- tapism and operational glitches to be focussed on.

Participants: 395

Keynote Speech by:

Dr. Vinod Kumar

Vice Chancellor, Jaypee University

Prof Dr Vinod Kumar, Vice Chancellor, Jaypee University of Information Technology, India Dr Vinod Kumar started the session by introducing his core research areas, that are medical signal processing, specialising in the field of ECG and medical image processing.

Further he divided his talk in 5 parts.

1. **Health Care Status:** As per World health organization statistics, the life expectancy has increased from 66.5-72.0 years, i.e., an increase of 5.5 years. Further there is increase in healthy life expectancy at birth from 58.5 to 63.3 years. However, there is increase in unhealthy life years from 8 to 8.7 years. To take care of unhealthy life year's healthcare will be important. Various reasons for unhealthy lifestyle are: Cardiovascular diseases, Diabetes (both type 1 and type 2), Cancer, Chronic respiratory diseases etc. These affect millions of people in India and can be considered as main reasons for unhealthy life.

2. **Strengths:** From economy growth point of view, India is sixth largest economy in world according to nominal GDP that stands at $2.6 trillion in FY 2020-21. It is the third largest economy by purchasing power parity with $8.7 trillion in FY 2020-21. India is sixth largest manufacturer in the world and has 3% of global manufacturing units. Along with this we are a major exporter of IT services with $180 billion revenue and employing 4 million people. We are world's second largest telecommunication industry by number of mobile phones, smartphone and internet users having cheapest data connectivity. We have a large labour force and availability of cheap labour (520 million workers).

Economic growth is tied to Technical growth

- Technical Education and manpower in India (6000 engineering and technology institutions, more than 1.9 million students enrolled for engineering in 2019).
- Young population in India (more than 50% population below age of 25, more than 65% below age of 35).
- Young population in India has high technological awareness.
- India is known as world's leading outsources destination for global companies in technology sector (low cost, Outsourcing destination for global companies in technology sector (Low cost outsourced software, values at $150 billion).
- Improved rank of world innovation index from 81 in 2015 to 52 in 2019.
- In 2019, India ranked third in the world terms of attracting investment for technology transactions.

3. **Government Initiatives Ayushman Bharat:** A flagship scheme of Government of India to achieve vision of Universal Health Coverage (UHC).
   - Designed to meet sustainable Development Goals (SDGs) with commitment of "Leave no one behind".
   - Moving from sectoral and segmented approach to comprehensive need-based health care services.
   - Holistically address health care system (Prevention, promotion, ambulatory care).

- Health care wellness Centre (HWCs):

Creation of 1,50,000 Health and Wellness Centres (HWCs) by transforming the existing Sub centres and primary health centres for the purpose of:

  - Delivering Comprehensive primary health care (CPHC) brining healthcare closer to homes of people.
  - Emphasis of health promotion and prevention.
  - Focus on keeping people healthy.
  - Choose healthy behaviours.
  - Reduce the risk of developing chronic diseases and morbidities

- Pradhan Mantri Jan Arogya Yojana (PM-JAY)
  - Health covers of Rs.5 Lakhs per family per year.
  - For secondary and tertiary care hospitalization
  - Over 10.74 crores poor and vulnerable families
  - Approx. 50 crores beneficiaries
  - World's largest health insurance
  - Covers up to 3 days of pre-hospitalization and 15 days of post hospitalisation expenses.
  - No restriction on family size, gender. National policy on Electronics 2019
- Hardware manufacturing of electronics is given high priority in National policy on Electronics 2019.
  - It is also considered as one of important pillars of both "Make in India: and "Digital India" programs.
  - Demand for electronics hardware is projected to about INR 26,00,000 crore by 2025.
  - Greater need of medical devices and Point-of-care Testing (POCT) in COVID situation.

Healthcare market is expected to reach US$ 372 billion by 2022 while medical devices market is expected to cross US$ 11 billion by 2022. Investment in healthcare infrastructure is set to rise benefiting both hospitals and R&D education infrastructure. The hospital industry in India is expected to grow CAGR of 16-17 percent to reach Rs 8.6 trillion by FY22 from Rs4 trillion in FY17. The government aims to develop India as a global healthcare hub. Creation of new drug testing laboratories and further strengthening of 31 existing state laboratories.

4. Technological Solutions:

- Affordable and user-friendly monitoring instruments and software applications (BP, Blood sugar, Oxygen level, smartphone applications)
- Remote access to telemedicine and mobile healthcare
- Artificial Intelligence
- Hybrid closed loop insulin delivery system
- Government funding for research and development
- Advertisement/awareness programs
- Role of NGOs
- Promotion of Yoga for stress level management
- Ways to improve mental health.

Another sector where India can be manufacturing hub is *Point-Of-Care Testing (POCT).* Any screening test that is performed outside traditional laboratory. Designed to use at or near the site where patient is located. This allows rapid and reliable diagnostic testing in which outcomes can be obtained instantly.

One more sector is *Telemedicine.* This is practicing medicine over distance. Utilization of IT for medical diagnosis, treatment and patient care. Providing care for patients in remote area, causality in battle field and in areas affected by natural calamities.

AI in Medical Imaging Leading the way better patient care used frequently in MRI, CT scans, Triage, Aided Reporting, follow up planning. Therapeutical Devices include cervical collar Traction Pillow, electrical nerve stimulator Wearable ice hat, pain relief massager.

Lastly, he concluded about global health status have improved in terms of life expectancy and health life expectancy over past two decades. Point-of-Care units and wearable sensor network for fast and convenient health check-up. Use of telemedicine and ubiquitous healthcare for disease diagnosis treatment. Creating awareness by government agencies/NGOs about healthy life style, food habits, environment. AI automated analysis and decision making, Deep Learning, Machine Learning for fast diagnosis and analysis, cloud computing architecture etc. and Healthcare modelling and decision-making during pandemic.

Keynote Speech by:

Dr. Jitendra Sharma

CEO & MD, Andhra Med Tech Zone (AMTZ), Vizag, India

Dr. Jitendra Sharma spoke on "Indian medical device market of 50,000 crore is made of what"

From a regulatory perspective they are in 4 verticals but from citizen perspective how do we classify medical devices, as citizens are only seeking help. So, from help centric citizen how do we define medical device? From a societal perspective are of 3 baskets,

- Medical device that cure diseases and saves lives, it's about 35,000 crores per annum.
- Medical devices that neither gives help nor saves lives, are diagnostics that make 15,000 crores in Indian market.
- Medical devices that promote health such as labor beds, Obstetrics gynaecological, physiotherapy etc. (5,000-7,000 crores).

As a country, we have to invest accordingly, if we have to target these 3 verticals. But our investment pattern is just opposite. R&D happening on devices that are of variable nature that promote health, but it does not answer to devices that are burden to economy. The effort is more towards devices that promote health but it's not economic solution to our problem

Other is in-vitro diagnostic that tell us whether we are healthy or not healthy. We have more than 150 diagnostic products in market, all of them are indeed in India. 5-10 %of our in vitro diagnostic for COVID-19 has actually foreign roots. Continuous works in R&D had led to technology transformation and industry production of COVID-19 diagnosis kits. So, substantial amount of effort is going on technology that actually tell us whether we are healthy or not and minimum effort is going on black hole which is 35,000 crore technologies that save lives. Even today we don't make pacemaker or insulin pumps which are all imported.

He provided his suggestions and reasons why we came up was to bring balance between research priority and effort and economic problem. Medical technology has no or very few Indian brands, so we have to trade if domestic production and technologies because of their accuracy and effectiveness. To do this we have to engineer state of ecosystem which help manufacturers to produce what they want to. Companies that we see such as Medtronic today, they are not their today because they have good marketing but because they have stood to their credibility for decades. This credibility came by uncompromising compliance to safety standards and therefore these agencies when they develop and bring product in market, they need safety compliance that are internationally benchmark because none of these companies would like to ethically or commercially take chance with standard product.

Then he shared a small video of 2.5 minutes in which he showed Biome centre for biomaterial testing, Electra centre for electromagnetic compatibility and safety testing, COBALTA centre, etc.

Lastly, he ended his keynote by commenting that the day when patients walk into a hospital and finds almost 60 percent medical equipment are made in India that is the day when all our efforts, knowledge and work will have found success.

Speaker:

Prof. Ramesh Loganatham

Professor Co-Innovation/Outreach, IIIT Hyderabad

Prof. Ramesh Loganatham introduced his topic of the speech about medical data sets. This is an aspect of AI that is talked about very less, that is data science in medical research. He told that data science and AI can be used in various domains of healthcare like ophthalmology, oncology and dermatology. We can use a lot of image data to easily diagnose and check for diseases. His team started to build a large dataset of medical AI with the help and support from Government of India, Government of Telangana and Intel. The different areas identified by him where AI can come in use are:

- Diagnostics – New algorithms, Point of care devices (remote and telemedicine), precision diagnostics low cost and rapid diagnostics.
- Health Service Optimization – Ayushman Insurance service optimization, Supply chain of medicines and other essentials optimization
- Personal specific strategies – Cultures/geo specific interventions, identifying the vulnerable groups, getting insights and creating datasets.
- Proactive public health – Predicting outcome of public health initiatives, risk profiling, contributary effects of broader ecosystem,
- Treatment protocols discovery – Devising new treatments models from existing data, ICT based treatment models, Genomics and biochemistry-based models and methods.
- Standardization – Creating standardized practices and using the 1MTM method for devising treatment strategies.

The different areas identified by him where AI can come in use are Indian start-ups are emerging in this field and doing a lot of work in this, but there is only 1 company in the list of global top 100 companies from India. We have a large talent pool and a lot of understanding of the medical field, but still we are unable to make a difference at the global scale. This is a challenge ahead of India and we need to change this scenario. The thing is medical domain understands the medical side, technology domain understands the technology, but there is no common ground. We need a common ground between both and make each other understand what miracles can be done in medical science when we integrate technology with it. We can change this scenario if we properly integrate the data generated by tests with proper testing. We have a lot of data generated from tests from COVID alone. This can be greatly used if any future pandemic strikes. The areas where we can use this are: Diagnostics and testing, Risk Profiling, making drug trials faster and efficient and easier drug discovery.

A big challenge is the overburdening of hospitals. The medical ecosystem has all the data but it is unavailable for the technical system. This is due to the fact that clinicians are extremely busy in their own work and hardly have any time to thing about this and share the data. This is a loop problem. Hospitals have data, but less innovators. Innovators are sitting, but are unable to get the data. We need life sciences professionals to bridge this gap. They know the value of data and how to use it as well as a lot about medical sciences too. Increasing number of life sciences personnel would be able to bridge this gap.

This is where Almed HUB comes into effect. It is a data bank of medical data, that is curated to have the data of India. It is a platform to create research lead medical innovations and solutions. This would eventually enable high impact medical research for healthcare. It is in its pilot stage having a lot of COVID data that is compiled regularly and on an urgent basis. It also has a lot of ophthalmological data from Aravind Eyecare hospital and also on cancer and oncological studies.

The goals of AlmedHUB are:

- Developing a deploying a web accessible medical databank.
- Enable experts from medical profession as well as innovators to come to a common stage to seek help and provide solutions.
- Provide anonymized data o research groups, developers and data scientists.
- And host challenges and competitions to increase participation in this field of research.

As Prof. Loganatham said, it took him more than 4 months to get to case files and then some more time to get data. This has to be changed. We need to make this process streamlined to make this a success.

In the end he shared the regulators in this space that are ICMR and other organisations and told us that the toughest part in this is to collect the data and he told that now, since medical institutes are themselves coming in this space, it may have a bright future, since data would not be a problem.

Presidential Remarks by:

Mr. Madan Krishnan

Vice President & MD, Medtronic India

Mr. Krishnan started by stating that healthy India is a successful India beacuse health is wealth. He spoke that we have a vibrant ecosystem of diagnostics, pharma and related healthcare industry, but, at the same time, we also have challenges to face that are equally large that are gaps in infrastructure and gaps in human resource as well as capital. We need to look at the bigger picture and inculcate technology with healthcare to get the best out of the system. We also need to look after quality assurance a lot. This would help in India being the leader in this and truly an Aatmanirbhar Bharat.

Mr Krishnan stated that India is the capital of non-communicable diseases. It is not something we must be proud of, but ironically work out for eradicating the same. A study from Harvard Medical School depicted that more than $5 trillion of damage is being done to economy just from NCDs in a span for few years. We are a $3 trillion economy and if we are losing so much, it is very destructive to our economy. We have a significant number of patients of diseases like diabetes that only account of 100 million cases of NCDs. Many such diseases are making India much more vulnerable.

India has close to 56% population of patients of NCDs in APAC (Asia – Pacific), but merely a 9% of market share in medical devices industry. And this makes only 0.26% of the economy. He stated that Ayushman Bharat is an applaudable scheme, but funding must be proper and reach ground level. This would be a driver of economic growth of the company. He further stated that India accounts for almost 15 percent of global population, but in terms of innovative healthcare space, we have less that 1 percent of market share.

He continued to tell about Medtronic, that is the largest healthcare provider company in the world. He stated that it keeps quality at its core. The company serves in 160+ country with lakhs of employees. The company is also in process to set up the worlds largest R&D hub outside of USA in India located at Hyderabad. This is some great news for people of India as it would bring about the talent in India and also create jobs over here.

Mr. Krishnan thinks and stated that we have to work in the areas of our core competency. We must not always look to others and do what they are doing. This would harm us more than doing good. Instead doing things of core domain would have a good impact and help the economy as well as nation. We must also ensure that technology and human capital, that are abundant in India play a key part in making the medical ecosystem of India much more prosperous.

Then Mr. Krishnan told us how medical technology is different from pharma. He told that pharma depends a lot on life sciences and chemistry, whereas medical technology depends a lot on physics and miniaturisation. This is because we need devices that are small, battery powered and portable. This would help a lot in making the devices truly reachable to masses. In this sense, medical technology has a significant higher clock speed than every such health- related company. He said that we must ensure everything is outcome based. This would enable an ethic-based research in a directional manner and not just vague research. This would be key in developing India as a global leader in health tech and become a country of excellence. New technology that are key to this are:

- Micro-Electronics
- Material Science
- Power and battery technology
- Biosensors
- Tissue Regenerative technology
- Medical Imaging and Visualisation
- Data collection and management
- Big data and analytics
- Communication sciences and platforms and
- 3D Printing

Lastly, he told us about the areas of competence where we can look forward to that are:

- Tele-health
- Diagnostic devices
- Care pathway
- AI digital tools
- Outcome analysis tools and
- Tailored products

At the end, he also highlighted that we need to develop an ecosystem of sustainable and proper competitive development with start-ups at its heart to make India a thriving economy in global healthcare space.

CIBioD Best Social Impact Innovation award to

Sh. Ramdev Krishnan
Head-Business Development-Healthcare Solution,
Tata Communications

Sh. Amar Sable
Former Member of Parliament, Maharashtra
Director, Healthy Globe

Sh. Sushil Rana
Vice President R&D,
RMS India

Dr. Rohit Garg
Laproscopic and Bariatric Surgeon, Patiala

CIBioD Best Social Impact Innovation award was conferred on Sh. Ramdev Krishnan, Head-Business Development-Healthcare Solution, Tata Communications; Sh. Amar Sable, Member of parliament, Maharashtra; Sh. Sushil Rana, Vice President R&D, RMS and Dr. Rohit Garg, Laparoscopic and Bariatric Surgeon for their contributions in their respective fields.

Recommendations:

- Availability of natural resources in ample amount for establishing high level manufacturing units for biotechnology, healthcare and biomedical sectors.
- Continuous effort should be made to improve areas such as infrastructure, roads, electricity. Other problems like crime rate, policy problems, focus areas, red- tapism and operational glitches may also be discussed.
- One sector where India can be manufacturing hub is *Point-Of-Care Testing (POCT)*.
- Affordable and user-friendly monitoring instruments and software applications (BP, Blood sugar, Oxygen level, smartphone applications)
- Promotion of Yoga for stress level management
- AI can be used for diagnostics, health service optimization, proactive public health, treatment protocols delivery and standardization. This will be facilitated by collecting and maintaining annotated public health datasets.
- Medical devices that promote health, cure diseases and provide diagnostics, all should be encouraged to be developed in India keeping in view the compliance to safety standards with the development and setting up of more MedTech centers across India.
- Outcome based and ethical research should be carried out in the technology areas of Micro-Electronics, Material Science, Power and battery technology, Biosensors, Tissue Regenerative technology, Medical Imaging and Visualization, Data collection and management, Big data and analytics, Communication sciences and platforms and 3D Printing.

Session VI: Role of Good Agricultural Practices in Health Promotion: Reduction of non-Biodegradable Chemical Entry in Food Chain

Key Points:

Agriculture can affect a range of health issues including under nutrition, chronic/ infectious diseases, food safety, environmental and occupational health. How to address these issues and to plan strategies to find the solutions to overcome these issues? Other key points to be focussed on are: Development and deployment of existing and new technologies for production, processing, preservation, and distribution of food other important health risks include agrochemical poisoning, transmissible animal diseases, toxic or allergenic agents, ergonomic hazards and accidental harms from machinery; India with huge diversity of medicinal plants is an excellent source for biomedical and healthcare support.

Participants: 187

Keynote Speech by:

Dr. B. Dinesh

Scientist-G, ICMR-NIN, Hyderabad

Dr. Dinesh began his address by talking about the Atmanirbhar Bharat. Currently working as a frontline volunteer for the COVID-19 pandemic and representing the ICMR, NIN, he shared his experiences of working in the drug division for over 20 years. Through his session, he enlightened the audience about various everyday plants that have extraordinary uses and are available for a very minimal price but can become great value addition products. One of the examples he gave in the session was that of the thorny plant called "babool", which the British brought to India and grows in deserts across the country. He discussed how his team at ICMR worked on transforming this plant into a utility product. He said that although the hard seeds of *babool* caused infection in monkeys, the seeds are used as coffee powder in some countries, including Chile. When they began working on the plant, questions for safety arose, but they were able to transform this gift from British, to a value addition product. Finally, the team found that in combination with wheat, *babool* can become a source of nutrition for the tribal communities. He then talked about the *Durva* grass that is commonly used in pujas and found that it has ten properties relating to the menopausal syndrome and could be a medicine for heart disease. He also told the audience about how they were able to translate this grass to Herbal Alternative Therapy, which is now in experimental stages and that they are in the process of submitting more documents for more formulations.

He also stressed on how the ***Atmanirbhar Bharat*** initiative is excellent in propelling forward the work he and his team are doing. His insightful address also included the example of *Patalgaurda*, a plant which is used as snake antivenom and usually collected from hilly areas like Dehradun. He said that it has a T-lymphocyte stimulating activity and is an excellent candidate to be used for tuberculosis therapy and treatment. He also spoke about the value addition of herbal plants and about making them into market viable products, giving the example of *Spirulina*, a rich source of β-carotene which could become a great dietary supplement. He said that *Spirulina* could soon be introduced in the mid-day meals programme in a jelly-like form.

He also discussed the interesting case of *Cassia tora*gum, which was exported from India to various countries in the world 12 years back. He talked about how this gum, which he had no idea about, was being used in treatment of cancer outside the country. He also mentioned in his keynote, the *Amarbel*, which is currently being used as COVID drug delivery system, and has been used as an alternative vegetable by villagers of Andhra Pradesh for a long time now. He also stressed on how these rare and unexplored plants have very wonderful effects. His keynote address had him talking about a wide variety of plants, including *gum acacia*, which was procured from the tribal population at the prices of peanuts in 1994 and has now become one of the best drug delivery vehicles. He also mentioned the drug 5-fluorouracil and how fenugreek is a very good hypoglycaemic agent and can be used for diabetes prevention. He concluded the session by saying that these herbal products and dietary products make for an excellent addition to India's Atmanirbhart initiative.

Session VI: Role of Good Agricultural Practices in Health Promotion: Reduction of non-Biodegradable Chemical Entry in Food Chain

Keynote Speech by:

Dr. Dinesh Goyal

Professor of Biotechnology, Former Executive Director, STEP, Thapar Institute of Engineering & Technology

Dr. Dinesh began his keynote address by thanking the organizers for giving him this opportunity and shared his work of the past 30 years, while also giving excellent insights on how we can move further and what we have to do yet. His address was titled "*Role of microbiome technologies in agriculture: Reduction of non-biodegradable chemical entry in food chain*". He started the keynote by talking about the current scenario of the soil ecosystem in Punjab, where nutrients deficiencies in soil are leading to deficiencies in crops and food for human beings and how, many of us are consuming water contaminated with organic residues and heavy metals. He also highlighted how industries and thermal power plants across the Punjab state have led to nitrate leaching to underground water and various health and environmental problems, like infant methemoglobinemia and eutrophication of lakes and waterways.

He also explained his *lab-to-land efforts* on innovative approaches to bioremediation and how microorganisms can be successfully used to degrade contaminants in the soil. While addressing the audience, he pointed out that a major problem is that we need to replenish important compounds back into the soil, which means there is an urgent need for monitoring soil health. And that this need is currently not being addressed as a result of the lack of equipment. He also talked about various microbiome technologies that can serve us very well.

The next part of his keynote session was focused on the market of agricultural microbials, which has become about $4,456.37 million in 2019 and continues to grow, while stressing on how we as a nation only contribute to a tiny fraction of this number. He also talked about the biofertilizer production facility established at TIET in 2005 works on developing and deploying new and existing technologies and connecting microbial potential with soil health and plant growth for sustainable agriculture. He also talked about his work in educating farmers about the various technologies, but he also realizes the need to take this process to a larger level to benefit people. He also mentioned that there is a need to address the challenges with rice and wheat products as they are the ones primarily grown in the country and how his work on algal biofertilizers is a step in that direction as these can reduce the amount of urea being applied to the crop. During the keynote, he also explained how there is a great deal of scope when it comes to developing real-time soil nutrient monitoring systems, addressing the problems of soil health and how the soil health card does it all. He also highlighted, during the keynote, the project that by 2025, soil deficiencies would reach a level where we would need a large amount of compounds for replenishing the soil. He also presented his work on identifying the sources that could be used for this replenishment. He said that there is a lot of data generated in this regard but there needs to be an innovative system to measure how we can use these resources.

He made sure to also highlight in his address the major challenge posed by metal discharging industries and how gallons of water contaminated with heavy metals ends up in fields and how unneeded heavy metals could enter the crops and finally the food chain, proving to be lethal for humans and animals alike. He also showcased the problems when he explained how a significant amount of green leafy vegetables he had sampled contain higher than permissible amounts of heavy metals like lead. He concluded his keynote by talking about the strategies and solutions we need to adopt and by highlighting the lessons we have learned so far and the lessons we need to learn in the future to protect ourselves.

Presidential Remarks by:

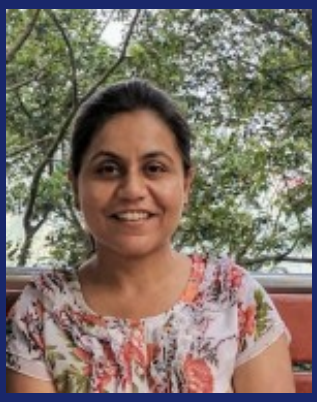
Sh. Rakesh Sinha

Member of Rajya Sabha, Govt. of India

Sh. Rakesh Sinha, esteemed MP of the Rajya Sabha and the presidential speaker addressed the audience next. During his address, he explained how India is a nation dependent on agriculture and how agriculture has been the basis of all the major social, political and economic discussions in the country. He then talked about how in India, agriculture doesn't just consist of the economic aspects like the other nations but it heavily influences all aspects in our nation. He explained how in India, the farmers are represented as *God* and how they consider land their mother and

agriculture a way to impact people.

He highlighted the importance of dissemination of the research that is being done, to the farmers in a language that they can easily comprehend, while also mentioning that ideas transcend all language and geographical barriers. He also talked about how each scientist and research group should think about the final beneficiaries of their work before starting their work. He also highlighted the need to make research accessible by recounting the experiences of students who have to struggle with the English language before they can contribute to scientific research, a challenge we immediately need to address. He also said that the media also plays a very important role in the effective dissemination of technology and that we should focus more on finding solutions to problems than trying to highlight problems and all negative news.



CIBioD Innovation Promotion Journalist of the Year Award to

Ms. Shimona Kanwar

Journalist, Times of India

CIBioD LifeTime Achievement Award for Innovation Promotion Award to

Sh. Vikas Dandekar

Editor, ET Times

CIBioD Innovation Promotion Journalist of the Year award was presented to Ms. Shimona Kanwar. Ms. Shimona Kanwar is an Assistant Editor at Times of India, who covers various topics in science and health for the national newspaper. She was lauded for her effort in simplifying science stories and making science accessible to all. While accepting the recognition, Ms. Kanwar said she hoped to take her work forward and contribute in taking Prime Minister's "Atmanirbhar Bharat". This announcement was followed by the announcement of ***CIBioD Lifetime Achievement Award for Innovation Promotion*** awardee: Sh. Vikas Dandekar, who is the Editor for Pharma and Life Sciences at ET Prime and has been tracking the pharmaceutical industry for over two decades having seen it transform from minnows to global scale.

Recommendations:

- Development and deployment of existing and new technologies for production, processing, preservation, and distribution of food while minimizing health risks should be done.
- India with huge diversity of medicinal plants is an excellent source for biomedical and healthcare support. This should be utilized.
- Herbal products and dietary products derived from plants make for an excellent addition to India's Atmanirbhar initiative. The use of local plants for medicinal purposes should be investigated and encouraged.
- There is a great deal of scope when it comes to developing real-time soil nutrient monitoring systems.
- The importance of dissemination of research in local languages for wider dissemination to the end user was emphasized.

Session VII: AI & ML in Healthcare: Synergy for Accuracy & Sustainability

Key Points:

AI-Enabled Genomics can help in the determination of personalized treatments at all levels. 3D Printing can help doctors replicate patient-specific organs. Advancements in 3D printing needs to be discussed. Other key points are : Wearable Technological devices can offer more than just counting steps such as monitoring heart rhythms, monitoring blood pressure, detecting atrial fibrillation and send reports to doctor etc. and Use of AI and ML in point-of-care devices to facilitate medical practitioners as well as common population.

Participants: 100

Keynote Speech by:

Dr. Deepak Garg

Director, LeadingIndia.ai and Director, NVIDIA-AI Research Lab, Bennett University

Dr. Deepak Garg spoke on "How AI brings synergy and sustainability in health sector". The speaker presented some key challenges and stated that if we can get over these issues then speed of acceptability in these issues as well as intervention of AI in health care will be multi- fold. The key challenges discussed were:

- Data Ecosystem: It is a challenge because the clinics, doctors and small hospitals don't know how to collect data from the patients, how to annotate it, store it and transfer it to somebody for sharing information.
- Expandability of AI: The adaptability of AI in health care is very low due to low expandability of AI in government sectors. AI is still an assistant to doctors and hospitals but AI hasn't replaced any single system. Thus, it a major road block for implementation of AI.
- Moral, ethical and legal framework: Many hospitals eve n if they want to implement AI and system is available but they are not implementing because as of now guidelines are not into practice. They don't want to violate guidelines, legal fraternity and legal obligations.

He highlighted the most important application of AI, i.e., to pre diagnose any disease so that people can avoid hospitalization. He mentioned some applications such as Microsoft has developed diabetic recognition in early stage and applications related to skin diseases.

The EHR system, a trillion-dollar industry was described by him. It is basically healthcare ecosystem in health sector. The integration of every system and implantation of AI embedded into these systems transform the whole health sector.

The recent new cases which transformed the medical industry were covered by him. The two companies Spirit-AI and Consort-AI has come up with new standards in health AI. They developed survey around the world and came up with a statement that says less than 1% of 20,500 studies of medical AI met benchmarks for quality. These protocols could help medical AI products pass peer and regulatory reviews faster, so they can help patients sooner. We need similar inputs in AI in India so that one can go through similar vigorous standards and quality of systems remains intact

Another benchmark states that insurance coverage for use of AI reimbursed Viz LVO app that spots signs of stroke so patients can receive time-critical treatments. A working application on Prosthetic leg with AI was also highlighted where the leg learns from user's movement. It is a very innovative technology which incorporates machine learning to generate human like stride.

Corona related AI interventions in the medical world were the special emphasis of the speaker. Infer vision, a Chinese company which detects signs of pneumonia on lung tissues in CT scans which helps to alleviate shortage of human technicians. Yidu cloud parses information from health care systems and track and predict the virus. Mining Lamp Technology's, a ML platform traces people who came into contact with COVID carriers. Lastly, Athena Security which scans crowds for people running in fever.

An innovative recent application "From patient to health record" describes how doctors are overwhelmed by clerical work. Healthcare –savvy voice assistants are picking up the slack. "Suki" retrieves the information from patient's records and thus is deployed in health network Ascension, Unified Women's Health Care. Also, it helps in domain for discovering new medicines such as Insilco used an algorithm of biochemical data to find potential drugs in 21 days which creates digital representations of molecules linked to several types of cancer and fibrosis. It attracted partnerships with pharmaceutical companies.

Keynote Speech by:

Dr. Rahul Garg

Innovation, Strategy and Clinical Advisor, Reinsurance Corporation of America

The title of Dr. Rahul's talk was "The Way Forward"

Why do we need AI/Ml/NLP technology in HealthCare? Is our current healthcare system not enough?

The answer to this question is, No; on various levels in our health care system we have aging problem and don't have enough human capital to serve it. There is an increase in chronic illness and lifestyle is getting deteriorated, so we need AI to be able to present everywhere and correct people's behaviour. There's no transparency in system and AI is helping in this area. So we need to figure out free time for administration for such work with use of technology.

Use Cases for AI/ML/NLP technology in HealthCare and Life Science Industry?

- Designing Clinical trials: Expedite drug discovery, shrink go-to-market timeline, and reduce uncertainties.
- Diagnostic Rules: Quicker diagnosis ahead of time, continuous monitoring.
- Personalized Medicine: Better treatment efficacy, increase life expectancy, powered patients.
- Operational efficiency: Reduce labour costs; improve patient engagement, reliable predictions.
- Population Health: Accountable care models, tailored health plans, proactive management.

Healthcare is likely between 5-7 years away from substantial momentum in AI/ML/NLP. *Technology Adoption Curve for AI/ML/NLP*

We are right now at early adopter stage. AI is an old concept as in during wrote about years ago in 1940, and then big four Google, Microsoft, Face book, Apple, Amazon built different AI and NLP models Right now companies like Tesla, Autonomous driving cars use AI very heavily and this is where we are presently and coming few years will see banks and retailers leveraging it, but then health care has usually been late majority.

Challenges in implementing AI/ML/NLP solutions in healthcare and life science industry

- Senior management lacks focus on AI/ML strategy.
- Unclear return on investment
- Untrained Human capital
- Data integrity challenges
- Regulatory barriers

Trends for AI /ML/NLP in health and life sciences

Trend 1: START-UP DOMINANCE

Smaller players are driving growth and innovation, creating fragmented market. The foremost trend is all AI that is developed are all small start-ups and we don't see any bring brand name coming up with something innovative because start-ups have that kind of stomach, that kind of risk.

Larger corporations are acquiring ML start-ups to gain understanding of concept. They focus on profit taking, they acquire small good start-ups and hire whole team to do same thing from campus

Trend 2: SLOWED DEVELOPMENTS

Every organization is solving a small piece of puzzle thus feature consolidation and knowledge exchange will continue.

Trend 3: EMERGING MARKETS BLOOM

While some ML concepts are developed in North America, technologies are tested in emerging markets.

He presented the recommendations for AI/ML/NLP and their unmet needs. The first one was preventive care which would create a compelling business care for governments to invest in ML In this space. The second was inclusion in technology development which could result in better produce and sustainable development. The last recommendation was convergence between life science and healthcare providers which would lead to value based care ecosystem.

Lastly, he concluded his talk by giving an insight that AI/ML/NLP are not the end solution for future technologies and evolution of cases but just a begining.

Presidential Remarks by:

Dr. Chander Shekhar

Head, Innovation & Translation Research & IPR Division, ICMR

Dr. Chander Shekhar mentioned about the new division that is innovation and translational research division in ICMR. In last two years, he also added one more tool in their feather which is AI & ML, a powerful tool in healthcare program. To make AI sustainable, tools have to be developed in an error free way because we are designing it for humans. He envisioned the audience by adding remarks which embarked the use of AI in health care facility.

CIBioD Best Innovation Promotion in Academics Award to
Dr. Anita Kaushal
Principal- GCG Sector-11, Chandigarh

CIBioD Best Affordable Healthcare Innovation Award to
Asian Institute of Gastroenterology, Hyderabad

CIBioD Best Innovation Promotion in Academics award was given to Dr. Anita Kaushal, Principal- GCG Sector-11, Chandigarh and CIBioD Best Affordable Healthcare Innovation award was awarded to Asian Institute of Gastroenterology, Hyderabad for their respective contributions.

Recommendations:

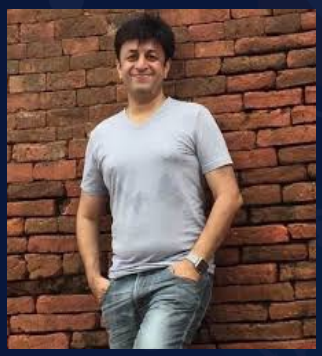
- AI-Enabled Genomics can help in the determination of personalized treatments at all levels.
- 3D Printing can help Doctors replicate patient-specific organs.
- Wearable devices can be used for monitoring heart rhythms, monitoring blood pressure, detecting atrial fibrillation and send reports to doctor etc. Use of AI and ML in point-of-care devices to facilitate medical practitioners as well as common population should be encouraged.
- Integration of AI into the EHR system can lead to prediagnosis and reduced hospitalisation costs.
- Role of AI in drug discovery and assistance to doctors are other applications.
- Governments should invest in AI/ML for preventive care.

Session VIII: Use Case Study: Why & How Telemedicine will Outlast the Pandemic?

Key Points:

Over the last few months hospitals have cancelled or eliminated elective procedures, and physicians have restricted physical access to their practices. Those trends are accelerating the adoption of telehealth services as providers and patients turn to virtual visits for safety and convenience. Interactive medicine, also known as "live telemedicine", allows patients and physicians to communicate in real-time while also maintaining compliance. Prior to Covid-19, patients used telehealth to "see any doctor," primarily for urgent care needs. The pandemic expanded the use of telehealth to "see any doctor" for the acute treatment and triage of patients with the coronavirus. But it also prompted a broader adoption of telehealth, allowing patients to "see my doctor" for ongoing care of chronic conditions. This new pattern of digital engagements is likely to continue and to increase the frequency of consultations, deepening the doctor-patient relationship. Besides why and how of telemedicine, points such as pandemic conditions can be resolved using telemedicine. Advancements in user-friendly software as well as medical device based hardware could be an important topic of discussion.

Participants: 152



Keynote Speech by:

Dr. Sanjay Sood

Associate Director & Head, Health Informatics, Centre for Development of Advanced Computing (CDAC)

Dr Sanjay Sood presented his project of E-Sanjeevani and discussed about the national telemedicine service in India, its age, distribution and gender distribution across the India using E-Sanjeevani B-HWC and E-Sanjeevani OPD. He also showed the graphics of people using E-Sanjeevani HWC and E-Sanjeevani OPD during the COVID-19 pandemic and also highlighted the top districts of India using tele consultancy outlining 300 doctors that are doing the E-consultancy service. Further he discussed about how various group of doctors and psychiatrists helps people in consultancy and how in Himachal Pradesh they are trying to bring E-Sanjeevani into practice at an old age, and to and jails, for the better consultancy of health services.They are also communicating with other companies for making it more powerful. An android app was formulated using multilanguage interface, speech to text with integrations to EXT'L system and AI Big data analytics. Lastly, he stated that in some states E-Sanjeevani is a great success for bring change in medical health services.

Keynote Speech by:

Sh. Sushil Rana

Vice President (R&D), RMS-India

Title of talk was "A path to Visual Integrated Care"

Dr Sushil Raina initiated his talk with the challenges faced during the COVID-19 in delivering the medical services. He stated that telehealth can be assumed as a lifeline in the midst of coronavirus outbreak. During the COVID-19 pandemic, mobility restrictions have made telehealth the safest interactive system between patients. Moreover, telehealth is bridging the gaps between patient physicians and health system and also helping in minimizing risk to healthcare workers which can be counted as a great initiative in health care.

The ICMR centre for innovation and BioDesign at PGIMER Chandigarh has started telemedicine services at its satellites centres in coordination with department of telemedicine PGIMER Chandigarh. Recently they focused on facilities that provide access to emergency specialist and consultation services in UNA (Himachal Pradesh) and SANGUR (civil hospital, Punjab). Department in which telehealth services has been started are cardiology, neurology, medicine, ENT, OBS, gynae, and paediatrics

He concluded his talk by mentioning various devices sent to centres with clinical significance in myocardial infarction, kidney functions, haemoglobin and also acknowledged how doctor's video conferencing facilities prove to be helpful in diagnosis of disease. He further added his comments about the reporting screen of the cloud software which they are using and disclosed their advantages such as: benefits of telehealth, system rapid access, remote access, early intervention, achieving minimal damage, shatter barriers, address strategic healthcare, accelerated interventions and improved care coordination's, etc.

Session VIII: Use Case Study: Why & How Telemedicine will Outlast the Pandemic?

Sh. Pavan Chaudhary
Chairman & Director General, MTaI
(Moderator)

Sh. Pavan Chaudhary
Chairman & Director General, MTaI
(Moderator)

Sh. Gautam Khanna
CEO , Hinduja Hospital, Mumbai

Sh. Pavan Chaudhary
Chairman & Director General, MTaI
(Moderator)

Sh. Hitpreet Kang
Global Head Strategy and Sales,
Clarity Medical

Panel Discussion: Panel discussion was moderated by Sh. Pavan Chaudhary, Chairman & Director General, Medical Technology Association of India (MTaI), Managing Director, Vygon India. He discussed the topic by seeing it through eyes of different stakeholders like patients, doctors or providers, and the government. Since the sofa of healthcare has been residing in shrine of hospitals, he asked Dr. Gautam Khanna what telemedicine brings for doctors and providers.

Dr. Gautam Khanna, CEO, Hinduja Hospital, Mumbai; President, associations of Hospitals, Mumbai; Co-Chairman, FICCI Health Services described statistics about telemedicine market which stated this market would reach 5.5 billion in 5 years and 4 things that are teleconsulting, tele pathology, teleradiology and e-pharmacy will contribute 95% of this growth. He mentioned that 11% of sessions happened through a practice management software, rest has all been over phone calls. Patients could upload the report in system so that doctors could provide them with e-prescriptions. A 3-way consultation can be beneficial to patients as well as doctors. It has given opportunity to hospitals to prescribe across the country and gave opportunity for less crowding in hospital infrastructure.

Dr. Vaibhav Tewari, CEO, Portea Medical, Bengaluru, Karnataka, India discussed about why patients have opted for telemedicine and why it has helped them. Their contribution to telemedicine has supported over 2 lakhs patients in isolation in COVID hit. Hospitals put doctors into teleconsulting and all pieces around managing patient's lifecycle.

Dr Pavan concluded by adding some points like patients can take tele-education to a new level, prioritization of patients can be done, pressure for doctors can be released, inaccuracies and waste can be reduced through this domain.

Further, Dr. Odd Sandbekkhaug CEO & Co-founder of Infiniwell added to conclusion that patient wants to stay home and monitor from homes only. It's an empowerment scenario when doctor visits through phone calls reducing physical and psychological movements of patients.

Dr. Hitrpreet Kang, Global Head of Strategy and Business Development, Clarity Medical Chandigarh, mentioned the delivery of right solutions to health systems. The pandemic gave telemedicine thrust and push to come into main stream. Adoption in medical platforms can be driven if risks are under control. The patient and physicians regulate trust among each other in terms of data which has to be reliably stored and trustworthy.

The panel chairman Dr. Pavan Chaudhary concluded with advantages of telemedicine that involves reduction in extra charges for visiting, overcome shortage of burses and doctors, layered consultation for patients, online money transfer which would benefit patients in many aspects.

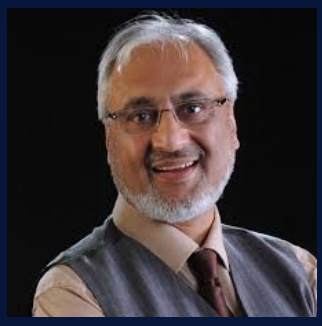
Session VIII: Use Case Study: Why & How Telemedicine will Outlast the Pandemic?

Special Address by:

Dr. KK Talwar

Former Director, PGIMER

The special guest of session was Dr. K.K. Talwar, Former Chairman, BoG, Medical Council of India, Former Director PGIMER, Chandigarh. They initiated Telemedicine in PGI in 2005 to outreach medical services. He mentioned telemedicine as a hybrid for both education and health in coming years. He congratulated organizers for organizing such a great event virtually by connecting expert from different domains on a single platform.



Presidential Remarks by:

Dr. JS Bamrah

Chairman, British Association of Physicians of Indian Origin

The session was concluded by Dr. J.S. Bamrah, Chairman, British Association of Physicians of Indian Origin. He mentioned about safety and confidentiality in telemedicine. He discussed about Telemedicine aspects and their spread in rural areas as well. He also highlighted advantages of Telemedicine such as cost effectiveness in situations such as COVID.

Vanavasi Kalyan Ashram

Vanvasi Kalyan Ashram

CIBioD Social Leadership for Making Healthcare Affordable Award to

We for WE global campaign WOMEN EMPOWERMENT

We for We

The insightful session was followed by the announcement of the CIBioD Social Leadership for making Healthcare Affordable award. It was awarded to the organisation "Vanvasi Kalyan Ashram". The second award was given to "Langar for zero hunger" (We for We-Global Campaign for women empowerment).

Recommendations:

- It was emphasized that a broader adoption of tele-health, allowing patients to "see my doctor" for ongoing care of chronic conditions, should be done. Advancements in user-friendly software as well as medical device based hardware are important steps in this direction.
- Projects like National Telemedicine service e-sanjeevani should be encouraged.
- Need to develop more platforms for access to emergency specialist and consultation services in remote areas using video conferencing and reporting mechanisms of cloud software.
- Safety and confidentiality need to be ensured while providing tele-health services.

Key Points:

The ongoing revolution in Information and Communication Technologies (ICT) has paved a way of transmitting knowledge globally, thus paced the innovation significantly. At the same time innovation and production activities of the companies are globalizing. This raises challenges in protecting, managing and enforcing Intellectual property rights across borders. So there is a need for information and implementation of well-designed IP systems to encourage the future innovators; Use of new technologies for innovations and how it can be used as an IP for the betterment of the human race; Commercialization of IP but keeping in mind the demand of the economy of the country involved (as it is an international summit so we can focus for this point towards Indian scenario)

Participants: 128

Chief Guest

Sh. V.Muraleedharan

Minister of State for External Affairs, Govt. of India

Sh. V.Muraleedharan sent his wishes and congratulated CIBioD team for organizing the global summit on the theme that is most relevant in today's scenario. The efforts and the deliberations made in this direction will strengthen the country to be self reliant and set a milestone in positioning India as a global hub for manufacturing medical devices.

Keynote Speech by:

Dr. Chieh-Hsiao Chen

Chief Medical Officer & Founder, iXensor Inc.
CEO, Brain Navi Biotechnology Co. Lt

Dr. Chieh briefed about managing and enforcing Intellectual property rights across borders. He highlighted the need for information and implementation of well-designed IP systems to encourage the future innovators and use of new technologies for innovations and how it can be used as an IP for the betterment of the human race. Commercialization of IP but keeping in mind the demand of the economy of the country involved (as it is an international summit so we can focus for this point towards Indian scenario). Dr. Chieh Hsiao Chen also briefed about Brain Navi Biotechnology Co. Ltd. And about the ongoing Projects of Nasal Swab Robot as it is Accurate, fast, safe and comfortable, Includes Mini PCR/ Ag Test within 25 minutes, it's Auto sample collection. After this, He explained about NaoTrac technology, Autopilot Neurosurgical Navigation Robot, Auto Patient Recognition, Planning Documents/ Robot and Instrument Recognition.

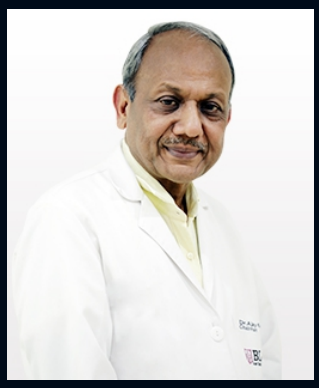
Keynote Speech by:

Mr. Vikas Asawat

Patent and Trademark Attorney

Mr. Vikas explained about the theme of the session, i.e., need for information and implementation of well-designed IP systems to encourage innovators, use of technology. like AI and ML for innovation and betterment of human race and Commercialization of IP, keeping in mind the demand of the economy. Due to the Pandemic, various medical technology start-ups have emerged and they require to fulfil various criterion in order to get Intellectual Property Rights over a particular technology , then about Clinical trial/need, proof of concept, working prototype, actual product, standardization compliance and market acceptability etc , told about the Software that can never be patented, it can only be patented in the form of Copyrights or in synchronization with some hardware.

He lighted upon the **CONCERNS IN PATENTING**: Patent is a territorial right, variation of patentable subject matter in various jurisdictions, Difference in formats adopted in different patent offices, Fees to be paid for prosecuting the applications, Enforcement of individual countries and Suitable marketing and license agreement enforceability. He made aware about **PATENT ISSUES**: Medical device patenting is a speciality and requires advance knowledge, Careful drafting of patent application to avoid the risk of infringement. **FACTORS AFFECTING VALUE OF INTELLECTUAL PROPERTY:** Short/ legal span of various types if IP , Availability of alternatives for IP, Likelihood of third party claiming the parallel ownership of IP and Suitable marketing strategies of the instant IP in terms of aggressive or conventional marketing strategy and those which are Non Patentable :Medicinal Methods, Surgical Methods ,Curative Methods , Diagnostic Methods ,Prophylactic methods ,Therapeutic Methods, Second medical use, Fixing of doses . Effect of claim language on patentability: method of treatment is not patentable; Composition claim is patentable and guided about the Provision of compulsory licensing in case of national emergency like situations.



Presidential Remarks by:

Dr Ajay Kumar

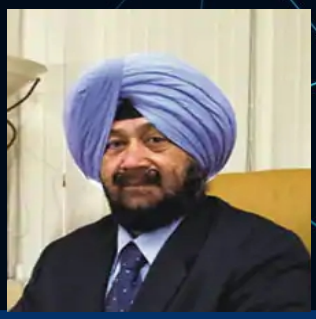
Chairman, BLK Institute for Digestive & Liver Diseases,
BLK Super Speciality Hospital, New Delhi

The session was concluded by Dr Ajay Kumar, Chairman, BLK Institute for Digestive & Liver Diseases, BLK Super Speciality Hospital, New Delhi. He mentioned about importance of IPR & Commercialization in Innovation and product design.

Ms. Jaya Bhardwaj

Principal, DAV School, Panchkula

CIBioD The Healthcare Social Work Award of the year to



Sh. SPS Oberoi

Chairman of Sarbat Da Bhala Charitable Trust

CIBioD The Healthcare Social Work Award of the year was given to Ms. Jaya Bhardwaj, Principal, DAV School, Panchkula and Sh. SPS Oberoi ji, Chairman of Sarbat Da Bhala Charitable Trust, for their contributions and philanthropy work towards the society.

***Recommendations*:**

- Need for information and implementation of well-designed IP systems to encourage the future innovators was highlighted.
- Commercialization of IP keeping in mind the demand of the economy of the country involved, can be done.
- Knowledge about medical device patenting should be propagated and the alternatives to IP, issues in patenting and IP should be disseminated.