

Personalized health care will revolutionize 21st century medicine, says NJIT professor

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A closer look at personalized or point-of-care healthcare was the focus of a recent international conference in India organized and chaired by NJIT Distinguished Professor Atam Dhawan. The IEEE Engineering in Medicine and Biology Society (EMBS) International Special Topic Conference in point-of-care healthcare technologies, broadcast around the world, focused on topics ranging from 21st century medicine with new smart cross-and trans-disciplinary technologies to how wireless communications will change how physicians care for patients.

"The last century witnessed a [technology revolution](#) in medicine and health through instrumentation, computer and information and communication technologies," said Dhawan, an electrical engineer. "This revolution has continued into the 21st century innovations re-defining the relationship between patient and healthcare providers."

Conference trends included the following.

- New smart cross and trans disciplinary [biosensor](#), [biomarker](#), and information and data communication technologies will become more widely used. These technologies, along with health monitoring and data analysis systems, address healthcare priorities in developing and developed economies. Among the key priorities: hypertension and cardiovascular diseases, diabetes, infectious disease, women's health during pregnancy and elderly healthcare.

- As life expectancy increases, the global community will face new quality of life and healthcare challenges at an affordable cost. The most vital challenge to [developing nations](#) is providing minimal quality healthcare to rural communities.
- Miniaturized devices and [wireless communication](#) will change dramatically how physicians and surgeons can care for patients and the role patients will need to take in their own health care.
- The hope is that health care will become more personalized through the tailoring of interventions to individual patients.
- Providing minimal healthcare in the eastern part of the globe which accounts for more than two-thirds of the world population will remain challenging especially for curbing diseases and infections like HIV/AIDS, tuberculosis or malaria. The issue will become more critical if there is a potential outbreak of an epidemic.
- Educating users on the implementation of these new technologies, data communication, compliance and behavioral change poses the most formidable challenge. People will need to realize and accept a new role and responsibility in keeping themselves, family members or others healthy, said Dhawan.

"It appears that personalized medicine or point-of-care healthcare technologies are creating a paradigm-shift in global healthcare. However, the development, deployment and compliance issues related to affordable global healthcare must be examined towards developing sound business models so they can be sustained with an economic impact to support the implementation infrastructure."

Dhawan, who is also the interim dean of the Albert Dorman Honors College (ADHC), was selected to represent the IEEE Engineering in Medicine and Biology Society as a 2012-2013 Distinguished Lecturer to travel worldwide providing lectures about advances today in medicine and technology. In December, he was a special guest lecturer at Cornell

University.

Dhawan is best known among engineering peers as the inventor of an important innovation for an instrument commonly used to detect skin cancer—the nevoscope. The optical transillumination technology developed by Dhawan was also commercialized into a line of vein visualization products, Veinlite.

Dhawan currently is developing a multi-spectral optical and near-infrared tissue imaging technology to measure and monitor glucose levels in the blood non-invasively without painful pricking to get a drop of blood as required by conventional glucose monitors.

Dhawan is the founder and executive director of the Interdisciplinary Design Studio offered to ADHC students. The Studio is a unique, enhanced undergraduate research program focused on teaching students a roadmap of innovation to entrepreneurship, where students develop innovative ideas of commercial products, designs or services with high-potential impact under a streamlined curriculum, faculty advising and industry mentoring over three and a half years.

Provided by New Jersey Institute of Technology

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