

Research and Innovation in Medicine : Challenges and Opportunities

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In 1881, when American President James Garfield was shot at his back inside a train station, even the best doctors attending on him could not save him. The president died 80 days after he was attacked simply because the bullet could not be located inside using current technology. Invention of X-Ray was some 14 years away.

It is well-known that Professor Wilhelm Conrad Roentgen's accidental invention of X-Ray in 1895 has revolutionised the practice of medicine forever.

A little over hundred years now. Through research and innovation modern medicine has completely changed the conventional concept of health care and disease management. Patients feel more assured and doctors more confident in treating their patients. Massive progress can be seen practically in each and every sphere of medicine and health-care activity. Doctors and scientists today venture to dream to take control of human life. Efforts are on to bring on earth disease-free newborn and manage diseases through bioengineering.

With the rapid advances in science and technology during the last 50 years coupled with mind-boggling communication revolution through information technology, the health sciences and health care practices are throwing possibilities and challenges never thought before. From the latest technology in imaging to new information in cell biology to genomics to proteomics to metabolomics to targeted drug delivery in cancer treatment to application of nanotechnology to experiments in stem cell implantation—every area and speciality is flooded with information. Happily, active researchers and practitioners are taking advantage of this scenario.

As a direct benefit of the improved health care, the developed nations have been able to provide quality care to their citizens. It is heartening to note that general longevity has increased in most of the countries. Increased longevity and changing life style have thrown up a new set of problems and challenges.

Despite all our knowledge and achievements we still need to work to understand Alzheimer's and many other neurological conditions including paralyzing afflictions such as multiple sclerosis, muscular dystrophy, ALS (Lou Gehrig's disease) and spinal injury.

Cancer is another area where more information is required. New ways to predict genetic susceptibility are being developed, and fresh insights on the regulation of cell division and programmed cell death are providing novel approaches for treatment.

Paediatric illnesses, birth defects and inherited disorders are another group of afflictions which need our attention. Knowledge of the genetic code has opened the way to prevent and cure a host of pediatric diseases. Many illnesses that strike at an early age have genetic influences -- congenital heart diseases and other birth defects; sickle-cell disease; cystic fibrosis and other pulmonary diseases and many forms of pediatric cancers.

Infectious diseases and immunology are areas which would demand our special attention for years to come. We need to develop better vaccines to prevent infections and more potent medicines to treat them. Immunological studies are revealing the body's special defense mechanisms, how they can go awry and how they may be enhanced. There is also an urgent need to accelerate our battle against conventional infectious diseases such as meningitis, hepatitis and AIDS.

Basic molecular research, biostatistics and computational biology. Molecular research in the human genome has provided promising data. Researchers will increasingly rely on biostatistics and computational biology, burgeoning fields that merge computer science and biomedicine. Clinical diagnosis and research are being transformed by amazing advances in the ability to make computer-assisted images of the body's organs, tissues, cells, and molecules. Partnership with biotech companies will ensure that our discoveries are translated as rapidly as possible into effective and useful products.

Delivery of clinical care and service. Despite breakthroughs in research and innovations in clinical practice, it has not been easy for the patients to access medical service, particularly in developing countries. Technological development and clinical excellence have no meaning if the practice of medicine is not patient-centered. Technology and innovation have added to the cost. Without heavy subsidy from the government, a large majority of the population, particularly in the third world countries, find the health care beyond their reach. Even the richest nation on earth, the USA, faces this problem, where several million people cannot pay for health insurance. This situation presents a contradiction that the new knowledge and innovation cannot reach people who need it most. This is a big challenge for the governments, hospitals and doctors.

Facilities, equipment and information systems. Without modern facilities and equipment, even the best and most committed scientists cannot apply their full intellectual resources to get the optimal result. It is essential to provide good ambience and facility in the work place including user-friendly telephone system and computerized medical records.

Last but not the least, the doctors must adhere to ethical practice and they must command the trust of the people.

Advanced nations are already busy in planning comprehensive development in the health sector to achieve optimal result. Needless to say that it is essential to have a multi-disciplinary approach with the help of leading centres working in various fields. Research and innovation are indeed important in medicine but it is much more important to reach the people who need it most. To start with, we need to conceptualise the development process. The next stage would be to focus on developing drugs, medical devices and clinical procedures. The most important job, however, is the effective translation of research results into clinical practice.

The practice of medicine and health-care delivery no longer remain confined to the professionals and health administrators. The entire chain involves a large number of experts from the fields of social science, psychology, behavioural science apart from religious and community leaders. It now requires planning at the highest level and implementation through multiple agencies. People expect service both at the grass root level as well as at the tertiary centres.

Ladies and Gentlemen, in this era of plentiful knowledge and information explosion, doctors and researchers would lose their credentials if they do not reach out to the people who need their service most. Therefore, the real challenge lies in meeting the growing expectation of the people and continuously upgrading the capacity of the government and the service providers. As we all know, everything needs money. And money is in short supply, particularly in public fund. It is for the governments and institutions to set their priority.

Friends, Ladies and Gentlemen! I sincerely thank the Director, his faculty colleagues and students of the Postgraduate Institute of Medicine, University of Colombo, for inviting me on this occasion. I am indeed grateful to all of you for your patience and indulgence.

(Professor Ramesh C. Deka , Director AIIMS, New Delhi delivered this speech as Guest of Honour at the 30th Annual anniversary of Academic Sessions of Postgraduate Institute of Medicine(PGIM), University of Colombo, Colombo, Sri Lanka on 27th April, 2011).