need for innovation in medical institutions

Practice of Medicine is rapidly changing the health seeking behavior around the world, however, an important aspect of this field hasn't changed in India. For instance, we have not witnessed credible translation of medical training or knowledge into indigenous solutions for surgical modalities or diagnostics. Can we do something about bringing transformation in order to make larger impact on Indian society? Let us discuss the various models of how to fill that big gap: the distance between competence and excellence, and how by doing so, one could attempt to amplify the efforts through multi disciplinary patient centric approach.

Overcoming stereotypes

There are a number of things that one is taught which are believed to be correct at the time of medical training. However, much of it has the possibility of being incorrect as one begins to test waters in real life. Avoiding the trap of thinking that one knows everything as well as projecting this to patients as such generally helps one excel and maintain an honest relationship with patients. Therefore, carrying the amber of doubt in the practice of medicine is the key to advancement in the field. For the very reason that doctors are often perceived as having certain stereotypes: all knowing, upright, trustworthy, clever, conservative, authoritarian etc, as medical students, one may have pressures to conform to one of these stereotypes. One shouldn't. A lifetime spent trying to become something you are not may destroy you. Being oneself and trying to learn steps that help bridge the gap that separates one from simply being competent to being excellent and innovative is the basis of originality in research and translation. One of the recipes to instill innovation is also to become investigative, carrying the amber of doubt while accosting every patient in a clinic or ward. There are many thinkers that argue that doctors should even share their ignorance with patients and together help patients overcome their misery. Evidence shows that genuine partnerships with patients generates better outcomes and greater satisfaction for both patients and doctors.

Innovation

Medicine is not only clinical work, it is much more: working out relationships, teamwork, communication skills, research, innovation, publishing and critical appraisal. With the amber of doubt one is more likely to discover new clinical associations, syndromes, and solve problems that medicine had never previously resolved. However, such efforts require multidisciplinary approach that should include individuals from basic sciences, engineers, MBAs and even patients. Some of us wonder why is this important when rush of patients need to be immediately addressed. This editorial is an attempt to argue that a link exists between such innovative endeavours and value addition in practice of medicine. As mere glance at the make of hospital instruments or prescription of drugs reveals that most of these are imported, invented by individuals outside India. India pays a huge cost for buying these drugs and instruments in the form of inventorship costs i.e patents acquired by scientists who are not resident Indians. These individuals have even gone out to win Nobel prizes in Medicine. Eventually, the cost of import combined with commercial cost of patents held by these individuals (read countries) is recovered from the end user i.e the patients. If the these individuals could be one among us, being passionate about converting the zeal into undertaking that journey between competence and innovation, such inventions could transform the Indian medical world. This is possible in collaboration with other stakeholders in healthcare systems such as Pharmacologists, basic scientists, venture capital and engineers. Such models have capacity to drastically reduce the healthcare costs directly affecting the costs of healthcare delivery. This is exactly why many of us argue research and innovation as the potent tool to advance our knowledge economy (or health economics), in whatever way one puts it.

There are limited number of innovators in India such as Dr. Sathya Jeganathan who invented low cost incubators, Dr. V Mohan who spearheaded mobile telemedicine clinic, Dr. Prakash Khanzode who invented affordable patient beds and so

on. There are even student role models who have published over two dozen articles in international Journals while in final year of MBBS. However, such examples need to increase in numbers. Kalam-Raju stent is another example of home grown stent which could not have been possible without residents not taking such an initiative outside immediate call of duty. The ability to say 'Yes' to opportunities outside immediate world of clinics and surgeries and venturing into medical innovation may add even great value to the healthcare landscape in India. It is time that our residents and trainees step out of the routine medical world and play 'larger' role in patient care through innovation driven entrepreneurship.

Research learning cycle

Learning is the basic ingredient for innovation. Orthodox learning may have stopped for us today, with acquisition of degrees, however, neither us nor our senior teachers can claim to know everything. They are still students as much as we are and are still learning. There are many methods of learning that are available in the field of medical education and depending on the one you adopt, you can make bigger impact in your field. Conversational or blended learning involves combined interaction and discussion at multi disciplinary level which has often been advocated to result in innovative spirit and should therefore be encouraged. Every patient, for that matter, can be regarded as a learning material as well as a research project that requires one to pause, listen and investigate, treating a patient not as organism replete with similarity of symptoms that characterize a certain disease, instead, one with a unique phenotype. Documenting and building patient data and compiling various investigations from various patients examined, may result in generation of new knowledge that can be useful drug trials and systematic reviews of tomorrow. These ideas can also become the grant applications seeking research funding from funding agencies. The colleagues in research learning approach could become our collaborators and the data we generate can become original research papers and patents.

Applying such knowledge for innovative solutions to existing clinical situations may then lead to discovery of new drugs, surgical techniques or diagnostics which is what India needs today at an affordable price in order to transform its health-care infrastructure.

Nobel Prizes

At this point it would be pertinent to be introduced to the world of high achievers most of whose research and innovation has transformed healthcare. Analysis shows that majority of Nobel prizes, constituted by Alfred Nobel's foundation, to reward the outstanding contributions towards mankind, have been won by individuals from West. Closer analysis also shows that average age of research productivity of these Nobel Prize winners peaks at 35-45, which is the age we reach in a couple of years after getting the regular tenure track. With an award coming from Alfred Nobel's will, each prize continues to approximate a staggering USD 1 million. Many surgeons and physicians have distinguished themselves by winning Nobel Prize in last few decades. These include Prof Banting (for Insulin), Prof Yamanaka (for induced pluripotent stem cells), Prof Mansfield (for MRI) etc. With growing number of MD Nobel laureates the national focus has shifted towards capitalising the potential of the physicians and surgeons so that they could convert clinical knowledge

into innovations. Such innovations from India can have immense ripple effect on patients whom we have not even seen. This was also the reason cited by Prof Yamanaka when he described his shift in focus on medical research (than just clinic) while choosing to work with induced pluripotent stem cells and providing a technology to convert skin cells into embryonic like stem cells, a feat that won him the Nobel Prize in 2012.

These efforts could not have been possible but for a care for quality work: generating data that is authenticated, test samples which could be back traced and records and investigations which could be audited. In other words implementation of quality systems is the heart of innovation. Working in an accredited hospital is a definite advantage for those clinicians who wish to organize their time well. Those hospitals who do not have such systems should implement such guidelines in order to bring more transparency and quality in practice of medicine. Medical students should similarly participate in activities of quality clinical care. Collaborative spirit combined with inter disciplinary pursuits in Medicine is the only way one can bridge the chasm that separates competence and excellence.

Mentorship

Mentoring requires a big heart and passion to derive pleasure at one's trainees surpassing our own professional exper-

tise. The joy of celebrating colleague's success is not experienced by each one of us. Only those who have crossed that vital bridge separating mediocrity from excellence experience such a bliss. We should aspire to reach that stage from where we do not envy anyone, from where we are able to disseminate knowledge, wisdom and share experiences.

Last, but not the least, it is important to emphasise the value of creating female medical leaders in the field. With their increase in the field, very few have reached the top managerial positions. Even reviewing the gender based winners of Nobel laureates, only 85 out of 823 Nobel Prizes have been found to belong to females (with Madam Curie topping the list). This needs introspection. Studies have also shown that female students do exceedingly well in their academics but are reluctant to take up leadership positions in academia and innovation enterprises, leaving enough scope for filling the void. Female medical students should therefore seize the opportunity and lead the field by participating in innovation endeavors so that the mankind can benefit from their intellect, compassion and integrity.

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