

## Innovation in Medicine: New Ideas for Translation

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The term *innovation* was derived originally from a Latin term '*innovare*' which means to '*introduce new*'. Medical innovation means introducing something new to medicine or its related fields which could help or benefit patients resulting in better clinical outcomes or delivery of better quality health care. As we talk about medical innovation, if we look back in time to somewhere around 1000 and 600 BC, on the banks of river Ganges in the city of Kashi, lived the current father of plastic surgery and the author of 'Sushruta Samhitha' - The great Sushruta who has innovated around 125 surgical instruments and 300 procedures.<sup>1,2</sup>

Out of his many astounding accomplishments, his biggest achievement is 'the Indian method of Rhinoplasty' (nasal reconstruction) which is the best and oldest practice stated so far in the literature.<sup>1</sup> The reason 'the Indian method of Rhinoplasty' has emerged as the best procedure is because of its requirement and demand in the society. The judicial system that prevailed during Sushruta's time was on the lines of Puranas, where cutting of nose and ears was a common punishment. In the epic tale of Ramayana, we notice that Lakshmana cuts off the nose and ears of

Shurpanakha as a punishment for her actions.<sup>3,4,5</sup>

Travelling back in time, we notice the doctor or the vaidya's involvement in medical innovations is tremendously high and it caters to the needs of the society.

Now, coming back to our current time, the need for innovations is huge. With advancements in science and technology, their applications are deemed necessary in addressing the medical problems, there by shaping a better and healthy society.

The society has emerged in such a way that doctor treats patients and engineers build things which may sometimes lead to bad outcomes due to the engineer's insufficient knowledge of medicine. I am not emphasizing that doctors should do innovations but suggesting an interdisciplinary approach among doctors and engineers to derive a solution for a better clinical outcome.

With our current medical education system, medical students including both undergraduates and post graduates are more confined to reading textbooks<sup>6</sup> and lack in understanding the core problem.<sup>7</sup> In their journey of becoming a clinician, students are simply taught to memorize arcane textbook treatments rather than

taught to contextually engage with individual patients to identify their unique and precise requirements towards delivering Precision Medicine.

So, revision of the current undergraduate curriculum is a must and should be focused more on critical thinking, an innovation-oriented lens which helps in identification of lacunae and clinical needs among the patients. It also needs an integrative approach with other departments such as biotechnology, designing and engineering to find a solution to the problem.

For this, I propose an idea of integrative, interdisciplinary communication between the various disciplines of sciences called **Innovation Cell for Health Care (ICHC)**.

Innovation cell for health care is a conversational platform which allows the students and professors across India to raise questions and solve the problems and challenges they come across in the treatment, health care delivery, and other aspects of health care.

This conversational learning platform has already been functioning since decades on online social media led by a few medical students and further details on their workflow can be accessed in the following reference.<sup>8,9</sup>

For a medical innovation to happen usually two to three team members of various disciplines such as an engineer

(biomedical or electrical or mechanical), clinician and product designer are required. Very few universities in India have an interdisciplinary approach where various disciplines are present in one place. For example, in an average Indian medical college has an only medical, dental and nursing stream with no contact with other disciplines of education to promote an integrative approach towards problem-solving.

Thus the lacuna I find is the lack of interdisciplinary communication across the various fields and stakeholders. ICHC serves as a platform where students, professors, and others can raise a question among the group members for discussion. These members with the appropriate knowledge and expertise vigorously discuss among themselves, to reach a solution through collective conversational learning and find out the potential solutions to current problems in health care.

#### **Workflow of Innovation Cell for Health Care:**

The concept of ICHC is based on User Driven Health Care (UDHC) and its agenda of "global learning towards local caring."<sup>8</sup> Similar to states of India, ICHC is divided into different states and is operated at the state level. It creates a common platform for all the members to raise their questions. The members are usually students and professors of various colleges across the country.

Once a question is circulated among its members, the questioner has a privilege to make a small group of focused members which allows them to discuss the possible and feasible solution for the problem. The small group thus created avoids the spamming, copyright and patent issues.

The group while creating a prototype requires funding or experts' advice which can be addressed to the ICHC that gives them an opportunity to interact with the experts', funding, to justify for clinical trials and even bringing it to the market.

#### **Urgent need for Innovation Cell for Health Care in India:**

- India is a vast country with a population of around 1.3 billion. To meet the unmet needs of the population, India must develop cost-effective solutions, especially in the healthcare delivery. Apart from the population, India is also known for its vast cultural diversity and practices which are specific to a particular region.

- Due to the wide practices and complexities in India, region specific solutions must be created and not a standardized solution for the whole country. ICHC can make this possible and also improve the quality of care.

- India, on the track of economic growth is also in enormous need for its own medical innovations and therefore

ICHC can act as a bridge to meet those needs.

#### **Advantages of Innovation Cell for Health Care:**

- ICHC allows students and professors to enrich their knowledge and increase their experience in various other fields apart from their respective fields and also leads to an increase in their critical thinking abilities and management skills.

- It is also useful in developing frugal innovations especially as it is the current need in developing countries such as India.

- It also leads to a decrease in the number of unmet needs of the society and equally provides an opportunity to everyone including both students and professors to have a patent in their name as a reward for their achievement.

- Always, it is believed that opportunities are generally given only to elite institutes, but this strategy or approach allows equal opportunity for everyone to work on something from their undergraduate level.

- Preferring western innovations over Indian is usually practised but innovation cell for healthcare (ICHC), may bring the change and shift the market towards Indian innovations which can be the real game changer.

· Cross-pollination of ideas takes place when qualified people belonging to different fields share one chat room leading to evolvement of the scientific community for a better and healthy society

· With this, there would be an increase in the number of physician-scientists and physician-innovators, which is an essential requirement for the improvement of healthcare in India.

To quote an example, one of the physician-innovators Dr. Jagadish Chaturvedi recently came up with an affordable ENT multi-scope recorder for the early detection of laryngeal carcinoma in rural areas. He was doing his post-graduation while he invented the device. A simple question of why patients are coming with an advanced stage of laryngeal carcinoma from rural and semi-urban regions led to this invention and subsequent 18 other inventions following it.<sup>10</sup>

Similar kind of conversational collaborative learning was started by students and professors all over the world for better patient outcomes. This is being done by critical appraisal of studies, and clinical decision making through evidence-based medicine. This reduces overtreatment and over diagnosis. It is known as CBBLE (case-based blended learning ecosystem) and on further scaling up of this unique strategy, CBBLE would come up with

innovations similar to ICHC in improving patients clinical outcome .<sup>11</sup>

With the introduction of ICHC, there would be generations of out of the box ideas, equal opportunities for everyone, increased healthcare delivery, increased transparency, increased number of Indian healthcare products, increased frugal innovations.

### **ICHC for Universal Health Coverage and Sustainable Health Development in India:**

With increasing population and its demanding needs, with a concept of universal health coverage, advances must be brought and innovations must be done keeping in mind the cost effective care. To achieve it, ICHC would play a chief role in developing accessible, efficient health care.

It also helps in achieving the health related Sustainable Developmental Goals more quickly by innovations coming from all over the India.

Hence without hesitation, I would like to advocate for ICHC, where there would be a translation to an effective healthcare system and low-cost health care delivery which is an utmost requirement for any developing country especially India.

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