Doctor Driven Innovation: How MedTech Players are Transforming the Indian Healthcare Sector

India continues to import over 75% of medical devices and this is how it needs to change

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Jan Arogya Yojana (PM-JAY) (aka Ayushman Bharat Scheme) launched in September 2018 by the honourable prime minister Narendra Modi is the world's largest state-funded health insurance scheme. While this scheme aims to reform the Indian healthcare sector by providing free secondary and tertiary care to over 50 crore citizens, it doesn't address one of the biggest challenges the nation is plagued with – a steep imbalance in doctor-to-patient ratio. According to a recent study by the Center for Disease Dynamics, Economics & Policy (CDDEP) in the US there are at least 600,000 doctor shortage in India, especially in rural India. Along with this problem, archaic infrastructure and limited resources are among the major factors compromising the quality of healthcare in India. Doctors often have to work in harsh environments with inadequate staff, medicine and equipment. This gives rise to an urgent need for the development of holistic indigenous solutions that can address the country's healthcare woes while lending a helping hand to doctors.

Traditionally, our society placed more emphasis in conformance and reproducibility rather than innovation and novelty. We have been to a great extent a risk averse society that adopts proven systems and technologies even at the risk of being late to the table and not reaping potential early adopter benefits. This is one of the reasons why technology-led product innovation is essentially non-existent in Indian healthcare. India continues to import over 75per cent of medical devices, with most home-grown companies focussing on manufacturing low-cost commodity products like bandages, syringes, patient monitors, test kits and stainless steel instruments. Even here often production of components or devices as a whole is done outside the country. Only a handful of MedTech firms are engaged in the creation of novel products, thus hindering cost-effective delivery of state-of-the-art healthcare services to the larger population. The complex regulatory framework, difficulty in doing business and lack of a supportive ecosystem are a deterrent or stumbling block for many

companies. The lack of clinical engagement in the development process leads to a disconnect between the end user and. This leads to an innovation gap and lack of adoption of the end product. A lot of challenges can be overcome if the right need is solved the right way. A multidisciplinary approach centered around the treating physician is the best way to innovate medtech.

For doctors, by doctors: Product innovation journey

In order for innovative products to make a positive impact in the healthcare industry, all the stakeholders, including the government, innovators, patients and healthcare providers need to be engaged. The most successful medical device companies, indeed any product company pursue ongoing stakeholder engagement. The active involvement of doctors in every stage of the product development process is encouraged.

One of the major healthcare challenges we are trying to tackle is the prevalence of Ventilator Associated Pneumonia (VAP). This is a condition where a patient on ventilation for a few days develops a lung infection that results in over 250,000 deaths each year in India alone. Globally also, this is a major problem that occurs in around 30% of all long-term ventilated patients and is associated with a mortality of 40-50%. While VAP and indeed any hospital acquired infection can be prevented with frequent and skilled oral hygiene management, a large number of Indian patients still end up contracting lung infection during ventilation due to the country's overworked staff and lack of appropriate tools. To develop VAPCare, the team consisting of designers, engineers and physicians first immersed itself in the clinical setting. They spent months observing procedures, healthcare providers and patient outcomes in critical care. This lead to identifying and understanding critical unmet needs. VAP was one such need. Following this a detailed need specification document was created identifying the gap and presenting the technical feasibility and business case for solutions. The same team went on to brainstorm concepts and finally hit upon what we believe is a solution. VAPCare is a sensor based secretion management and oral hygiene system. This is achieved through clever integration of a disposable lumen over existing endotracheal tubes and connecting it to a custom electronic device that regulates pressure and controls the suction and delivery process. This is a patented and first-in-the-world product that can solve an urgent need locally and globally.

Building the product was only phase two and was done with constant inputs from a group of healthcare providers like intensivists, nurses and medical educators. The team then deployed VAPCare to multiple hospitals across the country, including the top facilities like AIIMS, Delhi, NH, Bangalore, and NIMS, Hyderabad for to gain clinical inputs and validate the concept further. Feedback was gathered on VAPCare's efficiency, usability and the scope for large-scale

deployment. The final USFDA approved product now in the market has gone through rigorous safety testing as well as extensive usability assessments. There has been widespread interest globally for this product as well as support from the department of biotechnology, Govt. of India to take this concept forward.. Identifying the problem, innovating the solution, creating the product and now sales and demonstration of the product have involved doctors as part of the core team. This clinical engagement has this helped us create a robust and useful product as well as save time and money during development through minimizing iterations.

Transforming Indian healthcare, one product at a time

India, as an emerging economy and with the third highest start-up pool globally, is ideally positioned to be the leader of MedTech innovation. India has a large talent pool of qualified professionals, essential for building novel products that address unmet healthcare needs of the country. Through the right policy measures, financial access and public-private partnerships India can emerge as the MedTech innovation hub for emerging markets and affordable medtech globally. Companies operating in this space must keep their eye on the ultimate goal of adhering to the global standards of quality, but improving the lives of both patients and doctors locally.