

## Solving the supply-demand gap in Healthcare with Smart Patient Monitoring

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Last month, the National Health Protection Scheme (NHPS) 2018-2019, was announced by the Honourable Finance Minister, Mr. Arun Jaitley. The scheme intends to deliver health insurance to more than 10 crore families who fall under the poverty line. A total of Rs. 2,000 crores have been allocated for the success of this scheme.

While this is a noble move for the country, a question remains. Is the Indian healthcare sector ready to handle this load? With more people being able to afford better healthcare, an excess demand will be created that cannot be managed with the current shortage of hospital beds and staff.

### **Proactive vs. Reactive Care**

Healthcare can be practiced in two disparate ways. The first way is common and widespread: reactive care. Reactive care is when a minor symptom escalates to significant issue before the treatment plan begins. Appropriate reaction is begun only after the problem has escalated to a negative outcome.

The second way, is unfortunately the most neglected: proactive healthcare. Proactive care is when clinical care is provided before the symptoms escalate. Instead of waiting for drastic outcomes, measures are taken proactively to prevent small symptoms from growing irreversible. Proactive healthcare is the way forward but is challenging to implement. The right

information needs to reach the right stakeholder at the right time for proactive healthcare to exist.

## **Yesterday's monitoring systems don't solve today's healthcare problems**

In the past, insufficient monitoring of patients has led to many instances of preventable death. The lack of available staff initially drove lack of sufficient monitoring. To resolve the manpower issue, bedside vitals monitors were created to aid clinicians keep an eye on their patients and catch critical events. These monitors would sound an alarm when vitals went outside of the limits that were set by the clinical staff. With the "better safe than sorry" approach, there were many instances when these monitors excessively rang due to motion or other artefacts, requiring human input to understand if it was a genuine emergency.

Initially, these monitoring systems were built and designed for the Intensive Care Units (ICU) of hospitals. In the ICU, patients decline rapidly, and thus alarm systems could never release the "better safe than sorry" approach. Fortunately, ICU's are sufficiently manned with one nurse available per patient and a clinician on 24/7 duty. However, hospital beds outside of the ICU were not so fortunate. Due to limited capital and manpower, patients outside of the ICU rely on their family members as there is normally only one nurse per five to ten patients. These patients are unlikely to suddenly deteriorate; thus, the nurses visit these patients every few hours to record their vital signs. Clinicians receive these patient charts to see how a patient is "trending" over the course of their treatment. Unfortunately, when nurses are overworked, they are only able to monitor patients once every 4 hours leading to patient charts that are sparse in data.

This problem of monitoring patients outside of the ICU is recent. As more hospitals reach tertiary and quaternary care and patients present more complex illnesses, the average patient is more vulnerable in the wards than ever before. The assumption that patients are perfectly safe when they leave the ICU is outdated. Hospitals must move patients out of the ICU to minimize costs, prevent unnecessary infections, and receive incoming critical patients.

## **Smart monitoring allows for proactive patient care**

The new smart monitoring systems were designed with these problems in mind. These systems ensure that vulnerable patients are effectively monitored outside of the ICU setting even with limited nursing staff and doctor availability. These systems prioritize automatic documentation of vital signs to ensure that the patients' health trends are charted for clinicians to see during their rounds. These high-resolution charts provide the complete picture of the patient's status rather than an intermittent one provided by nurses manually documenting vitals. Through automatic documentation, these systems unlock a secret superpower for clinicians: allowing them to analyse the correlation between multiple vital signs together. By creating a direct relation between different vital signs, the doctor will be able to tell if the patient is stable or not in a matter of seconds.

High quality data is irrelevant if it does not reach the right stakeholder at the right time. When clinicians are normally only doing rounds on the patient once a day, it is very challenging for old monitoring systems to effectively inform clinicians at the right time. Smart monitoring systems can provide the right information to the right stakeholder at the right time through the power of the internet. These internet-connected devices allow clinicians to keep track of their patients right from their smartphones. When doctors can keep track of their patients remotely, the quality of care goes up and preventable deaths are eliminated from the hospital setting.

Since smart monitoring systems are just entering the market, hospitals still resort to outdated medical practices. When non-critical patients are given ICU beds solely for monitoring, valuable beds are taken away from more critical patients. When patients leave the ICU, they are at high risk for an unexpected outcome during the first 24 hours, yet these patients immediately go from 1:1 nursing care to 1:5+ nursing care with no middle step. Without continuous monitoring that is easily available to clinicians, confidence of moving patients to the wards is low, leading to extended ICU stays and unnecessary medical bills. In order to meet the booming demand for healthcare, hospitals have to use their resources more efficiently.

The new age of monitoring systems will heavily disrupt this space. Hospitals will become more efficient while driving down medical costs for patients. Both the hospital and patients will thrive when preventable deaths are eliminated from the care pathway. Today's supply of healthcare will greatly grow to meet the overwhelming demand.

## **Bridging the gap with proactive patient care**

To bridge the supply-demand gap soon, proactive healthcare needs to take a front seat. Smart continuous patient monitoring is a frontrunner in the race to push proactive healthcare to the lead.

However, a major deterrent towards this shift arises in terms of implementation. Clinicians are not used to trusting their wards as a safe place for vulnerable patients. Hospitals are still learning how efficiency can lead to increased margins for their facility while delivering top quality care. The slow technology adoption curve along with an inherent fear of return on investment will be the key stumbling blocks for the adoption of proactive patient care.

To overcome these problems, hospitals will have to change their perceptions and be open to the usage of unfamiliar technology. They will have to trust that by investing in the future, hospitals, doctors, nurses, and most importantly, the patient will all thrive.