# Electronic intensive care units: an innovation in critical care delivery

## Apollo Hospitals, India

### What was the challenge?

Historically, India has experienced a major shortfall of skilled intensivists (a physician dedicated to the care of critically ill patients) to manage critical care units. At the start of the coronavirus pandemic, this paucity of well-trained and skilled ICU physicians presented an urgent concern for the Apollo Hospital Group, which manages 73 hospitals in the country.

### What was the task?

The group identified an innovative solution to meet this challenge: electronic intensive care units (e-ICUs). Unlike a typical intensive care unit, in an e-ICU, patients do not need to be in the same hospital or locality as their critical care physician. Instead, using high-definition audio-visual equipment - such as cameras which can pan, tilt, and zoom around a patient's bed - a critical care intensivist can virtually enter a hospital room, providing real-time support while evaluating for the patient's response to treatment and ventilation changes.

### What was the action taken?

Apollo Hospitals operated a small e-ICU network for generalised critical care support prior to the coronavirus crisis, which was quickly scaled up its capacity for to virtually monitor patients needing intensive care during the pandemic. The e-ICU technology helps to remotely monitor and aid in treating critical patients in ICUs, in any part of the world from a command centre at Apollo Health City, based in Hyderabad. In the centre, over 600 patient beds in eight Indian states are overseen by a central monitoring team comprising critical care nurses, respiratory therapists, and intensivists. This team make virtual assessments using digital monitors (e.g. pulse rate, blood pressure, breath flow, temperature) to ensure appropriate patient management with minimal virus exposure for bedside clinicians. A 24/7 helpdesk is available for troubleshooting any technical issues regarding the patient monitoring equipment.

Prior to participation in the e-ICU, all clinical staff must undergo online structured training – lasting three months - in how to use the electronic intensive care technology. Participants on the training program are monitored and mentored by Senior Critical Care Consultants. The training module is developed in-house at Apollo Hospitals and is for 3 months' duration, on the job training in the command centre. Participants receive an internal certification from Apollo Hospitals upon completion of their training.

Initially, there was a learning curve for staff unfamiliar with this model of critical care to get 'up to speed' with the technologies required of an e-ICU, and on occasion, the lack of digital infrastructure in hospitals impeded efforts of expansion. However, despite these initial setbacks, the e-ICUs have optimised the time of a limited pool of clinicians, cut the risk of coronavirus transmission by reducing bedside treatment and have accrued cost-efficiency savings as no PPE is required for this model of care.

### What were the results?

The Apollo Group has plans to sustain this model of care and extend e-ICU provision beyond those patients affected by COVID-19 as part of a wider initiative to address shortfalls in critical care staff. Employing e-ICUs during the coronavirus pandemic has ensured that all patients connected to the Apollo network living in rural regions can access the same type and quality of care as their counterparts in urban areas. Thus, helping to minimise historical care disparities between urban-rural settings.

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