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Cover Story:

COVID-19 Care Continuum

How the Digitisation of ICU can Power the Fight Against COVID-19

GE Healthcare introduces an out-of-the-box COVID-19 tailored solution that automatically captures data and provides quick and relevant COVID-19 clinical insights.

As the tsunami of Coronavirus "COVID-19" (SARS-CoV-2) cases surged across the globe from east to west, the scaling up of Intensive Care Units (ICU) in Europe accelerated to increase patient capacity and prepare clinical staff for its imminent impact. The unpredictability of the virus pandemic and uncertainty of science that accompanies the new disease still presents real and ready dangers to the people, economies and our healthcare systems.

We have experienced the first response to COVID-19 in Europe with the successful escalation of ICUs, reorganisation of teams and fast reaction to treatment planning. As we take a breath between waves, we can now start to see what worked well and share experiences from collected patient data to shape and prepare our future responses.

Scaling up to Optimally Manage the Pandemic

In the ICU, every second counts to make life or death choices for critically ill patients. In usual circumstances, access to quick and accurate patient information powers the decision making to help save time and lives. In today's COVID-19 climate, digital tools become of paramount importance when speed and accuracy of information is even more vital. The pressure of working in clinical environments has intensified - increased number of patients, a tired ICU workforce, and higher infection control measures than ever before.

The use of a clinical information system in the ICU that automatically collects real-time information from medical devices at the patient's bedside, and displays the data for remote and instant review in a central ICU location, offers huge time and treatment potential. It reduces the need for manual, paper-based data collection directly in the care environment, saving time and reducing recording errors.

Saving Time Means Saving Lives

The Hospital Universitari Joan XXIII de Tarragona, part of the Catalan Health Institute in Spain, scaled up its ICU from 28 to 79 beds at the start of the COVID-19 crisis. Dr. María Bodí, Head of ICU Service states, "We went from two to six units as part of our Coronavirus capacity measures. The Centricity Critical Care solution gave us the opportunity to expand at speed. I cannot imagine being able to attend to patients in different units with different information systems - it would have been impossible to guarantee a high level of patient care."

Dr Bodí continues, "Being able to monitor patients at the bedside as well as remotely made things much easier when under extreme pressure. Having a process for data recording forces you to not leave any area of patient care uncovered - it improves the safety and quality of patient care. Although some of the staff deployed to ICU during the crisis had not used the system before it has been easy for them to use. The information in the system will always be found, recorded and recalled in the same way and this has been key to systematising the work."

A Reliable and Scalable Solution to Fight an Unpredictable Virus

In response to the pandemic, GE Healthcare has quickly mobilised a Centricity High Acuity 'out of the box' COVID-19 tailored solution. Implementation in a matter of weeks includes online training and remote support. It automatically captures data from monitoring and respiratory systems from multiple vendors' models, saving nursing staff the time of documenting manually at the bedside.

Providing quick and relevant COVID-19 clinical insights, it also captures and displays the information as trends that can be combined with medication, fluids and care documentation to provide a single overview at a glance. Furthermore, colour coded worklists provide a tailored structure for preconfigured admission, discharge and care documentation helping

speed-up those processes and save nursing time.

Enabling a Rapid COVID-19 ICU Digitisation Strategy

The review of COVID-19 patient data using the tailored Centricity solution can be accessed at the bedside or a central location in the ICU, outside of high contamination areas, or in a remote location on other floors or buildings of the hospital. Multi-patient lists help with care prioritisation and the ability to review and alter treatment plans without needing to be at the actual bedside.

Medication order sets can be tailored to provide standardised care and fast prescribing for the most common medications to help support bedside staff that may have variable experience levels. For example, redeployed staff from other clinical specialities now working in ICU can be steered and supported using the system to standardise the quality of patient care.

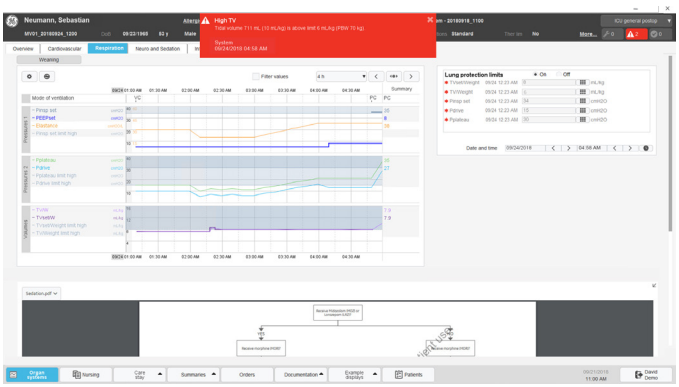
Rule-based notifications can alert bedside staff for timely medication administration or execute planned care tasks. Notifications for patient deterioration could be displayed at the bedside and on the central patient list to provide prompt care responses. The built-in Lung Protective Ventilation clinical expertise, for example, focuses on a combination of lung protective ventilation guidelines, trends from ventilators, targets and smart notifications when measured ventilation values are outside of the target set for the individual patient (Figure 1).

Consistency in the Delivery of ICU Care From Visiting Staff

One of the key challenges facing ICU during the first wave of COVID-19 was the shortage in staff numbers, either due to contracting the illness, the need to isolate due to symptoms, or the requirement for more to cover the larger number of beds. This led to nurses and clinicians from other specialties being deployed into the ICU environment. The use of the clinical information system therefore helped enable consistency in the delivery of ICU care from newcomers with different medical backgrounds.

Dr Bodí from the Hospital Universitari Joan XXIII de Tarragona adds, "We had such a scenario where physicians from different areas of the hospital like emergency, cardiology and anaesthesiology joined our ICU medical team in response to the COVID-19 escalation. I am very grateful for this collaboration as it has been essential in our efforts. We quickly reorganised ourselves at a team level and leaned on the systematisation of the system's processes to effectively train new professionals over three days – there was no time to wait months."

Unfamiliarity with the ICU environment could be very challenging for redeployed staff. However, with a digital ICU management system, rule-based decision support, notifications and protocols are provided at the bedside and at the central dashboard to help address these challenges. Worklists customised for COVID-19 as task reminders also provided



Integrated lung protective ventilation clinical expertise

consistency in the records and delivery of treatment.

Looking Ahead to Continue the Management of Pressures

"Preventing ICU from being overwhelmed has been key to managing the first wave of COVID-19 cases in Europe. Now the challenge is to learn from this experience and prepare for subsequent peaks as we look ahead to the rest of the year," says Professor Dr Mathias Goyen, Chief Medical Officer, Europe at GE Healthcare. "Software that automatically collects real-time information at the patient's bedside in the ICU offers potential for both huge time savings and improved treatment."

Dr Bodí agrees, the recent experience has yielded many learnings and important data for the future, "The value of all our clinical patient data from our COVID-19 experience is like gold. It shows how the oxygenation, haemodynamics, sedation and treatment evolved continuously. It is real information, what really happened in sequence. It is much more valuable than a retrospective report written by a doctor after an event. This information will be important to share with other groups and intensivists, even other countries, to be able to make prognostic or predictive models with decision support tools that could even be incorporated into the clinical information system itself."

The scalability and standardisation of ICU via critical care management systems have stood the ultimate test and demonstrated positive outcomes. The automatic collection of patient data, remote access and management of rules-based tasks have enabled staff to do the impossible - be in many places at one time.

Now we can see that anything is possible when we are tested to our limits. Intelligent, collaborative and connective health such as the digitisation of the ICU can combine traditional hands-on care and virtual surveillance to turn the tide against a global emergency, and power the fight for optimistic patient outcomes. ■

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