

Information Technology to Improve Patient Care during COVID-19 Pandemic

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DESCRIPTION

During the COVID-19 pandemic, the nation's largest municipal health care system, was forced to rely on information technology to speed up and expand its volume of work in caring for large numbers of socioeconomically marginalized New Yorkers who were disproportionately affected by COVID-19 [1]. Just two years prior to COVID-19, the health care system, which serves more than 1.1 million patients annually through eleven acute care hospitals, a long-term care facility, a certified home care agency, and more than seventy ambulatory clinics, was operating on a variety of medical record, scheduling, financial, and data storage platforms, preventing maximum coordination, efficiency, and rapid-cycle learning. The system turned on its unified Electronic Medical Record (EMR) at its final remaining inpatient facility on March 1, 2020, the same day New York City announced its first case of COVID-19. The manner in which technicians used its recently launched EMR to direct and facilitate pandemic response were critical in assisting tens of thousands of New Yorkers during the crisis' peak phase, March to May 2020 [2].

Informatics

Using information science concepts to obtain and analyze health data has proven critical. As the urgency of the COVID-19 crisis overtook institutional slowness, information technology and our office of population health quickly produced dashboards representing ED patient volume, ICU and medical floor availability, and staffing. These dashboards drew data from the connected EMR and other data sources to create a unified single source of data. Capacity was matched to bed demand across the company, not only at particular hospitals [3]. Patients were transferred from our worst-affected hospitals to our other institutions on a daily basis. Patients' labs, radiography, notes, and vitals from the previous institution were all accessible when they arrived at the new location. It was unnecessary to search through paper records. These methods assisted in "leveling-loading" patients and staff members more evenly across the system, reducing patient surges and provider shortages in the most afflicted locations. This effort was made possible by shared

EMR that was accessible to clinically active leadership. The dashboards were created in collaboration between data scientists and doctors who also worked in operations, and they were not adjusted to satisfy clinical demands. During the crisis, enterprise standards of ICU space, medical floor space capable of caring for severely sick COVID-19 patients were agreed upon, and historical local definitions were thrown aside. On a daily morning call with the facility chief medical officers, chief executive officers, and system leadership, the dashboard's contents were evaluated. This made it possible to make data-driven decisions and quickly remedy mistakes.

Medical floor space was changed to allow ICU-level patients, and post-anesthesia care units and operating room space were transformed into new ICUs. Adult medical floor units were created from rehab space and pediatric levels [4]. The EMR was modified so that intensivists treating patients in a post-anesthesia care unit or adult hospitalists caring for patients on a previous pediatric ward would see the same layout they were used to and would not have to retrain. The enterprise-wide dashboards reflected this increased capabilities. We were able to standardize, distribute, and use information considerably more quickly with the integrated EMR system than we could with a paper-based system or a non-standardized electronic system, allowing us to adapt in real time to fast changing demands. Our intensivist could view and trend all of the important clinical variables, such as vital signs, recent lab tests, ventilator settings, and medications, on a single screen, thanks to an ICU patient summary tailored to COVID-19 patients, and an infectious disease-focused summary tracked all suspected and long-established COVID-19 cases across an entire hospital.

CONCLUSION

The ability of health care hospitals to efficiently employ its information technology improved patient care and laid the framework for a more streamlined system response during a crisis. It was critical to make decisions quickly, which necessitated established contact with front-line workers, which was hindered by direct patient care. There were a few roadblocks to overcome,

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but data was efficiently used to address population and individual patient requirements. Together, these innovations not only helped health care hospitals weather one of the worst health crises in the city's history, but they also put the organization in a structural position to deploy enterprise information technology in novel and ground-breaking ways in the aftermath of the epidemic.

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