Large-Scale Implementation of a COVID-19 Remote Patient Monitoring Program

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Background/Objectives: COVID-19 has placed immense pressure on global health system resources. With limited inpatient space and the need to avoid population clustering, many have sought to redistribute care from the hospital setting to the community. Remote Patient Monitoring (RPM) - the use of digital technology to collect physiologic data from a remote site (often from the patient's home) - has proven to be a powerful tool in this regard. RPM allows for early detection of disease progression, while providing additional reassurance to those who are safely recovering at home. In this retrospective observational study, we demonstrate feasibility and safety of a large-scale COVID-19 RPM program at a multiregional health system.

Methods: Enrollment took place across nine emergency departments (ED) between December 2020 and October 2021. Upon ED discharge, participants were provided a pulse oximeter and enrollment on our RPM platform (GetWell Loop or Harmonize Health). Pending smartphone availability, the patient was outfitted with either a standard pulse oximeter or a Bluetooth-enabled pulse oximeter (the latter automatically uploads vital signs once the device is applied to the patient's finger). The platform was monitored by our team of medical assistants and nurse practitioners, 7 days a week. Participants transmitted oxygen saturation, heart rate, temperature, and symptom progression data over a 16-day monitoring period, and engaged patients via video call, phone call, and in-platform chat. Abnormal vital signs or concerning symptom reports (e.g., worsening dyspnea or chest pain) were flagged by the RPM team, with escalation to in-person care as needed.

Results: In total, 4163 patients were referred and 2047 enrolled, making this the largest COVID-19 RPM program to-date with both physiologic and symptom data collection. Average age was 49.5 years, with 39% of participants being male. Patients on GetWell Loop uploaded oxygen saturation data an average of 8.4 times throughout the duration of the monitoring period; patients on Harmonize Health did so an average of 6.0 times. Average duration of engagement on the platforms was 6.4 days. Participants are distributed widely across the metropolitan DC and Baltimore regions, including in rural geographies with lower density of medical access.

We encountered several obstacles, most notably difficulties with continued patient engagement after initial enrollment, patient technologic fluency in operating the pulse oximeter and app, and device tracking and shipment for individual enrollment sites. We elected to include both patients with smartphones and those without, to minimize selection bias due to socioeconomic status or technologic literacy. This resulted in allocating dedicated time resources to call patients and manually log physiologic data.

Conclusions: RPM provides an effective means to monitor COVID-19 recovery at home, allowing for population distancing and hospital decompression, while serving as a safety net for at-risk patients. We describe here the steps to implement such a program. We encourage careful consideration of inclusion criteria, platform selection, communication modality, and methods of data collection, as all of these have significant impact on patient experience. The lessons learned regarding barriers and disparities in enrollment are closely applicable to RPM for other acute disease states.