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The Adoption and Implementation of Digital Health Care in the Post—COVID-19 Era



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The practice of medicine in the United States was transformed in March of 2020 as providers were forced to rapidly adapt and continue to deliver care during the coronavirus disease 2019 (COVID-19) pandemic.¹ The use of telehealth has been rapidly incorporated into daily patient care. In addition, we believe that remote patient monitoring (RPM) has increased, with examples including more frequent home monitoring of blood pressure, home pulse oximetry, and home digital spirometry. Although digital technology has been increasingly available to medical practice for the past 2 decades, its application, development, and adoption has been impeded by government policy, reimbursement, and lack of initiative to advance change. As social distancing became the societal norm, the practice of medicine needed to respond urgently. The barriers to telehealth were temporarily suspended, and rapid expansion of remote health care was implemented to provide added safety to patients and health care providers (HCPs) through social distancing. The Cleveland Clinic, an early adopter of telehealth, saw virtual care visits increase in 1 month by 20-fold.²

To meet urgent needs for remote care, insurers and regulators rapidly crafted interim solutions for payment for HCP telehealth services and governance to protect patient confidentiality; federal regulations were adapted to permit access to digital technologies. Health care organizations including medical schools, hospitals, insurers, and medical societies quickly implemented training for HCPs to perform primary and specialty care visits. Interim requirements for documentation, determination of billing codes, and charges for services were established. Assurances were provided that use of the digital tools would not be a violation of

patient privacy.³ The Food and Drug Administration, additionally, issued guidance to fast-track devices for remote patient care.

More changes in the adoption and administration of remote health care occurred in the first 20 days of March than in the previous 20 years to meet the health care crisis. Remote health care promoted social distancing by keeping patients out of HCP offices, clinics, urgent care centers, and especially emergency departments unless no appropriate alternative existed. Limiting the potential exposure of both patients and HCPs was the priority to minimize unintentional or inadvertent exposure to other patients with COVID-19. As the COVID-19 pandemic evolves, the experiences from this crisis need to resonate in the design and improvement of our health care system, not only to address the deficits faced today but also to strengthen the needs of our diverse population moving forward. Asthma and chronic obstructive lung disease (COPD), 2 common, high-cost chronic diseases, are appropriate for digital technology and will serve as the examples for this commentary, recognizing that the concepts are applicable to many disease states.

The lessons learned in the past months serve as motivation for change in the post—COVID-19 era. In asthma and COPD, RPM devices have been used to track patient utilization of rescue and controller medications and monitor lung function, oxygen saturation, exhaled breath condensates, heart rate, respiratory rate, and physical activity. Greater use of rescue inhalers, deteriorating lung function, and decreasing steps have all been associated with increased risk of exacerbations and the need for high-cost resources.^{4,5} With more than 250,000 digital health applications and 300 million wearable devices available in 2017, the determination of which device and in what clinical setting will provide the greatest improvement both in the patient's clinical status and in quality of life is critical.⁶ Devices that track adherence to medications or pedometers for activity are passive collectors of data and others, such as spirometry, require the patient to actively participate. A combination of both may be required to provide both the sensitivity and specificity of RPM to ensure a low rate of false negatives and a high rate of true positives. Passive sensors may alert the patient to a decrease in activity or an increase in rescue medication use that could be verified by actively performing a peak flow or forced expiratory maneuver. Digital technology is not infallible and backup planning needs to be in place if sensor, app, or servers crash as witnessed by the recent experience with diabetes monitoring.⁷

Consideration of several important questions for implementation of digital technology is required. The following are examples: (1) In what clinical settings is telehealth appropriate: rural health care, triage of acute medical services, delays in scheduling office visits, or routine follow-up visits? (2) What

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Conflicts of interest: G. S. Mosnaim received research grant support from Astra-Zeneca and GlaxoSmithKline and currently received grant support from Propeller Health; owned stock options in Electrocore; and served as a consultant and/or member of a scientific advisory board for Electrocore, GlaxoSmithKline, Sanofi-Regeneron, Teva, Novartis, Astra Zeneca, Boehringer Ingelheim, and Propeller Health. D. Van Sickle and D. A. Stempel are employees of Propeller Health. H. Stempel declares that she has no relevant conflicts of interest.

Received for publication May 2, 2020; revised May 22, 2020; accepted for publication June 5, 2020.

Available online June 22, 2020.

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J Allergy Clin Immunol Pract 2020;8:2484-6.
2213-2198

© 2020 American Academy of Allergy, Asthma & Immunology
<https://doi.org/10.1016/j.jaip.2020.06.006>

measures should be included in RPM: physiologic data and/or patient-reported outcomes? (3) Should the measures be collected passively or require active patient participation or both? (4) How often should these data be collected? (5) Does RPM enhance telehealth and in office patient visits or provide value between visits? The answer to these questions requires careful assessment and study to comprehend how the data are used to improve clinical outcomes, the costs of the intervention (both direct and indirect), and the impact on the patient's quality of life. From the patients' perspective, it is critical that they are involved in shared decision-making processes and recognize the implications and benefits derived from the digital intervention and how it addresses their goals and reduces the limitations on their daily activities related to their respiratory disease.

New technologies and therapeutics such as robotic surgery and biologics for asthma have been adopted when there were clear pathways for reimbursement. In contrast, the implementation of digital technologies has been impeded by the lack of consistent payment for HCP services related to RPM and telehealth. First, to successfully incorporate digital technology into clinical practice in the future, the barriers that were jettisoned and solutions implemented to deal with the COVID-19 pandemic need to be adjusted, augmented, and made permanent to reflect the use of digital technology in both primary and specialty outpatient practice. In addition, a comprehensive plan for reimbursement needs to be established that reflects the value of these programs including required documentation, fee structure, and billing codes for the digital intervention. Detailed programs for training HCPs in digital technology are required for proper implementation. As program development proceeds, other components may be required.

Standards for telehealth visits need to be established, tested, and modified. Development of protocols is required that determine when digital technologies are appropriate and should include the indications for use, the clinical setting, and the frequency of patient contact. Contraindications must be established, such as in cases of acute respiratory distress or severe chest wall pain on respiration. The thresholds may vary by disease, acuity, or rural or urban locations and the ability of patients to travel to health care sites. As we educate the health care team, it is equally important that the patient be informed and instructed on how and when to access and use digital technology and recognize where it is appropriate such that there is neither underutilization nor excessive reliance on the technology.

Telehealth is now being incorporated into the electronic health record (EHR) either because it is a component of the EHR, or the EHR serves as documentation of the episode of care required for billing.⁸ RPM needs to be incorporated into the EHR to provide the HCP with a single platform for it to be easily adopted into daily practice. Patient data and alerts need to be communicated through the EHR similar to patient laboratory data reporting.⁹ Currently laboratory alerts are highlighted when the results are outside of the predicted values and immediate alerts and notifications triggered when the result may indicate a critical value that needs prompt attention. Both patients and HCPs need to be apprised of critical alerts and the notifications need to have a high level of both sensitivity and specificity. The timing and responsibility of review are important topics that will require a comprehensive understanding. All systems have communication limitations whether digital or traditional phone

and mail and therefore HCPs and patients need to have action plans for these events.

Increasing inclusion of digital technology in the practice of medicine mandates review of present-day practice norms and understanding where improvement is needed.⁹ When assessing the therapeutic response to a treatment, RPM allows assessment of weeks of data rather than just the day of visit. Longitudinal data for lung function, activity, and use of rescue medications may be of greater value than data collected on the single day of an office visit.¹⁰

The use of telehealth during COVID-19 was accompanied by the promise to eliminate many co-pays, allowing for greater access.¹¹ Successful adoption of digital technology will include appropriate payment to HCPs and facilities for services and reducing or eliminating financial obstacles to digital technology that may offer improved care at lower costs. Future growth in digital technology requires that economic, educational, or technological barriers related to the technology do not prevent access to proper health care.

The present pandemic highlights issues related to a large part of the US population being unable to access health care because of cost and/or availability of providers. One of the positive outcomes of the pandemic may be the recognition that if a greater number of Americans had access to health care, the response to the pandemic may have been more focused, especially in high-risk populations with chronic disease. If health care access is increased postpandemic, digital technologies could help accommodate the growing demand on HCPs and health care facilities and potentially provide patients with better and more timely care. Technology can both facilitate access and record outcomes to assess the benefits of treatment.

RPM implementation has been hindered by the lack of financial criteria and incentives for deployment.¹² Both passive and active devices to monitor patients' physiological parameters and clinical status are needed. Assessing adherence to controller medications, overuse of rescue medications, and activity levels for patients with asthma and COPD highlight patients at potential risk. Although the data may lack the specificity required for clinical decision making, they have an important role in screening patients at risk for disease worsening. They may alert the HCPs to patients who may require further active home or office data collection. As an example, if one notices that a patient with respiratory disease is experiencing an increase in rescue medication use or a decrease in physical activity, one might ask them to perform spirometry or a peak flow measurement at home. Past experience suggests that patients are unlikely to comply with daily lung function measures but may comply with peak flow measures during times of clinical change or when prompted by digital technology. The use of RPM can preemptively alter the medical regimen, keep patients out of high-cost facilities including the emergency department or hospital, and ultimately improve the patients' quality of life.

The COVID-19 pandemic has focused attention on the limitations of our present health care system's ability to treat all Americans during the crisis and has forced a radical transformation in care. Past response to health care crisis has had beneficial legacies.¹³ We now have the opportunity to use the lessons learned during this crisis to make revolutionary improvements in the delivery of medical care. HCPs and patients are currently experiencing the benefits of telehealth and RPM. We hope that federal and state governments and payers will

continue to support these services, and their expansion, post the COVID-19 pandemic.

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