

The Good, the Bad, and the Unknown of Telemedicine in Asthma and Allergy Practice



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Telemedicine (TM) takes advantage of new technologies to advance the methods by which physicians provide care to patients. With the increased ubiquity of personal devices, the TM industry has seen an exponential expansion, with an expected market valuation of more than \$20 billion by 2025.^{1,2} TM shows promise through benefits such as expanded access to care, decreased wait times, and innovative opportunities to remotely monitor medical conditions including asthma. Nevertheless, the increased implementation of these technologies has raised questions about potential challenges. How do we provide convenient care without compromising the quality of care? How do we engage institutions, patients, and providers amid complicated billing and information sharing processes? What policies are in place to ensure the safety and regulation of TM services? The focus of this issue of *Journal of Allergy and Clinical Immunology: In Practice* is the use of TM in asthma and allergy practice, and these articles provide a review of the benefits, challenges, and future directions of TM in clinical settings. Some of the benefits and barriers to TM programs are presented in Table I.

TM offers the ability to increase care access for all patient populations. Given that median wait times for in-person consultations with allergy specialists or primary care physicians can range from 3 weeks to months, a rate that is higher in remote areas with significant physician shortages,^{3,4} increased care access is a well-known TM strength. One form of telehealth services called electronic consultations, or e-consults, allows clinicians such as primary care physicians to quickly consult with specialists through electronic health records for specific cases. As mentioned by Elliott et al,² e-consults expedite the process for receiving specialist second opinions. The use of e-consults has been shown to improve care coordination and to reduce the turnaround time for specialist clinical input from weeks to hours as reported by Greiwe et al¹ and Phadke et al³ in this issue. These asynchronous encounters, which do not require real-time communication between patients and

providers, have been shown to decrease the costs incurred by preventable referrals and subsequent work absenteeism.^{1,3,4} Other forms of TM, including synchronous encounters with live communication, are highly promising from a health equity perspective. Furthermore, remote communities, such as rural populations, are often disproportionately affected by a high burden of illness³; TM services in these populations eliminate long travel times and increase access to care despite geographic maldistributions of clinicians in their communities as reported by Taylor et al.⁵

In this issue, Himes et al⁶ report that TM is especially useful for chronic asthma management, including detecting and avoiding triggers and for monitoring the use of medication to prevent exacerbation of symptoms. In asthma management, close monitoring is often beneficial in improving a patient's daily quality of life. TM services can allow for remote data collection on patients' symptoms, triggers, and medication adherence.⁶ Certain programs integrate these data with allergen and air quality reports to enhance predictions of symptom flare-ups. With this information, both patients and physicians can longitudinally track trends or catch substantial deviations in the severity of a patient's case. This ability can assist in detecting and preventing asthma exacerbations that could lead to hospitalizations.⁶ With increasing knowledge and data on asthma management, there are also more chronic disease educational platforms that physicians can use to stay informed on best practices and patients can use to gain education on chronic asthma management such as proper inhaler usage.^{4,7}

When used properly, TM services have evident benefits. Nonetheless, many barriers to their implementation in health care settings still exist. First, some individuals may not have access to the required technology or overall infrastructure to use telehealth programs.² Also, with high initial and low sustained engagement, the long-term utility of these programs must be analyzed for strategies to retain users.⁶ On the provider level, the overwhelming number of options for telehealth programs, complex billing policies that increase documentation burdens, and difficulties in conducting thorough physical examinations have brought decreased willingness for implementation.^{1,2} These concerns are being addressed, and new technologies to improve remote examinations exist. At the same time, it is important to note that the role of most TM programs is not to completely replace in-person doctor's visits but to supplement them with visits that can be completed comprehensively online. In addition, providers and institutions face the lack of integration of certain telehealth programs with electronic health records, burdening institutions to discover ways to address this lack of information flow between TM programs, specialists, and primary care physicians.^{2,6} For this reason, administrators are also hesitant to make a large investment in these technologies.² Complicated and

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TABLE I. Benefits and challenges of telemedicine (TM) and electronic applications as interventions for allergy and asthma

Level	Benefit	Challenge
Individual	• Access to specialist second opinions	• Technological limitations
	• Convenient appointment times	• Control over privacy and security of patient records and data
	• Eliminate travel time	• Lack of long-term user engagement
	• Increased rates of follow-up	
	• Reduced unplanned ED hospitalizations	
Provider	• Opportunities for patient education	• Lack of standardized training
	• Computer-assisted algorithms can diagnose and treat common conditions	• Complex billing procedures and reimbursement policies
	• Ability to remotely monitor conditions	• Increased burden of documentation
	• Reduced burden of expanding clinical knowledge through online education	
	• Longitudinally track patient condition, symptoms, medication adherence, and trigger data	• Inability to conduct in-person physical examination (though an examination can be performed via TM using digital equipment)
	• Reduction of medical prescription errors	
	• E-Consults decrease unneeded referrals and improve care coordination among primary care physicians and specialists	
Community	• Reduce clinic congestion	
	• Increase access to care for hard-to-reach patient populations	• Ensuring acceptability of telemedicine across race/ethnicity, language, gender, education, health literacy levels, and SES groups
Institutional	• Greater access to chronic AR education programs	
	• Decreases burden on understaffed institutions	• Lack of information sharing between clinical and telemedicine clinical records
Policy		• Institutional coordination
		• Lack of standardized guidelines and procedures
		• Assigning responsibility to regulatory figures (eg, FDA)
		• Quality control

AR, Allergic rhinitis; ED, emergency department; FDA, Food and Drug Administration; SES, socioeconomic status.

inconsistent policies on licensing, guidelines, training, and data safety also contribute to provider disinclination.^{6,8}

These benefits and barriers illustrate that many factors must be considered before widespread TM implementation. Because of the low barrier to enter the TM market, Bousquet et al.⁸ suggest that developing legislation to regulate TM services often takes much longer than developing these technologies. Thus, it is important to quickly address potential gaps in policies and identify methods to ensure the safety and quality of TM services. Above all, for TM services to be successfully implemented, greater education and awareness are needed by institutions, providers, and patients who may benefit from these services.

As an additional challenge, reimbursement and licensing policies need to be addressed for TM. Between state-level Medicare, Medicaid, and private insurance policies, studies show that the greatest reason institutions and providers cite for not adopting TM programs is the complexity of reimbursement.⁹ State-level policies have restrictions regarding facility type and geographic location (reimbursing only if services are provided in a Health Professional Shortage Area or non-Metropolitan Statistical Area).¹ To add to the fragmentation, states often have different restrictions, which change annually, on the types of services covered. For example, all 50 states provide coverage for synchronous live video services, but only 11 have adopted coverage for store-and-forward asynchronous services such as the e-consult service explained previously.^{1,9} To incentivize providers, states are advocating for “parity laws” that guarantee that both the level of care and reimbursement rates for TM visits be equivalent to in-person visits. However, the content of these laws

strongly dictates the services covered and methods of reimbursement. This means that the coverage provided by a parity law may vary, so this can be a challenge for TM practitioners that provide services in different states.¹⁰

In terms of licensing, before the creation of the Interstate Medical Licensure Compact (IMLC), physicians could only practice TM within state lines. Because the IMLC adopted a “driver’s license model,” physicians who meet the criteria for licensure in any of the 29 states that implemented the IMLC can now practice TM in states adhering to this compact.⁵ This policy has greatly expanded the reach of physicians’ ability to provide TM care and demonstrates how advantageous standardized policies across states are to increasing the capacity of TM.

Patient privacy is another challenge. Although the use of specific Health Insurance Portability and Accountability Act (HIPAA)-compliant software mitigates some issues with privacy, many companies lack privacy statements that outline patient data protections.⁶ Adding to this concern, the jurisdiction of different federal agencies (eg, the Federal Trade Commission and Food and Drug Administration) to regulate the safety of TM programs is unclear, with certain programs only subject to discretionary regulation.^{6,8,10} Given the numerous styles of TM delivery, a greater development of baseline measures should be used to determine the quality and security of TM services. States should continue working to expand patient protections when using these services.

Finally, the efficacy of telehealth varies significantly among specialty areas and methods of delivery. Some studies have focused on best practices of general TM, but their findings would

likely differ across different diseases and areas of medical practice. Furthermore, it is important that studies also look into TM acceptability across demographics: race/ethnicity, gender/sex, socioeconomic status, and health literacy levels.⁶ Along with the need for more variation in studies across groups, specialties, and services, there should be variation in the methods of measuring the effectiveness of these services. One study found that guidelines for telehealth programs are mainly based on randomized control trials. Because the generalizability of these studies can vary, it is important for researchers to also explore TM through large observational studies to see the uptake of these services in the context of everyday care.⁸ With more studies on the current state of telehealth delivery, ease of implementation has the potential to improve along with the quality of services provided.

TM has immense potential to positively impact a wide range of populations and address major barriers in access to care. As the TM industry continues to expand and innovate, it is essential for reimbursement policies, regulation, and research to continue to expand the scope of their efforts to ensure greater patient safety and satisfaction.

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