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Patient satisfaction with telemedicine encounters in an allergy and immunology practice during the coronavirus disease 2019 pandemic



The use of telemedicine dates as far back as 50 years ago, when the University of Nebraska used interactive telemedicine to transmit neurologic examinations.¹ Since that time, despite advances in available technologies and proven utility of telemedicine in allergy and immunology (AI),^{2,3} the use of telemedicine by AI physicians remains low.⁴ With the global spread of the novel coronavirus disease 2019 (COVID-19), AI physicians were abruptly forced to change their mode of health care delivery. Given the need for social distancing and exposure mitigation, many practices quickly adapted to remote encounters from primarily in-person care.⁵ Because it has become clear that the COVID-19 pandemic will have long-lasting consequences, the emergence of telemedicine presents an opportunity for optimizing health care delivery in our specialty. Given the paucity of data on patient satisfaction with telemedicine, we aimed to further characterize this understudied area.

We prospectively collected patient encounter data for the 4-week period from April 13, 2020 to May 08, 2020, among 4 physicians at the Rochester Regional Health AI practice, Rochester, New York. The appointment type (in person, telephone, or telemedicine) was tracked for all encounters, but only telemedicine encounters were studied further. Telemedicine encounters were completed using the following third-party vendors: Epic Warp (Epic Systems Corp, Verona, Wisconsin); Skype (Skype Communications, Palo Alto, California); FaceTime (Apple Inc, Cupertino, California); and Doximity (Doximity, San Francisco, California), depending on the patient preference. For telemedicine encounters, the following were collected: number of new patient (NP) encounters, number of follow-up (FU) encounters, patient sex, patient age, primary diagnosis, biologic therapy or immunotherapy, and encounter completeness as determined by the treating physician. Patients evaluated by telemedicine were contacted by telephone within 7 days to answer 3 patient satisfaction questions (Table 1). Statistical analysis was performed using Stata software (StataCorp LLC, College Station, Texas). Fischer's exact test was used to compare the frequencies of the baseline variables vs low and high patient satisfaction scores.

A total of 518 encounters occurred during the study period. Of these, 34 (6.6%) were in person, 194 (37.5%) were by means of telephone, and 290 (56.4%) were conducted with telemedicine. Of the 290 telemedicine encounters, 110 patients (37.9%) could not be

reached to complete the FU satisfaction questions, 3 (1.0%) declined to answer, and 177 (61.0%) completed the satisfaction questions. Of the 177 encounters of patients who completed the satisfaction questions, 72 (40.6%) were NP evaluations, and 105 (59.3%) were FU evaluations, with 115 (64.9%) of female patients. The median age of the cohort was 33 years (interquartile range, 9–55 years). The primary diagnoses were as follows: chronic rhinitis and sinusitis, 48 (27.1%); asthma, 33 (18.6%); food allergy, 32 (18.0%); urticaria, 14 (7.9%); immunodeficiency, 7 (3.9%); and drug allergy, 6 (3.4%). Notably, 37 patients (20.9%) received other diagnoses and 40 patients (22.6%) were receiving immunotherapy or therapy with a biologic. The treating physician deemed 102 evaluations (57.6%) to be complete, whereas 75 (42.4%) were deemed incomplete.

Responses to the patient satisfaction questions are given in Table 1. Nearly 97% of patients were satisfied with their telemedicine encounter, and 77.4% believed it was as satisfactory as an in-person encounter. When asked the most important reason to prefer an in-person evaluation, 95 of 177 (53.7%) patients offered a reason. The desire for a more personal interaction was the most frequently cited reason by 45.3% of patients. No significant associations were found between the following patient satisfaction scores and baseline variables: NP vs FU ($P = .38$), sex ($P = .67$), age ($P = .65$), primary diagnosis ($P = .47$), treatment with immunotherapy or biologics ($P = .62$), and whether the physician deemed the evaluation to be complete ($P = .24$).

The COVID-19 pandemic has facilitated widespread adoption of telemedicine in AI practices. Despite the sudden change in the mode of health care delivery, our results indicate that patients have been highly satisfied with these encounters. Nearly 97% agreed or strongly agreed that they were satisfied with their telemedicine encounter. These rates mirror similar work by Staicu et al³ and Waibel et al⁶ who found that 98% of patients were satisfied with a telemedicine evaluation. In addition, in our study, most patients thought that their telemedicine encounter was as satisfactory as an in-person encounter, whereas only 12.8% of patients disagreed with this sentiment. Although telemedicine has currently been necessary for social distancing to mitigate the risk of exposure to COVID-19, we hypothesize that going forward patients may continue to favorably view telemedicine because of its potential to save time and improve access to specialty care. These benefits must be weighed against the advantages of an in-person evaluation, including the sense of a more personable interaction, the ability to perform a physical examination, and the ability to order routine diagnostic testing.

Our data indicate that patients report high satisfaction with telemedicine regardless of their primary diagnoses and types of evaluations (NP vs FU). Although nearly half of the encounters were deemed to be incomplete by the treating physician, these

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Table 1
Patient Satisfaction Questions

Statement	No. (%) of responses					
	Overall response	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Overall, I was satisfied with my telemedicine encounter		0	2 (1.1)	4 (2.3)	27 (15.3)	144 (81.4)
My telemedicine encounter was as satisfactory as an in-person evaluation would have been		0	13 (12.8)	27 (15.2)	46 (26.0)	91 (51.4)
What is the most important reason you would prefer an in-person evaluation? (n = 95)						
I prefer a more personal interaction	43 (45.3)					
I wanted a physical examination	22 (23.2)					
I wanted skin testing	17 (17.9)					
I wanted lung function assessment	9 (9.5)					
I experienced technical difficulties	4 (4.2)					

encounters still resulted in high patient satisfaction. Although certain diagnoses in the field, such as chronic urticaria, would seem better suited to a telemedicine evaluation, patients also reported satisfaction with their evaluations for allergic rhinitis, food allergy, and asthma. These findings could potentially be explained by patients accepting physician decision making without customary testing (ie, spirometry for patients with asthma or skin testing for evaluation of food allergy) or expecting such testing at future visits. The high patient satisfaction also supports that clinical history remains the most important part of a medical evaluation, whether it occurs in person or by means of telemedicine.

We acknowledge that our cohort may be more accepting of telemedicine during the COVID-19 pandemic, and their responses may have been skewed by a desire to positively review their personal physicians. One-third of patients could not be reached for a FU, and they may represent a subgroup who had a less positive experience with telemedicine. We also acknowledge that our data are reflective solely of patient satisfaction and not patient outcomes. However, previous data have indicated that patient care outcomes are comparable with telemedicine vs in-person visits^{7,8} and that telemedicine can result in cost savings.⁶ Comparing video visits with telephone and in-person visits would have also strengthened our study. Nevertheless, our data on telemedicine mirror the high level of patient satisfaction that has been previously reported. We urge AI physicians to continue to educate themselves on evolving telemedicine regulations and reimbursements unique to their practice settings.⁹ The use of telemedicine was hastened by the COVID-19 pandemic, but it is likely to be an important part of AI practices in the postpandemic era.

S. Shahzad Mustafa, MD*[†]
Luanna Yang, MD*

Mahta Mortezaei, MD*[†]
Karthik Vadmalai, MD[‡]
Allison Ramsey, MD*[†]
*Division of Allergy
Immunology and Rheumatology
Rochester Regional Health
Rochester, New York
[†]Department of Medicine
University of Rochester
Rochester, New York
[‡]Department of Medicine
Mercy Hospital
Springfield, Missouri
shahzad.mustafa@rochesterregional.org

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Atopy is predictive of a decreased need for hospitalization for coronavirus disease 2019



The coronavirus disease 2019 (COVID-19) pandemic has caused high utilization of health care resources, including hospitalization and

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intensive care unit treatment. There has been considerable interest in determining which clinical factors stratify patients into high or low risk for severe COVID-19 illness to aid with clinical decision making. Advanced age, cardiovascular disease, and diabetes have been associated with increased COVID-19 severity.¹ Asthma seems to be underrepresented as a COVID-19 comorbidity compared with the global prevalence of the disease.^{1,2} To date, the effect of atopic conditions on the disease course of COVID-19 has yet to be fully elucidated. This study is a large, 2-site cohort of patients positive for