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Incorporation of telemedicine by rhinologists: The COVID-19 pandemic and beyond

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ABSTRACT

Objectives: The current analysis queries rhinologists’ attitudes about the use of telemedicine, including the degree to which it has impacted practice patterns during the COVID-19 pandemic. Our objective was to survey rhinologists and understand the extent to which telemedicine serves as a rejoinder to in-person consultation: appreciation of relevant factors may be important in planning for present and future considerations.

Methods: A 14-question anonymous survey sent out to the American Rhinologic Society (ARS) membership in April 2020. It included demographic factors and detailed questions examining the extent of telemedicine use. Numerous topics including the degree of use, satisfaction with services, and utility of services were evaluated.

Results: There were 134 respondents. Most reported seeing ≤30% of typical in-person volume, with 14.8% not seeing any patients at all. 88.1% used telemedicine; 82.0% reported some level of satisfaction with telemedicine. The vast majority utilized platforms employing audio and video (83.3%), and a plurality reported spending 5–15 min on calls. Numerous reasons were cited for the use of telemedicine, including significant public health benefits amid the crisis (89.7%). Only 12.0% of respondents reported using telemedicine for hospital consultation.

Conclusion: Rhinologists have embraced telemedicine during the COVID-19 pandemic in an attempt to improve accessibility, patient satisfaction, and revenue stream. When utilized appropriately, this technology obviates the need for seeing at-risk patients and performing procedures such as nasal endoscopy. Only a minority of rhinologists was dissatisfied, viewing this as a temporary fix during the pandemic.

1. Introduction

Societal labor practices have evolved towards telecommuting over the past decade, particularly in the fields of finance and technology [1–3]. In recent months these trends have been intensely amplified by the COVID-19 pandemic, and certain aspects of healthcare have turned to telemedicine in an effort to preserve patient access as well as revenue stream [4]. Traditional “frontline” providers such as those working in emergency and critical medicine have never been more important. In addition, telemedicine plays an increasingly important role for providers in other specialties, including those practicing otolaryngology and rhinology. Familiarity with the mechanisms by which this tool functions is of paramount importance [4].

There is great potential for the use of telemedicine among...
rhinologists, both in an overall manner as well as during the COVID-19 crisis. The Centers for Medicare and Medicaid Services (CMS) offers guidelines for telehealth visits preexisting the pandemic. These principles have been updated with rule changes retroactive to March 1, 2020 in an attempt to line up reimbursement practices to that of initial in-person visits during the current public health emergency [4,5,7]. The changes realigning telemedicine visits towards reimbursement consistent with in-person consultation have been described elsewhere [4], and this may be playing an important role during the current crisis [4] and with future expected waves.

In the current analysis, we queried rhinologists’ attitudes about the use of this technology and the degree to which it has impacted practice patterns. Our primary objective was to utilize a survey-based study design to help understand the extent to which telemedicine is being used as well as the details with which rhinologists are adopting it. An appreciation of how telemedicine is utilized may be important in planning not just for present concerns, but also for strategies of how to proceed as we enter the new contemporary healthcare reality.

2. Methods

A 14-question anonymous survey was sent out to the American Rhinologic Society (ARS) membership on April 20, 2020, with a reminder sent out three days later. This survey contained anonymous demographic questions as well as queries examining telemedicine use. Details regarding the manner of telemedicine services utilized were also explored. Attitudes addressing satisfaction with these services and whether telemedicine use would continue beyond pandemic times were also examined, as these are important issues in considering the role telemedicine services may play in future guidelines for rhinologists.

The survey is illustrated in Table 1. Categorical comparisons were made as appropriate by region and years in practice to determine these factors impacted results. Chi-square analysis was used for categorical comparisons by these factors, with threshold for significance set at p < 0.05. SPSS version 20 (An IBM Company, Chicago, IL) was used for statistical calculation. An Institutional Review Board (IRB) exemption was obtained for this survey.

3. Results

There were 134 respondents out of the 835 total surveys sent to ARS membership (16.0%). The 835 ARS members included both current regular fellows and international members, a breakdown which was not made available to the authors. A plurality of respondents (33.6%) practiced in the Northeast, a majority in private practice (56.0%), and a majority reported not having rhinology fellowship training (54.1%) (Table 2). Most individuals reported that rhinology comprised a majority of their practice (Table 2). A near majority (47.0%) reported > 20 years of experience in practice (Fig. 1).

In-person practice volume has changed tremendously during the COVID-19 pandemic, with the vast majority of respondent seeing > 80% of their typical volume and 14.8% not seeing any patients in person (Table 3). Greater than half of respondents report telemedicine comprises > 80% of their practices during the pandemic (Table 3). 88.1% of respondents used telemedicine. On the other hand, there were 16 (11.9%) of respondents indicating the reasons they were not using telemedicine at all, with a plurality of these individuals citing that this represents only a fix during COVID-19, and the next most common reason being patient refusal. Respondents used telemedicine in a variety of settings. The vast majority noted using telemedicine that utilized both audio and video (83.3%) (Table 4), while Doxy.me was the most popular platform (33.1%) (Table 4).

A slight plurality (40.3%) reported spending 5 to 15 min on telemedicine calls (Fig. 2), followed by 15 to 20 min (36.6%) and 20 to 25 min (13.4%). During these calls, 82.0% noted feeling some level of satisfaction ranging from absolutely satisfied to satisfied, while 18.0% reported dissatisfaction or total failure (Fig. 3). A variety of reasons were cited by respondents for the use of telemedicine, including significant public crisis health benefits amid the crisis (89.7%), patient convenience and satisfaction, maintaining revenue, and practice convenience (Fig. 4). Only 12.0% of respondents reported using telemedicine for hospital consult during the COVID-19 pandemic up to the time of this survey.

Statistical differences were observed among the use of telemedicine by region (p < 0.05). Only a minority of respondents from the midwest (28.6%) used telemedicine for at least 50% of their practice volume, a far smaller proportion compared to those practicing in the northeast (67.4%), south (48.5%), and west (72.0%). Telemedicine satisfaction levels (absolutely satisfied/mostly satisfied/satisfied versus dissatisfied/total failure) did not differ by region (MW, NE, S, W satisfaction at 86.2%, 84.1%, 78.8%, 76.0%, respectively, p = 0.73). In addition, telemedicine levels did not differ by years in practice (82.3% vs. 81.1%, p > 0.05).

4. Discussion

The novel coronavirus has had a profound impact on how our society functions and has rebranded the way otolaryngologists market their practice. As the virus dwells in the upper aerodigestive tract, including the nasal cavity and nasopharynx [8,9], rhinologists performing nasal endoscopy may be at significant exposure risk due to aerosolization and disruption of nasal mucosa [10]. Furthermore, any exposure to COVID-19 patients, especially patients with occult disease, places both the provider and assisting staff at risk. > 90% of respondents reported their in-person practice volume was at 30% or below of their pre-pandemic levels (Table 3). Consequently, this has led to the popularization of alternate modes of communication via telemedicine services, as approximately 80% of rhinologists report using telemedicine for at least half of their practice and only 1.5% reporting not using telemedicine at all (Table 3).

As detailed, a notable proportion of respondents indicated that telemedicine visits comprise a significant proportion of their practice. Perhaps this is not surprising, as the potential for telemedicine in otolaryngology has been studied in other settings in the past. Gilani [11] and McCool [12] have both examined otolaryngologists and found a variety of complaints may be appropriate for telemedicine visits; both groups noted that ear-related complaints were most amenable. Expansion of telemedicine services has been suggested for enhancing the care of Veterans Affairs (VA) patients with sleep disorders [13]. Real-time telemedicine services have also been suggested as a cost-effective strategy for otolaryngology clinics in general [14], although further study is admittedly required. To our knowledge no rhinology-focused studies have focused on this topic.

The implementation of telemedicine visits optimizes the ability of rhinologists to perform needed care and mitigates the impact of the COVID-19 crisis [4]. As a result, CMS provided a waiver allowing for reimbursement of office visits starting in March of 2020. Many telemedicine encounters are performed using real-time video encounters billing HCPS/CPT codes 99,201–99,215, allowing for preservation of revenue now that these are reimbursed at the same levels as in-person visits. In addition to these new billing rules, rhinologists’ need to understand the differences between telehealth and telemedicine, as telehealth is a broader term that encompasses the use of telecommunications technologies to promote healthcare, patient, and professional health-related education, while “telehealth” can detail remote non-clinical services including provider training and administrative meetings [4].

Despite the purported advantages of telemedicine services during both the epidemic and beyond, a minority of respondents did not incorporate this as part of their practice and reported a variety of reasons for this decision. 11.9% of respondents reported not using telemedicine and provided reasons for this decision. A plurality of these individuals
Table 1
Survey design sent to American Rhinologic Society membership.

| What region do you practice in? |
|---------------------------------|
| Northeast                        |
| Midwest                          |
| West                             |
| South                            |

| Practice Setting |
|------------------|
| Private          |
| Academic         |
| Other            |

| Rhinology Fellowship |
|----------------------|
| Yes                  |
| No                   |

| What proportion of practice is rhinology? |
|------------------------------------------|
| 0-25%                                    |
| 25-50%                                   |
| 50-75%                                   |
| > 75%                                    |

| Years in Practice |
|-------------------|
| 0-5 years         |
| 6-10 years        |
| 11-15 years       |
| 16-20 years       |
| > 20 years        |

| How has your practice changed? (In-person volume) (10 = 100% practice volume, 5 = 50%, 0 = not seeing patients) |
|----------------------------------------------------------------------------------------------------------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

| What proportion of your practice is telemedicine? |
|--------------------------------------------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

| If not using telemedicine now – Why? |
|-------------------------------------|
| No interest                         |
| Planning on it                      |
| Patients refuse                     |
| Only a fix during COVID-19          |
| Too Complicated                     |
| Other                               |

| What telemedicine service is your primary means of care? |
|--------------------------------------------------------|
| Telephone (voice)                                      |
| Telephone (chat/text)                                  |
| Email                                                  |
| Telemedicine (audio and video)                         |
| Other                                                  |

| What video platform are you using primarily? |
|---------------------------------------------|
| Doxy.me                                     |
| Zoom                                        |
| Google Hangouts                             |
| Apple Facetime                              |
| Skype                                       |
| Upfox                                       |
| VSee                                        |
| Other                                       |

| How long goes your typical telemedicine service last? |
|-------------------------------------------------------|
| 5-15 minutes                                           |
| 15-20 minutes                                          |
| 20-25 minutes                                          |
| 25-30 minutes                                          |
| > 30 minutes                                           |
| Other                                                  |
noted they felt this was “only a fix during COVID-19,” while other reasons included having “no interest,” in telemedicine, reporting it was “too complicated,” and noting that patients were refusing to participate.

Overall rhinologist satisfaction with telemedicine has been high, with > 80% of respondents reporting they were satisfied, mostly satisfied, or absolutely satisfied with their telemedicine experience (Fig. 3). Nonetheless, nearly a fifth of respondents reported they were dissatisfied and reasons for this may need to be explored. Hints for why this may be the case are noted above among those who chose not to use telemedicine; this personal preference may change as the pandemic progresses and/or further waves ensue, as telemedicine may become necessary to preserve a revenue stream for most individuals. Regardless, there has been a mostly positive reception and this is something that should be kept in mind when further guidelines informing its use in our specialty are formulated by societies.

While there has been much satisfaction with telemedicine, actual experiences have varied and these differences are critical to understand.
A majority of respondents indicated their typical telemedicine experiences last either 5–15 min or 15–20 min, with nearly an even proportion of respondents reporting one of these two categories as their answer (Fig. 2). For those looking to incorporate telemedicine in their practices, these figures may provide valuable standards for how much time to budget. The most popular video platforms are illustrated in Table 4 and include Doxy.me (33.1%) and Zoom (20.0%) by far, with Epic coming in a distant third. In terms of what telemedicine service represented one’s primary means of care, platforms utilizing audio and video were reported by 83.6%, perhaps not surprisingly as a video component is required for reimbursement on initial telehealth visit per CMS [4,7]. As previously mentioned, it is important to be familiar with the rules for telehealth in this environment to facilitate appropriate reimbursement and provide adequate patient care [4]. Importantly, rhinologists believe in a variety of significant beneficial aspects of telemedicine, with the vast majority noting it facilitates public health safety amid the crisis and improves patient convenient and satisfaction (Fig. 4); a significant proportion also noted benefits related to practice revenue.

Interestingly, telemedicine is not being used by a significant proportion of rhinologists for hospital consult services during the COVID-19 crisis. Only 12.0% of respondents reported this being the case when asked. One limitation of this analysis is that we should have compared this figure to the number of inpatient rhinology consults being seen by this respondent population before the pandemic. Nonetheless, CMS rules encompassing full reimbursement for initial telemedicine visits are not restricted just to office consults and do include emergency department and inpatient visits, so it is interesting that this number is at such a low level and it may need to be addressed. Nearly half of respondent report they work in an academic setting, and an additional amount may work in settings that include trainee coverage; this means trainee coverage may be impacting such billing numbers, although this is speculative.

### Table 3
How has your patient volume in clinic been impacted?

| 10 | 0.7% |
| 9  | 1.5% |
| 8  | 0.7% |
| 7  | 0.0% |
| 6  | 1.0% |
| 5  | 2.2% |
| 4  | 1.5% |
| 3  | 14.9% |
| 2  | 22.4% |
| 1  | 41.0% |
| 0  | 14.9% |

Since the start of the COVID-19 Pandemic, what proportion of your practice is telemedicine?

| 10 | 12.7% |
| 9  | 30.6% |
| 8  | 12.7% |
| 7  | 7.5% |
| 6  | 3.0% |
| 5  | 5.2% |
| 4  | 5.2% |
| 3  | 6.0% |
| 1  | 11.9% |
| 0  | 1.5% |

### Table 4
Telemedicine characteristics.

| What telemedicine service is your primary means of care? | % |
|--------------------------------------------------------|---|
| Telemedicine (audio AND video)                         | 83.6% |
| Telephone (voice)                                       | 14.9% |
| Telephone (chat/text)                                  | 1.5% |

| What Video Platform are you using primarily? | % |
|---------------------------------------------|---|
| Doxy.me                                     | 33.1% |
| Zoom                                        | 20.0% |
| Epic                                       | 7.7% |
| Apple Facetime                              | 6.2% |
| Other                                       | 33.0% |
To our knowledge this is the first analysis focusing on rhinologists’ attitudes towards use of telemedicine during the current COVID-19 crisis. Despite the relative novelty of these findings, this study is not without its limitations and the authors would be remiss not to comment upon these shortcomings. There are several weaknesses related both to our study design as well as inherent to the use of telemedicine. The 134 rhinologists responding to this survey may represent a self-selected group and this could skew results. As noted in our findings, the vast majority utilized telemedicine, and such practitioners may be more likely to respond to a study focusing on telemedicine habits. These results should be taken with this important consideration in mind. Another limitation that needs to be stressed is that the authors’ own biases informed which questions were included; we attempted to deal with this by incorporating a diverse authorship group from multiple

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**Fig. 3.** Reported satisfaction with telemedicine services as per respondents.

**Fig. 4.** Significant beneficial aspects of telemedicine, as reported by respondents. Public Health = Public health safety amid the crisis, Pt = Patient, Revenue = Additional Revenue.
institutions. In addition, as shorter surveys often lead to higher response rates [15,16], we were also constrained to minimize the amount of questions in order to maximize response rates; this could have impacted the types of practice patterns reported in this analysis.

Telemedicine represents a relatively novel technology for our field, and there is much we do not know about it. Hence, understanding unique technological aspects of telemedicine to a better degree could have also informed and altered our question choice. Despite these limitations, this still represents the most comprehensive look at telemedicine practice patterns among rhinologists, and we feel that findings from this may assist in guidelines development by societies such as the ARS when keeping both the current COVID-19 pandemic and future waves in mind.

5. Conclusion

Rhinologists have embraced telemedicine during the COVID-19 crisis, particularly as in-person consultation has plummeted. Utilizing telemedicine has played a significant role in improving public health safety amid the crisis and facilitating patient convenience and satisfaction per study respondents, and a significant proportion also cite the benefits of maintaining practice revenue. Telemedicine also plays a significant role in obviating the need for seeing many at-risk patients in person and performing nasal endoscopy. There is overwhelming satisfaction with the use of telemedicine, although a minority of rhinologists are dissatisfied and view this as just a temporary fix during current times. It remains to be seen whether telemedicine represents a paradigm shift in our specialty or will disappear as the current crisis and ensuing waves resolve.

Level of evidence

n/a.

Financial disclosures and declaration of competing interest

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