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ORIGINAL RESEARCH

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Utility of telephone visits at an urban safety-net hospital during 2020: A retrospective review

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Abstract

Objective: During COVID-19, otolaryngology clinics rapidly implemented telehealth programs in accordance with social distancing guidelines and institutional policies. Our objectives are to evaluate the usefulness of telephone audio visits for underserved patients seeking otolaryngological care at an urban safety-net hospital and identify patient factors associated with telephone visit attendance.

Methods: In a retrospective review of all adult telephone visits in 2020, we compared the demographics and visit characteristics of patients who attended telehealth versus in-person visits and patients who attended versus missed telehealth visits. Univariable and multivariable regressions were utilized to identify predictors of missing telehealth visits.

Results: We identified 318 telehealth encounters completed by 254 patients (72.8% were of racial/ethnic minority; 76.3% had low-income, need-based insurances; 43.7% had limited English proficiency). The most common chief complaints were related to head and neck oncology ($n = 85$, 26.7%), otology/neurotology ($n = 74$, 23.3%), and general otolaryngology ($n = 69$, 21.7%). The following actions were executed during telephone visits: behavioral and/or medication patient education ($n = 152$, 47.8%); sharing testing/imaging/tumor board results ($n = 125$, 39.3%); referrals to another department ($n = 103$, 32.4%); rendering a new diagnosis ($n = 98$, 30.8%); changing medications ($n = 60$, 18.9%). Less than half of telephone visits (46.2%) resulted in in-person follow-up, most commonly for in-person exams. The distribution of race/ethnicity differed between attended in-person appointments versus telephone visits ($p = .01$), but race and ethnicity were not significant predictors of telephone visit attendance.

Conclusion: Despite limited diagnostic capabilities, telephone audio visits can be an effective and accessible tool for providing continuity and advancing care in socially disadvantaged patients.

Eric K. Kim and Joseph Kidane contributed equally to this study.

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Level of evidence: IV.

KEYWORDS
clinical otolaryngology, health disparities, social determinants of health, telehealth

1 | INTRODUCTION

Telemedicine is the "use of electronic information and communications technologies to provide and support healthcare when distance separates the participants."[1] During the COVID-19 pandemic, several hospitals limited in-person clinic visits to telehealth visits for non-emergency medical appointments. These institutional changes accelerated the uptake of telehealth in all specialties, including otolaryngology-head and neck surgery (OHNS).[2]

Telehealth has the potential to improve health equity because it offers increased accessibility to services for underserved patient populations, especially in rural areas where physician density is significantly lower.[3,4] And yet, some have voiced concerns that health disparities persist in telemedicine care because socially disadvantaged patients may lack the technical equipment and knowledge required to participate in video visits.[5,6] Studies have identified that Black and Hispanic race, public insurance, low income, and older age are associated with lower utilization of telehealth.[7,8] Telehealth in otolaryngology has been successfully implemented using advanced technology for various purposes, including remote otoscopy,[9–11] peri-operative visits,[12–14] diagnosis of peritonsillar abscess,[15] and voice evaluations.[16] However, there is limited literature on how telephone audio visits, one type of telehealth, function and are applied in OHNS, specifically in the care of marginalized patients for whom telehealth video visits may not be an option.

The objective of this retrospective study is to describe our experience with the implementation of telephone audio visits at a safety-net hospital, analyze the functions of telephone visits in the care of a low-income, racially diverse patient population, and identify demographic factors associated with missing telephone visits. We postulate that telephone visits are widely accessible to and can further the continuity of care for these populations.

2 | MATERIALS AND METHODS

This study was approved by the University of California San Francisco Institutional Review Board (20-32367). Starting in 2020, providers determined whether to schedule a referred patient for an in-person or a telehealth appointment based on the anticipated clinical need. A retrospective chart review of all completed and missed telehealth encounters in 2020 was conducted. Pediatric patients below age 18 were excluded because their medical care and appointment attendance are managed by their caregivers. Patient demographics (age, sex, race/ethnicity, primary language, insurance status, and housing status), visit characteristics (duration of visit, provider, and chief complaint), and visit outcomes (rendering a diagnosis, reviewing lab or imaging results, patient education, arranging follow-up, placing a referral, and changing medication) were collected. Patients self-selected their race (White, African American/Black, American Indian or Alaska Native, Asian/Pacific Islander, Other, or Unknown/Decline to Answer) and ethnicity (Hispanic/Latinx vs. non-Hispanic/Latinx). Furthermore, demographics were compared between (1) patients who attended telehealth appointments versus patients who attended in-person appointments and (2) patients who attended versus missed telehealth visits.

Need-based insurances included MediCal fee for service and San Francisco Health Plan MediCal managed care health plan (California's Medicaid programs) as well as Healthy San Francisco, a local safety-net insurance program for uninsured residents of San Francisco. In 2020, people qualified for MediCal/San Francisco Health Plan or Healthy San Francisco if they had an income below 138% or 400% of the Federal Poverty Level, respectively ($17,609 and $51,040 for a one-person household).[17,18] Housing status was categorized into stable housing (rent or own), unstable housing (e.g., shelter, single room occupancy, and street), and other (e.g., correctional facility).

Each chief complaint was categorized into a corresponding OHNS subspecialty: general otolaryngology, head and neck oncology, otology/neurotology, sinus/allergy/rhinology, laryngology, facial plastic and reconstructive surgery, or sleep surgery. As a secondary outcome to assess for safety of telephone visits, we also recorded whether a patient presented to the emergency department (ED) for a complaint previously addressed at the telehealth clinic.

Descriptive statistics (mean and standard deviation) were utilized to characterize quantitative data. Categorical and continuous variables were compared using Chi-square/Fisher's exact test and Student's *t*-test, respectively. Additionally, univariable and multivariable regression analyses were used to assess for demographic variables associated with telehealth visit attendance. p-Value <.05 was considered statistically significant. Pairwise comparisons of rates of scheduled follow-up were conducted across specialties, excluding sleep surgery which did not have statistical power to be included in the analysis. Fifteen comparisons were made between six specialties, setting a significance value of .003 after Bonferroni adjustment. We used Stata (Ver 16.1, StataCorp LLC) for statistical analysis.

3 | RESULTS

3.1 | Patient demographics

Demographic characteristics of patients who completed telephone and in-person visits are shown in Table 1. In 2020, we identified a total of 318 telephone encounters completed by a cohort of

TABLE 1 Demographics of patients who completed telehealth appointments versus in-person appointments

	Telehealth appointment	In-person appointment	
	N = 254	*N* = 1498	*p*
Mean age, years (SD)	52.4 (15.4)	51.8 (18.8)	.63[a]
Sex, *N* (%)			.99[b]
Male	134 (52.8)	794 (53.0)	
Female	119 (46.9)	704 (47.0)	
Race, *N* (%)			.01*[c]
White	66 (26.0)	341 (22.8)	
African American/Black	25 (9.8)	169 (11.3)	
American Indian or Alaska Native	8 (3.2)	16 (1.1)	
Asian/Pacific Islander	57 (22.4)	446 (29.8)	
Other	95 (37.4)	492 (32.8)	
Unknown/decline to answer	3 (1.2)	34 (2.3)	
Hispanic/Latinx, *N* (%)	90 (35.4)	522 (34.9)	.86[b]
Housing status, *N* (%)			.60[c]
Housed	244 (96.1)	1348 (90.0)	
Unstable housing	7 (2.8)	60 (4.0)	
Other	2 (0.8)	14 (0.9)	
Unknown	2 (0.8)	76 (5.1)	
Insurance type, *N* (%)			.09[c]
Medicare	51 (20.2)	374 (25.0)	
Medicaid (MediCal)	29 (11.5)	146 (9.8)	
Healthy San Francisco	46 (18.2)	195 (13.0)	
San Francisco Health Plan	118 (46.6)	668 (44.6)	
PPO	6 (2.4)	20 (1.3)	
Other	4 (1.57)	95 (6.3)	
Primary language, *N* (%)			.26[b]
English	143 (56.3)	767 (51.2)	
Spanish	65 (25.6)	377 (25.2)	
Cantonese	23 (9.1)	186 (12.4)	
Other	23 (9.1)	168 (11.2)	

Abbreviations: IQR, interquartile range; *N*, total count; N/A, not available; SD, standard deviation.
[a]Student's *t*-test.
[b]Chi-square test.
[c]Fishers exact test.
*Statistically significant ($p < .05$).

254 patients. Of the 254 subjects, 72.8% identified as non-White racial/ethnic minority, and 76.3% had low-income, need-based insurance. English was the primary language for 56.3% of the subjects. In comparison, 1498 patients completed 2559 in-person appointments in 2020. Overall attendance rates of all scheduled telehealth visits and in-person visits did not differ (87.1% vs. 83.6%, $p = .11$). When comparing these 254 attendees of telephone visits to 1498 attendees of in-person appointments in 2020, race/ethnicity statistically differed ($p = .01$). Sex, housing status, insurance type, and primary language were similar between subjects who attended in-person versus telephone encounters.

We also compared the characteristics of patients who attended versus missed telephone visits and did not identify differences in age, sex, race, housing status, or language (Table 2). While the telephone visit attendance rate of African-American patients (75.8%) was lower than those of other racial/ethnic groups, the difference did not reach statistical significance ($p = .46$). Univariable and multivariable regression analyses did not identify any demographic factors associated with whether a patient attended or missed a telephone encounter.

3.2 | Telehealth visit characteristics and outcomes

The five most common diagnoses addressed at 254 initial telephone visits were hearing loss ($n = 26$, 10.2%), oropharyngeal cancer

TABLE 2 Demographics of patients who completed telehealth appointments versus patients who missed telephone appointments

	Completed telehealth appointment	Missed telehealth appointment	
	N = 254	*N* = 43	*p*
Mean age, years (SD)	52.4 (15.4)	52.3 (15.3)	.99[a]
Sex, *N* (%)			.97[b]
Male	134 (52.8)	23 (53.5)	
Female	119 (46.9)	20 (46.5)	
Race, *N* (%)			.47[c]
White	66 (26.0)	10 (23.3)	
African American/Black	25 (9.8)	8 (18.6)	
American Indian or Alaska Native	8 (3.2)	0 (0)	
Asian/Pacific Islander	57 (22.4)	8 (18.6)	
Other	95 (37.4)	16 (37.2)	
Unknown/decline to answer	3 (1.2)	1 (2.3)	
Hispanic/Latinx, *N* (%)	90 (35.4)	15 (34.9)	.84[b]
Housing status, *N* (%)			.75[c]
Housed	244 (96.1)	41 (95.4)	
Unstable housing	7 (2.8)	1 (2.3)	
Other	2 (0.8)	1 (2.3)	
Unknown	2 (0.8)	0 (0)	
Insurance type, *N* (%)			.48[c]
Medicare	51 (20.2)	8 (18.6)	
Medicaid (MediCal)	29 (11.5)	7 (16.3)	
Healthy San Francisco	46 (18.2)	5 (11.6)	
San Francisco Health Plan	118 (46.6)	21 (48.8)	
PPO	6 (2.4)	0 (0)	
Other	4 (1.6)	2 (4.7)	
Primary language, *N* (%)			.95[c]
English	143 (56.3)	24 (55.8)	
Spanish	65 (25.6)	10 (23.3)	
Cantonese	23 (9.1)	5 (11.6)	
Other*	23 (9.1)	4 (9.3)	

Abbreviations: *N*, total count; N/A, not available; SD, standard deviation.
[a]Student's *t*-test.
[b]Chi-square test.
[c]Fishers exact test.
*Statistically significant ($p < .05$).

($n = 14$, 5.5%), tinnitus ($n = 13$, 5.1%), thyroid cancer ($n = 11$, 4.3%), and gastroesophageal reflux disease ($n = 10$, 3.9%). Across all 314 visits, the majority of the telephone encounters lasted 5–20 min (28.0% 5–10 min; 30.2% 11–20 min; 5.3% 20 min or longer), although the visit duration was not recorded in 36.5% of the clinic notes. The three most relevant subspecialties were head and neck oncology ($n = 85$, 26.7%), otology/neurotology ($n = 74$, 23.3%), and general otolaryngology ($n = 69$, 21.7%). The visit characteristics are detailed in Table 3.

The most common interventions executed during initial telephone visits in decreasing order were behavioral, medication, and/or treatment patient education ($n = 152$, 47.8%), sharing lab, imaging, audiology, or tumor board results ($n = 125$, 39.3%), making referrals to another department ($n = 103$, 32.4%), rendering a new diagnosis ($n = 98$, 30.8%), and changing medications ($n = 60$, 18.9%). The top reason for requesting in-person follow-up was to conduct in-person exams; the top reason for requesting telephone follow-up was to review lab, imaging, and tumor board discussion results. Less than a tenth of visits (9.2%) did not result in any of the aforementioned interventions and required an in-person following up. The details of clinical decisions from telephone encounters are shown in Table 3.

While the subspecialty focus of a patient's patient complaint did not influence whether the provider scheduled the initial visit as a telephone or an in-person encounter ($p = .55$), clinic visits and outcomes varied by subspecialty. Rates of medication prescription significantly differed based on the subspecialty focus of clinic visits ($p < .001$). Clinic visits related to sinus/allergy/rhinology had the highest rate of medication prescription ($n = 21$, 37.5%), followed by laryngology ($n = 6$, 35.3%), and general otolaryngology ($n = 18$, 26.1%). Initial telehealth visits concluded with a scheduled follow-up after 64.7% of visits, significantly varying depending on subspecialty ($p = .006$). The rate of scheduled follow-up appointments after initial visits was significantly higher in head and neck oncology ($n = 48$, 84.2%), compared to otology/neurotology ($n = 42$, 56.8%; $p < .001$) and laryngology ($n = 8$, 47.1%; $p = .003$).

Three patients presented to the ED for a concern previously addressed at a telephone visit. Their chief complaints were throat pain, dysphagia, and headache. All three patients were discharged home after reassurance and symptom management.

4 | DISCUSSION

In this study, we demonstrate that telephone visits are accessible to and can serve various functions in the otolaryngological care of patients. The most common usages of telephone visits were placing a referral, counseling, and managing a patient's pharmacotherapy. Additionally, we did not identify demographic factors that predicted a missed telephone visit, suggesting that low-income safety net patients do not face disparities in accessing telephone audio visits.

Our analysis showed that no specific patient groups (e.g., racial/ethnic minorities, those whose primary language is not English) experienced disparities in overall telephone visit attendance at our institution. Although statistically nonsignificant, the attendance rate of telephone visits was higher than that of in-person visits, which corroborates the results of a previous study.[19] These findings together are reassuring that our clinic is providing equitable access to telephone visits and suggest that telephone visits can serve as an accessible point of entry to otolaryngologic care for socially disadvantaged patients who may have a challenging time presenting for in-person visits for various reasons, such as distance, work commitments, or childcare.[20,21]

A telephone visit bypasses the issue of internet access and video conferencing difficulties and may be a more accessible telehealth modality of communication for our patient demographic than video visits.[22,23]

TABLE 3 Analysis of characteristics and outcomes of all completed telehealth visits

Telehealth visit was a follow-up from a previous in-person or telehealth visit? *N* (%)	245 (77.0)
Type of provider, *N* (%)	
Attending physician	54 (17.0)
Nurse practitioner	133 (41.8)
Resident physician	131 (41.1)
Visit length, *N* (%)	
5–10	89 (28.0)
11–20	96 (30.2)
21–30	16 (5.0)
35+	1 (0.3)
N/A	116 (36.5)
Subspecialty, *N* (%)	
Head and neck oncology	85 (26.7)
Otology/neurotology	74 (23.3)
General	69 (21.7)
Sinus/allergy/rhinology	56 (17.6)
Laryngology	17 (5.4)
Facial plastics and reconstructive surgery	16 (5.0)
Sleep	1 (0.3)
What counseling was performed? *N* (%)	
None	166 (52.2)
Diet/exercise	34 (10.7)
Smoking/alcohol	7 (2.2)
Medication adherence	39 (12.3)
Symptom management	46 (14.5)
Risks/benefits/alternatives of treatment or procedure	50 (15.7)
Other[a]	5 (1.6)
What changes did the provider make to a patient's medication regimen? *N* (%)	
None	258 (81.1)
Dosage	2 (0.6)
Add a new medication	57 (17.9)
Discontinue a medication	6 (1.9)
What results were reviewed? *N* (%)	
None	193 (60.7)
Labs	42 (13.2)
Imaging	50 (15.7)
Audiology	24 (7.5)
Tumor board discussion	19 (6.0)
What follow-up was arranged? *N* (%)	
None	103 (32.4)
Telehealth	56 (17.6)
In-person	144 (45.3)
Unspecified type	10 (3.1)
Both telehealth and in-person	3 (0.9)
Unknown	2 (0.6)
Reason for telehealth follow-up *N* = 56	
Monitor	17 (30.4)
Patient preference	2 (3.6)
Other/unknown	11 (19.6)
Review lab/imaging/tumor board results	28 (50.0)
Reason for in-person follow-up *N* = 144	
Need for in-person exam	82 (56.9)
Communication issues	0 (0)
Patient preference	8 (5.6)
Need for in-person treatment	23 (16.0)
Other/unknown	33 (22.9)
Referral placed to another department, *N* (%)	103 (32.4)
Rendering a new diagnosis, *N* (%)	98 (30.8)

[a]Other: Access to hearing aids, hearing loss prevention, stress, following up after a procedure, reassurance about management.

Darrat et al. found that individuals who are older, reside in lower income areas, and have public or no insurance are likelier to participate in a telephone than a video visit.[8] Common complaints about video visits include low quality of the video, audio–video lag, length, and complexity of virtual check-in.[24] Many people also simply cannot connect to video visits, as 21 million individuals in the United States lack broadband internet access.[25] Our findings that age, race/ethnicity, insurance type, language, and housing status do not impact telephone visit attendance are consistent with Darrat et al.'s results and suggest that telephone visits are not equally affected by the disparities seen in video visits.[8]

As many postulate that telehealth will remain a fixture in OHNS well beyond the COVD-19 pandemic, it is imperative to understand how to harness the strengths of telemedicine and ensure equitable access to disadvantaged patient populations.[26] Most telephone encounters resulted in an actionable outcome that advanced patient care, such as rendering a diagnosis and prescribing or adjusting pharmacotherapy. This is in part due to the efforts of the OHNS providers, who triaged referred patients and determined the appropriateness of telephone visits depending on their clinical needs.

Telephone visits may be best suited for certain diagnoses and OHNS subspecialties. Our findings showed that the most common diagnosis among first-time telephone visits was hearing loss and that nearly a quarter of all visits were related to otology/neurotology.

While previous studies have shown that otology/neurotology is particularly well-suited for telehealth because telephone cameras can be used to conduct ear examinations,[27,28] our results show that telephone audio visits can be effective in addressing otologic concerns outside of visual assessments. We also found that telephone visits may be useful for providing continuity for cancer patients, as evidenced by the high frequency of cancer-related diagnoses and chief complaints related to head and neck oncology. Even if an in-person biopsy or imaging is needed to make a definitive diagnosis of cancer, telephone visits can be utilized in tandem to arrange follow-up and coordinate multidisciplinary care between medical oncology, otolaryngology, and radiation oncology. Considering the complexity of oncological care, telephone visits with providers can serve as a tool of patient advocacy to ensure that no patients, especially minority groups disproportionately affected by head and neck cancer,[29,30] fall through the cracks.

Our findings also suggest rhinological and laryngological problems can be managed and monitored through telephone encounters. Visits centered around chief complaints like congestion, post-nasal drip, and voice hoarseness, which may not necessitate immediate in-person examination, led to medication prescription from clinical history and presentation over the phone. Moreover, these visits were used to medically optimize patients before surgical consideration. Future efforts should focus on expanding telephone services and educating clinicians on how to best provide care for such chief complaints that may not require in-person exams.

We also demonstrate the triaging capabilities of telephone visits. Only three individuals seen at the telephone clinic presented to the ED for the same complaint and were discharged home after symptom management. While our telephone visits did not miss any acute pathology, it suggests that providers may need to provide clearer patient education about expectations, symptom management, and return precautions during telephone visits.

Nearly half of telephone visits resulted in in-person follow-up, most commonly for in-person examinations, which reflects the greatest limitation of telephone visits. Providers cannot rely solely on clinical reasoning and require specialized equipment (e.g., fiberoptics) to make certain diagnoses. While a telephone visit does not afford the ability to conduct certain physical examinations, it nonetheless provides an accessible opportunity for an OHNS provider to communicate with the patient and engage in shared decision-making to determine the next appropriate steps in management.

This study has a few notable limitations. Our analysis is limited to a single institution and one time and retrospective in nature. Because our data derives from only what was documented on the clinic notes, our analysis may not be capturing every intervention resulting from the telephone visits. Due to the low number of patients who missed telephone visits, our study might have been underpowered to detect differences in telephone visit attendance rates between different demographic groups. We also lack insight into the reasons a patient may miss a telephone visit, which can better inform our understanding of the barriers to accessing telephone visits.

5 | CONCLUSIONS

While the majority of literature around telehealth otolaryngology has focused on video visits, our analysis examines the applications and utility of telephone visits in a low-income, safety net patient population. Our retrospective review reveals that telephone visits may be limited diagnostically but can be instrumental in providing continuity and advancing patient care through care coordination, counseling, and managing pharmacotherapy. By elucidating the patterns of the applications of telephone visits, we hope to identify how to best optimize our telehealth delivery and inform our improvement and education efforts to best benefit socially disadvantaged patients.

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CONFLICTS OF INTEREST

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