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Perceptions of telemedicine at a pediatric otolaryngology-head and neck surgery program

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ABSTRACT

Objective With few studies investigating the effectiveness of telemedicine (TM) in pediatric otolaryngology (ear, nose, and throat; ENT), its role in clinical practice is unclear. The objective of this study was to investigate provider perspectives regarding utility of TM in pediatric ENT practice.

Methods A survey gauging the relative merits of TM visits for common pediatric ENT chief complaints and postoperative visits was distributed to all pediatric ENT providers at a tertiary care, free-standing children's hospital. Respondents were asked to assess the effectiveness of TM visits compared with in-person visits for completing the following tasks: history collection, physical examination, medical decision-making, and patient counseling.

Results Providers rated TM visits as less useful than in-person visits for completing the most predefined tasks but did identify advantages in history taking via TM for the majority of complaints. Compared with providers with ≥10 years of experience, those with <10 years of experience found TM to be more effective than the in-person appointment for making clinical decisions for patients presenting with recurrent/chronic pharyngitis, neck masses, and stridor/noisy breathing. Opinions regarding the utility of TM for postoperative visits were mixed, with adenoidectomy, tonsillectomy and superficial procedures being most frequently deemed appropriate for TM.

Conclusions The introduction of TM to pediatric ENT faces limitations in detailed examination of areas not accessible without specialized instrumentation. Due to its strength in history taking, results suggest an asynchronous, 'store and forward' encounter followed by an in-person physical examination to confirm the diagnosis and treatment plan could be beneficial.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Prior to the COVID-19 pandemic, little was known about the utility of telehealth in pediatric ear, nose, and throat (ENT).

WHAT THIS STUDY ADDS

⇒ By collating and analyzing the perceptions of pediatric ENT providers, hospital systems can move forward with telehealth by using it in ways that are perceived to be more effective.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Using these data, more centers can compare their perceptions and experience with telehealth and continue to use this method to make healthcare more cost-effective and accessible.

INTRODUCTION

Telemedicine is a technology created to assist with the remote care of patients. In 2002, a review of the literature talked about early advancements that allowed telemedicine to be used in pediatric otolaryngology (ear, nose, and throat; ENT).[1] At this time, there were still advancements to be made to make telemedicine more practical for widespread use. Prior to the COVID-19 pandemic, research on the use of telemedicine by pediatric specialists was rare and not widely used by ENT providers at our institution.[2] In an effort to reduce viral transmission and in response to the changing needs of patients during the COVID-19 pandemic, pediatric healthcare providers turned to telemedicine as a method to provide care for their patients.[3–7] This led to a shift in clinic procedures due to larger volumes of clinic visits being done online. While the majority of practice has returned to in-person care, the use of telemedicine in pediatric ENT care delivery during this time has raised awareness for the potential of telemedicine as a part of pediatric ENT practice.

The transition to telemedicine provides added challenges for ENT providers who often use specialized tools to complete a comprehensive examination.[3] Despite challenges brought on by an incomplete physical examination, studies have shown that telemedicine can provide benefits for patients presenting for ENT care through decreases in time lost to commute, decreases in lost wages, and decreases in lost school time.[8–12] It can also decrease geographic barriers to second opinions, allowing more patients to access specialized care.[12] Additional studies have reported few or no missed diagnoses when using telemedicine to evaluate ENT patients,

supporting the potential for telemedicine to deliver healthcare for this patient population.[9 13] In 2018, Seim and colleagues found that both patient satisfaction and the provider's ability to diagnose common conditions were comparable between telemedicine and in-person clinic visits.[9] While mostly positively perceived, common complaints for patients using telemedicine included technology issues.[8] Kokesh and colleagues found that tympanostomy tube placement follow-up can be just as effective in a telemedicine format, indicating a potential use in other postoperative visits.[14] The application of telemedicine has also demonstrated utility in other surgical specialties as an effective alternative to in-person postoperative follow-up.[15]

A study also aimed at assessing the usefulness of telemedicine in pediatric ENT during the pandemic looked at patient satisfaction.[16] McCoy and colleagues focused on satisfaction 6 weeks prior to telemedicine utilization and 6 weeks after implementation. This study found that there were problems with satisfaction from caregivers, specifically when surgical intervention was not recommended for patients. This indicates that quality of patient counseling and communication could possibly be hindered in telemedicine formats. Overall, however, the study found that patients were similarly satisfied with telemedicine as they were with in-clinic visits.

The aim of this study was to explore the perspective of ENT providers on their ability to effectively carry out necessary components of an appointment in the context of the recent increase in use in telemedicine. Additionally, we aimed to evaluate whether perspectives on telemedicine varied based on clinician experience during the beginning of the pandemic.

METHODS

Study design

We performed a cross-sectional observational cohort study to examine the perspective of ENT providers in using telemedicine to evaluate and treat pediatric patients presenting to an outpatient clinic. Additional interest was given to differences in perspective based on time in practice (<10 years, ≥10 years). Practice was defined as time as an attending physician for surgeons and years of practice in ENT as a nurse practitioner. Age was used to examine potential generational differences between native technology users and non-native users. Years of practice were examined to note the impact of ingrained practice patterns and likelihood of adopting changes in medical practice. The survey was designed by our group to meet the aim of the study and is available for review in online supplemental appendix A. The study was reviewed by our local Institutional Review Board and deemed exempt as the study did not meet the criteria for research on human subjects.

Survey creation

A survey was created by the authors (KJ and PW) and reviewed by the entire ENT group to measure provider opinions on the utility of telemedicine for multiple chief complaints and in postoperative follow-up for procedures commonly seen in pediatric ENT. For each chief complaint, respondents were asked to assess the effectiveness of using telemedicine visit compared with in-person visit to complete the four tasks related to a typical visit: history, physical examination, medical decision-making, and patient counseling. The first section of the survey focused on chief complaints and how telemedicine was viewed to impact each of the four domains mentioned above. The entire survey was designed such that providers only answered questions related to chief complaints that they had managed with telemedicine visits. On a scale of 0–100, the provider was asked to rate telemedicine effectiveness relative to in-person clinic visits, with 50 being equivalent to in-person clinic visits, 100 being clearly superior to in-person clinic visits and 0 being useless. In addition to rating the effectiveness of telemedicine for each chief complaint, providers were also queried regarding the utility of telemedicine for new patient visits or follow-up visits for each chief complaint. The provider was asked if they would recommend the use of telemedicine going forward for new patients as well as for follow-up visits. A 75% positive response rate was held as a threshold for acceptance of the telemedicine platform. Typical survey response rates can vary widely but are frequently below 50% and the ideal desired response rate with any given survey is 100%. Given the size of our sample, it was determined that as complete a response as possible would be desired, taking into account a subset that would not respond regardless of reminder requests. As such, the mean of the anticipated and desired response rates was used as a reasonably achievable end point.

The second section of the survey asked providers to identify postoperative follow-up appointments following various procedures that would be appropriate for telemedicine. For each procedure, the providers were asked to check a box if they believed that telemedicine could be appropriate for more than 50% of patients who would like to undergo that particular procedure. For example, if a provider had seen patients with recurrent otitis but not hearing loss, they would only answer survey instrument questions related to recurrent otitis media.

Survey distribution

The survey was distributed by email to all advanced practice providers and surgeons within the Department of Pediatric ENT and our institution who care for pediatric patients. This consisted of 11 pediatric otolaryngologists, 1 neurotologist whose practice is 50% based at our institution, and 5 pediatric ENT nurse practitioners. Survey responses were input directly into the Research Electronic Data Capture (REDCap) portal by respondents and housed on a secure network at our institution.[17]

Table 1 Breakdown of demographic factors as well as assessment of telephone and video telehealth visits by years of experience

Characteristics	Total (n=14)	Experience		P values
		Less than 10 years (n=10)	10 years or more (n=4)	
Years of experience*				
Less than 10 years	10 (71.4)	–	–	–
10 years or more	4 (28.6)	–	–	
Provider type*				
Surgeon	11 (78.6)	8 (80.0)	3 (75.0)	1.000
Nurse practitioner	3 (21.4)	2 (20.0)	1 (25.0)	
Age range (years)*				
30–39	6 (42.9)	6 (60.0)	0 (0.0)	0.0599
40–49	6 (42.9)	4 (40.0)	2 (50.0)	
50–59	1 (7.1)	0 (0.0)	1 (25.0)	
>60	1 (7.1)	0 (0.0)	1 (25.0)	
Gender*				
Male	11 (78.6)	9 (90.0)	2 (50.0)	0.1758
Female	3 (21.4)	1 (10.0)	2 (50.0)	
Overall assessment of utility of telephone†	50 (30.0–58.0)	50.0 (30.0–50.0)	44.0 (22.5–63.5)	0.9527
Overall assessment of utility of video telehealth visit†	60 (50.0–70.0)	61.5 (60.0–72.0)	52.5 (49.0–60.0)	0.1285

Fisher's exact test used to assess for association with categorical variables; Wilcoxon-Mann-Whitney test used to assess for differences among continuous variables; p< 0.05 indicates significance.
*Data presented as proportion (%).
†Data presented as median (IQR).

Data analysis

Counts and frequencies were computed for categorical variables while medians and IQRs were computed for continuous variables. Wilcoxon-Mann-Whitney tests were used to test for differences in provider perception of telehealth usage on chief complaints for each task by years of experience, age range and gender (self-described). Fisher's exact tests were used to test for association of provider perception of telehealth for each chief complaint by years of experience, age range and gender. Significance for the data was set at p<0.05. All statistical tests were done using the SAS Enterprise V.8.1.

RESULTS

Response rate and participant characteristics

The overall survey response rate was 87.5% and was completed by 91.7% of surgeons and 60% of nurse practitioners who comprised 78.6% and 21.4% of the cohort, respectively. In total, 14 participants completed the survey, among which all had provided telemedicine services to patients presenting with at least one of the predetermined chief complaints. The majority of respondents were male (78.6%, n=11) and most (71.4%, n=10) reported less than 10 years of clinical experience. Demographics of respondents and their telemedicine utilization are outlined in table 1.

New referrals

The perceived effectiveness of using telemedicine to complete the predefined components of a clinic visit did not vary based on provider experience for most diagnoses (table 1). Compared with providers with more clinical experience, providers with less than 10 years of experience reported higher perceived levels of effectiveness when using telemedicine to apply clinical decision-making to patients with recurrent/chronic pharyngitis (p=0.0163), a neck mass (p=0.0367), or stridor/noisy breathing (p=0.0368) (table 2, online supplemental table 1).

Figure 1 outlines the summarized ratings for each complaint based on whether the provider would recommend telemedicine for new or return patients. Overall, providers were supportive of telemedicine as a platform for meaningful patient assessment in most situations (online supplemental table 2). There were no significant differences found for return or new patients based on the provider's years of experience (online supplemental table 3).

Table 2 Perceived effectiveness on use of telemedicine based on years of experience

Reason for referral, mean (IQR)	Total (n=14)	Experience		P values
		Less than 10 years (n=10)	10 years or more (n=4)	
Recurrent/chronic pharyngitis				
History	50 (50–56)	50 (50–58)	50 (24–50)	0.2518
Physical examination	40 (30–50)	43 (33–50)	37 (29–40)	0.3418
Applying medical decision	50 (40–50)	50 (48.5–50.5)	38 (28–40)	**0.0163**
Patient counseling	50 (50–50)	50 (50–50)	50 (29–50)	0.3947
Useful for new patients* (n=11)	11 (100)	8 (100)	3 (100)	–
Useful for follow-up patients* (n=11)	11 (100)	8 (100)	3 (100)	–
Neck mass				
History	50 (50–55)	50 (50–59.5)	40.5 (31–50)	0.2043
Physical examination	30 (28–39)	34.5 (27–39.5)	28.5 (28–29)	0.359
Applying medical decision	50 (40–50)	50 (46.5–50)	32.5 (32–33)	**0.0367**
Patient counseling	50 (45–50)	50 (47.5–50)	39 (28–50)	0.3379
Useful for new patients* (n=10)	10 (100)	8 (100)	2 (100)	–
Useful for follow-up patients* (n=10)	9 (90)	7 (77.8)	2 (22.2)	1.0000
Stridor/noisy breathing				
History	50 (50–55)	50 (50–60)	42 (34–50)	0.2146
Physical examination	30 (19.5–38)	30 (20–40)	27.5 (19-36)	0.8591
Applying medical decision	46.5 (38-50)	50 (43–50)	28 (20–36)	**0.0368**
Patient counseling	50 (46.5–50)	50 (50–50)	41.5 (33-50)	0.3973
Useful for new patients* (n=8)	6 (75)	5 (83.3)	1 (50)	0.4643
Useful for follow-up patients* (n=8)	8 (100)	6 (100)	2 (100)	–

Fisher's exact test used to test for association among categorical variables; Wilcoxon-Mann-Whitney test used to assess for differences among continuous variables; p<0.05 indicates significance with statistically significant findings noted in bold.
*Indicates counts and proportion.

History taking

Survey respondents generally rated the telehealth utility of history gathering as equivalent to in-office visits. The median rating for all chief complaints was 50, all with IQR of approximately 50–60 with the exception of hearing loss (IQR 49–50), cerumen impaction (IQR 26.5–50), lip or tongue tie (IQR 32–61), and neonatal swallowing or feeding difficulties not related to tongue or lip tie (IQR 42–50). Chief complaints with IQR higher than 60 consisted of acute otitis media (IQR 50–63), snoring, sleep disordered breathing or obstructive sleep (IQR 50–62), and lip or tongue tie (IQR 32–61) (online supplemental table 2).

Physical examination

Median scores for physical examination fell below 50 for all chief complaints. The lowest rating was observed for chronic otitis media (median=1, IQR 0–7), followed by acute otitis media (median=3, IQR 0–15) and cerumen impaction (median=4.5, IQR 1.5–15.5). The highest ratings for the physical examination were observed for nasal injury or fracture (median=43, IQR 30–50), followed by recurrent or chronic pharyngitis (median=40, IQR 30–50), lip or tongue tie and neck mass (both showing median=36, IQR 30–50) (online supplemental table 2).

Medical decision-making

Median scores for the medical decision-making were more varied among each chief complaint. The highest ratings were observed for recurrent or chronic pharyngitis and neck mass (both showing median=50, IQR 40–50). The lowest ratings were observed for cerumen impaction (median=11, IQR 2–22.5) and hearing loss (median=27.5, IQR 21–40) (online supplemental table 2).

Patient counseling

Median ratings for patient counseling for each chief complaint fell mostly approximately 50 with the exception of cerumen impaction (median=10.5, IQR 8.5–37.5) and neck mass (median=41, IQR 34–50) (online supplemental table 2).

Postoperative follow-up

Respondents were in favor of using telehealth for follow-up visits among most chief complaints. High

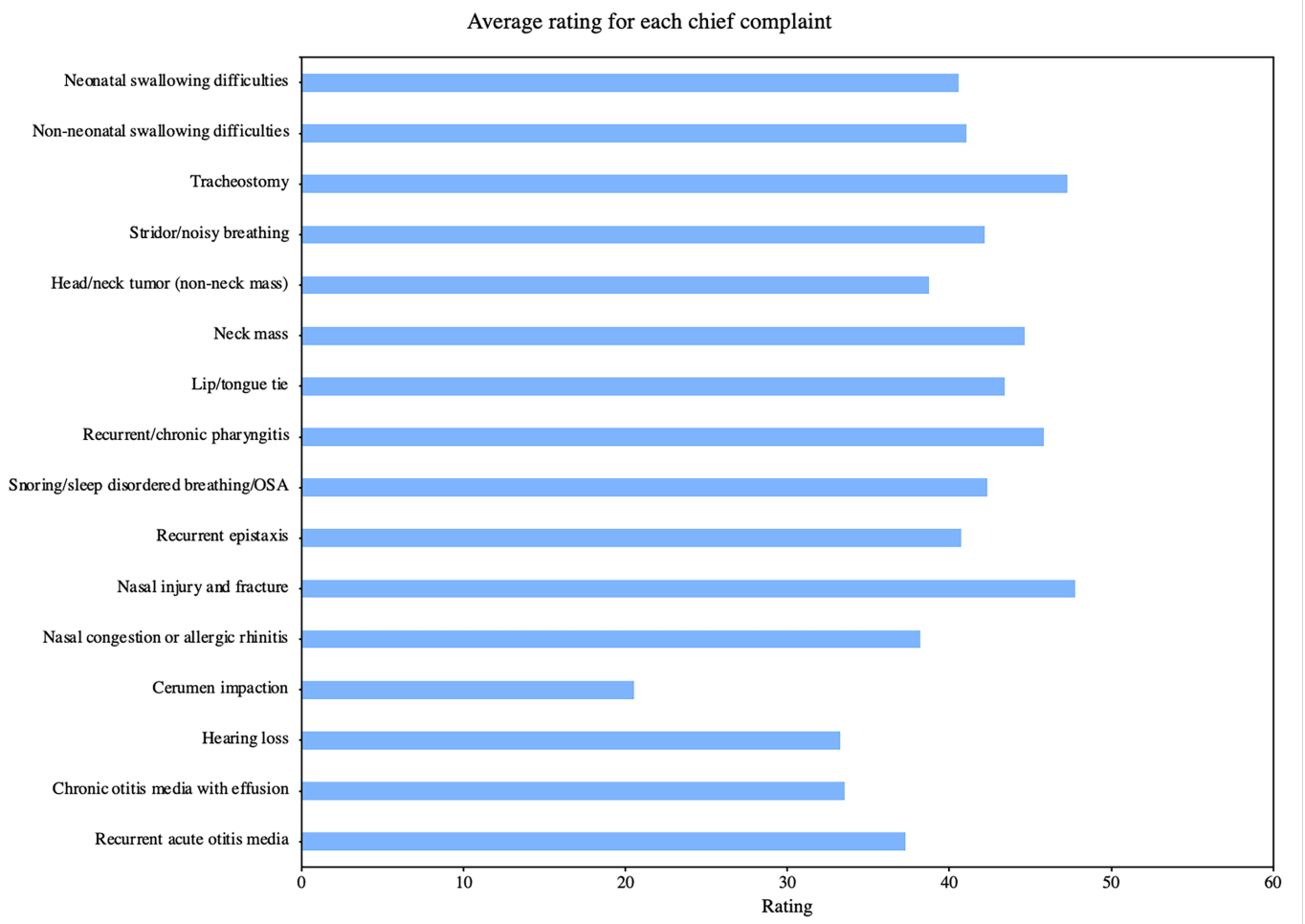

Figure 1 Mean source of all domains among all respondents for each complaint. On a scale of 0–100, the provider was asked to rate telemedicine effectiveness relative to in-person clinic visits, with 50 being equivalent to in-person clinic visits, 100 being clearly superior, and 0 being useless. OSA, obstructive sleep apnea.

agreement was seen in complaints related to mouth or throat as well as airway with 100% agreement that telehealth was favorable for follow-up visits for the majority of patients with those conditions (figure 2). Disagreement was observed for nasal complaints, with the largest level of disagreement observed for cerumen impaction (50% in favor, 50% against), nasal congestion (70% in favor, 30% against), and head and neck mass (66.67% in favor, 33.33% against) (online supplemental table 2).

DISCUSSION

The use of telemedicine offers the promise of mitigating barriers to care and minimizing the drawbacks of in-person visits for patients while improving clinic flow and potentially efficiency for providers. While the COVID-19 pandemic has thrust telemedicine into the spotlight, as we return to a system where in-person visits are an option, the application of telemedicine visits to an appropriately selected population will ensure that telemedicine is delivered to patients who will benefit most from this model. The pediatric ENT patient population represents a unique population in whom physical examination of the recesses of the ears, nose, and oropharynx is imperative for accurate diagnosis and management. As such, the current investigation sought to draw on the collective experience of the pediatric ENT providers to help understand which aspects of pediatric ENT are most amenable to telemedicine.

Out of all four of the domains, the physical examination was consistently rated unfavorably compared with the other domains. This is likely due to the lack of physical interaction as well as limitations to what a family member can describe or what can be visualized on the camera. Complaints that rely on general visual examination, such as nasal injuries or fractures, are more suited to a telemedicine physical examination, but these types of complaints are less frequently encountered in pediatric ENT.

The other three domains were generally rated higher, likely because these are carried out very similarly in the clinic as they are in telemedicine. The collection of an accurate history can be obtained over any protected health information virtual platform with equal efficacy compared with in-person visits, as the technology does

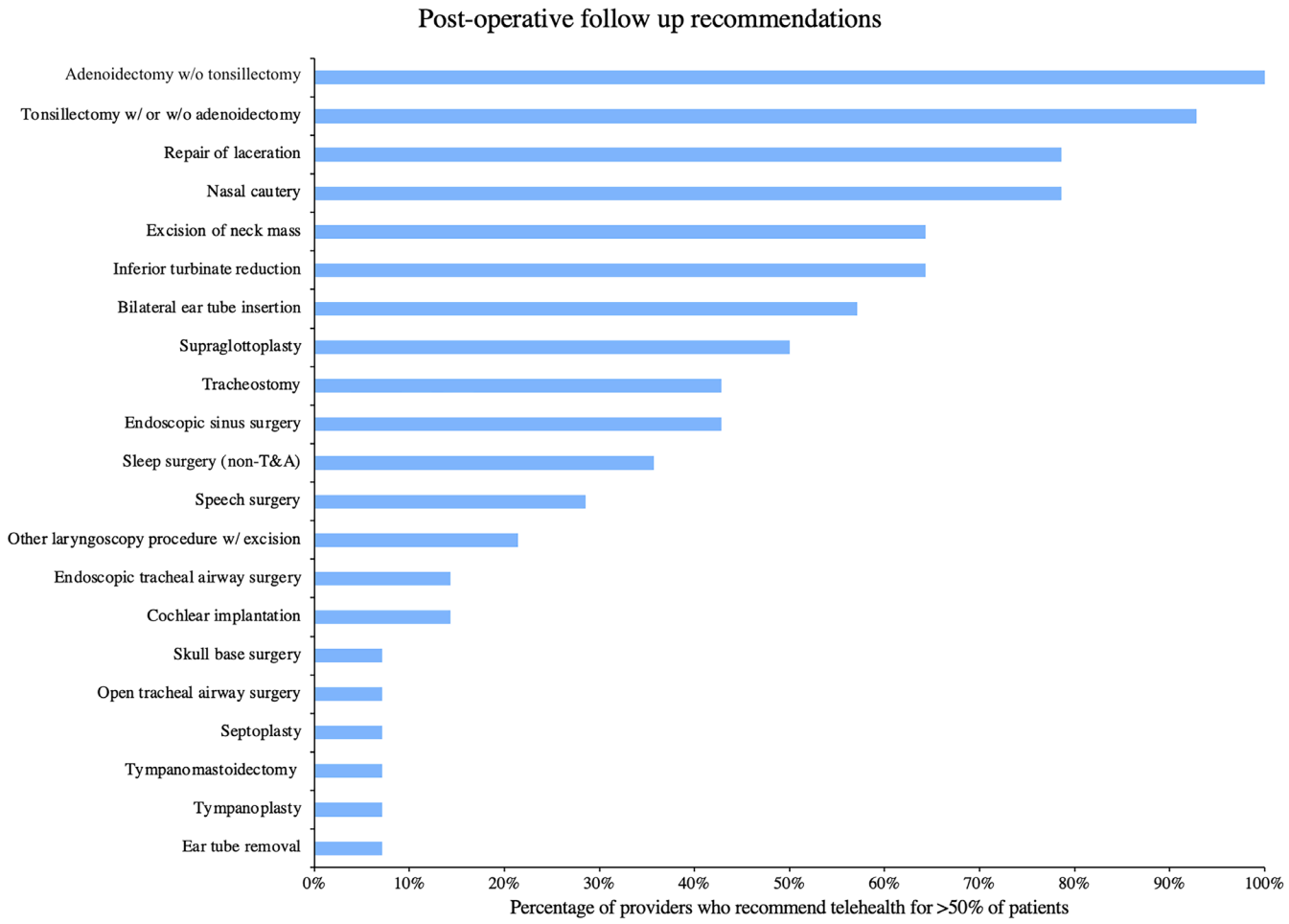

Figure 2 Telemedicine postoperative recommendation by intervention. Bars represent the percentage of survey respondents indicating they would use telemedicine for postoperative follow-up for the majority of patients undergoing the indicated intervention. T&A, tonsillectomy and adenoidectomy.

not present barriers to effective communication between provider and patient apart from potential connectivity issues. While medical decision-making was perceived as less effective via telehealth than in-person visits, the authors suspect that this decrement relates to incomplete data acquisition from impaired physical examination. However, the current instrument was not designed to elucidate this hypothesis. Of note, the known limitations in attainment of a thorough physical examination can also serve to improve history taking as the provider needs a more thorough history in order to make informed decisions. Aside from demonstrating how to administer a medicine on the patients themselves, patient counseling can be done well via telehealth as the provider can communicate and demonstrate on themselves and engage in teach-back by having the caregiver or patient demonstrate back to confirm understanding.

Overall, our findings are consistent with existing literature about the utility of telehealth within surgical specialties.[5 15] Our study found positive opinions in general about the effectiveness of postoperative evaluation using videoconferencing software, a finding also seen in the review by Asiri and colleagues examining surgical specialties and Belcher and colleagues with pediatric ENT specifically. Maurrasse and colleagues also found that telemedicine is very well suited to visits where counseling is a large portion of the visit, similar to our findings.[3] Also of note, providers believed that patient counseling was similar to in-person visits. It could be of further interest to assess both provider opinions as well as the patient/caregiver opinions of the same visit, as patient satisfaction was affected in telemedicine settings surrounding counseling.[16]

Some strengths of the survey were the high response rate from providers, including a complete sample of pediatric ENT providers at Nationwide Children's Hospital as well as the large range of both chief complaints and postoperative follow-up visits included. Another strength is the comparison to in-person clinic. Because telemedicine was sparingly used before hospitals chose to go virtual, providers were able to reflect on recent memory of how visits were conducted in person and compare to the new guidelines using telemedicine.

Some limitations of the current investigation include the small sample size of participants, the opinion-based nature of the survey, and the limited telemedicine knowledge of the providers given the novelty of the platform. Participants were also selected by convenience as opposed to random selection, although this would have significantly decreased the sample size at our institution. By expanding this kind of investigation to other sites, a more significant data set could be collected to draw broader conclusions. Additionally, the limited size of the population surveyed leads to limited statistical significance. Despite these limitations, the results of the current investigation provide an overview of how telemedicine can be used in pediatric ENT in the future.

In conclusion, while many telemedicine visits in pediatric ENT are hindered by limitations in physical examination, the majority of providers favorably rated the use of telemedicine in certain aspects of practice. Implementation of telemedicine practices that focus on increasing the yield of both telemedicine and in-person encounters can lower patient travel and time burdens and improve the allocation of telemedicine and in-clinic time to optimize efficiency in pediatric ENT practices. Should further assessment of telemedicine utility in pediatric ENT continue to demonstrate poor utility of telemedicine for physical examination, one potential avenue could be implemented using telemedicine's strengths in history taking to decrease office visit time and to improve clinic flow by taking history through telemedicine before the visit so the time allotted can be used for physical examination and patient counseling.

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Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request. All data relevant to the study are included in the article or uploaded as supplementary information.

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Pediatric ENT Provider Telehealth Perceptions Survey

Thank you for taking the time to complete this brief survey to help understand and hone the role of telemedicine in the care of pediatric otolaryngology patients. Your identity is being collected so that we can identify changes in provider perception over time.

Many thanks for your time.

Demographics: Filling out this section tells us a little about you. No identifiable information is collected.

Please select your role	◯ Surgeon ◯ Nurse Practitioner
How many years experience do you have after completion of training?	◯ < 5 years from completion of training ◯ >5 but less than 10 years from completion of training ◯ >10 but less than 20 years from completion of training ◯ >20 years from completion of training ◯ I prefer not to answer
What is your age range?	◯ < 30 years ◯ 30-39 years ◯ 40-49 years ◯ 50-59 years ◯ >60 years ◯ I prefer not to answer
What is your gender?	◯ Male ◯ Female ◯ Other ◯ I prefer not to answer
Please denote your prefered gender, if desired	_____

Telehealth General Questions: The following questions assess your use of telehealth to this point.

Please estimate the number of telephone visits per week completed in the last month.	◯ I completed no telephone visits in the last month ◯ < 5 ◯ 6-10 ◯ 11-20 ◯ 21-30 ◯ >30
What is your overall assessment of the utility of telephone visits?	No utility at all. All patients should have at least video visit — Some utility in certain situations, case dependent — Extremely useful. I could manage most of my patients with telephone visits *(Place a mark on the scale above)*

Please estimate the number of video visits per week you completed over the last month.

◯ I completed no video visits in the last month
◯ < 5
◯ 6-10
◯ 11-20
◯ 21-30
◯ >30

What is your overall assessment of the utility of video telehealth visits?

No utility at all. All patients should be seen in person	Some utility in certain situations, case dependent	Extremely useful. I could manage most of my patients with video visits

(Place a mark on the scale above)

Thank you for your participation. You do not need to complete the remainder of the survey questions. Please scroll to the bottom and submit.

◯ Yes ◯ No

In the following section, you will be asked to assess the utility of history gathering, obtaining a physical examination, and making and providing medical decisions via telemedicine visits. When answering these questions, please consider only telehealth video visits. Consider both assessment of new and follow up patients in your answers.

Martini: shaken or stirred?

◯ shaken ◯ stirred

EAR-RELATED COMPLAINTS

Have you seen patients via telehealth for ear-related complaints?

◯ Yes
◯ No
(Ear complaints: RAOM, COME, hearing loss, cerumen impaction, or similar)

-Recurrent Acute Otitis Media

Have you seen patients for recurrent acute otitis media via telehealth video visit?

◯ Yes ◯ No

For recurrent acute otitis media, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?

Much LESS effective than in-person visit	EQUAL to in-person visit	Much MORE effective than in-person visit

(Place a mark on the scale above)

For recurrent acute otitis media, how would you rate the effectiveness of physical exam gathered via telehealth visit as compared to in-person visit?

Much LESS effective than in-person visit	EQUAL to in-person visit	Much MORE effective than in-person visit

(Place a mark on the scale above)

For recurrent acute otitis media, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?

Much LESS effective than in-person visit	EQUAL to in-person visit	Much MORE effective than in-person visit

(Place a mark on the scale above)

For recurrent acute otitis media, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
Did you find telemedicine visits useful for NEW patients with recurrent acute otitis media?	◯ Yes ◯ No
Did you find telemedicine useful for FOLLOW UP patient visits (after a previous in person visit and exam) for recurrent acute otitis media?	◯ Yes ◯ No
Please feel free to leave any COMMENTS regarding telemedicine visits for recurrent acute otitis media.	_____

-Chronic Otitis Media with Effusion

Have you seen patients via telehealth video visit for chronic otitis media with effusion?	◯ Yes ◯ No
For chronic otitis media with effusion, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For chronic otitis media with effusion, how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For chronic otitis media with effusion, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For chronic otitis media with effusion, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
Did you find telemedicine visits useful for NEW patients with chronic otitis media with effusion?	◯ Yes ◯ No
Did you find telemedicine visits useful for FOLLOW UP patients with chronic otitis media with effusion (after a previous in person visit and exam)?	◯ Yes ◯ No

Please feel free to leave any COMMENTS regarding telehealth visits for patients with chronic otitis media with effusion? _____

-Hearing Loss

Have you seen patients via telehealth video visit for hearing loss? ◯ Yes ◯ No

For hearing loss, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?

Much LESS effective than in-person visit | EQUAL to in-person visit | Much MORE effective than in-person visit

(Place a mark on the scale above)

For hearing loss, how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?

Much LESS effective than in-person visit | EQUAL to in-person visit | Much MORE effective than in-person visit

(Place a mark on the scale above)

For hearing loss, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?

Much LESS effective than in-person visit | EQUAL to in-person visit | Much MORE effective than in-person visit

(Place a mark on the scale above)

For hearing loss, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?

Much LESS effective than in-person visit | EQUAL to in-person visit | Much MORE effective than in-person visit

(Place a mark on the scale above)

Did you find telemedicine visits useful for NEW patients with hearing loss? ◯ Yes ◯ No

Did you find telemedicine visits useful for FOLLOW UP patients with hearing loss (after a previous in person visit and exam)? ◯ Yes ◯ No

Please feel free to leave any COMMENTS regarding telehealth visits for patients with hearing loss? _____

-Cerumen Impaction

Have you seen patients via telehealth video visit for cerumen impaction? ◯ Yes ◯ No

For cerumen impaction, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?

Much LESS effective than in-person visit | EQUAL to in-person visit | Much MORE effective than in-person visit

(Place a mark on the scale above)

For cerumen impaction, how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For cerumen impaction, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For cerumen impaction, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
Did you find telemedicine visits useful for NEW patients with cerumen impaction?	◯ Yes ◯ No
Did you find telemedicine visits useful for FOLLOW UP patients with cerumen impaction (after a previous in person visit and exam)?	◯ Yes ◯ No
Please feel free to leave any COMMENTS regarding telehealth visits for patients with cerumen impaction.	_____

NASAL COMPLAINTS

Have you seen patients via telehealth for nasal complaints?	◯ Yes ◯ No (Nasal complaints: allergic rhinitis, nasal congestion, recurrent epistaxis or similar)

-Nasal congestion/Allergic rhinitis

Have you seen patients via telehealth video visit for nasal congestion or allergic rhinitis?	◯ Yes ◯ No
For nasal congestion or allergic rhinitis, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For nasal congestion or allergic rhinitis, how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*

For nasal congestion or allergic rhinitis, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For nasal congestion or allergic rhinitis, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
Did you find telemedicine visits useful for NEW patients with nasal congestion or allergic rhinitis?	◯ Yes ◯ No
Did you find telemedicine visits useful for FOLLOW UP patients with nasal congestion or allergic rhinitis (after a previous in person visit and exam)?	◯ Yes ◯ No
Please feel free to leave any COMMENTS regarding telehealth visits for patients with nasal congestion or allergic rhinitis.	_____

-Nasal injury/fracture

Have you seen patients via telehealth video visit for nasal injury/fracture?	◯ Yes ◯ No
For nasal injury/fracture, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For nasal injury/fracture, how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For nasal injury/fracture, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For nasal injury/fracture, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
Did you find telemedicine visits useful for NEW patients with nasal injury/fracture?	◯ Yes ◯ No

Did you find telemedicine visits useful for FOLLOW UP patients with nasal injury/fracture (after a previous in person visit and exam)?	◯ Yes ◯ No
Please feel free to leave any COMMENTS regarding telehealth visits for patients with nasal injury/fracture.	_____

-Recurrent Epistaxis

Have you seen patients via telehealth video visit for recurrent epistaxis?	◯ Yes ◯ No
For recurrent epistaxis, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For recurrent epistaxis, how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For recurrent epistaxis, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For recurrent epistaxis, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
Did you find telemedicine visits useful for NEW patients with recurrent epistaxis?	◯ Yes ◯ No
Did you find telemedicine visits useful for FOLLOW UP patients with recurrent epistaxis (after a previous in person visit and exam)?	◯ Yes ◯ No
Please feel free to leave any COMMENTS regarding telehealth visits for patients with epistaxis.	_____

ORAL CAVITY/PHARYNGEAL COMPLAINTS

Have you seen patients for mouth/throat-related complaints?	◯ Yes ◯ No (Mouth/throat complaints: lip/tongue tie, sleep disordered breathing, OSA, snoring, enlarged tonsils, recurrent pharyngitis, or similar)

-Snoring / Sleep Disordered Breathing / Obstructive Sleep Apnea

Have you seen patients via telehealth video visit for snoring/sleep disordered breathing/OSA?	◯ Yes ◯ No
For snoring/SDB/OSA, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For snoring/SDB/OSA, how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For snoring/SDB/OSA, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For snoring/SDB/OSA, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
Did you find telemedicine visits useful for NEW patients with snoring/SDB/OSA?	◯ Yes ◯ No
Did you find telemedicine visits useful for FOLLOW UP patients with snoring/SDB/OSA (after a previous in person visit and exam)?	◯ Yes ◯ No
Please feel free to leave any COMMENTS regarding telehealth visits for patients with snoring/SDB/OSA.	_____

-Recurrent / Chronic Pharyngitis

Have you seen patients via telehealth video visit for recurrent/chronic pharyngitis?	◯ Yes ◯ No
For recurrent pharyngitis, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For recurrent pharyngitis, how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For recurrent pharyngitis, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For recurrent pharyngitis, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
Did you find telemedicine visits useful for NEW patients with recurrent pharyngitis?	◯ Yes ◯ No
Did you find telemedicine visits useful for FOLLOW UP patients with recurrent pharyngitis (after a previous in person visit and exam)?	◯ Yes ◯ No
Please feel free to leave any COMMENTS regarding telehealth visits for patients with recurrent pharyngitis.	_____

Lip/Tongue tie

Have you seen patients via telehealth video visit for lip or tongue tie?	◯ Yes ◯ No
For tongue/lip tie, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For tongue/lip tie, how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*

For tongue/lip tie, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For tongue/lip tie, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
Did you find telemedicine visits useful for NEW patients with tongue/lip tie?	◯ Yes ◯ No
Did you find telemedicine visits useful for FOLLOW UP patients with tongue/lip tie (after a previous in person visit and exam)?	◯ Yes ◯ No
Please feel free to leave any COMMENTS regarding telehealth visits for patients with lip/tongue tie.	_____

HEAD AND NECK MASSES

Have you seen patients via telehealth for mass-related complaints?	◯ Yes ◯ No (Mass complaints: neck mass, other head and neck tumors, or similar)

-Neck Mass

Have you seen patients via telehealth video visit for neck mass?	◯ Yes ◯ No
For neck mass, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For neck mass, how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For neck mass, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For neck mass, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*

Did you find telemedicine visits useful for NEW patients with neck mass?	◯ Yes ◯ No
Did you find telemedicine visits useful for FOLLOW UP patients with neck mass (after a previous in person visit and exam)?	◯ Yes ◯ No
Please feel free to leave any COMMENTS regarding telehealth visits for patients with neck mass.	_____

-Head and Neck Tumor (non-neck mass)

Have you seen patients via telehealth video visit for a head and neck tumor (non-neck mass)?	◯ Yes ◯ No
For head and neck tumors (non-neck mass), how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For head and neck tumors (non-neck mass), how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For head and neck tumors (non-neck mass), how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For head and neck tumors (non-neck mass), how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
Did you find telemedicine visits useful for NEW patients with head and neck tumors (non-neck mass)?	◯ Yes ◯ No
Did you find telemedicine visits useful for FOLLOW UP patients with head and neck tumors (non-neck mass) (after a previous in person visit and exam)?	◯ Yes ◯ No
Please feel free to leave any COMMENTS regarding telehealth visits for patients with head and neck tumors (non-neck mass).	_____

AIRWAY

Have you seen patients via telehealth for airway-related complaints?	◯ Yes ◯ No (Airway complaints: stridor, noisy breathing, known airway stenosis, tracheostomy dependence, or similar)

-Stridor/ Noisy Breathing

Have you seen patients via telehealth video visit for stridor/noisy breathing?	◯ Yes ◯ No
For stridor/noisy breathing, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit — EQUAL to in-person visit — Much MORE effective than in-person visit *(Place a mark on the scale above)*
For stridor/noisy breathing, how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit — EQUAL to in-person visit — Much MORE effective than in-person visit *(Place a mark on the scale above)*
For stridor/noisy breathing, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?	Much LESS effective than in-person visit — EQUAL to in-person visit — Much MORE effective than in-person visit *(Place a mark on the scale above)*
For stridor/noisy breathing, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit — EQUAL to in-person visit — Much MORE effective than in-person visit *(Place a mark on the scale above)*
Did you find telemedicine visits useful for NEW patients with stridor/noisy breathing?	◯ Yes ◯ No
Did you find telemedicine visits useful for FOLLOW UP patients with stridor/noisy breathing (after a previous in person visit and exam)?	◯ Yes ◯ No
Please feel free to leave any COMMENTS regarding telehealth visits for patients with stridor/noisy breathing.	_____

-Known Airway Stenosis (non-trach dependent)

Have you seen patients via telehealth video visit for known airway stenosis (non-trach dependent)?	◯ Yes ◯ No
For airway stenosis, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For airway stenosis, how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For airway stenosis, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For airway stenosis, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
Did you find telemedicine visits useful for NEW patients with airway stenosis?	◯ Yes ◯ No
Did you find telemedicine visits useful for FOLLOW UP patients with airway stenosis (after a previous in person visit and exam)?	◯ Yes ◯ No
Please feel free to leave any COMMENTS regarding telehealth visits for patients with airway stenosis.	_____

-Tracheostomy Dependence (any reason)

Have you seen patients via telehealth video visit for tracheostomy dependence (for any reason)?	◯ Yes ◯ No
For tracheostomy dependence, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For tracheostomy dependence, how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*

For tracheostomy dependence, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For tracheostomy dependence, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
Did you find telemedicine visits useful for NEW patients with tracheostomy dependence?	◯ Yes ◯ No
Did you find telemedicine visits useful for FOLLOW UP patients with tracheostomy dependence (after a previous in person visit and exam)?	◯ Yes ◯ No
Please feel free to leave any COMMENTS regarding telehealth visits for patients with tracheostomy dependence.	_____

FEEDING/DYSPHAGIA

Have you seen patients via telehealth for feeding/swallowing problems?	◯ Yes ◯ No

-Non-Neonatal Swallowing/Feeding Difficulties

Have you seen patients via telehealth video visit for non-neonatal swallowing or eating difficulties?	◯ Yes ◯ No
For feeding/swallowing difficulties, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For feeding/swallowing difficulties, how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For feeding/swallowing difficulties, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*

For feeding/swallowing difficulties, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
Did you find telemedicine visits useful for NEW patients with feeding/swallowing difficulties?	◯ Yes ◯ No
Did you find telemedicine visits useful for FOLLOW UP patients with feeding/swallowing difficulties (after a previous in person visit and exam)?	◯ Yes ◯ No
Please feel free to leave any COMMENTS regarding telehealth visits for patients with feeding/swallowing difficulties.	_____

-Neonatal Feeding/Swallowing Difficulties (not related to lip/tongue tie)

Have you seen patients via telehealth video visit for neonatal swallowing or feeding difficulties (not related to tongue/lip tie)?	◯ Yes ◯ No
For neonatal feeding/swallowing difficulties, how would you rate the effectiveness of history gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For neonatal feeding/swallowing difficulties, how would you rate the effectiveness of physical examination gathered via telehealth as related to that gained in an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For neonatal feeding/swallowing difficulties, how would you rate the effectiveness of applying medical decision making via telehealth visit as compared to in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
For neonatal feeding/swallowing difficulties, how would you compare the effectiveness of providing patient counseling via telehealth video visit as compared to an in-person visit?	Much LESS effective than in-person visit / EQUAL to in-person visit / Much MORE effective than in-person visit *(Place a mark on the scale above)*
Did you find telemedicine visits useful for NEW patients with neonatal feeding/swallowing difficulties?	◯ Yes ◯ No

Did you find telemedicine visits useful for FOLLOW UP patients with neonatal feeding/swallowing difficulties (after a previous in person visit and exam)?	◯ Yes ◯ No
Please feel free to leave any COMMENTS regarding telehealth visits for patients with neonatal feeding/swallowing difficulties.	_____

POSTOPERATIVE VISITS: LAST QUESTION!!!

After which of the following surgeries would you feel comfortable managing the postoperative visit with a video telehealth? Assume no combo procedures when answering. Please select ALL that apply. If telehealth would be appropriate for the majority (>50%) of patients but not all, please include in your selections.	☐ Bilateral ear tube insertion ☐ Ear tube removal with/without myringoplasty ☐ Tympanoplasty ☐ Tympanomastoidectomy with/without OCR ☐ Cochlear implantation ☐ Nasal cautery ☐ Inferior turbinate reduction ☐ Septoplasty ☐ Endoscopic sinus surgery ☐ Adenoidectomy (without tonsillectomy) ☐ Tonsillectomy (with or without adenoidectomy) ☐ Supraglottoplasty ☐ Other laryngoscopy with excision ☐ Tracheal airway surgery (endoscopic) ☐ Tracheal airway surgery (open) ☐ Tracheostomy ☐ Excision of neck mass ☐ Repair of laceration ☐ Speech surgery ☐ Sleep surgery (non T&A) ☐ Skull base surgery
Thank you very much for taking the time to complete the survey. Please feel free to enter any general comments.	_____

Note on quantitative vs qualitative research

While qualitative or categorical variables such as gender and provider role were used in this study, an important distinction must be made that the majority of variables collected were not open ended questions but were continuous or binary in nature. As such, the type of research conducted was quantitative rather than qualitative. Additional support for this statement is that the data were not collected through focus groups or cognitive interviews - methods that are more supportive of qualitative research.

We feel that compiling provider assessment of telehealth in Otolaryngology practice is a concrete and straightforward concept – one that brings about little concern for contextual bias, where social or cultural values play a part in how survey questions can be interpreted or misinterpreted. As such, the choice to conduct this study using quantitative research methods rather than qualitative methods feels well justified.[1]

1. Lakshman M, Sinha L, Biswas M, Charles M, Arora NK. Quantitative vs qualitative research methods. *Indian J Pediatr*. 2000;67(5):369-377.

Supplementary Table 1. Perceived effectiveness of using telemedicine based on years of clinical experience

		Experience		
	Total n = 14	Less than 10 years n = 10	10 years or more n = 4	
Reason for referral	**median (IQR)**	**median (IQR)**	**median (IQR)**	**p value**
Recurrent acute otitis media				
History	50 (50-63)	50 (50-66.5)	50 (39-52)	0.4582
Physical exam	3 (0-15)	2.5 (0-11.5)	3 (0-34)	0.7897
Applying medical decision	37 (32-41)	38.5 (33.5-45)	35 (25-41)	0.6622

Patient counseling	50 (50-50)	50 (50-53.5)	50 (33-50)	0.2162
*Useful for new patients (n = 11)	10 (90.91)	7 (87.5)	3 (100)	1.0000
*Useful for follow up patients (n = 11)	10 (90.91)	7 (87.5)	3 (100)	1.0000
Chronic otitis media with effusion				
History	50 (50-50)	50 (50-50)	50 (33-50)	0.5398
Physical exam	1 (0-7)	0 (0-6)	2 (0-34)	0.6360
Applying medical decision	38.5 (21.5-45)	40 (39-50)	33 (10-38)	0.1750
Patient counseling	50 (42.5-50)	50 (50-50)	50 (35-50)	0.9085
*Useful for new patients (n = 8)	6 (75)	3 (60)	3 (100)	0.4643
*Useful for follow up patients (n = 8)	6 (75)	3 (60)	3 (100)	0.4643
Hearing loss				
History	50 (49-50)	50 (49.5-55)	41 (32-50)	0.4627
Physical exam	15 (2-28)	15 (5-34)	15 (2-28)	1.0000
Applying medical decision	27.5 (21-40)	35 (27.5-45)	12 (3-21)	0.1426
Patient counseling	50 (18-50)	50 (50-50)	15 (12-18)	0.0686
*Useful for new patients (n = 6)	4 (66.67)	3 (75)	1 (50)	1.0000
*Useful for follow up patients (n = 6)	5 (83.33)	3 (75)	2 (100)	1.0000
Cerumen Impaction				
History	50 (26.5-50)	50 (50-50)	3 (3-3)	0.2414
Physical exam	4.5 (1.5-15.5)	3 (0-25)	6 (6-6)	1.0000
Applying medical decision	11 (2-22.5)	20 (2-25)	2 (2-2)	0.7486
Patient counseling	19.5 (8.5-37.5)	25 (14-50)	3 (3-3)	0.4999
*Useful for new patients (n = 4)	1 (25)	0 (0)	1 (100)	0.2500
*Useful for follow up patients (n = 4)	2 (50)	1 (50)	1 (50)	1.0000
Nasal complaints				
History	50 (50-50)	50 (50-56)	50 (35-50)	0.2342
Physical exam	14 (1-35)	14 (1-39)	14 (0 -29)	0.5748
Applying medical decision	34.5 (25-50)	49 (25-50)	28 (25-34)	0.2644
Patient counseling	50 (36-50)	50 (50-50)	36 (31-50)	0.2339
*Useful for new patients (n = 10)	9 (90)	6 (85.7)	3 (100)	1.0000
*Useful for follow up patients (n = 10)	7 (70)	5 (71.43)	2 (66.7)	1.0000
Nasal injury / fracture				
History	50 (50-60)	50 (50-55)	55.5 (50-61)	0.7304
Physical exam	43 (30-50)	43 (33.5-48)	44.5 (30-59)	0.7969
Applying medical decision	45 (40-50)	45 (40-50)	47 (34-60)	1.0000

Patient counseling	50 (50-50)	50 (45-50)	54.5 (50-59)	0.5273
*Useful for new patients (n = 6)	6 (100)	4 (100)	2 (100)	---
*Useful for follow up patients (n = 6)	6 (100)	4 (100)	2 (100)	---
Recurrent epistaxis				
History	50 (50-60)	50 (50-60)	29 (29-29)	0.2835
Physical exam	12 (0-37)	7.5 (0 -37)	30 (30-30)	0.8600
Applying medical decision	50 (36-50)	50 (50-50)	28 (28-28)	0.1422
Patient counseling	50 (38-50)	50 (50-50)	29 (29-29)	0.2843
*Useful for new patients (n = 7)	6 (85.71)	5 (83.3)	1 (100)	1.0000
*Useful for follow up patients (n = 7)	6 (85.71)	5 (83.3)	1 (100)	1.0000
Snoring / Sleep disordered breathing / Obstructive sleep apnea				
History	50 (50-62)	50 (50-66)	50 (28-50)	0.2518
Physical exam	30 (30-33)	30 (30-33)	30 (20-39)	1.0000
Applying medical decision	41 (35-50)	47.5 (40.5-50)	35 (28-40)	0.0723
Patient counseling	50 (47-50)	50 (48.5-50)	50 (28-50)	0.6509
*Useful for new patients (n = 11)	11 (100)	8 (100)	3 (100)	---
*Useful for follow up patients (n = 11)	11 (100)	8 (100)	3 (100)	---
Recurrent / Chronic pharyngitis				
History	50 (50-56)	50 (50-58)	50 (24-50)	0.2518
Physical exam	40 (30-50)	43 (33-50)	37 (29-40)	0.3418
Applying medical decision	50 (40-50)	50 (48.5-50.5)	38 (28-40)	**0.0163**
Patient counseling	50 (50-50)	50 (50-50)	50 (29-50)	0.3947
*Useful for new patients (n = 11)	11 (100)	8 (100)	3 (100)	---
*Useful for follow up patients (n = 11)	11 (100)	8 (100)	3 (100)	---
Lip / Tongue tie				
History	50 (32-61)	55.5 (50-61)	32 (32-32)	0.6625
Physical exam	36 (30-50)	43 (36-50)	30 (30-30)	0.6711
Applying medical decision	50 (28-50)	50 (50-50)	28 (28-28)	0.3354
Patient counseling	50 (28-56)	53 (50-56)	28 (28-28)	0.6655
*Useful for new patients (n = 3)	3 (100)	2 (100)	1 (100)	---
*Useful for follow up patients (n = 3)	3 (100)	2 (100)	1 (100)	---
Neck mass				
History	50 (50-55)	50 (50-59.5)	40.5 (31-50)	0.2043
Physical exam	30 (28-39)	34.5 (27-39.5)	28.5 (28-29)	0.359

Applying medical decision	50 (40-50)	50 (46.5-50)	32.5 (32-33)	**0.0367**
Patient counseling	50 (45-50)	50 (47.5-50)	39 (28-50)	0.3379
*Useful for new patients (n = 10)	10 (100)	8 (100)	2 (100)	---
*Useful for follow up patients (n = 10)	9 (90)	7 (77.8)	2 (22.2)	1.0000
Head and neck tumor (non-neck mass)				
History	50 (50-54)	52 (50-54)	50 (50-50)	1.0000
Physical exam	28 (16-41)	34.5 (28-41)	16 (16-16)	0.6711
Applying medical decision	41 (19-41)	41 (41-41)	19 (19-19)	0.3354
Patient counseling	41 (34-50)	45.5 (41-50)	34 (34-34)	0.6655
*Useful for new patients (n = 3)	3 (100)	2 (100)	1 (100)	---
*Useful for follow up patients (n = 3)	2 (66.67)	1 (50)	1 (100)	1.0000
Stridor / Noisy breathing				
History	50 (50-55)	50 (50-60)	42 (34-50)	0.2146
Physical exam	30 (19.5-38)	30 (20-40)	27.5 (19-36)	0.8591
Applying medical decision	46.5 (38-50)	50 (43-50)	28 (20-36)	**0.0368**
Patient counseling	50 (46.5-50)	50 (50-50)	41.5 (33-50)	0.3973
*Useful for new patients (n = 8)	6 (75)	5 (83.3)	1 (50)	0.4643
*Useful for follow up patients (n = 8)	8 (100)	6 (100)	2 (100)	---
Tracheostomy dependence (any reason)				
History	50 (50-50)	50 (50-50)	50 (50-73)	1.0000
Physical exam	36 (27-40)	33 (26-40)	36 (27-50)	0.8005
Applying medical decision	50 (39-60)	59 (50-68)	39 (38-60)	0.4022
Patient counseling	50 (50-50)	50 (50-50)	50 (39-50)	1.0000
*Useful for new patients (n = 5)	3 (60)	1 (50)	2 (66.7)	1.0000
*Useful for follow up patients (n = 5)	5 (100)	2 (100)	3 (100)	---
Non-neonatal swallowing / feeding difficulties				
History	50 (50-60)	50 (50-55)	69 (69-69)	0.1986
Physical exam	20 (5-25)	12.5 (2.5-22.5)	43 (43-43)	0.4081
Applying medical decision	50 (50-50)	50 (36.5-50)	50 (50-50)	1.0000
Patient counseling	50 (50-50)	50 (38-50)	50 (50-50)	1.0000
*Useful for new patients (n = 5)	4 (80)	3 (75)	1 (100)	1.0000
*Useful for follow up patients (n = 5)	5 (100)	4 (100)	1 (100)	---

Neonatal feeding / swallowing difficulties (not related to lip / tongue tie)				
History	50 (42-50)	50 (50-50)	46 (42-50)	1.0000
Physical exam	32 (16-40)	32 (32-32)	28 (16-40)	1.0000
Applying medical decision	39 (27-50)	39 (39-39)	38 (27-50)	1.0000
Patient counseling	50 (41-50)	41 (41-41)	50 (50-50)	0.3381
*Useful for new patients (n = 3)	1 (33.33)	0 (0)	1 (50)	1.0000
*Useful for follow up patients (n = 3)	3 (100)	1 (100)	2 (100)	---

*Indicates counts and proportion; IQR = Interquartile range

Fisher's exact test used to test for association among categorical variables; Wilcoxon Mann-Whitney test used to assess for differences among continuous variables; *P* value < 0.05 indicates significance

Supplementary Table 2. Breakdown of provider preference for telemedicine among chief complaints.

		History Gathering		Physical Exam		Medical Decision	
Complaints	**N**	**Min / Max**	**Median (IQR)**	**Min / Max**	**Median (IQR)**	**Min / Max**	**Median (IQR)**
Otologic							
Acute otitis media	11	39 / 75	50 (50 - 63)	0 / 34	3 (0 - 15)	20 / 50	37 (32 - 41)
Chronic otitis media	8	33 / 61	50 (50 - 50)	0 / 34	1 (0 - 7)	10 / 50	38.5 (21.5 - 45)
Hearing loss	6	32 / 60	50 (49 - 50)	0 / 48	15 (2 - 28)	3 / 50	27.5 (21 - 40)
Cerumen impaction	4	3 / 50	50 (26.5 - 50)	0 / 25	4.5 (1.5 - 15.5)	2 / 25	11 (2 - 22.5)
Nasal							
Nasal congestion	10	35 / 75	50 (50 - 50)	0 / 40	14 (1 - 35)	25 / 50	34.5 (25 - 50)
Nasal injury or fracture	6	50 / 61	50 (50 - 60)	27 / 59	43 (30 - 50)	34 / 60	45 (40 - 50)
Recurrent epistaxis	7	29 / 70	50 (50 - 60)	0 / 50	12 (0 - 37)	28 / 50	50 (36 - 50)
Mouth or throat related complaint							

Snoring, sleep disordered breathing or obstructive sleep apnea	11	28 / 78	50 (50 - 62)	2 / 39	30 (30 - 33)	16 / 50	41 (35 - 50)
Recurrent or chronic pharyngitis	11	24 / 69	50 (50 - 56)	0 / 50	40 (30 - 50)	28 / 70	50 (40 - 50)
Lip or tongue tie	3	32 / 61	50 (32 - 61)	30 / 50	36 (30 - 50)	28 / 50	50 (28 - 50)
Mass							
Neck mass	10	31 / 65	50 (50 - 55)	18 / 61	36 (30 - 50)	32 / 60	50 (40 - 50)
Head and neck mass	3	50 / 54	50 (50 - 54)	16 / 41	28 (16 - 41)	19 / 40	41 (19 - 41)
Airway							
Stridor or noisy breathing	8	34 / 60	50 (50 - 55)	2 / 50	30 (19.5 - 38)	20 / 50	46.5 (38 - 50)
Airway stenosis	0	-	-	-	-	-	-
Tracheostomy	5	50 / 73	50 (50 - 50)	26 / 50	36 (27 - 40)	38 / 68	50 (39 - 60)
Neonatal swallowing or eating difficulties	5	50 / 69	50 (50 - 60)	0 / 43	20 (5 - 25)	23 / 50	50 (50 - 50)
Neonatal swallowing or feeding difficulties not related to tongue or lip tie	3	42 / 50	50 (42 - 50)	16 / 40	32 (16 - 40)	27 / 50	39 (27 - 50)

		Patient Counseling		**New Patient**		**Follow Up**	
Complaints	**N**	**Min / Max**	**Median (IQR)**	**Yes n (%)**	**No n (%)**	**Yes n (%)**	**No n (%)**
Otologic							
Acute otitis media	11	33 / 61	50 (50 - 50)	10 (90.91)	1 (9.09)	10 (90.91)	1 (9.09)
Chronic otitis media	8	20 / 54	50 (42.5 - 50)	6 (75)	2 (25)	6 (75)	2 (25)
Hearing loss	6	12 / 50	50 (18 - 50)	4 (66.67)	2 (33.33)	5 (83.33)	1 (16.67)
Cerumen impaction	4	3 / 50	10.5 (8.5 - 37.5)	3 (75)	1 (25)	2 (50)	2 (50)
Nasal							
Nasal congestion	10	31 / 62	50 (36 - 50)	9 (90)	1 (10)	7 (70)	3 (30)
Nasal injury or fracture	6	40 / 59	50 (50 - 50)	6 (100)	0 (0)	6 (100)	0 (0)
Recurrent epistaxis	7	29 / 69	50 (38 - 50)	6 (85.71)	1 (14.29)	6 (85.71)	1 (14.29)
Mouth or throat related complaint							

Snoring, sleep disordered breathing or obstructive sleep apnea	11	28 / 56	50 (47 - 50)	11 (100)	0 (0)	11 (100)	0 (0)
Recurrent or chronic pharyngitis	11	29 / 58	50 (50 - 50)	11 (100)	0 (0)	11 (100)	0 (0)
Lip or tongue tie	3	28 / 56	50 (28 - 56)	3 (100)	0 (0)	3 (100)	0 (0)
Mass							
Neck mass	10	28 / 62	50 (45 - 50)	10 (100)	0 (0)	9 (90)	1 (10)
Head and neck mass	3	34 / 50	41 (34 - 50)	3 (100)	0 (0)	2 (66.67)	1 (33.33)
Airway							
Stridor or noisy breathing	8	33 / 54	50 (46.5 - 50)	6 (75)	2 (25)	8 (100)	0 (0)
Airway stenosis	0	-	-	-	-	-	-
Tracheostomy	5	39 / 50	50 (50 - 50)	3 (60)	2 (40)	5 (100)	0 (0)
Neonatal swallowing or eating difficulties	5	26 / 50	50 (50 - 50)	4 (80)	1 (20)	5 (100)	0 (0)
Neonatal swallowing or feeding difficulties not related to tongue or lip tie	3	47 / 50	50 (41 - 50)	2 (66.67)	1 (33.33)	3 (100)	0 (0)

Supplementary Table 3. Provider preference for telemedicine among chief complaints by clinician experience, age range, and gender.

	History Gathering				
	Age Range				
	30 - 39 years n = 6	40 - 49 years n = 6	50 - 59 years n = 1	> 60 years n = 1	
Complaints	Median (IQR)	Median (IQR)	Median (IQR)	Median (IQR)	p value
Otologic					
Acute otitis media	56.6 (50 - 69)	50 (50 - 52)	50 (50 - 50)	-	0.5656
Chronic otitis media	55.5 (50 - 61)	50 (50 - 50)	50 (50 - 50)	-	0.2938
Hearing loss	55 (50 - 60)	49.5 (40.5 - 50)	-	-	0.2735
Cerumen impaction	50 (50 - 50)	26.5 (3 - 50)	-	-	0.6514
Nasal					
Nasal congestion	50 (50 - 75)	50 (50 - 50)	50 (50 - 50)	-	0.6178
Nasal injury or fracture	50 (50 - 60)	50 (50 - 61)	-	-	1
Recurrent epistaxis	50 (50 - 60)	50 (50 - 61)	-	-	0.8518
Mouth or throat related complaint					
Snoring, sleep disordered breathing or obstructive sleep apnea	56 (50 - 66)	50 (47 - 50)	50 (50 - 50)	-	0.4618
Recurrent or chronic pharyngitis	53 (50 - 58)	50 (47 - 50)	50 (50 - 50)	-	0.4618
Lip or tongue tie	55.5 (50 - 61)	32 (32 - 32)	-	-	0.6026
Mass					
Neck mass	52.5 (50 - 60)	50 (50 - 50)	-	-	0.3079
Head and neck mass	54 (54 - 54)	50 (50 - 50)	-	-	0.5528
Airway					
Stridor or noisy breathing	55 (50 - 60)	50 (42 - 50)	-	-	0.1773
Airway stenosis	-	-	-	-	-
Tracheostomy	50 (50 - 50)	50 (50 - 73)	-	50 (-)	0.7165
Neonatal swallowing or eating difficulties	50 (50 - 60)	59.5 (50 - 69)	-	-	0.7631
Neonatal swallowing or feeding difficulties not related to tongue or lip tie	50 (50 - 50)	56 (42 - 50)	-	-	1
	Gender			Experience	
	Male	Female		< 10 Years Exp	> 10 Years Exp

	n = 11	n = 3		n = 10	n = 4	
Complaints	**Median (IQR)**	**Median (IQR)**	**p value**	**Median (IQR)**	**Median (IQR)**	**p value**
Otologic						
Acute otitis media	50 (50 - 63)	52 (52 - 52)	0.6162	50 (50 - 66.5)	50 (39 - 52)	0.3942
Chronic otitis media	50 (50 - 50)	50 (50 - 50)	1	50 (50 - 50)	50 (33 - 50)	0.2799
Hearing loss	50 (49 - 50)	50 (50 - 50)	1	50 (49.5 - 55)	41 (32 - 50)	0.4938
Cerumen impaction	50 (26.5 - 50)	50 (50 - 50)	-	50 (50 - 50)	3 (3 - 3)	0.3318
Nasal						
Nasal congestion	50 (50 - 50)	50 (50 - 50)	1	50 (50 - 56)	50 (32 - 50)	0.1944
Nasal injury or fracture	50 (50 - 60)	50 (50 - 50)	0.7431	50 (50 - 55)	55.5 (50 - 61)	0.6074
Recurrent epistaxis	50 (50 - 60)	-	-	50 (50 - 60)	29 (29 - 29)	0.217
Mouth or throat related complaint						
Snoring, sleep disordered breathing or obstructive sleep apnea	50 (50 - 62)	50 (50 - 50)	1	50 (50 - 66)	50 (28 - 50)	0.2489
Recurrent or chronic pharyngitis	50 (50 - 56)	50 (50 - 50)	1	50 (50 - 58)	50 (24 - 50)	0.2489
Lip or tongue tie	50 (32 - 61)	50 (50 - 50)	-	55.6 (50 - 61)	32 (32 - 32)	0.6026
Mass						
Neck mass	50 (50 - 55)	50 (50 - 50)	0.8489	50 (50 - 59.5)	40.5 (31 - 32)	0.1754
Head and neck mass	52 (50 - 54)	50 (50 - 50)	1	52 (50 - 54)	50 (50 - 50)	1
Airway						
Stridor or noisy breathing	50 (50 - 60)	50 (50 - 50)	1	50 (50 - 60)	42 (34 - 50)	0.2199
Airway stenosis	-	50 (50 - 50)	-	-	-	-
Tracheostomy	61 (50 - 73)	50 (50 - 50)	0.4601	50 (50 - 50)	50 (50 - 73)	0.704
Neonatal swallowing or eating difficulties	50 (50 - 60)	50 (50 - 50)	-	50 (50 - 55)	69 (69 - 69)	0.3013
Neonatal swallowing or feeding difficulties not related to tongue or lip tie	46 (42 - 50)	50 (50 - 50)	1	50 (50 - 50)	46 (42 - 50)	1

	Physical Exam				
	Age Range				
	30 - 39 years n = 6	**40 - 49 years n = 6**	**50 - 59 years n = 1**	**> 60 years n = 1**	
Complaints	**Median (IQR)**	**Median (IQR)**	**Median (IQR)**	**Median (IQR)**	**p value**

Otologic					
Acute otitis media	4 (0 - 14)	4 (0 - 15)	0 (0 - 0)	-	0.5916
Chronic otitis media	4 (0 - 8)	2 (0 - 6)	0 (0 - 0)	-	0.6487
Hearing loss	5 (0 - 10)	24 (11 - 38)	-	-	0.1649
Cerumen impaction	12.5 (0 - 25)	4.5 (3 - 6)	-	-	1
Nasal					
Nasal congestion	35 (1 - 40)	14 (4 - 29)	0 (0 - 0)	-	0.243
Nasal injury or fracture	46 (40 - 50)	30 (27 - 59)	-	-	0.6807
Recurrent epistaxis	0 (0 - 50)	21 (7.5 - 33.5)	-	-	0.6118
Mouth or throat related complaint					
Snoring, sleep disordered breathing or obstructive sleep apnea	30 (30 - 31.5)	31.5 (30 - 35)	20 (20 - 20)	-	0.3765
Recurrent or chronic pharyngitis	46.5 (36.5 - 50)	36.5 (29 - 43)	40 (40 - 40)	-	0.441
Lip or tongue tie	43 (36 - 50)	30 (30 - 30)	-	-	0.6026
Mass					
Neck mass	34.5 (30 - 39.5)	28.5 (24 - 39)	-	-	0.3114
Head and neck mass	28 (28 - 28)	28.5 (16 - 41)	-	-	1
Airway					
Stridor or noisy breathing	30 (22.5 - 42.5)	27.5 (10.5 - 38)	-	-	0.678
Airway stenosis	-	-	-	-	-
Tracheostomy	40 (40 - 40)	36 (26 - 50)	-	27 (27 - 27)	0.6703
Neonatal swallowing or eating difficulties	20 (0 - 25)	24 (5 - 43)	-	-	0.7872
Neonatal swallowing or feeding difficulties not related to tongue or lip tie	32 (32 - 32)	28 (16 - 40)	-	-	1

	Gender			**Experience**		
	Male n = 11	**Female n = 3**		**< 10 Years Exp n = 10**	**> 10 Years Exp n = 4**	
Complaints	**Median (IQR)**	**Median (IQR)**	**p value**	**Median (IQR)**	**Median (IQR)**	**p value**
Otologic						
Acute otitis media	2.5 (0 - 15)	3 (3 - 3)	1	2.5 (0 - 11.5)	3 (0 - 34)	0.7547
Chronic otitis media	0 (0 - 18)	2 (2 - 2)	1	0 (0 - 6)	2 (0 - 34)	0.6483

Hearing loss	20 (10 - 28)	2 (2- 2)	0.5836	15 (5 - 34)	15 (2 - 28)	1
Cerumen impaction	4.5 (1.5 - 15.5)	-	-	3 (0 - 25)	6 (6 - 6)	1
Nasal						
Nasal congestion	14 (1 - 35)	14 (14 - 14)	1	14 (1 - 39)	14 (0 - 29)	0.5805
Nasal injury or fracture	46 (40 - 50)	30 (30 - 30)	0.5836	43 (33.5 - 48)	44.5 (30 - 59)	0.8261
Recurrent epistaxis	12 (0 - 37)	-	-	7.5 (0 - 37)	30 (30 - 30)	0.8093
Mouth or throat related complaint						
Snoring, sleep disordered breathing or obstructive sleep apnea	30 (30 - 33)	39 (39 - 39)	0.1655	30 (30 - 33)	30 (20 - 39)	1
Recurrent or chronic pharyngitis	41.5 (30 - 50)	37 (37 - 37)	0.8761	43 (33 - 50)	37 (29 - 40)	0.3747
Lip or tongue tie	36 (30 - 50)	-	-	43 (36 - 50)	30 (30 - 30)	0.6026
Mass						
Neck mass	30 (28 - 39)	29 (29 - 29)	0.7342	34.5 (28 - 41)	28.5 (28 - 29)	0.3818
Head and neck mass	34.5 (28 - 41)	16 (16 - 16)	0.6026	34.5 (28 - 41)	16 (16 - 16)	0.6026
Airway						
Stridor or noisy breathing	35 (20 - 40)	19 (19 - 19)	0.4117	30 (20 - 40)	27.5 (19 - 36)	0.8723
Airway stenosis	-	-	-	-	-	-
Tracheostomy	38 (26 - 50)	36 (27 - 40)	1	33 (2 - 40)	36 (27 - 50)	0.7872
Neonatal swallowing or eating difficulties	20 (5 - 25)	-	-	12.5 (2.5 - 22.5)	43 (43 - 43)	0.3486
Neonatal swallowing or feeding difficulties not related to tongue or lip tie	36 (32 - 40)	16 (16 - 16)	0.6026	32 (32 - 32)	28 (16 - 40)	1

	Medical Decision				
	Age Range				
	30 - 39 years n = 6	**40 - 49 years n = 6**	**50 - 59 years n = 1**	**> 60 years n = 1**	
Complaints	**Median (IQR)**	**Median (IQR)**	**Median (IQR)**	**Median (IQR)**	**p value**
Otologic					
Acute otitis media	38.5 (28.5 - 45)	37.5 (35 - 41)	25 (25 - 25)	-	0.4413
Chronic otitis media	39.5 (39 - 40)	38 (33 - 50)	10 (10 - 10)	-	0.3844
Hearing loss	35 (30 - 40)	23 (12 - 37.5)	-	-	0.3545
Cerumen impaction	22.5 (20 - 25)	2 (2 - 2)	-	-	0.3081

Nasal					
Nasal congestion	25 (25 - 50)	42 (34 - 50)	25 (25 - 25)	-	0.2455
Nasal injury or fracture	50 (40 - 50)	40 (34 - 50)	-	-	0.8311
Recurrent epistaxis	50 (50 - 50)	43 (32 - 50)	-	-	0.3125
Mouth or throat related complaint					
Snoring, sleep disordered breathing or obstructive sleep apnea	50 (45.5 - 50)	40 (28 - 45)	35 (35 - 35)	-	0.111
Recurrent or chronic pharyngitis	50 (50 - 50)	45 (38 - 50)	40 (40 - 40)	-	0.2168
Lip or tongue tie	50 (50 - 50)	28 (28 - 28)	-	-	0.5528
Mass					
Neck mass	50 (46.5 - 50)	45 (33 - 50)	-	-	0.5836
Head and neck mass	41 (41 - 41)	30 (28 - 45)	-	-	1
Airway					
Stridor or noisy breathing	50 (46.5 - 50)	38 (38 - 50)	-	-	0.168
Airway stenosis	-	-	-	-	-
Tracheostomy	68 (68 - 68)	39 (38 - 50)	-	60 (60 - 60)	0.2019
Neonatal swallowing or eating difficulties	50 (50 - 50)	36.5 (23 - 50)	-	-	0.4601
Neonatal swallowing or feeding difficulties not related to tongue or lip tie	39 (39 - 39)	38.5 (27 - 50)	-	-	1

	Gender			**Experience**		
	Male n = 11	**Female n = 3**		**< 10 Years Exp n = 10**	**> 10 Years Exp n = 4**	
Complaints	**Median (IQR)**	**Median (IQR)**	**p value**	**Median (IQR)**	**Median (IQR)**	**p value**
Otologic						
Acute otitis media	36 (32 - 40)	41 (41 - 41)	0.4445	38.5 (33.5 - 45)	35 (25 - 41)	0.6897
Chronic otitis media	39 (10 - 50)	38 (38 - 38)	1	40 (39 - 50)	33 (10 - 38)	0.2166
Hearing loss	30 (25 - 40)	3 (3 - 3)	0.2943	35 (27.5 - 45)	12 (3 - 21)	0.1661
Cerumen impaction	11 (2 - 22.5)	-	-	20 (2 - 25)	2 (2 - 2)	0.6695
Nasal						
Nasal congestion	35 (25 - 50)	34 (34 - 34)	1	49 (25 - 50)	28 (25 - 34)	0.2727
Nasal injury or fracture	50 (40 - 50)	34 (34 - 34)	0.2818	45 (40 - 50)	47 (34 - 60)	1

Recurrent epistaxis	50 (36 - 50)	-	-	50 (50 - 50)	28 (28 - 28)	0.17
Mouth or throat related complaint						
Snoring, sleep disordered breathing or obstructive sleep apnea	43 (35 - 50)	40 (40 - 40)	0.7523	47.5 (40.5 - 50)	35 (28 - 40)	0.1248
Recurrent or chronic pharyngitis	50 (43 - 50)	38 (38 - 38)	0.2837	50 (48.5 - 50.5)	35 (28 - 40)	**0.0371**
Lip or tongue tie	50 (28 - 50)	-	-	50 (50 - 50)	28 (28 - 28)	0.5528
Mass						
Neck mass	50 (43 - 50)	32 (32 - 32)	0.1716	50 (46.5 - 50)	32.5 (32 - 33)	0.0663
Head and neck mass	41 (41 - 41)	19 (19 - 19)	0.5528	41 (41 - 41)	19 (19 - 19)	0.5528
Airway						
Stridor or noisy breathing	50 (40 - 50)	20 (20 - 20)	0.2057	50 (43 - 50)	28 (20 - 36)	0.0917
Airway stenosis	-	-	-	-	-	-
Tracheostomy	44.5 (39 - 50)	60 (38 - 68)	0.7872	59 (50 - 68)	39 (38 - 60)	0.4353
Neonatal swallowing or eating difficulties	50 (50 - 50)	-	-	50 (36.5 - 50)	50 (50 - 50)	1
Neonatal swallowing or feeding difficulties not related to tongue or lip tie	44.5 (39 - 50)	27 (27 - 27)	0.6026	39 (39 - 39)	38.5 (27 - 50)	1

	Patient Counseling				
	Age Range				
Complaints	**30 - 39 years n = 6 Median (IQR)**	**40 - 49 years n = 6 Median (IQR)**	**50 - 59 years n = 1 Median (IQR)**	**> 60 years n = 1 Median (IQR)**	**p value**
Otologic					
Acute otitis media	50 (50 - 53.5)	50 (50 - 50)	50 (50 - 50)	-	0.8334
Chronic otitis media	52 (50 - 54)	50 (35 - 50)	50 (50 - 50)	-	0.2605
Hearing loss	50 (50 - 50)	34 (15 - 50)	-	-	0.4487
Cerumen impaction	37.5 (25 - 50)	8.5 (3 - 14)	-	-	0.3293
Nasal					
Nasal congestion	50 (50 - 50)	43 (35 - 50)	50 (50 - 50)	-	0.6303
Nasal injury or fracture	50 (50 - 50)	50 (40 - 59)	-	-	1
Recurrent epistaxis	50 (50 - 50)	44 (33.5 - 59.5)	-	-	0.7099

Mouth or throat related complaint						
Snoring, sleep disordered breathing or obstructive sleep apnea	50 (50 - 53)	48.5 (39 - 50)	50 (50 - 50)	-	0.1557	
Recurrent or chronic pharyngitis	50 (50 - 50)	50 (49 - 50)	50 (50 - 50)	-	0.8449	
Lip or tongue tie	53 (50 - 56)	28 (28 - 28)	-	-	0.6026	
Mass						
Neck mass	50 (47.5 - 50)	50 (40 - 50)	-	-	1	
Head and neck mass	50 (50 - 50)	37.5 (34 - 41)	-	-	0.6026	
Airway						
Stridor or noisy breathing	50 (50 - 52)	46.5 (38 - 50)	-	-	0.1803	
Airway stenosis	-	-	-	-	-	
Tracheostomy	50 (50 - 50)	50 (39 - 50)	-	50 (50 - 50)	0.7165	
Neonatal swallowing or eating difficulties	50 (50 - 50)	38 (26 - 50)	-	-	0.4601	
Neonatal swallowing or feeding difficulties not related to tongue or lip tie	41 (41 - 41)	50 (50 - 50)	-	-	0.5528	

	Gender			**Experience**		
	Male n = 11	**Female n = 3**		**< 10 Years Exp n = 10**	**> 10 Years Exp n = 4**	
Complaints	**Median (IQR)**	**Median (IQR)**	**p value**	**Median (IQR)**	**Median (IQR)**	**p value**
Otologic						
Acute otitis media	50 (50 - 50)	50 (50 - 50)	1	50 (50 - 53.5)	50 (33 - 50)	0.1838
Chronic otitis media	50 (35 - 50)	50 (50 - 50)	1	50 (50 - 50)	50 (35 - 50)	0.7427
Hearing loss	50 (50 - 50)	12 (12 - 12)	0.2245	50 (50 - 50)	15 (12 - 18)	0.1134
Cerumen impaction	19.5 (8.5 - 37.5)	-	-	25 (14 - 50)	3 (3 - 3)	0.437
Nasal						
Nasal congestion	50 (50 - 50)	36 (36 - 36)	0.4529	50 (50 - 50)	36 (31 - 50)	0.1915
Nasal injury or fracture	50 (50 - 50)	50 (50 - 50)	1	50 (45 - 50)	54.5 (50 - 59)	0.3233
Recurrent epistaxis	50 (38 - 50)	-	-	50 (50 - 50)	29 (29 - 29)	0.217
Mouth or throat related complaint						

Snoring, sleep disordered breathing or obstructive sleep apnea	50 (47 - 50)	50 (50 - 50)	0.8584	50 (48.5 - 50)	50 (28 - 50)	0.5676
Recurrent or chronic pharyngitis	50 (50 - 50)	50 (50 - 50)	1	50 (50 - 50)	50 (29 - 50)	0.3849
Lip or tongue tie	50 (28 - 56)	-	-	53 (50 - 56)	28 (28 - 28)	0.6026
Mass						
Neck mass	50 (45 - 50)	50 (50 - 50)	0.8489	50 (47.5 - 50)	39 (28 - 50)	0.4005
Head and neck mass	45.5 (41 - 50)	34 (34 - 34)	0.6026	50 (50 - 50)	34 (34 - 34)	0.6026
Airway						
Stridor or noisy breathing	50 (43 - 50)	50 (50 - 50)	1	50 (50 - 50)	41.5 (33 - 50)	0.3715
Airway stenosis	-	-	-	-	-	-
Tracheostomy	44.5 (39 - 50)	50 (50 - 50)	0.4601	50 (50 - 50)	50 (39 - 50)	0.704
Neonatal swallowing or eating difficulties	50 (50 - 50)	-	-	50 (38 - 50)	50 (50 - 50)	1
Neonatal swallowing or feeding difficulties not related to tongue or lip tie	45.5 (41 - 50)	50 (50 - 50)	1	41 (41 - 41)	50 (50 - 50)	0.5528

	New Patient				
	Age Range				
Complaints	**30 - 39 years n (%)**	**40 - 49 years n (%)**	**50 - 59 years n (%)**	**> 60 years n (%)**	**p value**
Otolgoic					
Acute otitis media	3 / 4 (75)	6 / 6 (100)	1 / 1 (100)	0 (0)	0.4545
Chronic otitis media	1 / 2 (50)	4 /5 (80)	1 / 1 (100)	0 (0)	1
Hearing loss	1 / 2 (50)	3 / 4 (75)	0 (0)	0 (0)	1
Cerumen impaction	2 / 2 (100)	1 / 2 (50)	0 (0)	0 (0)	1
Nasal					
Nasal congestion	3 / 3 (100)	5 / 6 (83.33)	1 / 1 (100)	0 (0)	1
Nasal injury or fracture	3 / 3 (100)	3 / 3 (100)	0 (0)	0 (0)	-
Recurrent epistaxis	3 / 3 (100)	3 / 4 (75)	0 (0)	0 (0)	1
Mouth or throat related complaint					
Snoring, sleep disordered breathing or obstructive sleep apnea	4 / 4 (100)	6 / 6 (100)	1 / 1 (100)	0 (0)	-

Recurrent or chronic pharyngitis	4 / 4 (100)	6 / 6 (100)	0 (0)	0 (0)	-
Lip or tongue tie	2 / 2 (100)	1 / 1 (100)	0 (0)	0 (0)	-
Mass					
Neck mass	4 / 4 (100)	6 / 6 (100)	0 (0)	0 (0)	-
Head and neck mass	1 / 1 (100)	2 / 2 (100)	0 (0)	0 (0)	-
Airway					
Stridor or noisy breathing	4 / 4 (100)	2 / 4 (50)	0 (0)	0 (0)	0.4286
Airway stenosis	-	-	-	-	-
Tracheostomy	1 / 1 (100)	2 / 3 (66.67)	0 (0)	0 / 1 (0)	1
Neonatal swallowing or eating difficulties	3 / 3 (100)	1 / 2 (50)	0 (0)	0 (0)	0.4
Neonatal swallowing or feeding difficulties not related to tongue or lip tie	1 / 1 (100)	1 / 2 (50)	0 (0)	0 (0)	1

	Gender			**Experience**		
Complaints	**Male n (%)**	**Female n (%)**	**p value**	**< 10 Years Exp n (%)**	**> 10 Years Exp n (%)**	**p value**
Otolgoic						
Acute otitis media	9 / 10 (90)	1 / 1 (100)	1	7 / 8 (87.50)	3 / 3 (100)	1
Chronic otitis media	5 / 7 (71.43)	1 / 1 (100)	1	3 / 5 (60)	3/ 3 (100)	0.4643
Hearing loss	4 / 5 (80)	0 / 1 (0)	0.3333	3 / 4 (75)	1 / 2 (50)	1
Cerumen impaction	3 / 4 (75)	0 (0)	-	3 / 3 (100)	0 (0)	0.25
Nasal						
Nasal congestion	8 / 9 (88.89)	1 / 1 (100)	1	6 / 7 (85.71)	3 / 3 (100)	1
Nasal injury or fracture	5 / 5 (100)	1 / 1 (100)	-	4 /4 (100)	2 / 2 (100)	-
Recurrent epistaxis	6 /7 (85.71)	0 (0)	-	5 / 6 (83.33)	1 / 1 (100)	1
Mouth or throat related complaint						
Snoring, sleep disordered breathing or obstructive sleep apnea	10 / 10 (100)	1 / 1 (100)	-	8 / 8 (100)	3 / 3 (100)	-
Recurrent or chronic pharyngitis	10 / 10 (100)	1 / 1 (100)	-	8 / 8 (100)	3 / 3 (100)	-
Lip or tongue tie	3 / 3 (100)	0 (0)	-	2 / 2 (100)	1 /1 (100)	-
Mass						
Neck mass	9 / 9 (100)	1 / 1 (100)	-	8 / 8 (100)	2 / 2 (100)	-

Head and neck mass	2 / 2 (100)	1 / 1 (100)	-	2 / 2 (100)	1 / 1 (100)	-
Airway						
Stridor or noisy breathing	6 / 7 (85.71)	0 / 1 (0)	0.25	5/ 6 (83.33)	1 / 2 (50)	0.4643
Airway stenosis	-	-	-	-	-	-
Tracheostomy	1 / 2 (50)	2 / 3 (66.67)	1	1/ 2 (50)	2 / 3 (66.67)	1
Neonatal swallowing or eating difficulties	4 / 5 (80)	0 (0)	-	3 / 4 (75)	1 / 1 (100)	1
Neonatal swallowing or feeding difficulties not related to tongue or lip tie	1 / 2 (50)	1 / 1 (100)	1	1 / 1 (100)	1 / 2 (50)	1

	Follow Up				
	Age Range				
Complaints	**30 - 39 years n (%)**	**40 - 49 years n (%)**	**50 - 59 years n (%)**	**> 60 years n (%)**	**p value**
Otologic					
Acute otitis media	4 / 4 (100)	5 / 6 (83.33)	1 / 1 (100)	0 (0)	1
Chronic otitis media	2 / 2 (100)	3 / 5 (60)	1 / 1 (100)	0 (0)	1
Hearing loss	2 / 2 (100)	3 / 4 (75)	0 (0)	0 (0)	1
Cerumen impaction	1 / 2 (50)	1 / 2 (50)	0 (0)	0 (0)	1
Nasal					
Nasal congestion	3 / 3 (100)	4 / 6 (66.67)	0 / 1 (0)	0 (0)	0.1583
Nasal injury or fracture	3 / 3 (100)	3 / 3 (100)	0 (0)	0 (0)	-
Recurrent epistaxis	3 / 3 (100)	3 / 4 (75)	0 (0)	0 (0)	1
Mouth or throat related complaint					
Snoring, sleep disordered breathing or obstructive sleep apnea	4 / 4 (100)	6 / 6 (100)	1 / 1 (100)	0 (0)	-
Recurrent or chronic pharyngitis	4 / 4 (100)	6 / 6 (100)	1 / 1 (100)	0 (0)	-
Lip or tongue tie	2 / 2 (100)	1 / 1 (100)	0 (0)	0 (0)	-
Mass					
Neck mass	4 / 4 (100)	5 / 6 (83.33)	0 (0)	0 (0)	1
Head and neck mass	1 / 1 (100)	1 / 2 (50)	0 (0)	0 (0)	1
Airway					
Stridor or noisy breathing	4 / 4 (100)	4 / 4 (100)	0 (0)	0 (0)	-

Airway stenosis	-	-	-	-	-
Tracheostomy	1 / 1 (100)	3 / 3 (100)	0 (0)	1 / 1 (100)	-
Neonatal swallowing or eating difficulties	3 / 3 (100)	2 / 2 (100)	0 (0)	0 (0)	-
Neonatal swallowing or feeding difficulties not related to tongue or lip tie	1 / 1 (100)	2 / 2 (100)	0 (0)	0 (0)	-

	Gender			**Experience**		
Complaints	**Male n (%)**	**Female n (%)**	**p value**	**< 10 Years Exp n (%)**	**> 10 Years Exp n (%)**	**p value**
Otologic						
Acute otitis media	9 / 10 (90)	1 / 1 (100)	1	7 / 8 (87.50)	3 / 3 (100)	1
Chronic otitis media	5 / 7 (71.43)	1 / 1 (100)	1	3 / 5 (60)	3/ 3 (100)	0.4643
Hearing loss	4 / 5 (80)	1 / 1 (100)	1	3 / 4 (75)	2 / 2 (100)	1
Cerumen impaction	2 / 4 (50)	0 (0)	-	2 / 3 (66.67)	0 (0)	1
Nasal						
Nasal congestion	6 / 9 (66.67)	1 / 1 (100)	1	5 / 7 (71.43)	2 / 3 (66.67)	1
Nasal injury or fracture	5 / 5 (100)	1 / 1 (100)	-	4 /4 (100)	2 / 2 (100)	-
Recurrent epistaxis	6 /7 (85.71)	0 (0)	-	5 / 6 (83.33)	1 / 1 (100)	1
Mouth or throat related complaint						
Snoring, sleep disordered breathing or obstructive sleep apnea	10 / 10 (100)	1 / 1 (100)	-	8 / 8 (100)	3 / 3 (100)	-
Recurrent or chronic pharyngitis	10 / 10 (100)	1 / 1 (100)	-	8 / 8 (100)	3 / 3 (100)	-
Lip or tongue tie	3 / 3 (100)	0 (0)	-	2 / 2 (100)	1 /1 (100)	-
Mass						
Neck mass	8 / 9 (88.89)	1 / 1 (100)	1	7 / 8 (87.50)	2 / 2 (100)	1
Head and neck mass	1 / 2 (50)	1 / 1 (100)	1	1 / 2 (50)	1 / 1 (100)	1
Airway						
Stridor or noisy breathing	7 / 7 (100)	1 / 1 (100)	-	6 / 6 (100)	2 / 2 (100)	-
Airway stenosis	-	-	-	-	-	-
Tracheostomy	2 / 2 (100)	3 / 3 (100)	-	2 / 2 (100)	3 / 3 (100)	-
Neonatal swallowing or eating difficulties	5 / 5 (100)	0 (0)	-	4 / 4 (100)	1 / 1 (100)	-

Neonatal swallowing or feeding difficulties not related to tongue or lip tie	2 / 2 (100)	1 / 1 (100)	-	1 / 1 (100)	2 / 2 (100)	-

Appendix 1. Chief Complaints and Follow Ups Included in the survey.

Chief Complaints Included	Post-Operative Follow Up Visits Included
• Recurrent Acute Otitis Media • Chronic Otitis Media with Effusion • Hearing Loss • Cerumen Impaction • Nasal Congestion or Allergic Rhinitis • Nasal Injury or Fracture • Recurrent Epistaxis • Snoring/Sleep Disorded Breathing/Obstructive Sleep Apnea • Recurrent/Chronic Pharyngitis • Lip/Tongue Tie • Neck Mass • Head and Neck Tumor (non-neck mass) • Stridor/Noisy Breathing • Airway Stenosis (non-Trach dependent) • Tracheostomy Dependence • Neonatal and non-neonatal swallowing/feeding difficulties	• Bilateral Ear Tube Insertion • Ear Tube Removal w/ or w/o Myringoplasty • Tympanoplasty • Tympanomastoidectomy w/ or w/o OCR • Cochlear Implantation • Nasal Cautery • Inferior Turbinate Reduction • Septoplasty • Endoscopic Sinus Surgery • Adenoidectomy • Tonsilectomy • Supraglottoplasty • Other Laryngoscopy with Excision • Tracheal Airway Surgery, endoscopic and open • Tracheostomy • Excision of Neck Mass • Repair Laceration • Speech Surgery • Sleep Surgery (non T&A) • Skull Base Surgery