



Review Article

Telehealth in the times of SARS-CoV-2 infection for the otolaryngologist

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Abstract *Objective:* In response to the American Academy of Otolaryngology – Head and Neck Surgery’s recommendations to limit patient care activities in the times of SARS-CoV-2, many elective surgeries have been canceled without patient clinics transitioning to virtual visits. With regulations for telemedicine loosened, new possibilities for the practice of otolaryngology have opened. To address the uncertain duration of this pandemic, a review was conducted of current literature on use of telemedicine services in the current SARS-CoV-2 pandemic and in previous national emergencies to reveal the role telemedicine can play for otolaryngology practices.

Data sources: Pubmed articles with an independent search query were utilized.

Methods: Literature review performed by one author searched for all published English-language literature on telehealth in the SARS-CoV-2 era. Articles were considered for discussion if they provided relevant developments for telemedicine in the context of the SARS-CoV-2 pandemic.

Results: Telemedicine can be up-scaled in the current SARS-CoV-2 pandemic where exposure containment is of the utmost priority. With patient interaction possible through virtual communication, telemedicine allows continued patient care while minimizing the risk of viral spread. In the realm of otolaryngology, telemedicine has been used in the past during disasters with other studies demonstrating high diagnostic concordance with inpatient visits. Many institutions have recognized the potential for such care as they begin utilize both virtual visits and in-person care during this pandemic.

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Conclusion: To limit the spread of SARS-CoV-2, we support the AAO-HNS recommendation for the adoption of novel ways to employ telemedicine in this era. Many emergency departments and health care systems have the infrastructure necessary for synchronous video telemedicine visits that can be leveraged to provide quality care with patients. With the continued need to socially distance, telemedicine can protect both physicians and patients from unnecessary exposure to the virus.

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Introduction

The practice of medicine is changing as the coronavirus infection, also known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), continues to spread. Currently, without a vaccine, social distancing and isolation have become the most effective measures to decrease transmission.^{1,2} Otolaryngologists appear to be at higher risk than their colleagues of contracting SARS-CoV-2 according to the director of the intensive care unit at Peking Union Medical College Hospital.³ This may be due to high viral load in the nasal cavities and nasopharynx.⁴ Additionally, the frequent use of irrigation and anesthetic sprays in otolaryngology may aerosolize these viral particles. This can dramatically increase exposure to SARS-CoV-2 as the virus can remain airborne viable for longer than 3 h.^{5,6} These compounding risks have resulted in the cancellation of elective surgeries, rescheduling of non-urgent office visits, and even alterations to how standard physical exams and diagnostic tests are performed.⁷ However, high-quality patient care must still be provided while minimizing the risk of exposure of patients and providers to the virus. In response to these evolving needs, the American Academy of Otolaryngology – Head and Neck Surgery (AAO-HNS) telemedicine committee has put forth new recommendations to prioritize novel applications of telehealth to help limit coronavirus disease pandemic spread while maintaining quality care.⁸ Telehealth and telemedicine are defined as direct exchanges of medical information from one site to another through secure electronic communication to improve a patient's health.⁹ Many health systems in the U.S. already have telemedicine programs in place, allowing clinicians to see patients who are at home. These services have traditionally been used for chronic disease management with increasing research in mental health and counseling use especially during times of crisis.^{10,11} These virtual sessions can be either synchronous with real time video exchange or asynchronous (store-and-forward) with clinical data stored and forwarded to a remote clinician for further analysis.

In the current SARS-CoV-2 pandemic, the Medicare population continues to be at high risk and a transition to telemedicine care for these patients may greatly reduce exposure and decrease risk of infection. There are three main types of virtual services practitioners can provide to Medicare beneficiaries: Medicare telehealth visits, virtual check-in, and e-visits.¹² Medicare telehealth visits require audio and video telecommunication systems that allow real-time communication between the patient and the

distant site. In the past, these visits required a prior relationship with the provider, but in this declared national emergency, the U.S. Department of Health and Human Services (HHS) stated that they will not conduct audits to confirm a relationship with the provider. Another major barrier to wide-spread adoption was reimbursement.¹² To address this, the HHS has waived certain telehealth regulations to allow for its expanded use for Medicare patients. Retroactive to March 6, 2020, Medicare will pay for office, hospital, and other visits through telehealth across the country at the same rate as regular, in-person visits. Additionally, the HHS Office for Civil Rights has also made flexibilities on HIPAA guidelines, allowing clinicians and patients to communicate through any non-public facing remote communication product including Apple FaceTime, Facebook Messenger video chat, Google Hangouts video, and Skype, though HIPAA-compliant video communication products such as Skype for Business, Updox, VSee, Zoom for Healthcare, Doxy.me, and Google G Suites Hangouts Meet are still recommended.¹³

As infection rates continues to change, the duration of this pandemic remains uncertain and necessitates plans to utilize available structures. In this article, we review the current literature on use of telemedicine services in the current SARS-CoV-2 pandemic and its use in previous national emergencies to help realize the true value of telemedicine and change the way otolaryngologists can provide care for patients.

Discussion

With the AAO-HNS telemedicine committee advocating for novel applications of telemedicine in this era of SARS-CoV-2, a review of its previous applications revealed telemedicine has long played a role in medical response to disasters.¹⁴ Telemedicine can deploy large numbers of providers and facilitate triage to prevent the overwhelming of front-line providers. This makes it an ideal model to upscale in a pandemic where exposure containment is of the utmost priority. Pandemic responses in the United Kingdom and Australia have already called upon the increased use of telemedicine.¹¹ However, clinician willingness and acceptance of telehealth, reimbursement, and organization of the current health care systems continue to be major barriers to increased implementation outside of the emergency department.^{11,15}

In the U.S., many hospital systems already have telemedicine departments embedded within their systems.

Recognizing that much of medicine is cognitive, many neurologic intensive care units across institutions like Cleveland Clinic, University of Pittsburgh and Jefferson Health provide virtual ICU visits through which neuro-intensivists monitor patients remotely while bedside critical care nurses examine patients with their guidance.^{16,17} The use of electronic Consults (eConsults), which allow primary care physicians to consult specialists through the electronic medical record, has been documented in the Canadian health system.^{18,19} This was recently studied in the otolaryngology practice at UCSD and resulted in improved access to specialists for timely advice and reduced unnecessary face-to-face specialist referrals.²⁰ Many major university hospital sites are now adopting more technology to improve their response to the SARS-CoV-2 pandemic. UCLA and New York Presbyterian hospitals have followed Singapore's response by providing rapidly accessible information through a chatbox on their websites to answer any questions regarding SARS-CoV-2.^{11,21,22}

As testing in the U.S. becomes more available in this era of SARS-CoV-2, telemedicine continues to take the main role of "forward triage", evaluating patients with respiratory symptoms before they arrive in hospitals.²³ Emergency departments and urgent care settings at Medical University of South Carolina, Cleveland Clinic, Jefferson Health, Mount Sinai, and Kaiser Permanente are leveraging telehealth to limit the medical staff exposure to possible contagious cases.^{23–28} Patients with respiratory symptoms can access an online portal for virtual screening and synchronous assessments with a remote clinician and then be directed to a testing center if testing is warranted. These measures protect all providers involved while allowing continued face-to-face communication between a patient and a clinician.

With the AAO-HNS recommending all otolaryngologists to limit patient care activities to time-sensitive, urgent, and emergent medical conditions, elective surgeries have been canceled with many outpatient clinics rescheduling appointments and transitioning to virtual visits.^{7,8} At institutions like Johns Hopkins and Ohio State, providers are asking patients to change appointments to virtual ones.^{29,30} Telemedicine appointments can be conducted with both the clinician and patient at home, limiting travel and exposure while maintaining uninterrupted quality care with established patients. As a part of the COVID-19 Public Health Emergency response, Medicare has stated that it will pay for office, hospital, and other visits through telehealth across the country at the same rate as regular, in-person visits.¹² This is especially important as geriatric patients typically covered under Medicare are among the highest at risk of developing complications from infection.³¹ Many commercial payors have followed suit and lessened members' out-of-pocket costs for telehealth visits.³² Telemedicine regulations for Medicare patients have also been loosened by HHS, opening up new modes of communication through any non-public facing interface. There has even been a proposal to allow providers to care for patients who do not live in the same state to improve access to care during these times.¹³ This presents a unique opportunity for clinicians to make use of telemedicine.

The otolaryngology field has been slow to widely adopt telemedicine, though it has been gaining ground as the frequent archiving of audio and visual images from exams makes the field uniquely suited to adopt advances in telemedicine. In 2010, the Hurricane Katrina disaster left Louisiana State University Health Science Center with no neurotology service. A store-and-forward model of telemedicine was implemented and a previously established telemedicine neurotology clinic in Baton Rouge forwarded clinical materials to a neurotologist in Pittsburgh, which resulted in positive anecdotal patient responses.³³ To identify specific areas in otolaryngology that would be most suitable for telemedicine visits, a study on veterans in the New England area identified that 62% of visits did not require specialized procedures and could be conducted with the help of a health technician that could synchronously communicate with a remote otolaryngologist.³⁴ Taking advantage of telemedicine and remote centers can also greatly reduce travel burden as the study found 42% of patients were driving over 3 h for otolaryngology services.

To address concerns of diagnostic accuracy through telemedicine visits, Ohio State piloted studies assessing diagnostic concordance of an on-site and remote practitioner receiving synchronous information through video.³⁵ For the 21 cases, there was a 95% diagnostic concordance for patients presenting with a variety of diagnoses such as vocal cord leukoplakia, acute otitis externa, and septal deviation. Of note, only 62% of patients indicated they would travel to see an otolaryngologist, suggesting that about one third of patients may not have pursued otolaryngology care if there was not a nearby telemedicine clinic. Physician and patient satisfaction of the video and audio quality were both over 95% and both agreed that care was more accessible with this technology. While all these applications of telemedicine resulted in high patient and provider satisfaction, they still required patients to travel to a telemedicine clinic and interact with a healthcare provider, making them less ideal in the era of SARS-CoV-2.

Some hospitals have employed telemedicine in ways that do not require any travel to a clinic to limit patient exposure to providers. Following head and neck free tissue transfer, residents at UCSF performed 60 flap checks through video. Evaluations of skin color, skin turgor, capillary refill and Doppler signal were similar between telemedicine and in-person groups.³⁶ Many patients at Jefferson Health continued post-operative care through telehealth visits even after discharge from the hospital. Using a telemedicine integrated electronic medical record system, patients accessed video portals through their online medical record and conducted post-operative visits through synchronous video with their providers without having to travel to the hospital.³⁷

Another issue facing many otolaryngologists is the clinical decision making about which patients are safe to postpone, and which are considered emergent enough to proceed with treatment during the escalating phases of a pandemic. The University of Washington, which serves the communities where the first cases of SARS-CoV-2 were diagnosed³⁸ and the Medical University of South Carolina have explored a balance of both virtual visits and in-person care.³⁹ At the otolaryngology department level, new patients with malignancies are offered an initial video visit to go over diagnostic studies and ensure all necessary data have been

collected before an in-person consultation for further evaluation. For established patients undergoing cancer surveillance, visits are conducted over video or telephone with patients only returning to clinic if there are any concerning symptoms or findings. These telemedicine meetings are held through Zoom, for which staff underwent an emergency credentialing process at the institutional level. However, if patients experience flu-like symptoms, they are urged to call the clinic or hospital and asked to call another number to assess if they will need further testing. Anecdotal evidence from physicians noted better reimbursement when compared to telephone visits and higher physician satisfaction with patient interaction. However, as the AAO-HNS still allows for in-person care of “time-sensitive, urgent, and emergent medical conditions”, hospitalized patients and post-operative visits after major surgery are still seen in-person with proper protection. Seattle’s slowing infection rates highlights how adherence to early social distancing and quarantine can reduce infection rates of SARS-CoV-2.⁴⁰

Even as elective surgeries are cancelled and non-urgent outpatient visits are postponed, there is still a way to provide quality care for patients. With the need for social distancing, telemedicine has become the ideal tool to allow communication between a physician and a patient.

Conclusion

Recommendation

To limit the spread of SARS-CoV-2, we support the AAO-HNS recommendation for the adoption of novel ways to employ telemedicine in this era. As many emergency departments and health care systems have the infrastructure necessary for synchronous video telemedicine visits, we propose the adoption of novel uses for existing telemedicine portals. For those without an existing structure, it is possible to outsource telemedicine services to programs such as Teladoc Health or American Well.²³ We have reviewed the available methods of employing telemedicine and continue to encourage new applications and integration into otolaryngology practices. Current use of telemedicine is targeted toward the screening and management of suspected SARS-CoV-2 patients. As the SARS-CoV-2 pandemic continues to unfold, recommendations on social isolation may evolve and require adjustments to traditional patient care workflow. We support the AAO-HNS recommendation to limit all in-person care to urgent cases, but propose the use of telemedicine to continue quality care with established patients. With the continued need to socially distance, telemedicine can protect both physicians and patients from unnecessary exposure to the virus.

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Declaration of Competing Interest

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