

Audiological Needs, Solutions in COVID-19

By Jackie Clark, PhD; Jeremy Donai, AuD, PhD; Nina Kraus, PhD; Kenneth Smith, PhD; Sarah Sydlowski, AuD, PhD; and Fan-Gang Zeng, PhD

The global COVID-19 pandemic has caught us by surprise. People are now forced to stay at home, schools have been shut down, and hospitals have canceled or postponed nonessential surgeries and procedures, including those related to hearing.¹ Although hearing health care providers were not included in the list of "Essential Critical Infrastructure Workers During COVID-19 Response,"² clearly the ability to communicate remains an essential human function. Our main goal in this article is to examine the challenges faced by people with hearing loss and providers of audiological services during the pandemic while sharing some exceptional solutions in response to unprecedented situations. We also identify extraordinary opportunities that could positively impact audiological care and service delivery after the pandemic.

ESSENTIAL HEARING CARE

First, although the Office of Homeland Security did not classify audiologists as essential workers, there are audiological services that are unquestionably critical to sustaining the quality of life

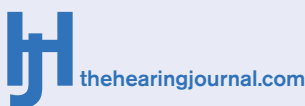
and cannot be dismissed or postponed. Patients with acute ear pain need to seek immediate care for potential causes related to infection of the ear, nose, or throat. Notably, sudden hearing loss requires immediate attention due to the short period (around two weeks) during which treatment can be effective in helping patients recover their hearing. For children whose long-term trajectories could be permanently altered by delays, cochlear implantation may also be considered. Finally, audiological diagnostics, monitoring, and evaluation are needed to support urgent and potentially life-threatening cancer or cholesteatoma surgeries. Interestingly, although the coronavirus has been shown to cause short-term sudden loss of smell and taste,³ little is

known about its effect on hearing abilities at present.

Second, for people with hearing loss in this time of crisis, functional hearing and communication are essential to daily life. For example, some of the 13,000 deaf residents in Wuhan, the first pandemic epicenter in China, reported: "We are always a step slower than normal-hearing folks, from getting the latest news to [not] getting food and masks or waiting for buses that never showed up due to the lockdown."⁴ The pandemic and the ensuing shelter-in-place and physical distancing measures have required people with hearing loss to rely on their limited hearing ability more than usual to get news reports from the radio, television, and internet, and/or to communicate virtually (via



From left: **Dr. Clark** is a clinical professor at the University of Texas at Dallas. **Dr. Donai** is an associate professor in audiology at West Virginia University. **Dr. Kraus** is a professor of auditory neuroscience at Northwestern University. **Dr. Smith** is the vice president and director of operations for the Hearing Center of Castro Valley in California. **Dr. Sydlowski** is the audiology director of Cleveland Clinic's Hearing Implant Program. **Dr. Zeng** is the director of the Center for Hearing Research and a professor at the University of California, Irvine. The authors are members of *The Hearing Journal* Editorial Advisory Board, with Dr. Zeng as the chairman.



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phone, Zoom, and other virtual platforms) with loved ones. One can easily imagine a situation where a hearing device user awakes to a nonfunctional hearing device (for whatever reasons); audiological care and service are certainly essential for these urgent and critical matters of safety and communication.

Third, the pandemic has posed an additional challenge unique to people with hearing loss. To minimize the spread of infection, personal protective equipment (PPE) such as face masks is required for health care providers and has been widely used by the general public. Face masks degrade the intensity and quality of acoustic signals and significantly impair lip-reading cues. A person with hearing impairment who contracted COVID-19 shared in a report: "I could not understand anything the doctor said because all the cues I rely on were distorted or unavailable with the masks and goggles."⁴ Because a significant other was not allowed to accompany this patient, the doctor needed to write down everything, thereby taking away the physician's time and attention from other critical tasks. With this reliance on written communication, one must also ask: What if the patient has vision problems, or what if the physician's handwriting is difficult to read? A spokesperson at a Beijing COVID-19 press conference displayed a prototype self-made transparent mask to enable viewers' lip-reading abilities (Figure). As wearing masks becomes a new social norm, there is an urgent need to develop an acoustically and optically transparent mask.

IMPLEMENTING SHORT-TERM DEVELOPMENTS

Despite the previously described needs, the reality is that regular audiology services have been disrupted, including the effective and important universal newborn hearing screening and early hearing intervention programs.⁵ Even if some audiological services are available, many individuals, particularly the vulnerable elderly population, are often compelled to cancel or postpone in-office appointments for fear of infection. Audiological professionals have developed novel solutions to meet their patients' needs during the current crisis.

- Few have kept their offices open, serving mostly urgent care needs while limiting hours and patient contact and employing stringent safety measures. Walk-in visits are either not allowed or require additional screening before accommodating the urgent need.
- Some practices have adopted drive-through or curbside services where a hearing health provider can deliver devices, accessories, or batteries to a patient or the patient can return them without entering the office. Andrea Yost, AuD, the owner of Yost Hearing in Morgantown, WV, shared: "Offering drive-up services has allowed us to serve our patients, especially the vulnerable elderly population, during this difficult time. Initially, the goal was to create a sense of security and ease of access for our patients, which it has, but I honestly can see the potential for this delivery approach in the future."
- Many offices have added teleaudiology services that may include a patient's virtual visit via telephone or videoconference for post-hearing aid fitting follow-up. Recent technological advances allow audiologists to remotely connect their



Figure. A sign language interpreter wears a transparent mask during a press conference in Beijing, China (published with permission from Beijing News⁴).

computer to a patient's hearing aids or a remotely located cochlear implant programming computer to make adjustments or conduct subjective evaluations, log data, provide counseling, and, in some instances, conduct hearing aids real-ear measurement and on-ear verification. With the proliferation of YouTube videos, many resources can be recommended to patients as a supplement to interactions with an audiologist or an audiology assistant. In a shelter-in-place scenario, the challenge still arises in the use of field-validated diagnostic (air, bone, speech in noise, immittance, otoscopy, otoacoustic emissions) audiometry for new patients without an assistant facilitating the equipment on the patient side.

- Telerehabilitation has been utilized in the effective delivery of counseling and support. For example, Henry and colleagues⁶ have developed an effective telehealth-based progressive tinnitus management system for veterans who live in remote areas or have mobility issues, but the system is now providing flexibility and expanded care to telehealth during the current crisis. A challenge is to provide telerehabilitation for children whose parents may not have time to supervise them at home.
- Tele-education is perhaps the biggest winner of them all. Online-based learning has been criticized for various concerns such as the following: It's difficult to build a trusting relationship online, the quality is not the same as face-to-face education, someone with lesser or no skills can take over the academic domain, or it's just too difficult and confusing. Many are realizing what enterprising progressive professionals have known for years: There is a panacea of online interaction options to ensure that all contact is contextually driven to meet the learners' emotional and physical needs using available resources. Every aspect of clinical and academic interactions has been achieved through

videoconferencing, online videos, and content/instructions delivered through electronic messaging or simply by phone. Many years ago, this restricted, gray, drab, and one-dimensional world was replaced by a vibrant, multidimensional, and global domain, ready to be molded into the contextual needs of individuals. Although videoconferencing can pose challenges to people with hearing difficulties because degraded signals and subtle audiovisual asynchronies require greater listening effort, several strategies and tools can optimize this encounter. For example, use instant captioning and translation services that may be provided by some vendors (e.g., Google) or require a third-party plug-in (e.g., Zoom). Remove other accessories on computers and around the videoconferencing space that may be distracting, posing challenges to individuals with auditory processing difficulties, which often overlap with attention difficulties. If you're leading a meeting or class, encourage frequent breaks (at least two to three minutes rest for every 30 minutes of the meeting). With consent, consider recording meetings or lectures so your colleagues or students can review them later at their own pace.

LONG-TERM COMMITMENT

Teleaudiology, telerehabilitation, and tele-education have produced an unprecedented and widespread use of innovative technology for business matters and personal interactions. Swanepoel and Hall in this issue of *The Hearing Journal*⁷ estimated that existing technology can serve 95 percent of adults with hearing loss in low- and no-touch models of audiological care. The pandemic is pushing for innovations in remote technologies in audiology. One such technology is a smartphone-based system that can perform otoscopy and tympanometry with commonly available accessories at home while making an initial diagnosis or uploading the data for an expert opinion. Recently, University of Washington researchers developed a smartphone-based system that not only outperformed a commercial acoustic reflectometry system in detecting middle ear fluid in children but, more importantly, could be easily operated by parents without formal medical training.⁸ Though it is unknown whether most parents will want to purchase technology for infrequent use, the palette has been prepared for a beautiful picture of the future of ear and hearing provision.

In addition to some technological limitations that are rapidly being mitigated by manufacturers, regulation and reimbursement remain the primary barriers to accessing teleaudiology and telerehabilitation care and service. Effective for services starting March 6, 2020, and for the duration of the COVID-19 public health emergency, Medicare could broadly utilize their waiver capability to allow payment for expanded telehealth service by recognized providers for certain codes.⁹ This flexibility allowed for the rapid deployment of remote health care services for recognized providers, allowing many health care systems to quickly pivot from delivering the majority of outpatient care in person to delivering these services remotely. Regulatory modifications prevented numerous barriers to health care that would have otherwise been suffered by patients unable to be seen in person. However, hearing and balance services were initially excluded. Fortunately, on April

30, 2020, the waiver was expanded to include all providers who are eligible to bill Medicare for their professional services, including audiologists.¹⁰ Additionally, cochlear implant programming codes (92601-92604) have been approved to be billed using telehealth.⁹ The current situation helps audiologists highlight the importance of being recognized similarly to other nonphysician providers to ensure continuity of care for patients. In the short term, the extension of this waiver to audiologists will allow audiologists flexibility to provide some remote care to patients where state law allows. Providers may also benefit from directly reaching out to commercial payers to ensure that audiology codes are at least temporarily approved for remote delivery. In the long term, the passage of legislation that classifies audiologists as practitioners will be essential.

To ensure financial viability during times of reduced revenue, audiology practices are finding ways to maximize their cash on hand and are considering future investment opportunities that generate non-operating revenue. In consultation with certified accountants, practice owners need to develop a rainy day fund to cover business expenses for a pre-determined number of months and situations similar to the current crisis. The fact that many companies are reporting difficulty obtaining funds from the governmental Payroll Protection Program highlights the importance of this planning. Doing so will help protect against a break in vital service delivery during emergencies that require physical distancing and result in subsequent reductions in operational revenue.

LOOKING AHEAD

Without a doubt, we have learned many important lessons—sociologically, psychologically, and professionally—during this pandemic. Some beautiful examples are the national and international virtual concerts that are bringing humanity together during this challenging time. In the same way, the challenges of COVID-19 have created a tremendous opportunity for audiological communities to change, improve, and expand care and service delivery by embracing new technologies and developing new business models. Drive-through services and teleaudiology have met physical distancing requirements while providing a high level of patient convenience and satisfaction. Technological advances in artificial intelligence and virtual reality have the capability of removing place, time, and even language barriers to someday allow an audiologist in Australia to counsel a patient in Africa to troubleshoot a malfunctioning hearing aid or a patient in the United States to seek tinnitus relief from a meditation practitioner in India. Vast opportunities lie in advocating for telehealth legislation on local and national levels, as well as updating the scope of practice at state licensing levels. COVID-19 shall pass eventually with lifestyle changes and the development of effective drugs and vaccines, but it has provided a once-in-a-lifetime opportunity for audiology to learn and fully embrace new clinical technologies and business models for improved reimbursement, service delivery, and patient satisfaction. ■

References for this article can be found at <http://bit.ly/HJcurrent>.