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American Academy of Audiology
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AUDIOLOGY

TODAY

The magazine of, by, and for audiologists

TELE-AUDIOLOGY IN A PANDEMIC AND BEYOND



THE STATE OF WIRELESS

Hearing Aids and
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In the May/June 2020 issue of *Audiology Today*, Coding and Reimbursement column, page 50, the code for ESRT measurement should be 92700 (not 92500).

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Real Change for Our Profession

On Friday, March 20, 2020, the entire group of audiologists I work with at the University of Pittsburgh Medical Center (UPMC) was taking care of patients in person. Three days later, Monday, March 23, 2020, we were providing all of our services remotely.

We had been thinking about expanding into telehealth over the past year, but we had all sorts of reasons why it wouldn't, couldn't, and shouldn't work. And then one day, it had to work or we wouldn't have been able to take care of our patients.

There's nothing like a crisis to create change in the moment and to make one wonder, "why didn't we do this before?"

For audiology, there are a myriad of reasons why we didn't pursue telehealth previously and those barriers changed almost overnight as well. In March, the Secretary of the U.S. Department of Health and Human Services waived certain provisions of the Health Insurance Portability and Accountability Act (HIPAA) (www.hhs.gov/hipaa/for-professionals/special-topics/emergency-preparedness/notification-enforcement-discretion-telehealth/index.html).

Roger Severino, director of the Office for Civil Rights, explained, "we are empowering medical providers to serve patients wherever they are during this national public health emergency. We are especially concerned about reaching those at risk, including older persons and persons with disabilities."

The Centers for Medicare and Medicaid Services (CMS) indicated that health-care



providers subject to HIPAA rules could use a range of remote-communication technologies that previously were not considered HIPAA-compliant to ensure that patients could be reached by whatever means were available.

Legislation passed in March (the Coronavirus Aid, Relief, and Economic Security (CARES) Act) with specific language that gave CMS waiver authority for any requirements relating to the coverage of telehealth services under Medicare.

On April 30, 2020, CMS announced that "all professionals who are able to bill Medicare for their professional services will be considered eligible telehealth providers for the duration of the COVID-19 public health emergency" (www.cms.gov/files/document/summary-covid-19-emergency-declaration-waivers.pdf).

CMS also added four cochlear implant codes (92601, 92602, 92603, and 92604) to the list of codes eligible for reimbursement when provided via telehealth. This is only a start;

a foot in an incredibly important door. The Academy will continue to work to expand coverage to include the services we are providing via telehealth.

Importantly, we also saw state licensure boards react to patient needs by expanding who can provide telehealth services at this time (www.cchpca.org/telehealth-policy/current-state-laws-and-reimbursement-policies).

Given the global health crisis and these sudden changes to telehealth accessibility for health-care providers, audiologists have risen to the occasion and provided our essential services remotely.

As we moved into June 2020, we saw a return to in-person care, but what of telehealth will remain in our practices? What is our responsibility to our patients and our profession?

Our patients are going to demand that we continue to provide remote access and we have clearly established that we can provide important evaluation and management services through tele/video visits.

Our responsibilities include refusing to be left behind as the provision of telehealth moves ahead. This includes the following:

1. Creating office set-ups that dedicate space, time, and technology for tele-/video-care visits.
2. Demanding that the e-records we use include audiology in telehealth documentation.
3. Using documentation language that acknowledges the care we provide, whether over the phone, through a video visit, or via e-mail communication.

4. Understanding state and federal guidelines related to our provision of telehealth services.

5. Charging appropriately for these services, whether we are reimbursed by an insurer or by the patient.

We must use this time of change to move our profession forward, resist any movement to rescind privileges that have been afforded to us, and demand further access. Support of the Medicare Audiologist Access and Services Act (HR4056, S2446) is critical.

This time has highlighted the need for direct access and for audiologists to be identified as practitioners to be included in the changes we are seeing in Medicare (www.audiology.org/get-involved/advocacy/legislative-action-center).

In addition, support of the interstate licensure compact is essential to enhance the expansion of telehealth care (www.audiology.org/advocacy/three-states-pass-legislation-proceed-interstate-licensure-compact-audiology-and-speech).

Just when you thought you couldn't work any harder, this is a time to be engaged and a time when we can see real change for our profession and, therefore, enhanced care for the patients who need us during and after a global health crisis.

Your responsibility goes beyond patient care; you have a responsibility to your profession. 



Catherine Palmer, PhD
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What's Trending!



CMS issues interim final regulation that all health-care professionals able to bill Medicare are considered eligible telehealth providers during the COVID-19 pandemic.

Published May 1

www.facebook.com/theamericanacademyofaudiology

Tips and tricks for communicating with individuals with hearing loss while wearing a face mask.

Published June 9

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95-year-old patient makes masks with clear vinyl in the middle to make it easier for audiologists to communicate with patients.

Published May 19

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Wake Forest, NC, mayor proclaims May 'Better Hearing Month' encouraging residents to recognize the work of local audiologists.

Published May 22

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TELE-AUDIOLOGY

IN A PANDEMIC AND BEYOND

Flexibility and
Suitability in
Audiology
Practice



BY BOPANNA BALLACHANDA, HARVEY ABRAMS, JAMES W. HALL III,
VINAYA MANCHAIAH, DEREK MINIHANE, SAMANTHA KLEINDIENST ROBLER,
AND DE WET SWANEPOEL

The scope of this article is to examine the opportunity tele-audiology can provide to clinical challenges associated with social distancing. Content experts in different areas of audiology share how tele-audiology services are laying the groundwork for “the new normal.”

Health-care providers are scrambling to keep up with the demand for telehealth services as the coronavirus (COVID-19) pandemic sweeps across the nation and world. Many are seeing unexpected benefits in the shift to connected health—and hoping the momentum continues after the emergency is over.

Similarly, audiologists are also looking for ways to reach their patients for regular check-ups, follow-up care, and other unexpected urgencies that need attention. The answer to current physical distancing can be addressed by adopting tele-audiology. The concept of tele-audiology is not new. It has been applied in many agencies (VA and Indian Health agencies) and practices in developing countries to help the unserved and underserved populations and to overcome the shortage of audiologists.

The scope of this article is to examine the opportunity tele-audiology can provide to clinical challenges associated with physical distancing. Content experts in different areas of audiology share how tele-audiology services are laying the groundwork for “the

new normal.” We will review the following:

1. Identification and diagnostic assessment of hearing disorders.
2. Intervention for hearing loss and related disorders, including hearing aid dispensing and post-fitting care, cochlear implant post-fitting care, auditory training, and tinnitus management.



We should expect to see considerable growth in online testing with the issuance of FDA regulations concerning OTC hearing aids.

The tele-audiology delivery model can be grouped into two categories. The first model is applied with a satellite clinic or a physical location away from the main clinic. The second model exclusively relies on mobile technology outside of the clinic.

The satellite clinic model of care, in addition to physical location, requires equipment similar

to that in the main clinic and a qualified assistant or facilitator.

The virtual clinic model is exclusively based on mobile technology such as smartphones, tablets, notebooks, and computers. In this model, the virtual space becomes the satellite clinic. The requirements, similarities, and differences between the two models are listed in TABLE 1.

Hearing-Loss Identification

Online or self-hearing testing has grown in recent years to serve the growing direct-to-consumer (DTC) hearing-device market. For the purposes of this discussion, online (personal computer (PC)- or smartphone app-administered) hearing testing is distinguished from remote administration of conventional manual or automated audiometry overseen by a technician at a satellite clinic. Also not included here are at-home hearing tests that require the use of application software and calibrated headphones.

Online hearing testing is primarily designed to identify the possible presence of a hearing impairment for the purposes of advising the user to seek additional professional care, to provide a manufacturer with information concerning a potential hearing aid user, or to initially program a device as part of a DTC process. These tests incorporate tones,

REQUIREMENTS	SATELLITE CLINIC MODEL	VIRTUAL CLINIC MODEL
STRATEGIC PLANNING	Yes	Yes
NEEDS ASSESSMENT	Market analysis and a business plan are important.	Market analysis and a business plan are important.
SPACE REQUIREMENTS	Satellite clinic	Virtual clinic
EQUIPMENT	The types of test equipment depend on the mission of the satellite clinic. Basic components include: Internet connection, video otoscope audiometer, middle-ear measurement device, equipment for real-ear measures, 3D ear scanner for taking impression of the ear, other equipment as needed.	Mobile smartphone, tablet, computer, internet connection, and calibrated headphones.
IDENTIFICATION/DIAGNOSIS	A fully functional satellite clinic is capable of performing all tests.	Currently technology permits hearing screening, hearing threshold assessment, and speech audiometry.
TRAINING STAFF AT MAIN CLINIC AND SATELLITE CLINIC	Critical to train the staff at both locations.	No facilitators are needed for this model, but a thorough understanding of technology is required.
VIDEO VISITS BETWEEN AUDIOLOGISTS AND PATIENTS	Video visits can be achieved by using a communication platform that is HIPAA-compliant; currently, HIPAA compliance has been relaxed.	Video visits can be achieved by using communication platform that is HIPAA-compliant; currently, HIPAA compliance has been relaxed.
PAYMENT	Several private payers pay for such services, not for Medicare patients.	This is a new service and the reimbursement should be negotiated or private-pay options explored.
HEARING AIDS AND COCHLEAR IMPLANTS	These services can be provided using tele-audiology.	These services can be provided using tele-audiology.
AUDITORY TRAINING AND TINNITUS	These services can be provided using tele-audiology. Video visits can be used as well as hybrid models that include asynchronous models between video sessions.	There are multiple smartphone, tablet, computer, and web-based tools for tinnitus and auditory training that can be used. Video visits also can be used.

words, numbers, and/or everyday sounds in quiet or in noise as target stimuli.

Research is underway to determine the use and effectiveness of online or self-hearing testing. Not surprisingly, the accuracy of online hearing tests, when compared to conventional audiometry,

varies as a function of transducer type and degree of hearing loss.

Barczik and Serpanos (2018) found that online hearing tests were generally accurate for threshold assessment of mild or greater (>25 dB HL) hearing loss when using appropriate transducers. Likewise, Saliba et al (2017) demonstrated that

TABLE 1. Comparison of Two Models of Tele-Audiology and the Requirements for Implementation



mobile-administered audiometry was within 10 dB of conventional audiometry when conducted in a quiet environment. This is an emerging technology and we should expect to see considerable growth in online testing with the issuance of Food and Drug Administration (FDA) regulations concerning over-the-counter hearing aids.

Hearing aid adjustments can be implemented using remote access of a computer, real-time remote programming, or asynchronous programming.

Hearing-Loss Assessment

The recent surge in clinical investigation of tele-audiology is motivated largely by the need to make quality hearing-health-care services accessible to underserved populations, particularly in developing regions of the world lacking adequate audiology services.

Using the satellite clinic model discussed earlier, it is possible for an audiologist to complete each step of a typical hearing-assessment process, including a focused

history to rule out ear disease (e.g., CEDRA), remote otoscopic inspection of the ear, hearing screening, pure-tone threshold assessment, and speech audiometry in quiet and noise (Klyn et al, 2019; De Sousa et al, 2019; Swanepoel 2020).

Due to COVID-19, physical-distancing and self-quarantine policies and protocols seriously restrict the assistance of technicians, facilitators, or other non-audiology personnel in providing remote patient services (satellite clinic model). Fortunately, several rather straightforward approaches, supported by novel technologies, are available for the delivery of quality hearing-health-care services while minimizing the risk of patient infection.

With some creativity, audiologists can conduct or coordinate each step of the hearing assessment process without any direct patient contact, that is, with patients collecting their own audiological data either independently with self-test systems or with the assistance of a family member (virtual clinic model).

Interventions

Interventions for hearing loss and related disorders include hearing aid dispensing and post-fitting care, cochlear implant post-fitting care, auditory training, and tinnitus management.

FEATURE	DESCRIPTION
FINE-TUNING	Full and limited fine-tuning via real-time and asynchronous remote programming
FITTING	Feedback measurements In-situ audiometry
SATISFACTION SURVEYS	Ability to rate listening situations and programming adjustments
TRACKING	Ability to see battery charge and datalogging
REMOTE FIRMWARE SOFTWARE UPGRADES	Ability to update device firmware remotely
HARDWARE DIAGNOSTICS	Ability to identify microphone, speaker, and internal noise issues
CONSUMER REMOTE CONTROL	Tone control Volume control Compression control Directional control Noise reduction Tinnitus control Speech enhancement Creation of custom programs
*Audiologists should check with manufacturer to see if specific features are available.	

HEARING AIDS

As consumers with hearing loss seek convenient solutions to address their hearing-health-care needs, audiologists must look for innovative and creative solutions for meeting the needs of the consumer in the comfort of their home, or potentially at a local clinic down the block.

Technology today has opened opportunities for audiologists to explore many iterations of fitting and follow-up options depending on the needs of the consumer. Mobile and internet technology can be used to present self-assessment questionnaires, such as the Hearing Handicap Inventory for the Elderly/Adults (HHIE/A), International Outcome Inventory for Hearing Aids (IOI-HA),

Satisfaction with Amplification in Daily Living (SADL), and Client-Oriented Scale of Improvement (COSI).

Remote real-ear measures can be done reliably with the assistance of a technician, and in-situ audiometry, through the manufacturer software, if all else fails. Hearing-aid adjustments can be implemented using remote access of a computer, real-time remote programming, or asynchronous programming.

The hearing aid industry has contributed many advancements to Bluetooth technology for connectivity, as well as created opportunities for audiologists to meet patient needs outside the clinic. TABLE 2 provides a summary of some of the features and

TABLE 2. Summary of Features Available via Smartphone Apps and Remote Programming*

functions audiologists can use, depending on manufacturer availability.

Tele-audiology in hearing aid follow-up and care can also be conducted via offline platforms (e.g., DVD, telephone), using the internet (e.g., websites, remote access, video-conference, messaging system/e-mail), and via mobile solutions (e.g., smartphone/tablet) (Paglialonga, 2018).

COCHLEAR IMPLANTS

In a situation where the clinics are in lockdown, the satellite clinic model is often not helpful, as travel and physical interaction are still required. Therefore, during this time, it is imperative to think outside the box and focus on the patient's specific need, rather than the traditional care pathway.

This is especially true for cochlear implant users who live greater distances from their providers. A simple questionnaire can help the clinic understand the patient need and video calls are available if specific follow-up is needed. A well-designed triage tool can help determine if the patient needs to see their doctor, get a new part or repair from the device manufacturer, or needs counseling.

Cochlear recently received FDA approval for its Remote Check solution, which is a smartphone app that provides a way for clinics and their patients to connect and share relevant information (Slager et al, 2017). The information includes implant site photos, various triage questions, and two

direct-connect-streamed hearing tests. The tool provides information for a clinician to make an informed decision on whether an in-clinic visit is needed, no visit is required, or other intervention is needed.

If the need is device training or repair, the patient can often contact device manufacturers through their consumer hotlines. For example, Cochlear Link enables the sharing of the clinic database with Cochlear so the company can securely access the patient's latest program (MAP) via the "cloud" and expedite service and repair requests for the patient as quickly as the next business day without any clinic involvement.

If changes to the patient's program are required, patients can make limited changes to their MAP using their smartphone, often with the support of the audiologist.¹ If further changes are required, at-home remote programming is possible.² While the at-home remote programming can be logistically challenging, one study showed it provides equivalent results (Slager et al, 2017).

AUDITORY TRAINING

As the audiology community transitions many of its clinical services to a telehealth platform, it's important to remember that many services are particularly well-suited to remote delivery and have been so for quite some time.

One example is computer-based auditory training (CBAT). Commercially available CBAT programs include, for example, Listening and

¹ The Smart App is compatible with Nucleus 7 processors (see <https://pronews.cochlearamericas.com/nucleus-smart-app/>). It is also supported for Nucleus 6 and Kanso device users via the CR230, as mentioned above.

² www.hearingreview.com/hearing-products/implants-bone-conduction/fda-approves-remote-programming-feature-nucleus-cochlear-implant-system.

Communication Enhancement (LACE) and cLEAR EARS for the Brain. Some manufacturers have developed auditory training apps, such as Hear Coach by Starkey and rehAB by Advanced Bionics. While not specifically marketed as auditory training programs, “Brain Fitness” programs such as Lumosity and BrainHQ are designed to improve auditory-processing functions that tend to be compromised as a result of age-related hearing loss, such as working memory, speed of processing, and selective attention.

What these programs have in common is that they employ the principle of gamification—the application of gaming strategies for non-gaming purposes such as health and wellness. These strategies include adapting the difficulty of the task, awarding points, and achieving higher levels based on the participant’s performance to keep them engaged and coming back for more training.

Research has demonstrated mixed results concerning the efficacy of CBAT programs (e.g., Abrams, 2015; Saunders et al, 2016). Although auditory training programs can be completed remotely, it’s important for the audiologist to remain engaged with and monitor the progress of patients to ensure their continued compliance, a challenge for even the most entertaining applications.

Tinnitus

Tinnitus is a heterogeneous condition by its etiology and presentation. Assessment should focus on (1) identifying red flags in terms of serious auditory pathologies and/or psychological conditions leading to additional and detailed audiological and/or psychological evaluations and (2) evaluation of the effects of tinnitus on day-to-day life and work.

Tinnitus-management options are based on the resulting severity and associated comorbidities such as anxiety, depression, or insomnia. Audiologists can offer tinnitus management using tele-audiology methods. This can be done by obtaining a detailed case history and self-reported outcome measures such as the Tinnitus Functional Index (TFI), Tinnitus Handicap Inventory (THI), and other validated scales for comorbid conditions. In addition, survey tools such as SurveyMonkey or Qualtrics will aid in the diagnosis of tinnitus.

Most tinnitus sufferers find tinnitus bothersome and may have some associated mild anxiety. For such individuals, informational counseling aimed at reassurance and increased understanding may be enough and can be offered online using encrypted technologies such as Skype. However, some individuals with severe tinnitus and other comorbidities, such as sleeping problems, high anxiety, and depression, may require a structured program.

Various psychological approaches including cognitive behavioral therapy (CBT) and progressive tinnitus management (PTM) have been found to be effective, and all of them can be done via tele-audiology methods (Beukes et al, 2018; Henry et al, 2018).

A few prominent psychologists have been offering successful tinnitus management, such as CBT (e.g., www.cbtfortinnitus.com) and mindfulness-based tinnitus stress reduction (e.g., <https://mindfultinnitusrelief.com>) using video coaching methods. Finally, the structured psychological therapies of choice (e.g., CBT, PTM) can be offered via the internet and smartphone apps (Sereda et al, 2019). This can involve regular meetings using video coaching techniques. In addition, web pages with

self-help information and smartphone apps can be used with patients to supplement the video coaching sessions.

Conclusion

This article reviewed the current state of tele-audiology in terms of two models. In conclusion, the availability of present mobile technology can support most clinical services offered using tele-audiology. However, the use of a complete mobile platform without the assistance of a remote site with an assistant or facilitator (addressed in the satellite clinic model) is still evolving. We foresee an opportunity for these emerging care models to lead to improved and more efficient hearing health care for consumers in the long term. 

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From Hearing Aids to Cochlear Implants

BY JASON GALSTER

The State of
Wireless Technology



Over the last 10 years, wireless technology has been a driver of innovation in hearing aids and cochlear implants. Today, our counseling narratives almost universally include discussion of the features and benefits that are enabled by wireless connectivity—it's been a short trip from novelty to normal. This article reviews the evolution of ear-level wireless technologies

and summarizes the landscape across hearing aids and cochlear implants.

On-ear wireless hearing devices (hearing aids and cochlear implant sound processors) can be first classified as having two basic modes of wireless communication: Magnetic induction and radio frequency (RF).

Magnetic induction systems transmit and receive signals at lower wireless frequencies (e.g., 10 MHz) with antennas that

To ensure that gaps in technological harmony are as brief as possible, close relationships among the companies developing tomorrow's hearing aids and cochlear implants will ensure that the visions are closely aligned, both in terms of technical capabilities and audiological benefits.



consist of a small magnetic core wrapped in a copper coil. In contrast, RF systems transmit and receive higher wireless frequency signals (e.g., 2.4 GHz) with antennas that are formed as a loop or strand of copper.

In the case of cochlear implant systems, the sound-processor headpiece uses a wireless inductive link to transmit power and data through tissue to the implant. For this article, inductive power

and data transfer will be considered a separate wireless application and not a focus.

Among audiologists, the concept of wireless communication through magnetic induction is a familiar one. Hearing aids and cochlear implants have offered telecoils that receive audio from compatible induction fields for decades, the

benefits of which have been thoroughly documented (Atcherson, 2019).

The early use of these magnetic induction wireless systems was motivated by a combination of size, low-power demands, and available technology. Still, today, the telecoil represents the most universally accessible method for providing directly streamed audio to a hearing aid or cochlear implant. However, the telecoil is limited by the need for proper alignment between the telecoil and the inductive field, as well as a very limited capacity to transmit data for signal processing.



After several years of development, the first made-for-iPhone hearing aids were introduced during 2013 and 2014.

Introduction of NFMI

In the years between 2005 and 2010, hearing aid developers introduced near-field magnetic induction (NFMI) wireless systems designed specifically for the transmission of audio and data. The key benefits of NFMI were related to the magnetic principles

of the wireless system. Firstly, these were low-power and low-frequency, which meant that data and audio could be transmitted for an acceptable period of time with a zinc-air hearing aid battery, and the low-frequency signal made transmission between ears (in a bilateral device pair) a possibility.

This contrasted with Bluetooth, which during these years was demanding of power, and the technical systems were sensitive to placement and orientation on the head. For this reason, hearing aids featuring NFMI as the primary mode of wireless communication also required an intermediate streaming device that was worn around the neck, contained its own larger battery, and acted as an intermediate between the hearing aid NFMI signal and Bluetooth connections available from mobile phones or other systems.

Integration of RF Wireless

The next stage of wireless development ushered in the retirement of neck-worn streamers in favor of integrating the RF wireless systems directly into the hearing aid and cochlear implant. In most cases, these integrated RF wireless systems operate in the 2.4 GHz international, scientific, and medical (ISM) frequency band. Note that 2.4 GHz is the same frequency band used by the Bluetooth protocol; however, there are many

devices that transmit wireless information at 2.4 GHz, but do not use the Bluetooth protocol.

As examples, most WiFi routers transmit at 2.4 GHz, some wireless mice and keyboards use proprietary 2.4 GHz protocols, and many modern hearing aids and cochlear implants use proprietary 2.4 GHz protocols to transmit low-latency, low-power audio from the developer's TV streamers and remote microphones. This wide variety of wireless communication and avoidance of interference across the 2.4 GHz band is managed by the signal-processing chipsets in each of the connected devices.

Bringing on Bluetooth

The integration of RF wireless systems into hearing aids and cochlear implants was enabled by the advancement of the Bluetooth protocol, developments on the part of Apple and Google, and the associated forward march of the necessary hardware. Today, the Bluetooth standard is a collection of different protocols, with each having a specific purpose.

The most used Bluetooth protocol is called Bluetooth Classic, which is responsible for managing most of the Bluetooth connections within our smartphones, computers, and cars. Bluetooth Classic allows for high-quality stereo audio transmission and secure high-bandwidth data transmission. Bluetooth Classic has proven to be a reliable and effective method of wireless communication for many of the devices we use every day. In the early 2010s, the realities of available technology made it nearly impossible to consider implementing Bluetooth Classic at the ear level, especially when 2010 wireless hardware would have consumed the power of a zinc-air battery in one to two hours.

During these same years, Bluetooth low energy (BLE) was introduced, allowing for wireless devices to transmit data (not audio) in an intentional and efficient manner that was not previously possible. Millions of activity-monitoring devices such as the FitBit and early Apple Watches, leveraged BLE to transmit activity and biometric data back to a smartphone.

Conceptually, BLE is like a water faucet: When data transmission is needed, you can open and close the faucet to the extent that allows for the data flow required. The cost is more or less power consumption with more or less data flow. While this was a solution for streaming data to and from hearing aids and opened the door for wireless programming, it was not a solution for streaming audio directly to hearing aids and cochlear implants.

After several years of development, the first made-for-iPhone hearing aids were introduced during 2013 and 2014. By this time, wireless hearing aids were well-established with ear-to-ear signal processing, remote programming, and neck-worn streamers for Bluetooth connectivity. The novelty of made-for-iPhone hearing aids was Apple's Low-Energy Audio (LEA) protocol, a new approach to low-power audio streaming that made it possible to stream audio directly from an iPhone to a hearing aid while maintaining several days of zinc-air battery life. This was a noteworthy step forward in terms of usability for patients, and it planted the seeds of innovation that would grow with a nearly pervasive connection between hearing devices of all kinds and the internet (via a smartphone).

Google has since introduced the audio streaming for hearing aids (ASHA) low-power audio protocol to compete with Apple's



The lifecycle of a cochlear implant sound processor always will be longer than that of a hearing aid.

low-power audio protocol and is specific to smartphones running newer versions of the Android operating system. Both low-power audio streaming protocols are implemented in parallel to BLE, which remains the mechanism for wireless data transfer to and from the hearing devices (e.g., wireless programming or remote control from a smartphone application).

While not as flexible as Bluetooth Classic, the introduction of smartphone-specific low-power audio protocols provides many patients with access to directly streamed audio. However, a technical challenge remains, in that maintaining a wireless connection across the head at 2.4 GHz presents a substantial technical challenge, even today.

Lessons Learned

Through lessons in acoustics and psychoacoustics, we learn that low-frequency sounds have a longer wavelength than

high-frequency sounds and that low-frequency sounds travel more efficiently through air than high-frequency sounds. These concepts extend to wireless signals as well, with lower frequency wireless signals having a longer wavelength that travels through and around objects more easily.

The NFMI systems in hearing devices transmit at lower frequencies that pass easily around the head and between a bilateral device pair. In contrast, signals transmitted at 2.4 GHz have a wavelength of four inches, which causes them to be impeded and dampened by the head.

Maintaining a data connection across the head becomes a delicate balance of power consumption versus the amount of data transmitted. For this reason, hearing aids and cochlear implants were developed to include both NFMI and RF wireless systems, with the NFMI system managing ear-to-ear communication and the RF system managing streaming of direct audio and data from other devices. The result is a layered package of electronics that leverages each system for its efficiency.

In the most complex implementation, a single hearing device also may include a telecoil for a total of three independent wireless systems—and a fourth when considering a cochlear implant

headpiece that powers the cochlear implant electrode through a wireless inductive link.

When broken into the individual wireless communication protocols, hearing devices may include the following:

1. An audio input for signals received via telecoil
2. A proprietary method for ear-to-ear communication
3. A proprietary protocol for low-latency direct audio streaming from accessory devices
4. Apple's made-for-iPhone protocol for direct audio streaming, Google's ASHA protocol, or Bluetooth Classic
5. Bluetooth low energy

Conclusion

Inroads are being made to simplify this technical complexity. At the time of this publication, hearing aids have been introduced that are developed on the first 2.4 GHz wireless hardware that is efficient enough to maintain a robust ear-to-ear connection, eliminating the need for NFMI hardware.

This trend will very likely continue across all the hearing device developers. Similarly, the need for numerous wireless protocols will be simplified through the implementation of new Bluetooth standards that eventually offer the convenient universal compatibility of Bluetooth Classic.

Today's hearing aids and cochlear implants share similar wireless designs and features as those described here. The lifecycle of a cochlear implant sound processor will always

be longer than that of a hearing aid, which means that eventual gaps in design and features should be expected. To ensure that these gaps in technological harmony are as brief as possible, close relationships among the companies developing tomorrow's hearing aids and cochlear implants will ensure that the visions are closely aligned, both in terms of technical capabilities and audiological benefits. 

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Being Mindful of Cultural and Linguistic Diversity IN EVERYDAY PRACTICE

BY KATIE M. COLELLA, LAURA GAETA, ERICA B FRIEDLAND,
MARY A HUDSON, AND DEBRA BUSACCO

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*Audiologists, whether
seasoned providers or new
to the field, can advance our
cultural competence by being
mindful of the cultural and
linguistic diversity of the
patients we serve.*

ciao

Hello

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A culturally and linguistically diverse (CLD) patient is one who comes from a home environment where a language other than English is spoken and whose cultural values differ from mainstream culture. According to the Center of Immigration Studies, about one in five U.S. residents speak a language other than English at home (Camarota and Zeigler, 2015).

This article provides information about factors related to cultural and linguistic diversity as they relate to best hearing health-care practices. Cultural and linguistic competence suggests an ability by health-care providers and health-care organizations to understand and respond effectively to the cultural and linguistic needs brought by patients to the health-care encounter (HHS, 2000). Readers will benefit from the examples, resources, and recommendations for removing communication barriers when interacting with CLD patients.

A changing and increasingly diverse population in the United States has created challenges for providers to deliver culturally competent services while maintaining a high quality of care and improving hearing-health outcomes. Communication barriers, including language, can impact patient satisfaction, understanding, and quality of care.

To provide culturally competent and high-quality services, clinicians must strive to effectively communicate with all patients, including the CLD population and those vulnerable to low-health literacy. Increasing cultural competence and adhering to best-practice guidelines will decrease communication barriers and increase patient satisfaction. In turn, this improves the effectiveness of

audiologists' services and achieves a positive patient-provider relationship. As clinicians, we need to strive to remove language and cultural barriers to provide excellence in hearing health care for all.

Best Practices for Using Interpreters

There are few health-care providers who are bilingual, leading many providers to rely on the patient's family members, clinic staff, or non-fluent health-care professionals for communication with the CLD population. These patients often feel less satisfied with their visit compared to a visit with those who have used professional interpreters. Moreover, using untrained interpreters is more likely to result in errors and poor outcomes (Juckett and Unger, 2014).

Participating with an interpreter for CLD patients is standard for most clinicians. Although using qualified interpreters and interpreting services is an important first step in creating a safe environment for CLD patients, there are best-practice techniques to consider (Rhodes et al, 2005).

- Avoid idioms, metaphors, colloquialism, or jargon. Phrases used by native English speakers such as "feeling blue" or "let's wrap up" may not translate effectively into another language.
- Review any professional vocabulary that could require an expanded explanation with the interpreter.
- Allow the interpreter enough time to interpret all messages.

- Look at and speak with the patient or caregiver(s), not the interpreter or phone.
- Ask the interpreter, patient, or caregiver(s) if he or she has any questions or needs clarifications.
- Defer from using a family member as an interpreter unless it is truly the only option.

Avoiding Microaggressions

Microaggressions are brief statements or behaviors that, intentionally or not, communicate a negative message about a non-dominant group, including the CLD population. The subtlety of these affronts is what makes them so harmful. FIGURE 1 includes examples of microaggressions and the messages they convey (Sue et al, 2007).

The challenge of avoiding microaggressions is that they are often disguised as banter. If you are the target of a microaggression, educate the offender by focusing on the comment itself instead of criticizing the person, especially if you believe no malice was intended.

When witnessing someone being the target of a microaggression, do not speak on their behalf, but offer support. Victims of

microaggressions may be accused of being over-sensitive.

Finally, if you are identified as using a microaggression, listen to the offended party. Take the opportunity to turn an unfortunate incident into a learning opportunity to grow not only as a clinician, but as a person (Clay, 2017).

Health Literacy

Health literacy refers to understanding basic health information to make appropriate health-related decisions (U.S. Department

FIGURE 1. Examples of microaggressions and the messages they can convey.

MICROAGGRESSION	MESSAGE
"You speak good English." OR "No, where are you really from?"	You are a foreigner.
"You are so articulate."	It is unusual for someone of your race to be intelligent.
"When I look at you, I don't see color."	Denying a person of color's racial/ethnic experience.
"As a woman, I know what you go through as a racial minority."	Your racial oppression is no different than my gender oppression.
"Don't be shy. I want to hear what you think."	Encouraging assimilation to a dominant culture.

of Health and Human Services, 2010). About 36 percent of American adults have basic or below basic health literacy (Kutner et al, 2006).

Low health literacy is associated with several negative health outcomes, such as increased emergency room admissions (Griffey et al, 2014) and mortality (Peterson et al, 2011). Not all CLD patients have low health literacy, but vulnerable groups include non-native speakers of English and minority groups. Additionally, older adults, those with lower levels of education and income, and people with chronic diseases are also at risk.

Even though certain populations are more vulnerable to low health literacy, clinicians can be mindful of specific red flags with their patients, including the following:

- No questions asked
- Difficulty explaining their diagnosis or equipment
- Frequently missing appointments
- Becoming angry, demanding
- Being quiet, passive
- Clowning around, using humor
- Submitting incomplete registration forms
- Making excuses. For example, “I forgot my glasses. Can you read this to me?” or “Let me bring this home so I can discuss it with my children.”

One way to support patients is to guide them to ask the right questions in their appointments.

The “Ask Me 3” program was developed by the Institute for Healthcare Improvement. The program encourages patients and families to ask three specific questions of their providers to better understand their health conditions:

- What is my main problem?
- What do I need to do?
- Why is it important for me to do this?

As part of a patient-centered approach, we need to effectively communicate with all patients. Clear patient-provider communication may encourage patients to take an active role in managing their overall health, and especially, their hearing health.

Recommendations for improving health literacy (AMA, 2007):

- State the most important information first and explain why that information is important.
- Confirm patient understanding by asking for a summary.
- Supplement conversations with written materials that focus on key information and include visuals, while keeping in mind that translated materials do not always increase health literacy.
- Avoid technical terminology and language.

- Speak in simple sentences and use active voice.
- Provide captions for all graphics, including step-by-step illustration guides.
- Use high-contrast paper and font color. Font size should also be large.

Providers can assess the readability of their clinical handouts by using measures available in Microsoft Word, such as the Flesch Reading Ease scale and the Flesch-Kincaid Grade Level.

Rudolph Flesch developed the Reading Ease scale with scores ranging from zero to 100 (Flesch, 1948). Lower scores (e.g., 0–40) indicate greater difficulty and higher scores (e.g., 80 and higher) indicate easier reading. Writers can achieve plain English with a minimum score of 60 (Flesch, 1979).

The Flesch-Kincaid Grade Level Formula measures the readability of a document based on the minimum educational level that the reader needs to understand the document (Stockmeyer, 2009). Cotugna and colleagues recommend a fifth- to sixth-grade reading level for patient-education materials (Cotugna et al, 2005). To use these features in Word, reference the following links:

MICROSOFT 2013

www.writeawriting.com/how-to-write/readability-statistics-word/

MICROSOFT 2016

www.officetooltips.com/word_2016/tips/viewing_document_and_readability_statistics.html

Conclusion

Audiologists, whether seasoned providers or new to the field, can advance our cultural competence by being mindful of the cultural and linguistic diversity of the patients we serve.

Implementing strategies such as embracing best practices when using an interpreter, avoiding microaggressions, and improving the readability of patient-education materials will enable audiologists to provide patient-centered care to CLD patients and those with low health literacy.

Being mindful of the cultural and linguistic diversity of the patients we serve and adjusting our practice strategies accordingly may decrease barriers to effective communication. This, in turn, may improve hearing health-care outcomes for all patients. ^{AT}



For more information about being mindful of cultural and linguistic diversity in everyday practice, including patient handouts, scan the following QR code.

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RECD – Not Just for Pediatric Fittings

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There is much uncertainty about the lasting impact the COVID-19 pandemic will have on our personal and professional lives. In hearing care, there will likely be an increased focus on sanitation of items that come in frequent contact with patients, such as transducer cables from audiometers, immittance instruments, OAE analyzers, and hearing instrument verification systems. Additionally, it's probable that hearing care professionals will want to limit close contact with patients as much as possible, as long as results aren't being affected.

Because of this, Sherman Lord, Au.D. of e3 Midlantic Technologies has written an article on simulated real-ear measurement (S-REM), real-ear-to-coupler difference (RECD), and the important role both can play in limiting physical contact with patients without sacrificing accuracy.

In the article, Lord discusses the various tools needed to successfully obtain RECD measurements. These include a hearing aid test/verification system capable of coupler-based verification measurements and a test box or real-ear coupler adapter kit.

The key to successfully predicting on-ear performance via coupler measurements is by using a custom RECD curve. This is because the custom curve accounts for the difference in decibel levels across frequencies between the dB SPL measured in the patient's ear using the same coupling method, sound source, and signal. It's a process that takes very little time, reduces contact with the patient, and results in a more accurate, predicted on-ear curve.

When discussing the value of RECD and the impact it can have on overall accuracy of the fitting,

Lord states it is important to know the two ways it is utilized in hearing instrument verification systems:

1. To convert dB HL audiometric thresholds obtained with insert phones to a dB SPL audiogram. These dB SPL thresholds are used to calculate the targets for the prescriptive method selected (e.g. NAL-NL2; DSL 5.0)

dB HL thresholds + ANSI insert phone calibration value + average or custom RECD = dB SPL threshold

2. To convert coupler audibility measured levels (in dB SPL) to on-ear audibility predicted levels (also in dB SPL)

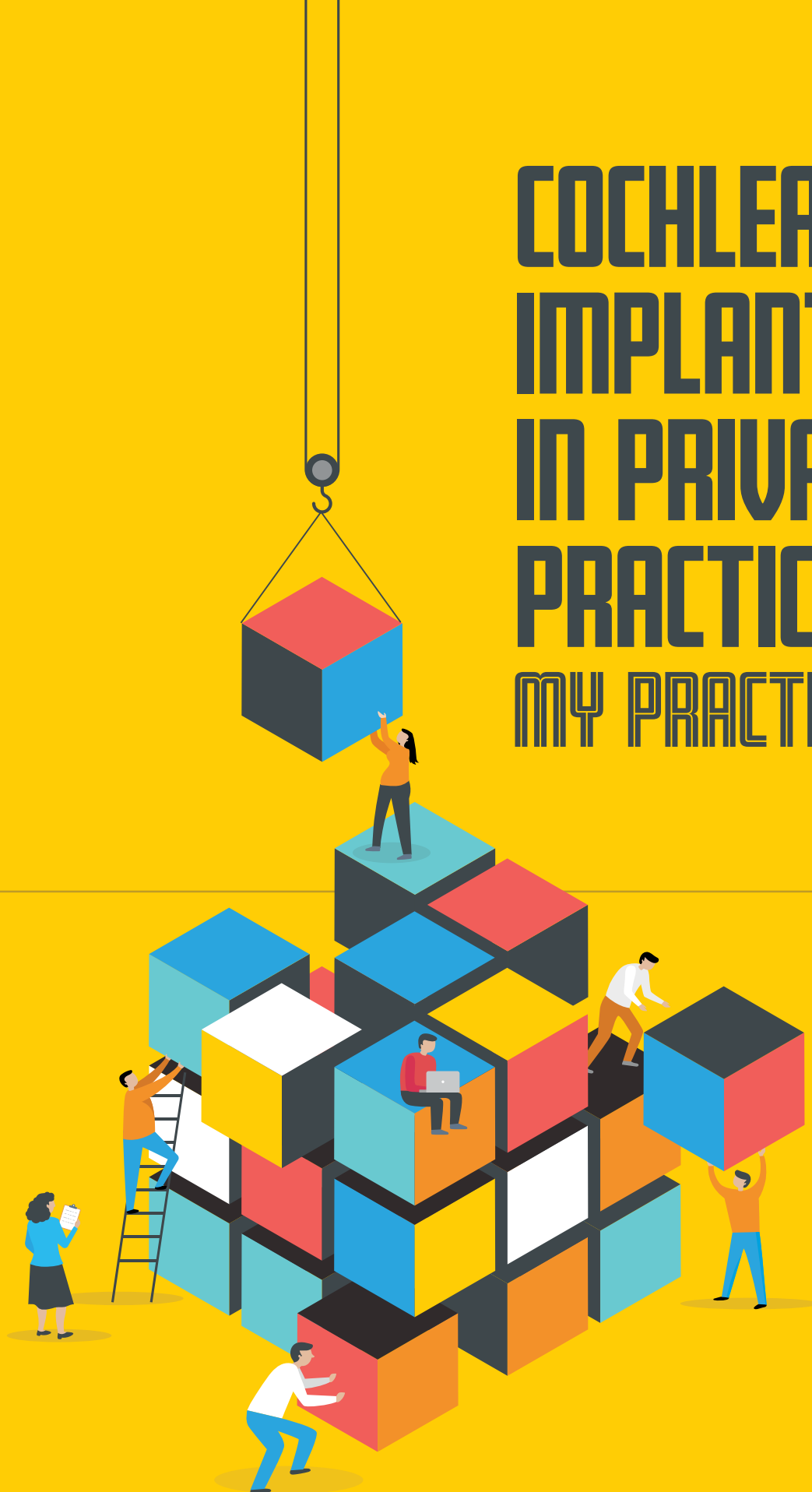
Coupler SPL + average or custom RECD + MLE = predicted real ear SPL (5)

Also covered in the article are the benefits of custom RECD compared to age-based average RECD. Lord says an average RECD does not consider how the individual differences in ear canal acoustics and impedance affect the dB SPL measured at the tympanic membrane, whereas a custom RECD will. It has been proven that dB SPL measured at the eardrum may vary greatly across listeners with the same dB HL audiogram.

At the conclusion, Lord summarizes that due to individual differences in ear canal acoustics, a custom RECD improves the accuracy of the SPL thresholds (when using insert phones for audiometry) used to calculate target estimation through the use of prescriptive methods such as NAL-NL2 and DSL. And it is essential if coupler audibility verification is to be used to predict on-ear performance.

To read the full article, visit <https://bit.ly/3eqhXIN>

COCHLEAR IMPLANTS IN PRIVATE PRACTICE... MY PRACTICE?



Access is the new focus in the world of cochlear implants. Traditional distribution channels lack the ability to absorb the future growth of this proven treatment modality. Do your clinical skills and your practice location have the potential to provide services in this underdeveloped market?



BY DAN QUALL

The world of cochlear implants (CIs) is evolving. What was once a treatment pathway for a limited population of patients with profound hearing impairment has expanded to include individuals with moderate to severe hearing loss. CI technology, which began as basic sound processing through an electrode array, has grown to include Bluetooth streaming and cell phone connectivity.

Above all, through the years, outcomes, as reported by patients, continue to improve. Now another aspect

of this industry is changing—access—getting the right patient to the right provider, at the right place and in the appropriate time frame.

The change in the CI industry is being driven by a number of factors, with the most urgent being poor use of this treatment pathway. Of the adults with severe to profound hearing loss, less than eight percent have been implanted and only 11 percent of audiologists specialize in CIs (Taylor, 2018).

Unlike 30 years ago when CIs were first approved for clinical use, the process of identifying and programming

patient care has become much more streamlined. What once was a process defined by research protocols in limited geographic locations has moved to treatment protocols that drive quality outcomes and clinical efficiency in local communities.

CI manufacturers now have dedicated networks and countless resources for private practice audiologists who have integrated CIs and other implantable hearing solutions into their technology portfolio. Is adding these services right for your practice?

Do Cochlear Implants Make Business Sense?

To answer this question, we will examine several factors. First, let's look at demand. Given the statistical data cited earlier, we know that, within the United States, there is a high need to provide this service.

What about local demand? In an article published in 2009, Huart and Sammeth sampled the patient files of five audiology and hearing aid clinics. Of the 7,000 files sampled, 3.2 percent of the patients appeared to be candidates for a cochlear evaluation (Huart and Sammeth, 2009). This would indicate that, for a clinic with a base of 4,000 patients, approximately 120 patients should be evaluated for CIs—and that is just one clinic in a community.

The conclusion: There is strong demand for these services in your community.

The next thing to consider is the operational variables of your current practices. Below is a summary of some characteristics of successful practices offering CIs. A review of your clinic profile should reveal that you and your team possess many, but not necessarily all, of these factors.

CHARACTERISTICS OF SUCCESSFUL PRACTICES OFFERING COCHLEAR IMPLANTS

- Long-established practice and/or large patient database
- Motivated, licensed audiologist willing to commit to the process and training
- Open to the medical model and can collaborate with surgeons
- Open to revenue streams other than hearing aids
- Participate with Medicare and other commercial insurance payers

If your clinic seems to meet the criteria of a successful practice offering CIs, a simple business exercise will be the final step. When considering the addition of goods or services to an existing business, the business owner should ask the following three questions:

1. Is this good for my customers (my patients)?
2. Is this good for my employees (my providers)?
3. Is this good for my bottom line (my practice)?

If the answer is “yes” to all three questions, it is reasonable to proceed with the product or service.

To provide clarity to these three questions, industry periodicals were reviewed and input

was solicited from several audiologists who have adopted CIs into their private practices in the past five years. Using industry data and the input from these audiologists, let's examine the impact of CI services by asking the three questions.

Is This Good for My Patients?

There is overwhelming positive clinical evidence regarding the benefits of CIs. Whereas the majority of these feel-good stories are coming out of the traditional implant channels, a growing number are happening in private practice settings across the country.

The expected benefit for CI patients is an improvement relative to benefits from hearing aids in terms of word-recognition and quality-of-life scores. Reviewing studies of benefits provided through CIs independently, and also in the bimodal condition (one CI, one hearing aid), clinical evidence reveals strong patient outcomes for adults with CIs.

Bittencourt et al (2012) demonstrated that a group of CI users had significantly higher word-recognition scores, one year post implantation, when compared to an equally matched group of hearing aid wearers.

More recently, in April 2019, results were shared from a study

involving 100 adult subjects across 13 sites who received the Cochlear Nucleus CI532. All of the subjects were fit in a bimodal configuration. All bimodal hearing aids were dispensed in the same time frame of the CI activation.

Speech-understanding scores at six months post activation revealed significant improvement in speech perception, in both quiet and noise (Cycle Continuum of Care 2020) (FIGURE 1).

Additionally, using a seven-point Likert scale, 95 percent of patients reported they were satisfied or very satisfied with

FIGURE 1. Improved hearing performance and quality of life (Cycle, 2020).

SUMMARY

Patient-Reported Outcomes



SIGNIFICANT IMPROVEMENT IN QUIET AND NOISE

9 of 10 Do Significantly Better in Quiet
7 of 10 Do Significantly Better in Noise



IMPROVED PATIENT-REPORTED QUALITY OF LIFE

83% Improved Their Health Utility Index



HIGH HEARING SATISFACTION

95% Reported Being Satisfied or Very Satisfied
with Overall Hearing Performance

FIGURE 2. Improved hearing satisfaction (Sycle, 2020).

their bimodal hearing solution, compared to only nine percent of individuals wearing appropriately fit hearing aids alone, pre-operatively (FIGURE 2). While not every patient achieves these performance levels, the evidence is very favorable for CI outcomes.

Audiologists also are reporting strong outcomes.

“One of the startling aspects when you incorporate cochlear implants into your practice is how grateful the patients are with the improvements in understanding and level of audibility they achieve with cochlear implants,” Dr. Kimberly Allred, the owner of ACI Hearing and Balance Center in Lafayette, Louisiana, said.

“Once you start taking care of your longtime patients by offering the ‘next level of technology,’ CIs, you begin to see how satisfied they are and how grateful they feel for regaining a level of audibility. Is it good for my patients? I would say absolutely yes. I know they like a 10- or 15-minute drive, compared to an hour-and-a-half commute for services.”

“Our patients have definitely seen a benefit having local access to cochlear implant services,” Dr. Ram Nileschar, the owner of The Hearing Center of Lake Charles, located in Lake Charles, Louisiana, said.

“We also work with a local speech therapist to provide auditory training. The most notable change with our implanted patients is the change in their quality of life. Our patients who are still working are reporting they are functioning more effectively. And a few weeks ago, I was in the grocery store and was stopped by

95% Were Satisfied with Their Bimodal Hearing Solution when Compared to Hearing Aids Alone.¹

¹Clinical Evaluation of the Cochlear Nucleus C15-32 *Cos Hear* Implants in Adult Investigator Meeting. 2018 Apr.

	BILATERAL HEARING AIDS (Appropriately Fit HAs)	SMART BIMODAL
 HEARING PERFORMANCE Satisfied or Very Satisfied	9%	95%
 Ability to Understand What Is Said on TV	13%	76%
 Ability to Understand Conversations in a Small Group	8%	79%
 Hearing Performance in Background Noise	2%	58%
 Ability to Listen to and Appreciate Music	13%	68%
 Ability to Understand People on the Phone	6%	71%

the wife of one of our recipients. She was almost in tears telling me the difference implants have made in his life. Yes, I would say our patients are benefiting from this local service.”

Is This Good for My Providers?

One of the key issues when introducing a new product or service into a practice is the stress placed on the providers and other staff members. The stress can be manifested in a number of ways, including through a steep learning curve, increased clinical pace, or additional caseload.

Although CIs are not as specialized as they were several decades ago, there is still formal training required and, more importantly, opportunities are needed to apply this training in the clinic with patients. The manufacturers of CIs understand how critical training is and offer solid programs, as well as on-site support resources.

Clinics that offer CI services do not see the same volume of patients as large CI centers. However, most audiologists can feel confident and proficient to provide services to most of their CI recipients if they are seeing 10 to 12 patients per year, on average.

Another issue to address with staff is the variable pay plans that exist with other clinical activities. Providers don't want to relinquish

time with hearing aid patients if the variable pay is extensively less with other procedures. Given the issues with Medicare reimbursement, a clinic must be sensitive to adjustments in pay structures relative to adding a service to the practice.



**IS IT GOOD FOR MY
PATIENTS? I WOULD SAY
ABSOLUTELY YES.**

“Our providers are eager to learn,” Dr. Nileshwar said. “As they learn and gain experience, they want more skills to handle the advanced cases. The providers seem to enjoy the trust that patients instill in them with providing this service. The benefits far outweigh the downside of initiating a program like this.”

“Once you get comfortable with the paperwork and the protocol, it all works a lot smoother,” Dr. Allred said. “You have to jump into the pool and change how you have done things in the past. Once we mastered the ‘language’

of the implant world, things got better. It's definitely worth the learning curve."

It's clear that the learning curve is the biggest hurdle for providers. However, once you push through the learning, the professionals all agree the reward far outweighs the risk. The audiologists report that providing CI services satisfies many of the emotional reasons they chose the profession of audiology. CI services appear to fit right in the wheelhouse of audiologists.



**AS PROFESSIONALS, WE
MUST UNDERSTAND THAT
OUR TIME IS THE WAY WE
GENERATE REVENUE.**

Is This Good for My Practice?

Although there are a number of factors that can make a CI program beneficial, let's begin by answering the most obvious question. Is it financially good for the practice? To answer this question,

we need a clinical revenue benchmark to compare revenue generated through CI activities relative to other clinical products and procedures.

In a 2019 article, Taylor established the margin per clinical hour for a median single provider/single location clinic to be \$186, based on 2,080 clinical hours per year. The calculated margin per hour rose to \$204 when adjusted for paid time off (PTO) and holidays (1,890 hours). For our comparison, we will measure the strength of the program based on the range of \$186 to \$204.

The typical CI journey for a patient starts in their local audiologist's office with a CI evaluation. Once surgery is complete, the patient returns to their audiologist for initial activation and all programming follow-up. On average, a patient would typically need six to eight appointments within the first year, which includes the CI evaluation, totaling approximately nine to 10 clinical hours.

Next, we need to review revenue generated directly from activities associated with the CI patient. These activities include revenue generated in three ways: billable CI services, revenue charged for non-billable activities, and the fitting of a bimodal hearing aid.

FIGURE 3 shows a hypothetical revenue generation and the time

REVENUE SAMPLE FOR 10 PATIENTS (60% Bimodal | 25% of Time with CI–Unbillable)

COCHLEAR IMPLANT REVENUE CALCULATION	TOTAL 1 YEAR	TOTAL 2–5 YEARS	TOTAL OVER 5 YEARS	MARGIN (Per Hour by Activity)
Billable Services for CI Evaluation (Medicare)	\$2,100	\$0	\$2,100	\$140
Hours for CI Evaluation	15	0	15	–
Billable Services for CI (Medicare)	\$9,000	\$7,000	\$16,000	\$178
Billable Hours for CI (CA Protocol)	60	30	90	–
Bimodal Margin Generated (ASP \$2,500/COG 40%/Unbundled) 60% Bimodal	\$9,000	\$0	\$9,000	\$188
Hours for Hearing Aid Fitting and Services	24	24	48	–
Service Package (Non-Billable Services CI and HA)	\$13,000	\$0	\$13,000	\$224
Total Clinical Hours Committed	44	14	58	–
MARGIN TOTALS	\$33,100	\$7,000	\$40,100	\$190
HOURLY TOTALS	143	68	211	–

spent by hour for all activities for 10 patients over five years. Interestingly, it is estimated that approximately 25 percent of the time spent by a provider with a patient is non-billable. Therefore, a clinic should recognize these activities, bill them independently, or create a service package to cover the non-billable events.

As professionals, we must understand that our time is the way we generate revenue. A service package and bimodal charge will be less costly than what patients have paid for hearing health care for most of their adult lives. And, in almost every case, patients will be receiving better hearing results with implants.

In addition, we must weigh the revenue generated relative to the time spent by the clinician. The values were based on approximate

national average rates (the numbers were rounded for clarity).

In comparing the revenue per clinical hour generated through all CI services provided in the mapping of the CI and the fitting of a bimodal hearing system to the benchmark of \$186 to \$204, it is evident that the numbers fall into the benchmark range in all but two categories. Those categories are CI evaluations and billable CI services. Service contracts and bimodal fittings are important financial tools within your CI program. CI programs can be financially stable.

Additional significant value in CI programs is also realized in what we call the “halo effect” provided by other benefits.

Here is a quick list of the additional benefits a CI program can bring to your clinic:

FIGURE 3. Medicare reimbursement rates based on national average applied to a one-year CI protocol. Rates were rounded for illustration purposes.

- Approximately half of your CI evaluations will not lead to candidates for implantation and very often will lead to hearing aid upgrades.
- People who wear implants are patients for life. They use your services again and again.
- These patients need related services and products, including batteries, repairs, and assistive listening devices.
- These patients know other people and are more likely to recommend you.
- A CI program establishes your practice as a center of hearing excellence.

Some observations from audiologists about the benefits of a CI program in their practice follow.

“Being part of a cochlear implant network has changed the way we view our clients,” Dr. Marlene Bevan, the owner of Audicare Hearing Centers in Traverse City, Michigan, said. “We see this more as a continuum of care and, even if patients don’t move forward, they feel more prepared and make better decisions when they know it’s a continuum.

“I’m billing for something I wasn’t able to bill for a year ago. It has helped my bottom line. We are able to reach out and educate a whole new demographic. I’ve made connections with other professionals and also expanded our marketing network.”

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- Les W, Hearing Care Professional

“I really appreciate how this procedure worked to keep us safe in these times.”

- Les's Patient



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"The financial return with each patient is, I would describe, reasonable," Dr. Nileshtar said. "It is not a huge profit center, given the volume of patients. But there are spinoffs."

"The number of hearing aid fittings go up. I'm receiving more referrals from two ENTs in my community. Perhaps the best benefit is that it elevates our status in the community. This makes us different than the other hearing providers in our town."

"Relative to value, our CI program is definitely not a loser," Dr. Allred said. "Our CI patients say it's the best thing since sliced bread. I get more referrals from our CI patients. They sing our praises."

"As professionals, we all feel better educated and find our CI outcomes to be significantly rewarding. Overall, it's great. But it's not all about what we get. It's about what we give. You have to be in this for the right reason."

Yes...we will let that be the last word. 

Dan Quall, MS, is an audiologist and the director of strategic initiatives for the Fuel Medical Group in Camas, Washington. He has served as a managing director and vice president for two of the largest clinical networks in the United States

and has extensive knowledge about nuts-and-bolts practice management. In his earlier years, he built a successful network of five dispensing offices in the Pacific Northwest as a second-generation hearing-care professional.

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A New Path to Clinical and Financial Balance

During these unprecedented times, as the country safely begins its journey toward economic normalcy, we're faced with challenges that will require bold solutions. Even before the pandemic, audiologists who relied on hearing services were feeling market pressure from third-party payers, online retailers, big-box stores, and OTC hearing aids. Now, with un-shuttering, many audiology practices are scrambling to find clinical balance and business stability.

Introducing the Dizziland way: Audiology practices can now increase revenues while helping more patients through the Dizziland licensing program. This nationwide program licenses and trains audiologists in Advanced Vestibular Treatment™ (AVT), the proprietary approach created by Newport-Mesa Audiology Balance & Ear Institute. It seeks to make audiologist-directed diagnosis and treatment of dizziness, vertigo, and balance disorders available to patients throughout the nation, while allowing the licensees to capitalize on this lucrative market.

AVT includes comprehensive diagnostic assessment of the 10 vestibular end organs, which provides the basis for customized treatment of each patient. Conversely, studies reveal 68 percent of patients with vestibular disorders are missed when only videonystagmography is performed, which is the industry standard used by many practices to diagnose vestibular disorders.¹

Additionally, audiologist-directed AVT delivers upwards of 90 percent clinical efficacy, while traditional vestibular rehabilitation therapy directed by physical therapists delivers 50–70 percent efficacy, leaving 30–50 percent of patients without significant measurable improvement.²

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¹Chung W, Chu H. (2010) Clinical role of rotary chair test, ENG and CDP. *Otolaryngol-Head Neck Surg* 143(2):226.

²Krebs DE, Gill-Body KM, Parker SW, Ramirez JV, Wernick-Robinson M. (2003) Vestibular rehabilitation: useful but not universally so. *Otolaryngol-Head Neck Surg* 128(2):240–250.

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Specialty Series: Pediatric Assessment

By Mariah Cheyney and Jennifer Frank

In January 2020, the American Academy of Audiology (the Academy) published its *Clinical Guidance Document on the Assessment of Hearing in Infants and Young Children*. The document covers four content areas: Pediatric Audiometry, Acoustic Immittance, Otoacoustic Emissions, and Electrophysiologic Audiometry. This article provides guidance on filing claims for pediatric audiometry and electrophysiologic audiometry. Coding for otoacoustic emissions and acoustic immittance are discussed elsewhere (Academy, Pediatric Audiology Billing & Coding Questions & Answers).

Coverage policies for pediatric assessment will vary from payer to payer. Benefits provided through Medicaid or Children's Health Insurance Program (CHIP) plans will vary from state to state. Clinicians are encouraged to contact insurers and reference coverage

policies regarding payer-specific coding guidance. The purpose of this article is to discuss considerations when filing claims for pediatric assessment procedures.

Pediatric Audiometry

Behavioral Audiometry

Behavioral audiometric evaluation methods will vary given the patient age. Behavioral observation audiometry (BOA), visual reinforcement audiometry (VRA), and conditioned play audiometry (CPA) are standard clinical procedures used to assess hearing in infants, children, and difficult-to-test patients.

BOA does not currently have a unique code for billing applications. This section will discuss considerations when billing for VRA and CPA procedures using the following current procedural terminology codes (CPT®, American Medical Association).

92579 Visual Reinforcement Audiometry is used to estimate hearing sensitivity by determining the type and severity of hearing loss using a reinforced response procedure. Code descriptions of 92579 reflect standard clinical assessment practices, necessitate the use of calibrated equipment, and include recording and interpretation of results (CPT Manual®, 2020). 92579 can be used when obtaining responses via soundfield speakers, headphones, insert earphones, or a bone oscillator.

Currently, no specific guidance is provided on a minimum number of responses needed to bill this code. In cases of uncertainty, clinicians should consider congruence with standard clinical practices when reporting this code. 92579 does include assessment of speech threshold, a standard of clinical practice when conducting VRA, and is therefore not customarily billed in combination with Speech Threshold Audiometry (92555).

It is not recommended to bill 92579 in addition to other audiometric procedures such as Pure-Tone Audiometry (Threshold), Air Only (92552) or Air- and Bone-Conduction Audiometry (92553) because 92579 is valued as a stand-alone procedure.

92582 Conditioning Play Audiometry is used to obtain diagnostic audiometric results using a conditioned response procedure. Testing can be conducted using a variety of transducers and should reflect standard clinical assessment practices. There is no stated requirement for a number of frequencies or test conditions that are necessary to report 92582, relying instead on standards of practice. This code is described to be a bilateral procedure and includes pure-tone air- and bone-conduction testing.

The -52 reduced services modifier can be appended when testing unilaterally. There is currently no recommended CPT code or modifier to report when test assistance was provided by a second audiologist. When conducting more time-intensive speech tests, clinicians may choose to also report codes that best describe additional testing such as Speech Threshold Audiometry (92555), Select Picture Audiometry (92583), or Speech Audiometry Threshold with Speech Recognition (92556).

When reporting these codes in addition to 92582, professionals should follow payer-specific guidance. Because 92582 is valued to include threshold testing, it is not recommended to bill this code as an add-on to Pure-Tone Audiometry (Threshold), Air Only (92552), or Air- and Bone-Conduction Audiometry (92553).

Speech Audiometry

Stand-alone speech audiometry procedures span three codes: Speech Threshold Audiometry (92555), Select Picture Audiometry (92583), and Speech Audiometry Threshold with Speech Recognition (92556).

Professionals are cautioned not to double bill when combining with other procedures since these stand-alone codes may already be bundled together with other audiometry codes (e.g., Comprehensive Audiometry Threshold Evaluation and Speech Recognition (92557)).

Mentioned earlier, there are instances where speech audiometry may be billed in addition to Conditioning Play Audiometry (92582). Clinicians are encouraged to check with payer policies first, as some payers may not accept these codes in combination.

92555 Speech Threshold Audiometry is described as using standard clinical practices to obtain bilateral speech-awareness thresholds or speech-reception thresholds. Use of the -52 modifier is recommended when performing unilateral testing.

92556 Speech Audiometry Threshold with Speech Recognition includes two types of tests. The code description includes mirrored language from 92555, as well as additional word-discrimination testing. Similar to the other procedures discussed, this is also a bilateral procedure and the -52 modifier should be used when indicated.

92583 Select Picture Audiometry has a code description that primarily relies on standard clinical practices when reporting this type of testing. This procedure specifically includes speech-threshold testing, but may also include time spent on word discrimination using the same elicitation method.

Electrophysiologic Audiometry: Auditory-Evoked Potentials

Auditory brainstem response (ABR) and auditory steady-state response (ASSR) audiometry are common electrophysiological exams used for recording auditory-evoked responses in the pediatric population. Both provide objective information about hearing sensitivity when reliable behavioral information is not able to be obtained.

Currently, there are two codes that describe ABR procedures, Auditory-Evoked Potentials (AEP) for Evoked-Response Audiometry, Limited (92586), and AEP for Evoked-Response Audiometry, Comprehensive (92585). These codes are available for billing pediatric AEP

procedures but are somewhat limited in the specificity of their definitions to differentiate among neurodiagnostic, threshold-search, air-conduction, or bone-conduction testing. Furthermore, ASSR currently does not have a unique code for billing applications.

This section will discuss and provide guidance regarding the use of these CPT® codes when filing claims for ABR testing.

92586 Auditory-Evoked Potentials (AEP) for Evoked-Response Audiometry, Limited is predominately used for hearing screenings by Universal Newborn Hearing Screening (UNHS) programs, or when assessing an objective pass/fail (refer) outcome. This code is also noted to be a bilateral procedure and should be appended using the -52 modifier in the case of unilateral testing.

92585 AEP for Evoked-Response Audiometry, Comprehensive is used for all other clinical or diagnostic auditory-evoked potential measures, including auditory steady-state response (ASSR), not pertaining to UNHS programs. 92585 is considered a bilateral, “session-based” code, meaning it may only be reported once per day per patient.

For example, if both ABR and ASSR are performed on the same patient on the same day, you may only bill 92585 once. Appending the code with the -22 extended service modifier could be considered in situations where more extensive testing is performed. It is always best to check with payer policies first, as some payers, including many state Medicaid programs, do not acknowledge all modifiers.

Edits to CPT codes for AEP testing are forthcoming in January 2021, thanks to the diligent efforts of the Academy and volunteers

from the Practice Policy Advisory Committee (PPAC), American Speech-Language-Hearing Association (ASHA), American Academy of Neurology, American Academy of Otolaryngology-Head and Neck Surgery, and American Clinical Neurophysiology Society. Until such time that the new guidance is released, the current codes as described above are recommended when billing AEP services.

Conclusion

Coding for pediatric audiology services is not always straightforward and ensuring that appropriate reimbursement is received for such services can be complicated. The recommended guidance provided in this article may vary from guidance from state Medicaid programs and third-party insurers. It is always advisable to review your state and local payer guidelines and follow payer policies to determine coverage prior to setting up billing protocols. ^{A1}

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American Academy of Audiology. Pediatric Audiology Billing & Coding Questions & Answers. www.audiology.org/practice_management/coding/pediatric-audiology-billing-coding-questions-answers

American Academy of Audiology. Coding and Reimbursement: When and Why to Modify www.audiology.org/audiology-today-septemberoctober-2019/coding-and-reimbursement-when-and-why-modify

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The Count Starts Here: The 2020 Audiology Student Census

By Stephanie Tittle, Stephanie Berry, Jessica Lewis, and J. Riley DeBacker

The beginning of 2020 marked the start of the 22nd decennial census of the United States.

The first census was conducted in 1790 during the presidency of George Washington. At the time of the first census, the U.S. population was 3.9 million. Today, the population is approximately 330 million, a number that depicts America's changes and expansion (Gauthier, 2020; U.S. Census Bureau, 2020).

U.S. census data is used to inform the allocation of federal and local resources. An accurate and complete counting of all of the individuals in the U.S. is of paramount importance

to ensure these resources are appropriately distributed for the nation's population.

Introduction

Similar to the purpose of the U.S. census, it is crucial to record student population changes over time to provide adequate resources to serve students appropriately.

The Student Academy of Audiology (SAA) identified a gap in knowledge about the audiology student population. In February 2020, the SAA distributed the inaugural Audiology Student Census (the Census). The Census captured the current demographics,

characteristics, and interests of this population. The results should interest key stakeholders, including universities (undergraduate and graduate programs), accrediting organizations, professional organizations, and audiology patients.

To the authors' knowledge, the SAA was the first to systematically report and publicly share the demographics, financial status, interests, and preferences of audiology students, as reported by those students. Health-care professions with similar clinical doctorate educational models have been collecting demographic, financial, and other detailed data on their graduate students for 10 or more years.

The SAA intends to formally share in the future all data collected from the Census. This article highlights the main findings regarding audiology student

demographics and compares and contrasts the Census results with numbers available for professional audiologists and clinical doctoral students in optometry and dentistry.

Methods

The Census was distributed via SAA local chapter contacts and high-traffic audiology social media accounts. To obtain responses from as many audiology graduate programs as possible, targeted emails were sent to graduate programs that were not otherwise represented with general distribution efforts.

Students were incentivized to participate by the opportunity to enter a drawing for one of six \$10 Amazon gift cards. SAA members and non-members at the undergraduate and graduate levels participated in the Census, which generated 418 responses from 83

TABLE 1. Comparison of Demographics by Sex

	MALE	FEMALE	OTHER
AUDIOLOGY STUDENTS*	7.4%	92.3%	0.3%
DENTISTRY**	49.2%	50.5%	0.2%
OPTOMETRY***	31.8%	68.2%	****
CURRENT AUDIOLOGISTS****	16.1%	83.9%	****

*As collected from the SAA 2020 Audiology Student Census

**As reported by the Commission on Dental Accreditation: <https://www.ada.org/en/science-research/health-policy-institute/dental-statistics/education>

***As reported by the Association of Schools and Colleges of Optometry: <https://optometriceducation.org/wp-content/uploads/2019/11/ASCO-Student-Data-Report-2018-19-updated-11-18-19.pdf>

****As reported by the U.S. Census Bureau 2018

*****not reported

universities. All demographic-related questions were obtained from an at-will response.

The SAA Census racial and ethnic demographic information was obtained using the same categories as the U.S. census.

The American Dental Association and the Association of Schools and Colleges of Optometry provided the most recent (i.e., 2018–19) demographic information available on their graduate students. Their data were obtained by directly soliciting information from the majority of accredited programs, not through a voluntary survey.

Additionally, data on the demographics of professional audiologists, collected by the U.S. Census Bureau (2018), in conjunction with the American Community Survey (ACS), was used. The ACS data is shared with the public using the Public Use Microdata Sample (PUMS), allowing individuals to create custom tables that might not be available through summary data provided by the ACS or the Census Bureau.

Due to differences in methodology on sex and race data collection among the four groups, the authors presented the closest comparison when possible, for simplicity and ease of reading.

Results

Seventy-five percent of the SAA Census participants identified as an audiology doctoral student. As indicated in TABLE 1, 92.3 percent of the student respondents identified as female, 7.4 percent as male, and less than 1 percent

as other. The average respondent age was 24.8 years.

In contrast, in 2018, 83.9 percent of U.S. audiologists were female and 16.1 percent were male, according to U.S. Census Bureau data. The average audiologist age in 2018 was 40.9 years, according to the Census Bureau (2018).

The demographic differences by sex are noteworthy (TABLE 1). Although optometry, like audiology, showed a stronger female representation, female optometry students made up 68.2 percent of the total number and male students accounted for 31.8 percent of the total. Dentistry showed a nearly equal representation of male (49.2 percent) and female (50.5 percent) students.

TABLE 2 provides information on demographics by race and ethnicity obtained from the SAA Census, available data for U.S. graduate students in optometry and dentistry, and U.S. census data on professional audiologists.

Audiology students showed a large proportion (81.9 percent) identifying as White, while dentistry and optometry both had slightly more than 51 percent of students identified as White. A total of 30.3 percent of optometry students were identified as Asian, 24 percent of the dentistry students were identified as Asian, and 6 percent of the audiology students described themselves as Asian. Dentistry had the highest number of Black or African American students (5.30 percent), followed by audiology (2.90 percent) and optometry (2.70 percent).

Professionals with hearing loss share the lived experiences of the patients they serve.

For audiology professionals, the demographics included 90.80 percent White, 3.59 percent Black or African American, and 3.10 percent Asian, according to the U.S. census data.

The SAA Census examined hearing data for respondents. Eleven percent of the SAA Census respondents reported using a hearing technology device in one of four categories and three percent reported a hearing loss but do not use amplification (TABLE 3). Adding these numbers together, the Census could indicate that 14 percent of audiology students have a hearing loss.

Although not a perfect comparison, it is estimated that 15 percent of the U.S. population ages 18 and

above have some degree of hearing loss (NIDCD, 2016).

Discussion

The demographic data on race and sex present a predominantly homogeneous population for audiology students and professionals in the field, with opportunities to grow diversity. The student population is 81.9 percent White and 92.3 percent female, according to the SAA Census data. The population of audiology professionals is 90.8 percent White and 83.9 percent female, according to the U.S. census data.

The student population shows a slightly increased racial diversity in some areas, with 6 percent of students identifying as Asian,

TABLE 2. Comparison of Demographics by Race/Ethnicity

	AUDIOLOGY STUDENTS*	DENTISTRY**	OPTOMETRY***	CURRENT AUDIOLOGISTS****
WHITE	81.90%	51.10%	51.40%	90.80%
BLACK OR AFRICAN AMERICAN	2.90%	5.30%	2.70%	3.59%
HISPANIC OR LATINO (ANY RACE)	4.60%	9.00%	6.60%	*****
AMERICAN INDIAN OR ALASKA NATIVE	0.00%	0.40%	0.50%	0.00%
ASIAN	6.00%	24.00%	30.30%	3.10%
NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER	0.00%	0.20%	0.30%	0.00%
TWO OR MORE RACES	4.30%	3.00%	2.00%	2.49%
UNKNOWN	*****	2.50%	6.10%	*****

**As reported by the Commission on Dental Accreditation: <https://www.ada.org/en/science-research/health-policy-institute/dental-statistics/education>

***As reported by the Association of Schools and Colleges of Optometry: <https://optometriceducation.org/wp-content/uploads/2019/11/ASCO-Student-Data-Report-2018-19-updated-11-18-19.pdf>

****As reported by the U.S. Census Bureau 2018

*****not reported

while 3.1 percent of audiology professionals were identified as Asian. A total of 4.3 percent of students identified as two or more races, while 2.49 percent of audiology professionals were identified in that category. Black or African American students made up 2.9 percent of the student population, while 3.59 percent of professional audiologists were identified as Black or African American.

One exciting result from the SAA Census information is the representation of students with hearing loss. Professionals with hearing loss share the lived experiences of the patients they serve. Students with hearing loss also bring a first-hand perspective to classroom and clinical training programs, which creates opportunities for students of all hearing statuses to learn from each other. The authors are proud to see this group represented among current audiology students and hope to see growth in that representation in a future census.

While the 2020 SAA Census did not capture responses from all audiology students, establishing a student census as a legacy initiative allows for growth to a 100 percent response rate in

the future. With most doctoral programs based on a four-year academic model, the SAA Census may require a similar four-year cycle to accurately represent the student population over time.

The SAA Census serves as the start of a quantitative analysis of the nature of our profession's student population. This data should be used to inform decisions about the future of the audiology profession by providing an understanding of the basic demographics of the incoming professionals.

More specifically, the profession should focus on recruitment efforts based on diversity and inclusivity in order to best attract and retain students. To that end, the SAA added the Diversity and Inclusion pillar to its global goals. Over the coming years, the SAA will actively and explicitly seek out opportunities and initiatives to broaden the diversity and inclusivity of our student population and future audiologists. ^{AT}

Stephanie Tittle is the 2019–2020 president-elect of the Student Academy of Audiology. She is a fourth-year student at the University of Texas at Dallas and is completing her externship at Arkansas Children's Hospital.

TABLE 3. Hearing Status of the Respondents to the SAA 2020 Audiology Student Census

NORMAL HEARING (HEARING WITHIN NORMAL LIMITS)	UNILATERAL HEARING AID	BILATERAL HEARING AIDS	BILATERAL COCHLEAR IMPLANTS	BIMODAL (COCHLEAR IMPLANT + HEARING AID)	HAVE HEARING LOSS BUT NOT WEARING AMPLIFICATION
86%	1%	7%	2%	1%	3%

Stephanie Berry is the 2019–2020 Education Committee chair of the Student Academy of Audiology. She is a fourth-year student at the University of North Carolina at Chapel Hill and is completing her externship at St. Louis Children's Hospital.

Jessica Lewis is the 2019–2020 secretary of the Student Academy of Audiology. She is a fourth-year AuD/PhD student at The Ohio State University. Jessica is currently applying for externships for the 2019–2020 cycle.

J. Riley DeBacker is the 2019–2020 president of the Student Academy of Audiology. He recently completed his audiology residency at the James A. Haley Veterans' Hospital in Tampa, Florida, and will be returning to Ohio State University to finish his AuD/PhD.

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AUDIOLOGY ADVOCATE

Audiology/SLP State Licensure Compact: The Path Forward

In 2016, the National Council of State Boards of Examiners for Speech-Language Pathology and Audiology (NCSB) formally began the multi-stage process for developing an occupational licensure compact for audiology and speech-language pathology. The NCSB worked with the National Center for Interstate Compacts (NCIC), a part of the Council of State Governments (CSG) that has successfully worked with other health-care professions to enact licensure compacts.

The NCIC guided the process and included the Academy as a key stakeholder, along with the American Speech-Language-Hearing Association (ASHA) and other groups, in helping to shape the development of the compact. In 2019, the NCIC finalized the compact language and began the adoption phase.

The Academy recognizes the value of multi-state licensure to audiologists and has supported efforts to advance the compact. The Academy provided input throughout the development process and submitted comments when draft language was available. Currently, the Academy is working collaboratively with NCIC, ASHA, and NCSB in advancing legislation for state adoption.

At this writing, four states (Oklahoma, Utah, West Virginia, and Wyoming) have passed legislation to implement the compact. The licensure compact will not become operational until a minimum of 10 states pass and adopt implementing legislation. The Academy's State Relations Committee is committed to supporting efforts to reach the needed 10 states within the year ahead.

How Would the ASLP-IC Work?

The Audiology Speech-Language Pathology Interstate Compact (ASLP-IC) would allow state-licensed audiologists and speech-language pathologists to apply for privileges to practice in other participating states and would enable them to provide services across state lines—either face-to-face or through telepractice.

This flexibility is needed in today's health-care marketplace to help promote continuity of care for patients who travel or relocate, as well as to facilitate job mobility for providers. Each state participating in the compact will not cede any regulatory autonomy; it will continue to regulate the actual practice of audiology and speech-language pathology and maintain

their individual scopes of practice. In addition, states that participate in the compact will be able to share provider disciplinary actions, providing an additional layer of consumer protection.

The COVID-19 Pandemic Emphasized the Need for the ASLP-IC

The COVID-19 pandemic has highlighted the need to eliminate barriers to the provision of health-care services via telehealth. Throughout the current crisis, governors in many states have highlighted other occupational licensure compacts (nursing, physical therapy, medicine) and the helpful role that they play in facilitating the provision of health care across state lines.

The ASLP-IC, like many other licensure compacts, would enable practitioners to provide services, both in person and through telehealth delivery options, to patients who reside in other states that participate in the compact.

Occupational licensure compacts such as the ASLP-IC are supported by the Federal Trade Commission, which reported in a policy paper that “by enhancing the ability of licensees to provide services in multiple states, and to become licensed quickly upon relocation, license portability initiatives can benefit consumers by increasing competition, choice, and access to services, especially with respect to licensed professions where qualified providers are in short supply.”

Moving Forward and Next Steps

As noted above, four states have passed and adopted the requisite implementing legislation and a total of 10 states are needed for the compact to become operational. Looking ahead to

the 2021 state legislative sessions, a list of target states has been created, based on action in 2020 or expressed interest from state licensing boards, legislators, and professional groups.

The list of target states has been divided into “tier one” states, in which passage is likely—Alabama, Colorado, Georgia, Iowa, Kansas, Kentucky, Louisiana, Maryland, Nebraska, South Dakota, and Texas—and “tier two” states, in which chances for passage are a bit less clear—Arizona, Delaware, Idaho, New Hampshire, North Carolina, Ohio, and Oregon.

Call to Action

It is not too early to get ready for the 2021 state legislative sessions. Get involved with your state Academy of Audiology, reach out to your state legislative representatives, talk to your fellow audiologists, and spread the word about the need for the ASLP-IC, for practitioners and patients alike.

More detailed information about the ASLP-IC can be found at the dedicated website <https://aslpcompact.com>, where you can find legislative text, fact sheets, and other advocacy materials. 

Reference

Federal Trade Commission. (2018) Policy Perspectives: Options to Enhance Occupational License Portability. www.ftc.gov/system/files/documents/reports/options-enhance-occupational-license-portability/license_portability_policy_paper.pdf.

EXECUTIVE SUMMARY

Year 2019 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs

Early Hearing Detection and Intervention (EHDI) activities beginning at the birth hearing screening and culminating in early intervention have positively impacted outcomes for children who are deaf or hard of hearing and their families in the United States and worldwide.

Universal newborn hearing screening has resulted in significantly lowering the average age of identification. Screening is a necessary first step, but does not ensure the next critical steps of timely identification and diagnosis of children who are deaf or hard of hearing, amplification, and referral to early intervention, all with the goal of promoting language development.

The goal of EHDI is to assure that all infants are identified as early as possible and appropriate intervention is initiated, no later than by 3–6 months of age. There is a body of literature demonstrating that children and families experience optimal outcomes when these benchmarks are met.

Additionally, communication and linguistic competence (in spoken language, signed language, or both) are achievable when timelines are met and when optimal audiological and early intervention services are accessible. Critical areas of improvement remain within the EHDI system to ensure newborns benefit from early recognition and have access to appropriate supports.

The current 2019 document builds on prior Joint Committee on Infant Hearing (JCIH) publications (2013 JCIH supplement on Early Intervention and 2007 JCIH Guidelines); updating best practices through literature reviews and expert consensus opinion on screening; identification; and audiological, medical, and educational management of infants and young children and their families.

Academy Fellows Alison Grimes, AuD, and Christine Yoshinaga-Itano, PhD, represent the Academy on the JCIH panel and have contributed their subject-matter expertise in the development of these guidelines.

The current JCIH document includes the following highlights.

Global Benchmarks and Rationale

- A review and reminder of the importance of early diagnosis of hearing loss following best practices.
- Recognition of the value of implementation standards for EHDI information systems.
- Recognition of the frequency, and impact, of delayed-onset and/or progressive hearing loss in infants and the need for continued surveillance of auditory and speech-language development in all infants, regardless of outcome of newborn hearing screening.
- States that meet the 1-3-6 benchmark (screening completed by 1 month, audiological diagnosis by 3 months, enrollment in early intervention by 6 months) should strive to meet a 1-2-3-month timeline.

Newborn Screening

- Endorsement of the necessity for audiology oversight of hearing-screening programs.
- Recognition of the critical need for the ability to calibrate screening equipment using a uniform and validated standard across all screening devices.
- Recognition of the need for manufacturers of screening equipment to provide data on the proportion of children who are deaf or

hard of hearing who pass the screening but are subsequently found to have a variety of degrees and types of hearing loss.

- An endorsement, for well-born infants only, who are screened by automated auditory brainstem response (AABR) and do not pass, that rescreening and passing by otoacoustic emissions testing is acceptable, given the very low incidence of auditory neuropathy in this population.
- An endorsement of rescreening in the medical home in some circumstances. If the rescreening is performed in the provider's office, the provider is responsible for reporting results to the state EHDI program.

Diagnostic Audiology and Audiological Interventions

- A review of current research on the physiologic/electrophysiologic methods for diagnostic audiological evaluation of hearing in infants.
- A reaffirmation of the importance of fitting hearing aid amplification using objective, evidence-based protocols to ensure maximal audibility.

Early Intervention and Family Support

- Reaffirmation of the need to provide families with individualized support and information specific to language and communication development to

support children who are deaf or hard of hearing by providing exposure to language models at the earliest possible age to ensure optimal cognitive, emotional, and educational development.

- Recognition that some families may benefit from infant mental health supports. Infant mental health is a field of research and practice that focuses on optimizing social, emotional, behavioral, and cognitive development of infants in the context of the emerging relationships between parents and infants.

Medical Considerations

- Reaffirmation of the need for otologic/medical evaluation and management of the newly-identified infant to be carried out as soon as possible following confirmation, in an effort to address potentially reversible conditions, discover associated medical disorders that can impact the infant's general health, and identify conditions that can impact communication strategy choice.
- Recognition that congenital cytomegalovirus has a larger impact than previously recognized.
- Updated risk indicators for congenital hearing conditions, including a new table with specified intervals for audiological evaluation.
- Consideration of reduction in the U.S. Food and Drug Administration (FDA)-approved

age for cochlear implantation to less than 12 months.

JCIH's guiding principle is for continued improvements in the EHDI system. This includes lowering the age of identification and diagnosis of infants, as well as ensuring timely and effective interventions to improve language and social-emotional outcomes in children who are deaf or hard of hearing.

Amplification (hearing aids, cochlear implants, and bone-conduction aids) and early language interventions (whether signed language, spoken language, or both) should be based on best-practice protocols and evidence-based practice as soon as possible following a diagnosis of hearing loss.

JCIH endorses early detection and early intervention for all infants who are, or who are at risk of being or becoming, deaf or hard of hearing. The goals of EHDI are to maximize language and communication competence, literacy development, and psychosocial well-being for children who are deaf or hard of hearing.

Without appropriate language exposure and access, these children will fall behind their hearing peers in communication, language, speech, cognition, reading, and social-emotional development, and delays may continue to affect the child's life into adulthood.

With early detection and appropriate, targeted intervention and developmental milestones, an infant who is deaf or hard of hearing can be expected to be achieved, more accurately reflecting the child's true potential (Tomblin et al, 2014; Yoshinaga-Itano et al, 2010).

Focusing on the importance of prompt diagnosis and timely, high-quality early

intervention for such infants, EHDI systems should facilitate seamless transitions for infants and their families through the processes of screening, audiological and medical diagnosis, and intervention.

Terminology

In this 2019 statement, the JCIH seeks to use terms that (a) are acceptable to a range of stakeholders and (b) clearly convey the intended meaning to the entire community.

Because of the diversity of the committee's composition and represented viewpoints, a compromise resulted in choosing currently recognized terms that reflect accepted, person-first language. In particular, the term infant or child who is deaf or hard of hearing is intended to be inclusive of the entire spectrum of children, representing varied hearing levels.

This spectrum includes children who are deaf or hard of hearing whose hearing losses may be congenital or acquired; unilateral or bilateral; of any degree from minimal to profound; and of any type including conductive, sensory (sensorineural), auditory neuropathy, and mixed hearing condition, whether permanent, transient, or intermittent. This spectrum includes those individuals who identify themselves as being a part of either, or both, the deaf or hard-of-hearing communities.

The commonly used term *hearing loss* is replaced, when grammatically appropriate to the written English language, with terminology such as “hearing thresholds in the mild, moderate, severe, or profound range,” acknowledging that, for an infant who is born with hearing thresholds outside the typical (normal) range, no loss has actually occurred.

The JCIH recognizes that terms such as hearing loss, hearing impairment, and hearing level have different values or interpretations assigned to them, depending on one's cultural perspective. It is the intent of the JCIH to convey audiological concepts using culturally sensitive language whenever possible. However, there are times the term *hearing loss* is retained to clearly convey audiological concepts/conditions, including references to late onset and progressive types.

Further, use of the word *normal* as a type of hearing is replaced, when appropriate, with the word *typical* to avoid any suggestion of the stigma of abnormality. Finally, in an effort to use clear language, the term *refer* for a hearing screening result that is a not-pass outcome is avoided, due to lack of clarity and confusion about the meaning and implications of the word *refer*. The term *fail*, which in years past had been discouraged in the belief that it would stigmatize infants, is recognized as a commonly used term in the medical world to describe the outcome of a binary screening and has been adopted for use in this document. 

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PRESENTED BY *Adam Voss, AuD, and Kristi Oeding, AuD* **0.15**

JULY 10, 1:00-2:00 PM ET
Diabetes Drug Management: An Overview for Audiologists (Tier 1)
PRESENTED BY *Robert M. Sigora, AuD* **0.1**

JULY 17, 2:00-3:00 PM ET
Demystifying the Speech-Perception Test Battery So All Dispensing Audiologists Can Conduct It (Tier 1)
PRESENTED BY *Alejandra Ullauri, AuD, MPH* **0.1**

JULY 31, 2:00-3:00 PM ET
Using Real-Ear Measurements in the Treatment of Tinnitus and Sound-Sensitivity Disorders (Tier 1)
PRESENTED BY *Natan Bauman, MA-Eng, EdD* **0.1**

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AUGUST 7, 1:00-2:00 PM ET
Real Talk About Real Ear: How to Integrate Rehabilitative Verification into Your Practice (Tier 1)
PRESENTED BY *Sarah Curtis, AuD, and Megan Jacobs, BS* **0.1**

AUGUST 14, 11:00 AM-12:00 PM ET
Precepting Hacks to Increase Effectiveness and Efficiency
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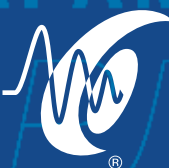


SILVER



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Academy 2020 Election Results

Congratulations to the following Academy members on their election to the Academy Board of Directors. Their term of office will begin on October 1, 2020. Full biographical information can be viewed online at www.audiology.org/about-us/academy-leadership/board-directors-nominations.



President-Elect

Sarah Sydlowski, AuD, PhD, CISC
*Audiology Director
Hearing Implant Program Cleveland Clinic*

Dr. Sydlowski's clinical and research interests have been predominantly focused on implantable hearing technologies. She has delivered numerous presentations and authored various publications, book chapters, clinical guidelines, and position statements primarily on this topic. More recently, her interests are centered on the intersection of health care and business.

Member-at-Large



Samantha Kleindienst Robler, AuD, PhD
*Director of Audiology
Norton Sound Health Corporation*

Dr. Robler provides clinical care from newborn to elder for both hearing diagnostics and rehabilitation. She leads the advancement of telemedicine use where nearly half of all of her encounters are done remotely and publishes/presents in telemedicine and access to hearing health care.

Member-at-Large



Christopher Spankovich, AuD, PhD
*Associate Professor and
Vice Chair of Research
University of Mississippi Medical Center*

Dr. Spankovich is a clinician-scientist with a translational research program focused on the prevention of acquired forms of hearing loss, tinnitus, and sound sensitivity. His research includes clinical trials of otoprotectants, epidemiological studies of determinants of hearing loss/tinnitus, basic research in thermal stress for prevention of ototoxicity, and translational research on the effects of noise on auditory physiology/perception. 

Member-at-Large



Marcia E. Raggio, PhD
*Professor
San Francisco State University*

Dr. Raggio's primary focus has been helping to develop and shepherd the passage of a bill that now allows the California state university system to offer stand-alone clinical audiology doctoral programs. She has published several research articles and given many research and policy presentations at state, national, and international venues.



2021 Call for Honors

Get Your Nominations in Now!

The Academy Honors Committee is excited to announce the opening of nominations for the 2021 Honors. There are several categories available for nominations of your colleagues. Read about the categories and nominate someone who should be recognized for his or her work.

Nomination Process

To nominate an individual, a nomination packet should be submitted by October 8, 2020. Self-nominations will not be accepted. The nomination packet should include:

- A one- to two-page nomination letter addressed to the committee chair (Patricia Gaffney, AuD) in which you describe why the nominee should be selected for the award. Focus on the nominee's achievements that are directly applicable to the award for which he or she is being nominated.
- The nominee's full curriculum vitae.
- Nominee achievements will only be considered for the category of award for which they have been nominated.
- Nominees for the Clinical Excellence in Audiology Award, the Jerger Career Award for Research in Audiology, the Outstanding Educator Award, the Marion Downs Pediatric Audiology Award, and the Early-Career Audiologist Award must be members of the American Academy of Audiology at the time they are nominated.

Nomination packets should be submitted to
Laura Thayer at lthayer@audiology.org.

With the exception of Honors of the Academy, one award in each category will be awarded each year.

Selection of Honorees

Awards will be made to qualified candidates who receive a majority vote of the voting members of the Honors Committee pending final approval of the Academy Board of Directors. An award may not be made in a particular year if there are no suitable nominations. Selected recipients will be presented with their awards at AAA 2021 + HearTECH Expo in Denver, Colorado, at the Honors and Awards Banquet.

Award Categories and Updates

Clinical Excellence in Audiology Award

Awarded to a clinical audiologist whose dedication and clinical excellence have resulted in improved quality of life for numerous individuals with hearing or vestibular dysfunction.

Early-Career Audiologist Award

Awarded to an individual who has been providing clinical services in the field of audiology for approximately less than 10 years and who has made outstanding contributions to the profession.

Honors of the Academy

Awarded to one audiologist and one non-audiologist for their exceptional support of the field of audiology and/or the patients we serve by focusing on issues that directly affect the profession and/or consumers with hearing loss and balance disorders.

Humanitarian Award

Awarded to an individual who has made significant voluntary and/or philanthropic contributions

to under-resourced communities through the provision of audiology or ear-and-hearing services, the philanthropic development of educational programs, and/or other service-oriented activities.

International Award for Hearing

Awarded to an audiologist and/or hearing scientist, who lives and works outside of the United States, who has provided outstanding contributions to the profession of audiology in a clinical, academic, research, or professional capacity.

Jerger Career Award for Research in Audiology

Awarded to an individual for research contributions in the field of audiology/hearing science whose work has had major impacts on the field and/or practice of audiology.

Marion Downs Pediatric Audiology Award

Awarded to an audiologist for exceptional contributions in pediatric audiology, either as an educator, clinician, or scientist.

Outstanding Educator Award

Awarded to an individual who has made significant contributions to audiology through his or her dedication and skill in the education of students.

Samuel F. Lybarger Industry Award

Awarded to an individual who has made important contributions to research or engineering achievements within the field of audiology. 



Join Us on the Pathway to Inclusion, Representation, and Equality

The Academy shares in the sadness and outrage being felt across our country for the unbearable stress that tragic, unthinkable events have placed on Black Americans and, specifically, on our Black members.

The Academy will not tolerate discrimination, racism, prejudices, or bias. We will implement institutional change by collaborating with our Black colleagues on how to execute a plan for change.

This is a first step on a journey to institutional change; all members will be invited to be part of this journey. This process is not meant to minimize the experience of other members of color or other individuals who feel marginalized. This is a starting point in the current context, and we will expand this conversation over time.

The Academy recognizes the inherent worth and dignity of all individuals. We will facilitate the needed dialogues and listen to how we can



Catherine Palmer, PhD, Academy president, and Antony Joseph, AuD, PhD, former Academy board member.

achieve needed shifts within the profession and truly be the organization of, by, and for each audiologist serving all individuals who need our help.

Read the full message from Catherine Palmer, PhD, Academy president, and Antony Joseph, AuD, PhD, former Academy board member, who ask for your participation. For more information, visit www.audiology.org/news/call-action-inclusion-representation-and-equality. 

Research Grants in Hearing and Balance

By Ryan McCreery

Through generous funding provided by the American Academy of Audiology Foundation (AAAF), the Academy awards grants to support new investigators and students in their research endeavors.

The AAAF funds the grants program. Contributions from The American Institute of

Balance, founded by Dr. Richard Gans, support the Vestibular Student Investigator Grant.

For more information on the application process, visit www.audiology.org and search “Research Grants.”

2020 Recipients

■ New Investigator Research Grant (\$10,000)

Biomarkers of Speech Perception in Adult Cochlear Implant Recipients



Sharon Miller, PhD

Assistant Professor | University of North Texas

MENTOR: Erin Schafer, PhD | University of North Texas

PURPOSE: To identify an objective biomarker of speech perception in adult cochlear implant recipients that is sensitive to individual differences in performance.

■ Student Investigator Research Grant (\$5,000)

Tinnitus and Decreased Subcortical and Cortical Inhibition



Kenneth V. Morse, AuD

PhD Student | Syracuse University

MENTOR: Kathy Vander Werff, PhD | Syracuse University

PURPOSE: To objectively determine whether there is evidence of compromised subcortical and cortical inhibition in people with tinnitus and to describe the potential effects of variables related to tinnitus, such as noise exposure, hearing loss, and age, on subcortical and cortical inhibition in an effort to determine whether it is tinnitus, another characteristic, or a combination thereof that influences subcortical and/or cortical inhibition.

■ Student Investigator Vestibular Research Grant (\$5,000)

Statistical Detection of Cervical Vestibular-Evoked Myogenic Potentials



Daniel Romero, AuD

PhD Student | James Madison University

MENTOR: Erin Piker, AuD, PhD | James Madison University

PURPOSE: To characterize the behavior of an objective statistical detection method called Fsp for detection of cVEMPs.

■ Student Summer Vestibular Fellowship (\$2,500)

Characterizing Adolescent Central Auditory Processing of Speech-in-Noise



Danielle N. Bubniak

Audiology Doctoral Student | Syracuse University

MENTOR: Kathy Vander Werff, PhD, and Karen Doherty, PhD, Syracuse University

PURPOSE: My proposed summer research fellowship project will be working on a cross-sectional study of adolescent and adult SiN processing, utilizing objective and behavioral measures of peripheral and central auditory function across age groups including adolescents (13–19 years), young-adults (20–40), and middle-aged adults (40–60). 

ACADEMY PARTICIPANTS SUPPORT OUR PROFESSION

The Academy's Loyalty Media Programs offer organizations the opportunity to connect with Academy members and the audiology community.

You can find participants featured here in *Audiology Today* magazine, on our Web site (www.audiology.org), and at Academy events. Consider supporting the companies that support your association.

Current Loyalty Media Program companies include:



For more information about the program, contact Eric Gershowitz at eric.gershowitz@mci-group.com.

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* Binaural measurements can be performed with Verifit 2 only

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Leading experts in tele-audiology will share translational and applied research with a strong clinical focus.

This virtual meeting will consider the changing role of technology, patient engagement, and service delivery in audiological care during COVID-19 and beyond.

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This conference was supported by the National Institute of Deafness and Other Communication Disorders of the National Institutes of Health under Award Number R13DC016546-03.

Chaired by De Wet Swanepoel, PhD, professor, University of Pretoria, the program will feature a range of timely topics divided into the themes of the patient journey, assessment and intervention, and support and rehabilitation.

www.AcademyResearchConference.org