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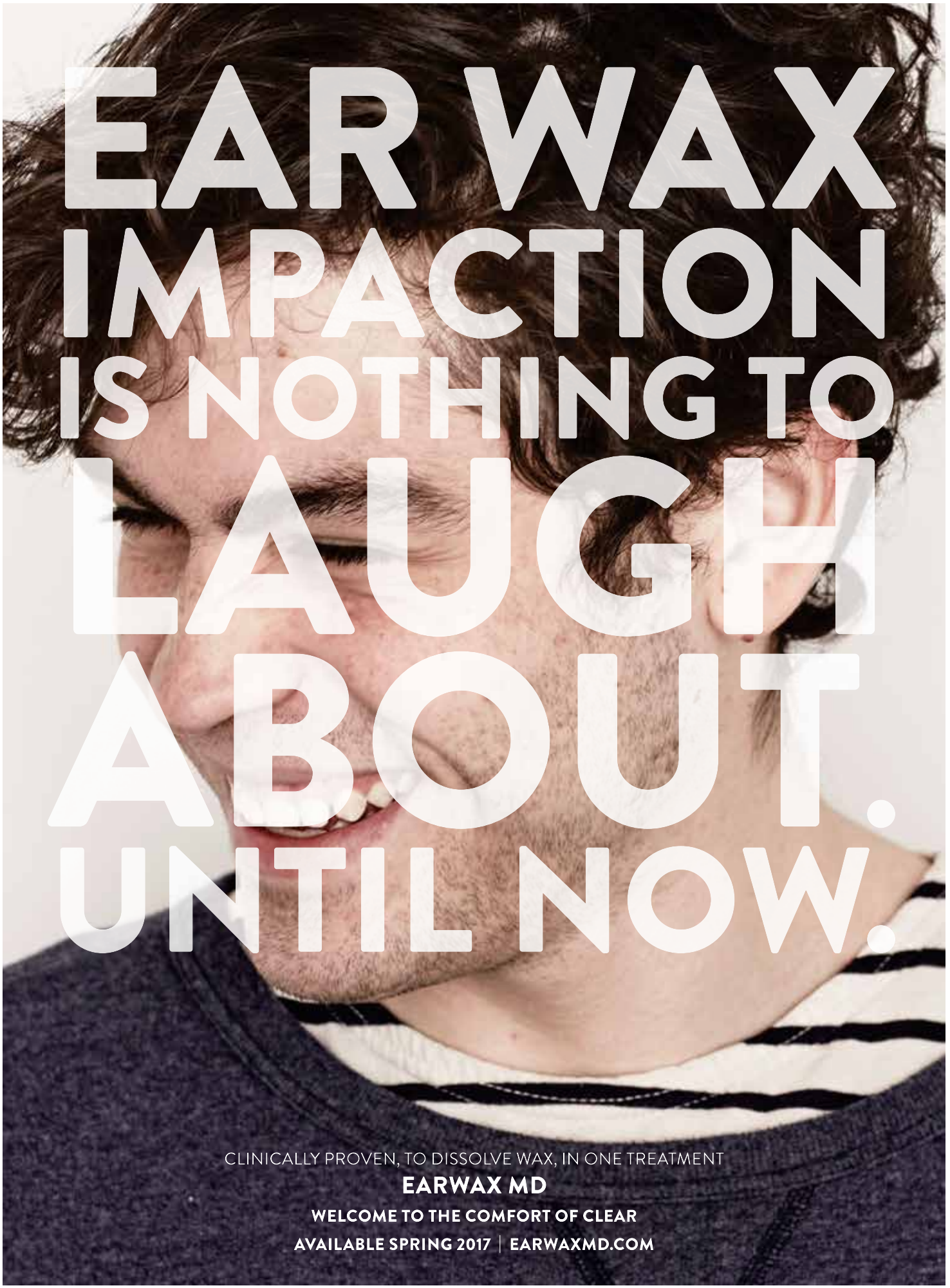
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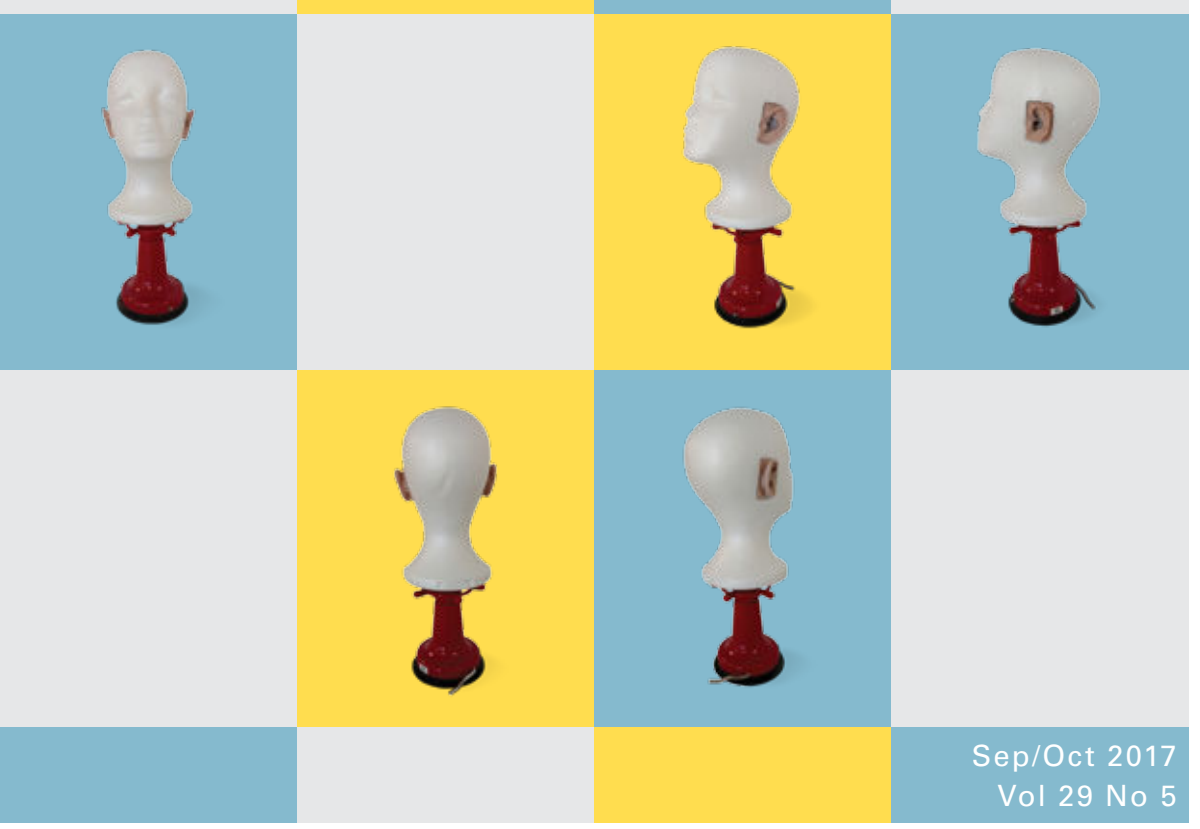

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Academy News

EDITORIAL MISSION

The American Academy of Audiology publishes *Audiology Today* (*AT*) as a means of communicating information among its members about all aspects of audiology and related topics.

AT provides comprehensive reporting on topics relevant to audiology, including clinical activities and hearing research, current events, news items, professional issues, individual-institutional-organizational announcements, and other areas within the scope of practice of audiology.

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Audiology Today (ISSN 1535-2609) is published bimonthly by the American Academy of Audiology, 11480 Commerce Park Drive, Suite 220, Reston, VA 20191; Phone: 703-790-8466. Periodicals postage paid at Herndon, VA, and additional mailing offices.

Postmaster: Please send postal address changes to *Audiology Today,* c/o Membership Department, American Academy of Audiology, 11480 Commerce Park Drive, Suite 220, Reston, VA 20191.

Members and Subscribers: Please send address changes to membership@audiology.org.

The annual print subscription price is $126 for US institutions ($151 outside the US) and $61 for US individuals ($114 outside the US). Single copies are $15 for US individuals ($20 outside the US) and $25 for US institutions ($30 outside the US). For subscription inquiries, telephone 703-790-8466 or 800-AAA-2336. Claims for undelivered copies must be made within four (4) months of publication.

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Our Year in Review

This is my last column as president, and there are so many things that need to be said. Over the past 12 months, the Academy Board, staff, and committees have tackled a lot.

- While OTC has been the dominate legislative issue, we've advocated for the Access to Frontline Care Act (student loan forgiveness in exchange for practicing in underserved areas), the Hearing Aid Tax Credit Bill, and the Early Hearing Detection and Intervention Act. We've supported legislation related to telehealth services, monitored potential regulations from the FTC for hearing-care services, and opposed cuts to funding for the National Institutes of Health. We continue to pursue the option for patients to see an audiologist without the need for a referral, and to monitor the legislative agenda for initiatives that may reduce reimbursement to audiologists.

- We've begun to evolve the annual conference to be more creative and inclusive. The name "AudiologyNOW!" is being retired in favor of something simple. The Academy's annual conference will be "AAA 2018," Columbus will be "AAA 2019," and so on. We are partnering with other organizations such as AVAA, ARA, and CAPCSD to offer specialty areas, and are changing the way featured session topics are selected. We want the annual conference and exposition to meet the educational needs of members, while also providing the networking opportunities necessary to enhance the professional endeavors of the audiology community.

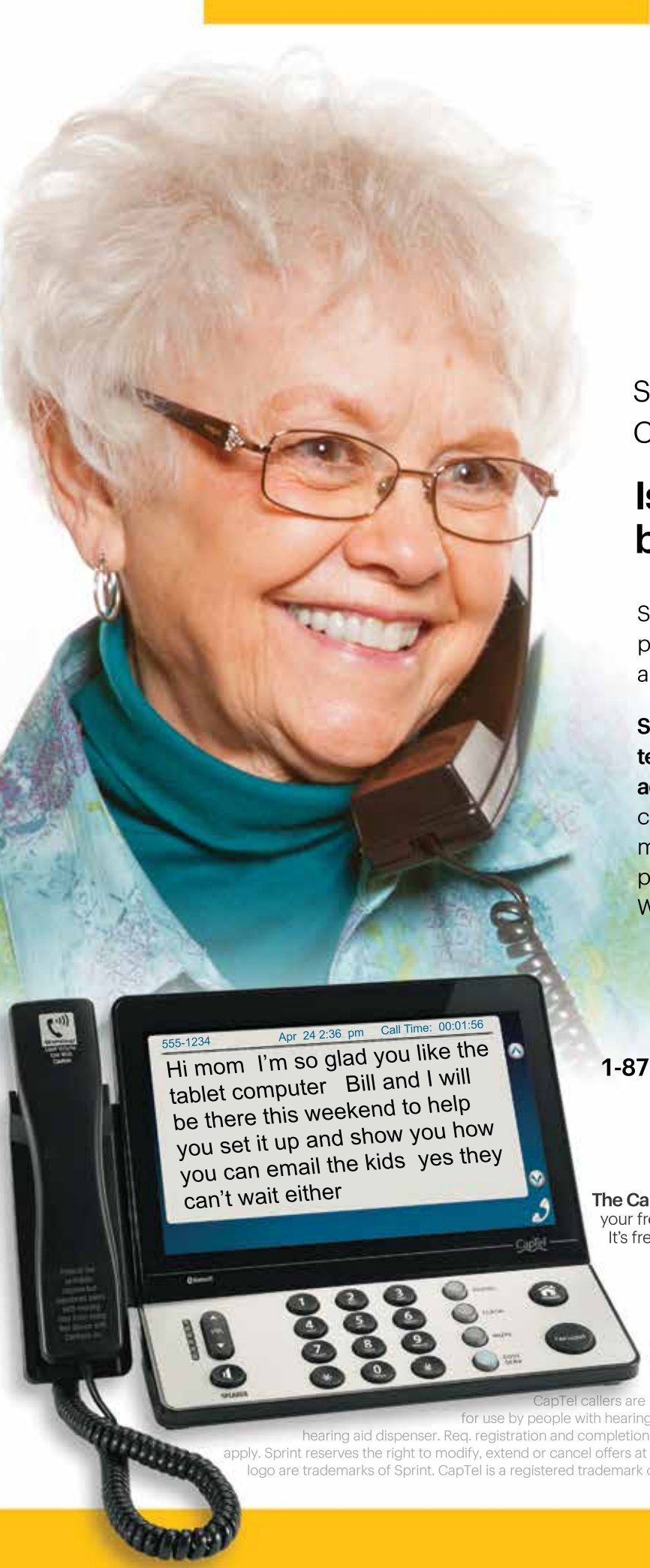
- The Board undertook a restructuring of the Academy to reduce redundancy, increase responsiveness, and allow the inclusion of more members in leadership roles. The staff of the Academy has simultaneously been restructured to match the new look. Our partners, ACAE, ABA, Foundation, and SAA have all been engaged in this process. We think this restructuring sets up the Academy to be a positive force for audiology for the future.

- As part of this restructuring, a two-year action plan for the Board, committees, and staff was developed. The action plan focuses our resources and provides a framework on which to provide a demonstrable return on investment for members.

Most importantly, I wish to convey my sincere thanks to the Board, the staff, the committees, and the members for your support over the past year. My goal was to build upon the efforts of my predecessors and to leave the Academy in better shape than when I started.

With appreciation and thanks to all!

Ian M. Windmill, PhD
Board Certified in Audiology
President
American Academy of Audiology



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Audiology Externs: They Really Are the Future of Audiology

By Dawn Hulthen Koncsol

When I began my career in 1996, I cannot say that I ever imagined audiology would become a doctorate-level profession, or that the fourth-year externship would evolve into its current level.

Now that I celebrate 20-plus years as a practicing and supervising audiologist, I look back and try to assess the value of that advanced degree and what our new, bright fourth-year candidates bring to the profession. I can remember with excitement, all of the discussions and hopes for what the doctorate-level degree would bring to our practice of audiology. I know I date myself to say that. I was genuinely excited at the prospect of pushing what we were and who we are to the next level. I expected to have a much more advanced focus on tinnitus, pharmacology, rehabilitation, and amplification, and create a more medical or provider based approach to what we do every day.

As a director of a large, private ENT medical group, I am fortunate enough to be exposed to many different facets of audiology—both clinically and in practice management. In accepting this role, I made the decision that we would develop externs rather than hire audio-techs or audiology assistants. I believed then and now that we needed to invest in our professional future rather than use staff who did not have extensive training in our field. We have grown our fourth-year externship program to a very competitive site in a few years' time, and have helped to train and support some of the most phenomenal preceptors.

Three-Track System

We divide our externs into three tracks. The first is a rotational track with focus on cochlear implants, vestibular testing, pediatrics, and tinnitus/amplification. The second track is focused on diagnostic assessment, hearing aid fittings, and management, as well as some videonystagmography or auditory brainstem response (VNG/ABR)

training. The difference in the second track is that we also spend a significant portion of time on practice management and learning how to run a business.

Our newest track is a pediatric/cochlear implant (PED/CI) track. This is our first specialty track. This track is designed for the extern who is looking for the opportunity to focus on cochlear implant evaluation, initial stimulation, mapping and follow-up, pediatric diagnostics, amplification, and follow-up. The externs in this track will also have at least one day per week for clinic diagnostics and routine hearing aid patients.

With this growth, it is time to step back and take a look at what we provide and what students really seem to need. In addition, it is great to get feedback from our externs on their perception of their academic training, their externship time, and what they feel needs improvement. Many of our externs have joined our staff, with some recently celebrating their fifth-year of employment with us. Their historical perspective and input is invaluable, and it is quite wonderful to see them grow as preceptors in their own right.

The basic question my extern clinical coordinator and I discuss each year with a new group of externs is, "What is our job/role/goal here with externs?" That seems like a very simple question, yet it has so many layers to it.

I have always believed that the goal of the externship that we provide is to make the externs independent, capable, and able to provide excellent patient care in any setting, with most any clinical service need. My own externship, or clinical fellowship year, as it was called 20 years ago, left me to be mostly independent with a routine check-in with my supervisor. It was expected that I would be capable of patient care, for the most part, on my own.

That was the expectation after six years completing an academic master's degree. Today, I have to ask, "What exactly changed when we moved to a doctorate-level profession? Are today's externs more capable now compared to clinical fellows of the past? Do they receive more clinical training prior to embarking on their fourth year?" In my experience as a hiring director of a facility that attracts and educates numerous externs each year, the answer appears to be variable, but in some cases, very little appears to have changed in these areas.

Trends in Preparedness

Over the last six years growing our extern program, we notice some trends in preparedness and experience level coming to us from good academic institutions. Clinically, it is noted that experience with providing direct patient care in pediatric testing and hearing aid fitting is often considerably absent or limited. Very few externs came with any exposure or direct patient care in tinnitus management, performing VNG and ABR testing. The fourth-year extern experience became much more about teaching students basic skills, rather than taking the year to polish their skills and make them independent. Observation or lab experiences for various audiology services are noted by the externs, but not as much hands on practical experience.

Additionally, externs come with very little understanding of billing, coding, reimbursement, or insurance benefits. Their previous off-site experiences did not typically allow for independence in billing of services or training to understand the details of the administrative and business knowledge the independent healthcare provider needs. Academic training at their universities typically included business plan creation, but little or no practical day-to-day benchmarking and tracking. We are training these students to expect the pay and respect that comes with the title doctor of audiology, but they have no clue how to justify the salary they want to receive or how to cost effectively run a clinic.

The combination of these facts makes the job of being a preceptor much more challenging. Preceptors have to be capable of assessing clinical skill level as well as teach what is necessary for audiological services. They have to monitor, sign off on the work, take the responsibility for services and billing, and be available to provide constant feedback. It is a burden. Our preceptors are willing to assume extraordinary stress to give back to their profession. Their role, at this point, should be as a mentor, a guide, and a polisher. Precepting should be a sharing of experience and helping in teaching the greater perspective on patient care.

As we transition new 2017–2018 externs in May and June, we decide to implement a confidence assessment questionnaire from the externs' point-of-view. The results confirm what we have seen clinically in our previous years. Only about 20 percent of the respondents indicate reasonable experience in providing VNG, ABR, and CI testing and service provision. They note that the ability to adequately interpret results is an area that needed focal improvement. Results further confirms that 100 percent of the respondents have no billing, coding, insurance, or practice management experience, and list it as an area with no confidence and required training.

With the amount of time, dedication, and work required to take on an extern, it is no surprise that busy medical offices look to adding

audiology technicians or hearing instrument dispensers. From the American Academy of Audiology:

> It is the position of the American Academy of Audiology that audiologist's assistants are vital to the future of this profession and they can provide valuable support to audiologists in the delivery of quality services to patients. The duties and responsibilities of audiologist's assistants should be assigned only by supervising audiologists. The supervising audiologist maintains the legal and ethical responsibilities for all assigned activities that the audiologist's assistant provides. The needs of the consumer of audiology services and protection of the patient will always be paramount. Audiologists, by virtue of their education and training, are the appropriate and only qualified professionals to hire, supervise and train audiologist's assistants.

Reading this definition, it strikes me to be remarkably similar to the definition of a preceptor to an audiology extern. I have sat in on many practice management seminars, symposiums, and conferences that include chief operating officers, directors, and audiologists. What is concerning is that I hear more frequently the reduction of audiologists in a clinic, and the addition of audiology technicians and hearing instrument specialists for cost reasons. Is that route easier for a practice than investing in externs? As a profession, we should support providing externship experiences, instead of adding assistants, and investing in the future of our field. In order to do that, we have to better prepare students to learn and help a practice thrive as a result, not challenge the preceptors with a heavy responsibility to teach and train more so than mentor.

Conclusion

Prior to its dissolution, and acting on a recommendation from the Conference on Professional Education II held in fall 2008, the American Foundation of Audiology (AFA) surveyed more than 6,500 audiologists regarding their views of the AuD program (Ulinski, 2010). Based on a 15 percent response rate, the survey provided "a snapshot of current trends and a good platform for future discussions and opinions," says Susan Paarlberg, who was then executive director of the AFA.

Survey questions about preceptoring produced some interesting findings. Most respondents (58 percent) had not been preceptors for an AuD student in the past two years, and when asked if they would be interested in doing so, only 38 percent said yes and 62 percent said no. When those who said no were asked what it would take for them to become a preceptor, the most common responses were a change in job, supervisor, or setting (about 20 percent); more time (about 12 percent); and more information and guidance about expectations (about 10 percent).

Current Academy President Ian Windmill (Windmill and Freeman, 2013) proposed that "a concerted and coordinated effort needs to be undertaken to increase the number of persons interested in audiology as a career." The demand for hearing care services will be rising over the next 30 years due to increases in the population. Windmill's numbers project the number of graduating AuDs will need to increase from approximately 600 per year to 900 per year.

Additional quality externship sites will be required to support the education and preparation of our AuD students. Clinical audiology must be prepared to focus on meeting the challenge of establishing and maintaining quality externship site programs. The importance of tight coordination between clinical audiology and academia has never been greater. Emphasis must shift from how to train assistants to how to maintain and support our profession's viability.

Dawn Hulthen Koncsol, AuD, is the director of ENT ancillary services at Charlotte Eye, Ear, Nose and Throat in Charlotte, North Carolina, which includes audiology, allergy, and sleep services.

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October 5–6
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October 26–27
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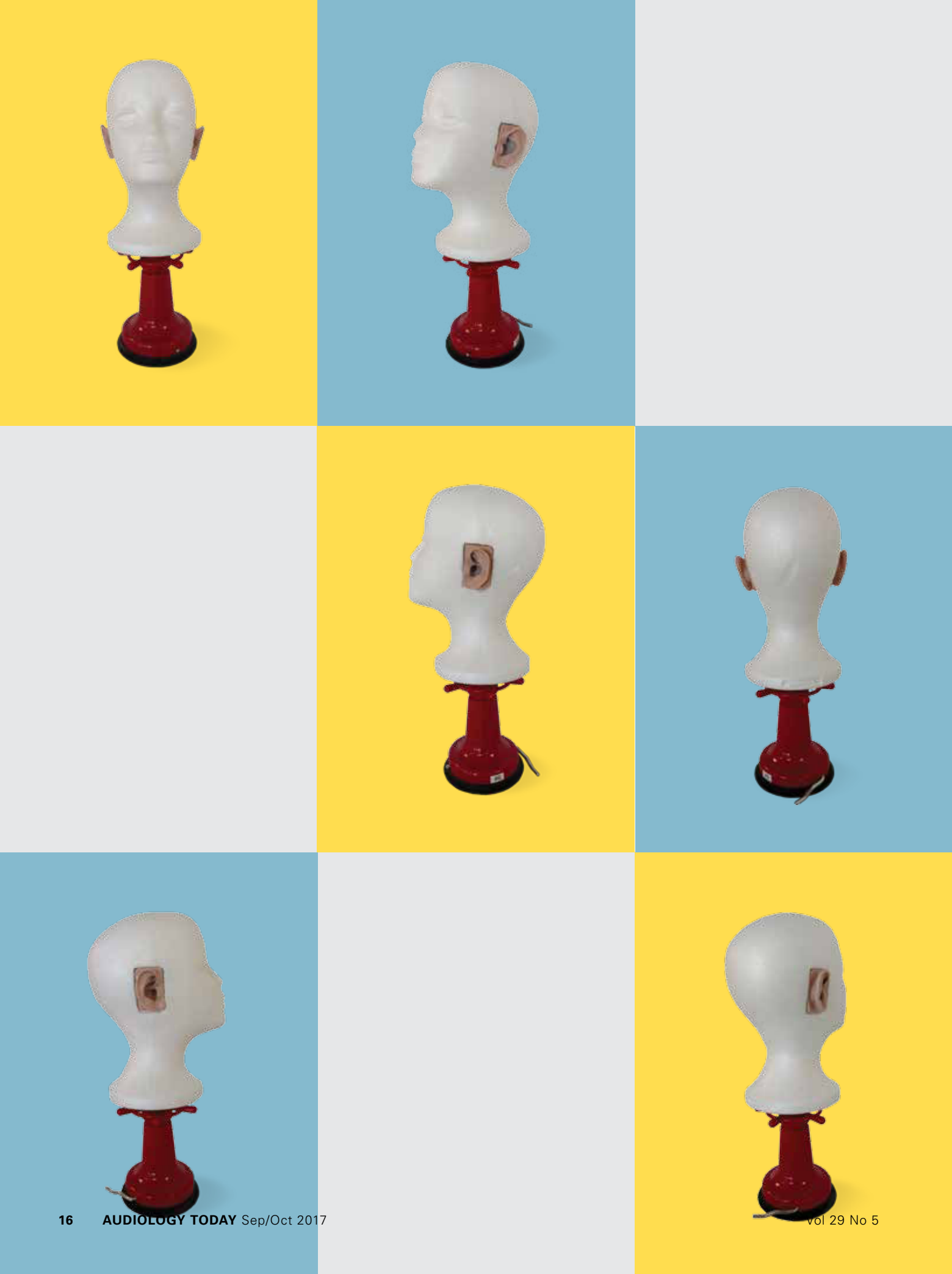

By using a simulation educational model for training audiologists, future students will be better prepared for clinical practice. The use of simulation serves to heighten the experience, develop and refine clinical skills, and to enhance students' ability to interact with patients.

Simulation Before Clinical Practice:
The Educational Advantages

BY DAVID K. BROWN

Simulation is used in many different professions for training, and assessing knowledge and skills. Although medicine has been using some type of simulation for centuries, it was the aviation field that pioneered its use back in the 1930s. They led the way by training pilots in flight simulators to allow them a safe and controlled environment in which to practice maneuvers and flying in conditions that they could not otherwise experience.

The first medical simulator was Resusci Anne, developed in the 1960s. It allowed individuals to practice prior to seeing critically ill patients. In the past 45 years, the number of publications per year on this topic has increased 80-fold and so have the number of fields that have embraced the use of simulation in the training of their professionals. It has become common place in universities and hospitals to have special facilities and equipment to train and assess staff and students. However, many audiology training programs have been slow to embrace the use of simulation in any form.

The key to simulation is that it allows the student to separate the equipment or test from the patient. In this way, it allows the student to practice and make mistakes in a safe environment without concern for patient comfort or risk (Barrows, 1993; Ziv et al, 2003). Manikins do not care how many times you need to repeat a procedure until you feel comfortable performing the test. Working with actors who portray patients' means that you will not compromise patient care when trying to develop communication skills and other techniques.

Simulation allows students to be able to learn a technique and practice it repeatedly until they feel comfortable and are prepared to be assessed on that skill. They can practice the same test on various pieces of equipment until they are proficient with that equipment. Most training programs do not have ready access to patients with a variety of disorders, such as acoustic neuroma, but they can through simulation. Parents will not allow you to practice on their newborn until you are competent conducting a threshold auditory brainstem response (ABR), but manikins do not complain.

Simulation also allows the student to quantify their clinical skills through both self assessment and mentor assessment. Students can be taught a skill or learn it in a self-guided method, practice those skills, monitor their improvement through self assessment, and finally demonstrate proficiency in a mentor assessment all before putting hands on a patient.

Simulation in an Audiological Educational Model

Students can monitor incremental improvement in the skill (self assessment), and faculty can assess clinical proficiency in that skill (mentor assessment) and determine if remediation is required. An example of this is the use of an otoscopy trainer, which uses a self-guided method to enhance the student's knowledge of a variety of conditions found in the ear canal and tympanic membrane. It provides information that the student can study to gain knowledge about the problem and visualize it through an otoscope in an ear simulator. Finally, it provides a self-assessment tool to determine if they are comprehending the material. Once they complete those tasks, the otoscopy trainer is utilized as part of a more comprehensive skills

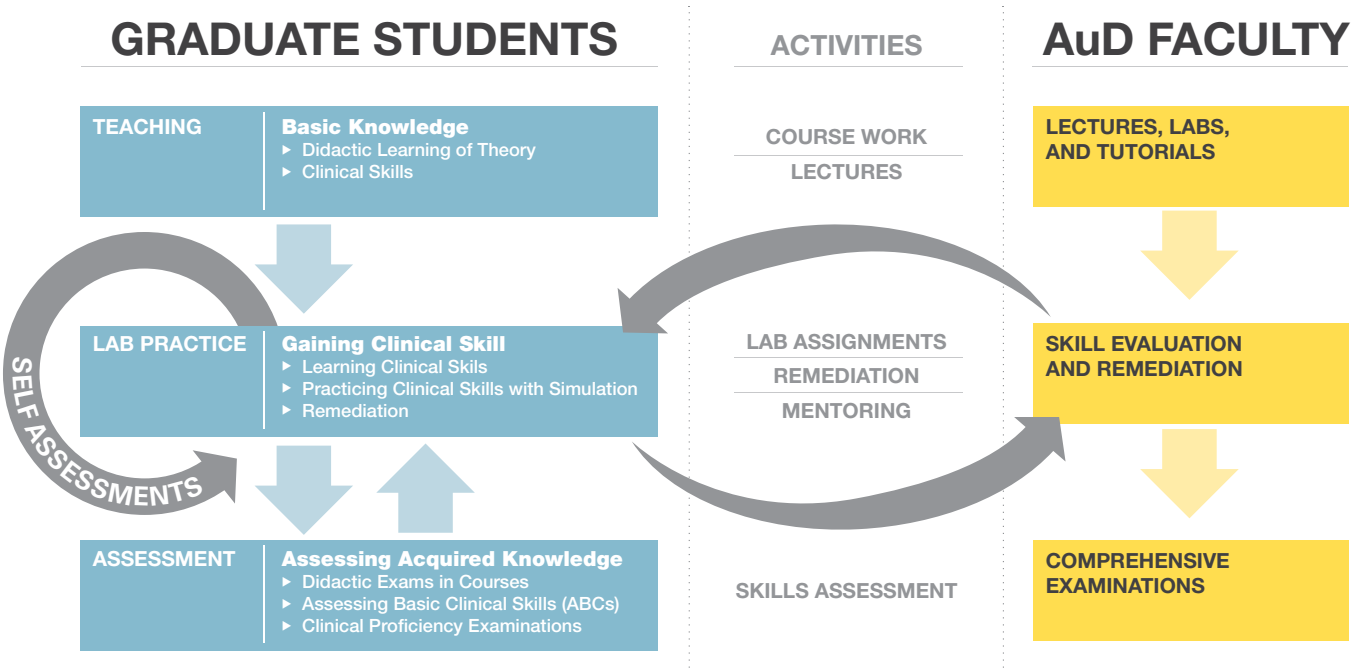

FIGURE 1. A model for the use of simulation training in audiology. Simulation can be used in both the education and assessment of clinical skills.

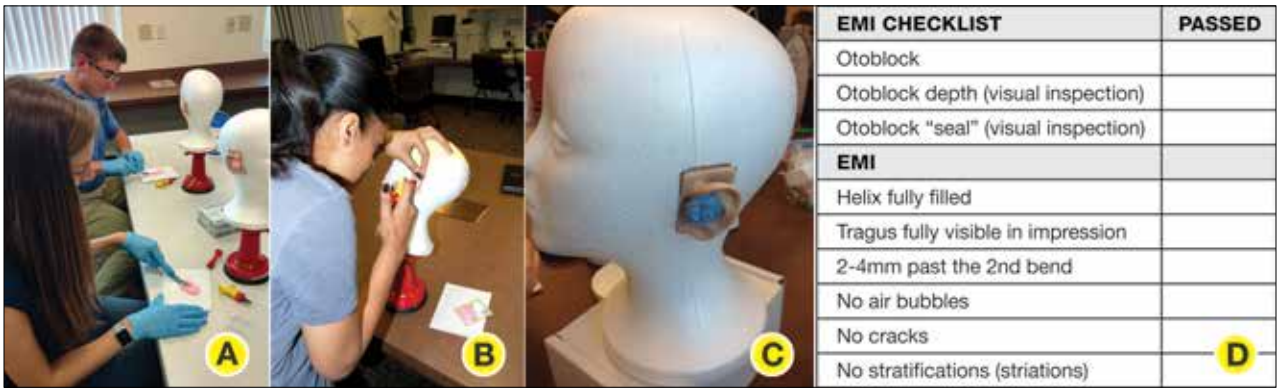

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FIGURE 2. EMI skill development using low-fidelity technology. (A) student preparing the material, (B) practicing the technique, (C) the manikin used for EMI practice, and (D) self-assessment tool for the students to determine if they are completing tasks appropriately.

check or proficiency exam, in combination with a standardized patient, as a part of a mentor assessment.

FIGURE 1 shows an educational model that utilizes simulation in a doctor of audiology (AuD) training program. This model combines the more traditional method of instruction and assessment with use of simulation. Didactic learning is enhanced with clinical skills learning and practice with simulation. The goal of this model is to produce competent audiology students who are prepared to move to the clinical portion of their training. An important step is the assessment and remediation of skills in which they are not competent. With the use of simulation, we can begin to determine those students who are not attaining the appropriate level of proficiency and develop strategies to remediate them so they can succeed.

The use of simulation occurs in the gaining clinical skills section of the model and involves different types of simulation depending on the skill set that is being taught. It is also an integral component of the assessment component of the model. It is important to note the loop-backs, which indicate that this is not a single fix but a continuous flow until the student shows competency and exits through the traditional comprehensive exams.

Types of Simulation

There are two types of simulation that can be used in training—(1) simulation technology and (2) standardized patients. Both allow the learner to practice repeatedly until the skill is acquired. Simulation technology includes devices that allow the learner to practice a particular skill using a "life-like" replica or virtual computer program. Standardized patients (SPs) are individuals who are taught to portray a variety of conditions and disorders, interact with the learner, and provide them with feedback. SPs provide a safe and controlled learning and testing environment to prepare students to see real patients. They provide students with the same, consistent case each time, and, as a result, the faculty can be sure that all students practice the same skills. With every student having the chance to both learn and practice a clinical skill with a SP, they can also demonstrate that skill in the same situation, which can assist with assessing clinical skills. Thus, making for a fair exam or learning experience for everyone.

Simulation Technology

Many audiologists are familiar with simulation technology that has been in existence for decades and have acquired skills though them (e.g., Resusci Anne). They are defined in terms of their fidelity or the degree to which they approach reality and are ranked from low to high (Aebersold and Tschannen, 2013). Simulators with low fidelity are non-computerized manikins or models, mid-fidelity simulators use computer programs or video games, and high-fidelity simulators use computerized manikins. At Pacific University, we utilize a number of different types of simulation technology from low- to

high-fidelity to assist with clinical skills training. Here are some examples of different types of simulation technology from each of the levels.

Low-Fidelity Simulation

Ear Mold Impression (EMI)—A low technology approach to teaching and assessing how students make EMIs is available. By using manikins, students can practice with or without faculty being present, as there are no safety concerns with the manikins. Use of this technology divides the task into different components and allows the students to learn and self-assess prior to being assessed by a mentor. Students receive instruction on the task, and are given a standard to work toward and a tool for self-assessment.

FIGURE 2 shows students practicing placing a block, mixing and inserting the material and the self-assessment tool for evaluating their product. When they are comfortable with how they are able to complete the skill and are satisfied with the final product, they proceed with a mentor assessment and then onto guided mentor assessment on "real" patients. Not all students are at the same level, and some need additional practice before being assessed on a skill. This technique allows the student to practice as much as is required before they move to the next level or to receive remediation if they are not competent.

Cerumen Management—Another example of low-fidelity technology is one that can be used with students who need to learn cerumen management techniques. With this simulation technology, students can practice unsupervised and become familiar with the different methods, visualization systems (i.e., loupes), and removal tools used in cerumen removal without needing to be concerned with patient safety. Utilizing artificial cerumen (audprof.com, Forest Grove, OR), they can gain experience with different consistencies of cerumen prior to touching a patient. Mentor-assessment can be used to determine when they are ready for clinical experience. (See FIGURE 3.)

Mid-Fidelity Simulation

Otoscopy—The OtoSim otoscopy trainer (OtoSim, Toronto, ON) is a

FIGURE 3. Cerumen management can be practiced using manikin heads and artificial cerumen. Various tools and illumination methods can be tried without concern for patient safety.

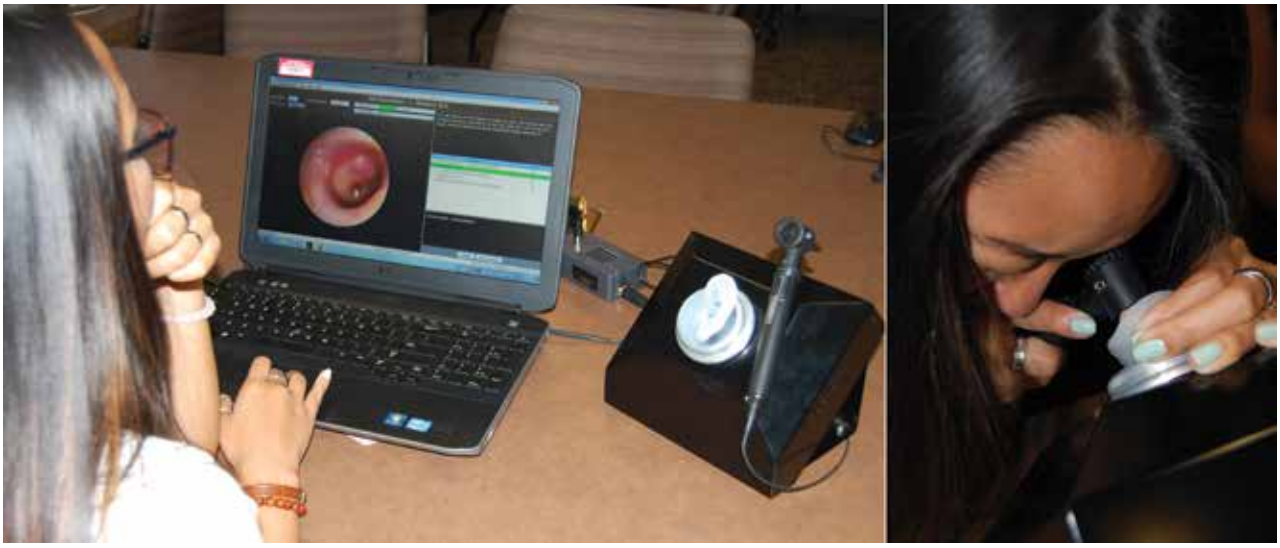


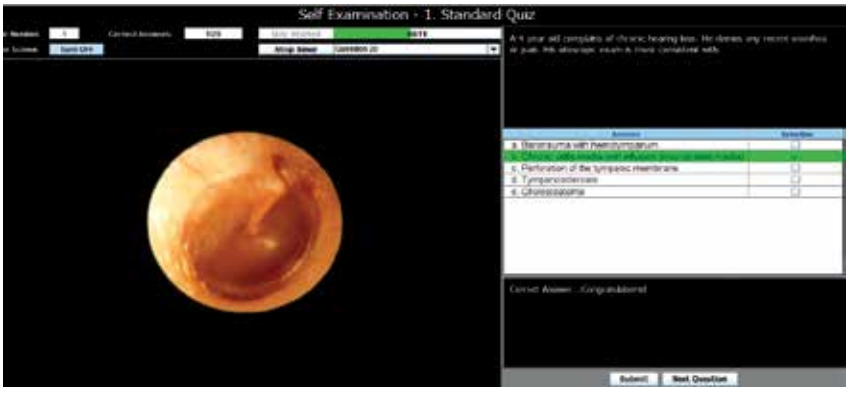
FIGURE 4. A student self-learning otoscopy skills using the OtoSim otoscopy trainer.

computer-based trainer consisting of an artificial ear and otoscope to display hundreds of pictures of tympanic membranes with various pathologies. FIGURE 4 shows a student reviewing the training program to learn about different tympanic membrane and middle-ear pathologies, and then visualizing them through an otoscope. There are a number of training programs available showing different pathologies for the student to complete.

When the student has completed an individual self-learning module, they are able to take a self assessment to determine their knowledge (FIGURE 5). They are able to spend as much time working through the different pathologies as necessary until they are comfortable with their knowledge, at which point they can be evaluated for this skill through a mentor assessment. The mentor has the ability to create an assessment tool that includes pictures that the student has not previously seen, which helps when evaluating concepts learned and not just rote memorization of pictures.

Audiometry—This mid-fidelity technology uses a virtual patient and audiometer to teach basic audiometric techniques including masking. There are different systems available including the AudSim Flex (AudStudent.com, Florida) and Otis—the virtual patient (INNOFORCE creative solutions, Liechtenstein). These computer-based programs emulate diagnostic audiometers and allow the student to perform pure-tone air and bone conduction testing (FIGURE 6). The virtual patients have

FIGURE 5. A self-assessment quiz for middle ear conditions using the OtoSim otoscopy trainer.



a variety of hearing loss patterns with type and degree of hearing loss. The program allows testing with and without the use of masking.

For self assessment, the student can compare their results to the intended results set out by the program. This can also be used to assess a student's ability to conduct an audiometric test, for use by the mentor to evaluate their readiness to test "real" patients.

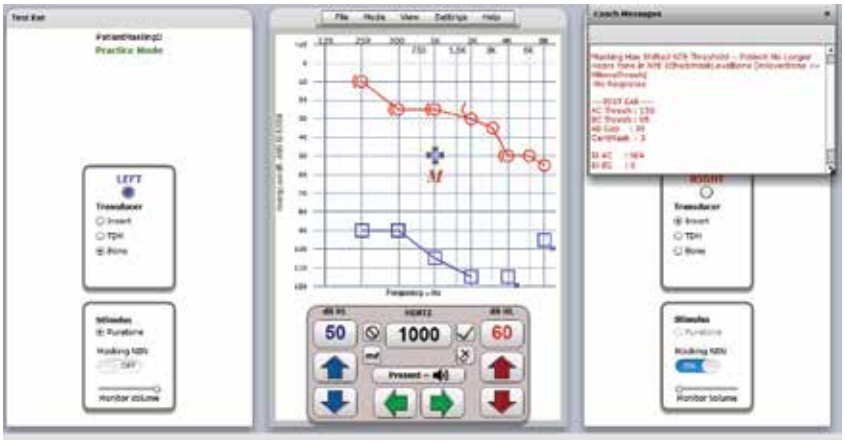


FIGURE 6. A computer-based audiometer showing an air-conduction test for the left ear of this virtual patient.

High-Fidelity Simulation

Auditory Brainstem Response (ABR) and Otoacoustic Emissions (OAEs)—There is only one high-fidelity simulator available currently. This computerized manikin (Intelligent Hearing Systems, Miami, FL) allows students to conduct both ABR and OAE testing with any manufacturer's diagnostic system. Students are able to practice making any evoked potential recording from neurodiagnostic testing to threshold estimation. They can practice picking peaks, measuring latencies, and determining the degree of loss using air conducted stimuli. Both transiently evoked otoacoustic emissions (TEOAEs) and distortion product otoacoustic emissions (DPOAEs) testing can also be competed with this manikin.

Students can practice each of the tests, complete a self assessment, and prepare for mentor assessment. We utilize this technology, in our clinical proficiency exam for newborn diagnostic hearing testing. FIGURE 7 shows the manikin and a test result for a neurodiagnostic test. The mentor has the ability to develop assessment tests that can assess any ABR or OAE test.

Standardized Patients

Standardized patients (SPs) are defined as an actor or layperson trained to simulate or portray a patient's condition in a realistic manner (Barrows, 1993; Furman, 2008). The terms standardized patient and simulated patient are often used interchangeably, although traditionally they had slightly different definitions (Barrow, 1993). Standardized patients are not volunteers or peers but trained individuals. Most programs require that their SP have a high school diploma, pass a criminal background check, a drug test, a physical examination, and have current immunizations. They must have a talent for acting and a desire to help train students to become more effective professionals. Large programs have SP of all ages, ethnicities, and physical characteristics, including hearing loss and balance issues.

Standardized patients are considered a mid-fidelity simulation technique and are used in most medical fields from nursing to medical students. FIGURE 8 shows a student interacting with a SP: the interaction between the student and

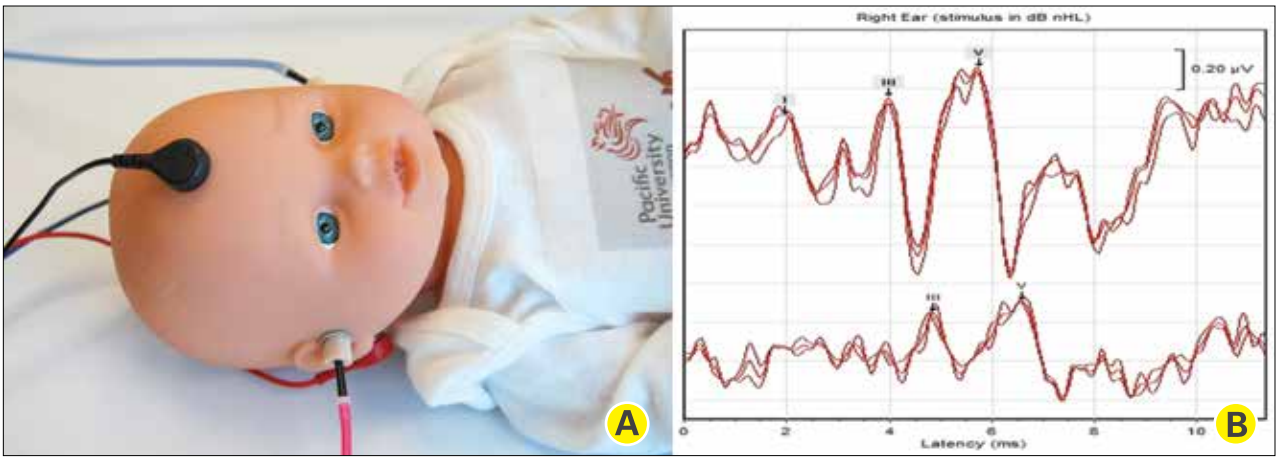


FIGURE 7. (A) Baby Isao, the first computerized manikin for ABR and OAE testing. (B) The results from a click ABR through the manikin.

an unknown "patient" enhances the experience more than use of a peer. Standardized patients allow students to practice communication skills with patients, practice dealing with difficult patients or in difficult situations; and review students own clinical behavior and terminology when communicating with patients. The use of SP improves counseling skills such as case history taking, ability to recognize and empathize with a client's perspective, and general counseling skills such as "breaking bad news" (Gilmartin et al, 2010).

Interactions with SPs help a student gain self-awareness of their own communication and clinical strengths and weaknesses, and their reactions to stressful situations (Shemanko and Jones, 2008). Debriefing from these sessions, whether self assessment or mentor assessment is a critical component of the use of SP. One evaluation tool to assess a simulated counseling session or interaction with a SP is the Audiologic Counseling Evaluation

FIGURE 8. Interaction between a student and a standardized patient. Use of a room with video/sound system or observation room allows the mentor to evaluate and provide feedback to the student during the debriefing session.

(ACE) (English et al, 2007). Use of this type of tool and a skillful mentor with a positive attitude and constructive criticism can reinforce student learning.

By using a simulation educational model for training audiologists, future students will be better prepared for clinical practice.

Conclusion

The goal of simulation is for the student to incorporate the skills and lessons learned from the simulation experience and assessment/debriefing and apply them to their real-world clinical situations. Using an educational model for training audiologists that includes simulation, future students will be better prepared for clinical practice. The use of simulation serves to heighten the experience, develop and refine clinical skills, and to enhance students' ability to interact with patients. Self assessment, feedback from mentors, and the opportunity for remediation will produce better-prepared audiologists.

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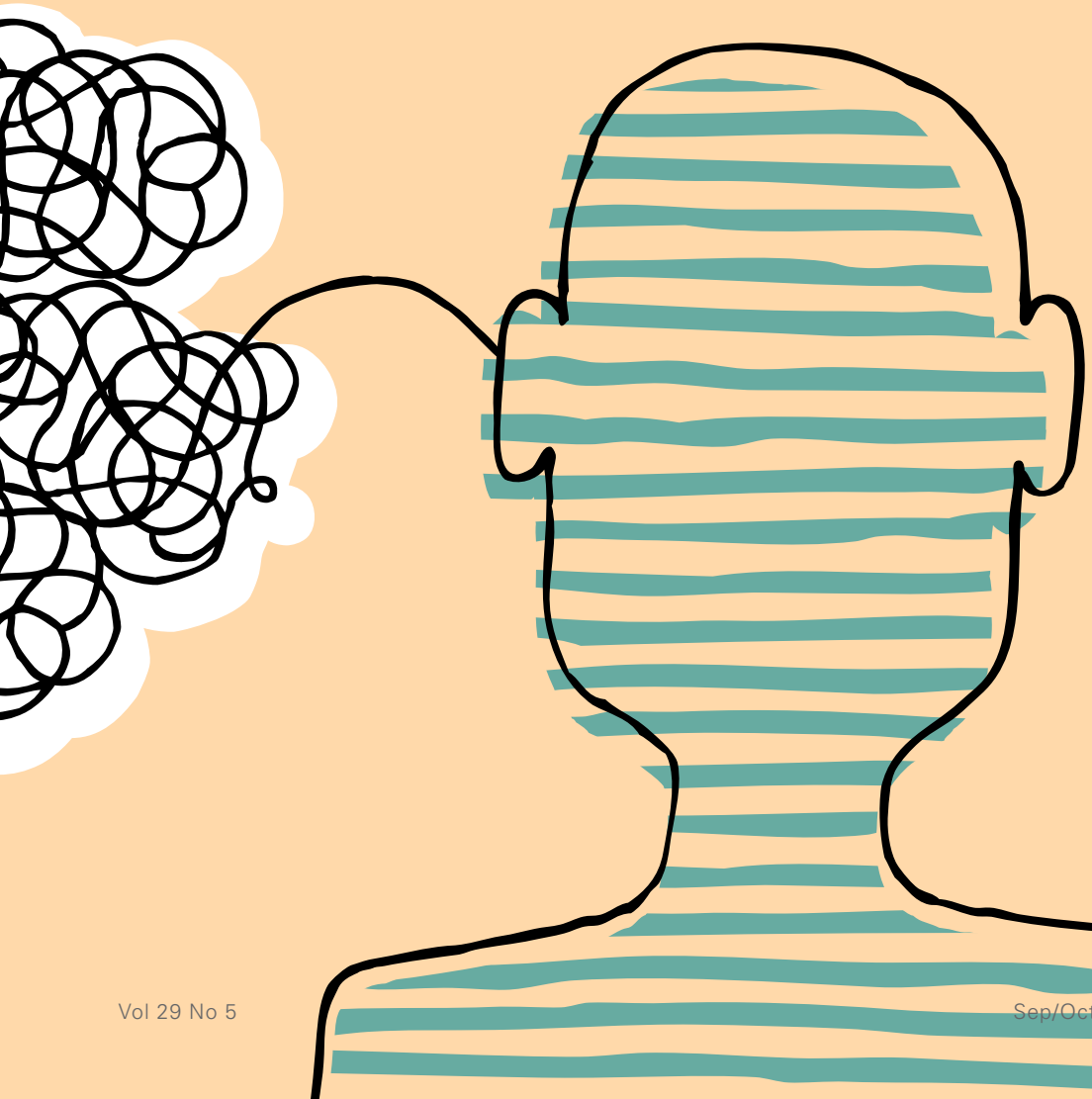
MOTIVATIONAL INTERVIEWING

AN INTRODUCTION **FOR AUDIOLOGISTS**

BY EVAN DRAPER
AND THOMAS R. GOYNE

PATIENT-CENTERED APPROACHES TO care and self-motivation are familiar concepts in the field of audiology. Motivational interviewing is a set of concrete techniques that can make those concepts a reality.



How often have you been flossing? Haven't you been meaning to exercise? Why aren't you eating better? There are many things we know we should be doing about our health—but aren't. It's not that we haven't been told about them many times and in many ways. We are just ambivalent about change. Perhaps we don't have the desire, ability, reasons, or need to change our behavior.

Why then, should we be surprised when patients do not accept our recommendations for amplification? According to the MarkeTrak IX survey (Abrams, 2015), hearing aid adoption rate among adults with perceived hearing difficulty is approximately 30.2 percent. The study also found that patients often view their initial visit to a hearing care provider as an information gathering appointment and will visit more than one before moving forward with amplification and hearing rehabilitation (Abrams, 2015).

It is tempting to view patients who refuse amplification as "resistant to change," "in denial," and "non-compliant." Instead, we should realize from these low adoption rates—and our own experiences as patients—that such resistance is part of a normal process. Better understanding this process and how to accelerate it can increase adoption rates, thereby improving our patients' quality of life and our bottom line.

The intention of this article, then, is to introduce audiologists to a method of counseling and begin a conversation about how it might be successfully used in any clinical setting. Patient-centered approaches to care and self-motivation are familiar concepts in the field of audiology. Motivational interviewing is a set of concrete techniques that can make those concepts a reality.

THEORY AND PHASES OF MOTIVATIONAL INTERVIEWING

Motivational interviewing (MI) was developed to work with another highly "change resistant" population: substance abusers. Alcoholics and drug addicts know very well about the negative consequences of their behavior, and yet they persist. The theory behind motivational interviewing is that the strongest motivations for behavioral change are the ones patients develop for themselves. But "waiting" for patients to develop their own resources can be a difficult task for a clinician. When a counselor sees a patient in difficulty, it is all too tempting to label the problem and offer a quick fix. William Miller, founder of motivational interviewing (2012), calls this the "righting reflex," our natural tendency to offer help to others by solving their problems.

We've all seen how telling a toddler "no" can cause a tantrum. It can be harder to see that trying to direct an adult's behavior evokes a similar psychological reactance. When someone tries to tell us what to do, it's as if they are dealing a blow to our autonomy, and our autonomy wants to push back. It's only natural if we feel angry, defensive, uncomfortable, or disengaged. (We may just be better at minimizing and hiding our distress than the toddler!) This is all to say that we may feel like we have done our job when we "tell our patients what they should do," but it is the least effective way of getting them to do it!

FIRST PHASE: **ENGAGING**

The first phase of motivational interviewing is engaging the patient by affirming their autonomy and offering compassion. Asking open-ended questions will elicit deeper patient engagement, and counselors must listen more than they talk, especially in the beginning stages. After

listening, counselors can reflect back what they've heard. Affirm the patient's strengths and positive choices, rather than mentioning shortcomings. If patients feel understood, it builds an atmosphere of trust and collaboration. The patient must feel that they are being placed in the driver's seat when it comes to their care. More accurately, clinicians need to let go of the burden of superior power and judgment that they never had in the first place!

Here's what it might sound like: "Why would you want to make this change?" "How might you go about it in order to succeed?" "What are the three best reasons for you to do it?" "How important is it for you to make this change, and why?"

SECOND PHASE: **FOCUSING**

As the counselor is establishing a compassionate, trusting relationship, they start to elicit the patient's goals and focus on an agenda. This is not yet the time to offer treatment recommendations! Rather, the patient needs to fully vent all of their concerns, after which time the clinician can help the patient decide what should be tackled first. Helping the patient create an agenda is critical when working on a wide range of issues over a longer time frame, which is more common in psychotherapy or social work. In situations with a narrower focus, like addressing a newly-identified hearing loss, let the patient draw their own conclusions about what needs to happen and when. Allow the patient time to reflect and share where they are. Resist the temptation to fill up silence with talking; you will better alleviate any discomfort your patients might feel by empowering them. If you need to raise possibilities that definitely wouldn't occur to your patient themselves, use hypothetical language when bringing them up.

THIRD PHASE: **EVOKING**

The next phase is the linchpin of MI: evoking change talk. Says Miller (2012), "people who are ambivalent about change already have *both* arguments within them—those favoring change and those supporting the status quo. This means that most clients do already have pro-change voices on their internal committee, their own positive motivations for change. These are likely to be more persuasive than whatever arguments you might be able to provide. Your task, then, is to evoke and strengthen these change motivations that are already present."

Clinicians should listen for phrases that indicate willingness to change. These will be interspersed with "sustain talk"—phrases in favor of continuing the existing state of things. This is normal, and clinicians shouldn't suppress or contradict sustain talk. Rather, they should ask questions that solicit change talk, and reflect and reinforce the change talk that patients produce. Over time, the proportion of sustain talk should diminish.

The acronym **"DARN CAT"** can help you identify kinds of change talk and sustain talk. The first four indicate a preparatory phase:

Desire	"I love..." "I hate..." "I would like..."
Ability	"I can..." "I'm not able to..."
Reasons	"This would help me to..." "I have to because..."
Need	"I have to…" "I can't go on like this..."

These three categories of "mobilizing change talk" indicate an advanced stage of readiness to change:

Commitment	"I will…" "I'm going to…"
Activation	"I'm willing to…" "I'm prepared to…" "I'm ready to…"
Taking Steps	"I did…" "I started by…"

Clinicians should aim for a less directive style of communication. When they do need to provide information, it should be surrounded by questions. Miller calls this strategy "Elicit-Provide-Elicit." This reinforces the autonomy of the patient and guards against the righting reflex. First, the clinician could ask permission to share information, or ask clarifying questions. Another good technique is to ask, "What do you already know about…."

Then, when providing information, the clinician should offer small amounts in clear language without interpreting its meaning for the client. Afterward, ask for the client's reaction, allowing them to process the information in their own way.

As the proportion of change talk increases, and patients start using more advanced change language, the clinician can try to consolidate this motivation. The clinician can summarize all of the motivations for change that the patient has already expressed. They can ask a big question, like "What do you think you'll do?" or "So what comes next?" It's useful to allow a pregnant pause here and there, to encourage patients to process their feelings vocally. Don't appear rushed, even if you are! As Miller says, "If you act like you have only a few minutes, it may take all day; act as if you have all day, and it may only take a few minutes."

FOURTH PHASE: **PLANNING**

Only once the client is voicing a clear commitment to change should conversations about next steps or planning start. It's still critical that patient motivations drive the planning process: it can be tempting to throw all of our recommendations at a patient when they indicate readiness for planning. It would be better to take two appointments for a patient to enthusiastically select a hearing aid than to sell them something in one appointment that winds up in a drawer! If your patient trusts you enough to admit the limitations of their commitment, you can help them devise a more realistic plan.

CASE STUDY

A recent case may serve to illustrate the benefits of employing the techniques of motivational interviewing in a typical hearing evaluation, hearing aid consultation, and hearing aid trial.

"Betsy R." is an 80-year-old female whose chief complaint was "difficulty hearing clearly." The visit began with a discussion regarding her general medical history and then more specifically any otologic symptoms. She reported being under the care of her family doctor for blood pressure issues and denied any tinnitus, vertigo, perception of asymmetry, fullness, or any other otologic symptom, other than her chief complaint. Questions regarding her difficulties in hearing speech were intentionally reserved for after completing the hearing evaluation. Before testing, she volunteered the fact that "an ENT office tried to sell me hearing aids a few years ago and I wasn't ready."

The hearing evaluation revealed a very typical case of presbycusis. Thresholds were very symmetric between ears, sloping from mild in the low frequencies to moderately-severe in the higher frequencies. Word recognition scores were good at elevated presentation levels.

After very briefly describing to Betsy the nature of her hearing loss, she was asked the question, "You stated earlier that you weren't ready for hearing aids several years ago, how do you feel about hearing aids now?" Betsy's reply was, "it's something I need to think about, but I know I need to hear better" to which she was then asked, "What types of things do you need to think about?" Betsy replied with several factors including appearance and cost, and the audiologist noted these. By asking these questions, the audiologist was able to determine that Betsy is motivated to hear better, which was reinforced by her own statement, and still has some apprehension.

The audiologist agreed that the factors Betsy stated were very valid concerns. She was then asked for permission to temporarily turn the discussion to specific listening situations that Betsy encountered that caused her the greatest difficulty or were most troubling to her. Betsy listed several situations and the audiologist asked for more information, at times, in order to make sure that the situations were fully described. At this point, the audiologist then said, "So, if I understand you correctly Mrs. R., you would like to understand people better in meetings, around the house, and in the occasional restaurant. Is this fair and accurate?" Betsy confirmed this with a smile on her face. This is an example of reflective listening and a summary statement, which not only elicits change talk but also provides an opportunity to verify that the clinician understands the patient's thoughts as accurately as possible.

The discussion then turned to specific devices that would fit into Betsy's budget and appropriately address the listening situations that she was prioritizing. The specific devices were ordered and a fitting visit was scheduled and performed several weeks later. What is important to notice is that at no point in the conversation did the clinician tell the patient what course of action she should take. Instead, the conversation allowed Betsy's own internal motivations to be brought forward, while not discounting her apprehensions about receiving help. In addition, the conversation was professional, but relaxed, which allowed the patient to freely express what she viewed as positives and negatives towards embarking upon a hearing aid trial.

Several weeks after the fitting, Betsy R. returned to the clinic in order to evaluate her progress in the trial period. Betsy began the discussion pleasantly, but apprehensively, with several complaints regarding the hearing aids. The audiologist listened carefully, and responded, "Okay, thank you for sharing that information. We will try

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to come up with some solutions to remedy those issues. Tell me though, how did you perform with the devices in meetings, around the house, and at restaurants?" Betsy responded with very positive reports regarding those situations and stated that she felt they were clearly providing considerable benefit. By asking about targeted experiences, the audiologist was not only able to verify that there were positives in Betsy's mind (since she had not volunteered them), but also, the answers helped to reinforce the progress that was being made during the action stage of treatment.

The audiologist finished up the appointment by creating some solutions for the issues that Betsy brought up at the beginning of the follow-up visit. Betsy successfully completed the trial period several weeks later.

As an audiologist, the temptation is to test the patient's hearing, explain to them the audiogram, explain to them the problems they are having, and then tell them that they need to make a significant investment in hearing aids. Motivational interviewing is a much different approach that requires much more listening and less talking on the part of the audiologist. When done effectively, it has the potential to greatly increase the probability of a patient agreeing to move forward to improve their quality of life.

ADDITIONAL APPROACHES FOR APPLICATION TO AUDIOLOGY

The field of audiology also has a few existing tools that are already consistent with motivational interviewing. The Client-Oriented Scale of Improvement (COSI) has the patient self-identify situations of hearing difficulty that they would like to improve. It grew out of a previous tool called Goal Attainment Scaling. These tools were modeled after those used in mental health programs, but their goal was not patient-centered treatment. Instead, it was found that patient-specific goals were much more reliable in validating treatment efficacy than global measures (Dillon, 1997). As regards MI, the COSI impels patients to find their own motivations for hearing aid adoption. These goals then become concrete "anchors" for clinicians in focusing their counseling.

The Ida Institute, an independent non-profit organization, has developed various motivational tools and opportunities for training in person-centered hearing health care. It is beyond the scope of this article to review all of these resources. It is worth pointing out, however, that "The Line" is remarkably similar to a tool Miller mentions, the "importance ruler."

The concept underlying both is a linear scale—perhaps numbered 0–10—for patients to assess themselves, say, on how important it is for them to make a certain change. Miller (2012) continues, "In itself, this question is of limited usefulness. The value…comes with the follow-up question about the number that the person chose: 'And why are you at a ____ and not [a lower number]?' …[this] is likely to evoke change talk—the reasons why change is important."

A related , original idea for maintaining patient autonomy during the hearing aid selection process is externalizing a decision tree onto laminated cards. Several manufacturers already produce a chart of listening situations that help patients find their appropriate technology level. Patients could also identify themselves on scale from "set it and forget it" to "I want to control my hearing aid performance," or "I want my aids to be invisible" to "I don't care what they look like."

Additional cards could be used to rank the importance of various hearing aid features, like smartphone connectivity or extended frequency response. As a result, patients should be much more invested in the instrument they have selected.

FINAL THOUGHTS

We hope this introduction has interested you in how motivational interviewing might enhance your clinical practice. But as William Miller stresses, while the concepts behind MI are very simple, putting them into practice is not easy. Audiology's recent focus on a medical model of care is associated with behaviors like professional distance and top-down expertise that run counter to MI's culture of collaboration and true patient-centeredness. Working with elderly and/or handicapped populations—as audiologists so often are—makes the righting reflex even more tempting. Understanding MI intellectually will not guarantee better patient outcomes; it may even make things worse when practitioners prematurely believe they "know how to do MI."

Rather, MI may demand an attitudinal change in its practitioners and a cultural shift in organizations. Miller devotes special emphasis to the "spirit of MI." "… MI involves a collaborative partnership with clients, a respectful evoking of their own motivation and wisdom, and a radical acceptance recognizing that ultimately whether change happens is each person's own choice,

an autonomy that cannot be taken away no matter how much one might wish to at times."

MI demands our vulnerability: we must acknowledge that no one truly needs hearing aids, that patients are making a choice not to wear hearing aids which confers benefits to them, and simply telling patients they should do otherwise means we have not fulfilled our real responsibility—helping them embrace change.

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Reminders for MI practitioners, on a printable reference card. www.centerforebp.case.edu/client-files/pdf/miremindercard.pdf

Further Resources

IDA Institute: Motivational tools for audiologists. http://idainstitute.com/toolbox/motivation_tools

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Motivational Interviewing: The official online resource. www.motivationalinterviewing.org

C.C. Bunch

THE FIRST AUDIOLOGIST

BY JAMES JERGER

A legendary figure in audiology celebrates audiology pioneer C.C. Bunch's forward-thinking practices by entertaining and educating readers about this remarkable individual's history and innovations...

I will always regret that I never met C.C. Bunch. I like to think of him as the very first audiologist. Toward the end of his life, he was a member of the faculty of my alma mater, Northwestern University, but he died three years before I entered the school as a freshman in 1945. He was well remembered by the older faculty, especially by voice scientist Paul Moore, who helped Bunch prepare his book, *Clinical Audiometry*, the first real tutorial on the techniques and interpretations of pure-tone audiometric testing. Bunch wrote the book while at Northwestern in 1941–1942, just before his untimely death in June of 1942.

The story of C.C. Bunch's career as the first audiologist begins in 1917 at the University of Iowa. Psychologist Carl Seashore was dean of the graduate school and a lifelong student of music. He is perhaps best known for the Seashore Tests of Musical Ability. His wide interests included many other aspects of the auditory sense, especially the measurement of hearing loss. He shared this interest with local otologist Lee Wallace Dean. Together they embarked on a project to study "practical applications of methods of testing hearing." In 1917, testing for hearing loss was still dominated by tuning fork tests, especially the Weber, Rinné, and Schwabach (Newby, 1958). These procedures were specialized for deciding what kind of hearing loss the patient had, but were not very good at estimating the degree of loss at various frequencies.

What Seashore and Dean had in mind was a device capable of presenting a pure-tone whose frequency and intensity could be controlled precisely, rather than by the imprecise manual stimulation from the stem of a tuning fork (i.e., nothing less than what we today call

an audiometer). What they needed, they both agreed, was a bright young physicist who could carry the project through to the actual fabrication of such a device. They had both been impressed by Bunch, who had just completed his master's degree in psychology and physics at Iowa. Dean described him as a brilliant young man. Supported by a five-year grant obtained by Seashore and Dean, Bunch pursued his PhD degree in psychology as he worked on the construction of what he termed the "pitch range audiometer." Bunch succeeded in building a prototype audiometer but it was never commercially available. The range of frequencies was generated by a variable speed DC motor, driving a set of two rotating disks. Intensity level was varied by means of resistors. Bunch used this device in early studies of Dr. Dean's patients, but in a few years the Western Electric 1-A audiometer, which took advantage of the capabilities offered by the recent development of the vacuum tube, was available. Bunch and Dean acquired one for the then-steep price of $1,500, and Bunch used it exclusively for the next two decades.

> "Bunch went on to show that in some patients there was high-frequency perceptive loss as well as conductive loss."

In 1920, Bunch was awarded the PhD degree in psychology and joined the Iowa faculty as associate professor of otology. He spent the next seven years testing Dean's patients in the otology clinic. In 1927, Bunch moved to the Johns Hopkins University in Baltimore as an associate in research otology, working with the renowned otologic anatomist, Stacy Guild. Meanwhile his mentor, Dr. Dean, had moved

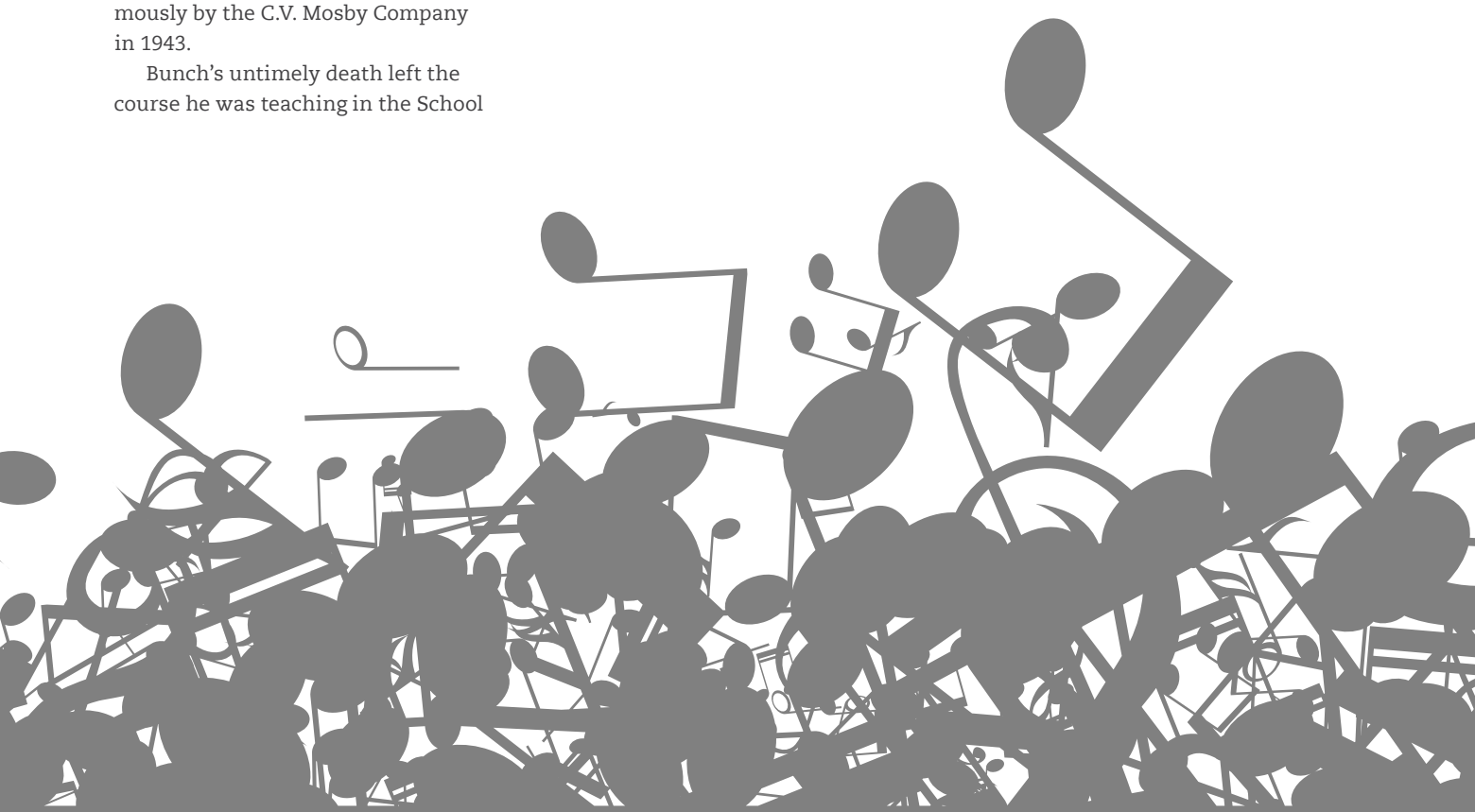
from Iowa City to St. Louis to a post in otology at the Washington University School of Medicine. Dean immediately invited Bunch to join him as professor of applied physics. Bunch accepted and, in 1930, moved to St Louis. Here he continued to test all of Dean's patients and to amass what must have been thousands of air-conduction audiograms. In 1938, Bunch became associate director of the highly-regarded Central Institute for the Deaf in St. Louis, then under the direction of the highly-respected educator of the deaf, Max Goldstein. Finally, in 1941, Bunch moved to Evanston, Illinois, where he joined the faculty of Northwestern University as research professor in Education of the Deaf in the School of Speech. Here, with the help of Paul Moore, he prepared the manuscript of his classic book, *Clinical Audiometry*, just before his death at the age of 57 in 1942. It was published posthumously by the C.V. Mosby Company in 1943.

Bunch's untimely death left the course he was teaching in the School of Speech without an instructor. A young speech scientist, Raymond Carhart, was assigned to finish the course. Carhart's subsequent interest in auditory matters may be traced to that event.

Bunch's Incredible Achievement

To fully understand the remarkable achievement of C.C. Bunch, you must keep in mind that the Western Electric 1-A audiometer was capable of only one measure: air-conduction thresholds at octave and half octave intervals from 32 to 16,384 double vibration (d.v.). Double vibration has a long history in musical acoustics. It refers to the displacement of a musical string (e.g., violin, harp, or guitar) first in one direction from the position of rest, then in the opposite direction from rest, when plucked or bowed. This constitutes two displacements, or one double vibration. In the 1940s, d.v. morphed among physicists into "cycles per second" or c.p.s. Finally, in the 1960s the International Union of Pure and Applied Physics renamed it Hertz, abbreviated Hz, to honor Heinrich Hertz, a 19th century German scientist, who pioneered the study of electromagnetic radiation.

In describing losses and redoing audiograms to make them more suitable for publication, I have preserved the original terminology of the 1920s and 1930s for the sake of authenticity. TABLE 1 translates archaic terms into modern usage.



There were no bone-conduction thresholds, no speech thresholds, no PB scores; there were only the air-conduction thresholds. With these limited data, Bunch managed to write 24 articles and a book on issues including age variations in auditory acuity, traumatic deafness, otosclerosis, deafness in aviators, conservation of hearing, late effects of otitis media in infancy, race and sex variation in auditory acuity, the acoustic nerve, and absence of the organ of Corti. And he did all of that over the space of only 22 years.

In the following sections, I describe some of Bunch's insightful observations concerning percentage hearing loss, masking, audiometric technique, conductive hearing loss, perceptive hearing loss, and the fitting of hearing aids. They are all based on his 1943 book, *Clinical Audiometry*.

ARCHAIC	MODERN
d.v.	Hz
Hearing loss (sensation units)	HL in dB
Perceptive	Sensorineural
Acuity	Sensitivity

TABLE 1. Archaic language from the 1920s and 1930s translated into modern terminology.

Percentage of Hearing Loss

Because patients so often ask, after being shown their audiogram, what is the percentage of hearing loss, Bunch gave the issue a good deal of thought before concluding that it was an exercise in futility. He illustrated his point by presenting the audiograms of three persons with congenital losses. Although the contours of the losses were strikingly different, the pure-tone averages, from which the percentage loss would be computed, were similar. Yet the ability of each patient to function in the auditory world differed substantially depending on both the shape of the audiogram and a variety of non-auditory factors. Bunch's point was that three people with the same percentage loss had significantly different degrees of disability in real-world communicative events.

Bunch recognized, however, that there would be situations in which persons appeared before compensation boards or courts seeking monetary damages for hearing loss. He wrote the following:

> The amount of award granted under present conditions is usually dependent on the relative skills of the opposing legal representatives. Fowler [Dr. Edmund Prince Fowler] has proposed a system for making such awards, but his plan has not as yet been accepted by otologists. It provides for awards on the basis of disability rather than upon the amount of hearing loss. His proposal is an attempt at a solution of this problem and indicates the trend of otological opinion (Bunch, 1943).

Unfortunately, the trend toward disability and away from loss never got much further. Three quarters of a century later, if you go to Google and enter the phrase "percentage of hearing loss," you will encounter programs allowing you to calculate percentage loss by simply filling out a form that asks for the patient's age, sex, air-conduction thresholds, handicap equation (there are eight different choices), and presbycusis

equation (there are four choices). A final click completes the process. A computer program prints out the percentage loss summaries immediately. But there is not even a hint of how much disability this represents for the individual who generated the data.

Masking

In my years at the Baylor College of Medicine in Houston, my otologic colleagues sometimes talked about surgeons who operated on dead ears, thinking they were pure conductive losses because the opposite, normal-hearing ear was not masked when the dead ear was tested audiometrically. Bunch was very much aware of this kind of problem, as well as the need for masking the better ear whenever one encountered a substantial interaural asymmetry.

Noting that a masking noise was not available on all commercial audiometers, he suggested using a Bárány noise apparatus or even the sound from an alarm clock. His final recommendation, however, would meet with some opposition from present-day inspectors and regulators:

> One who is mechanically inclined can construct an effective masking device by attaching a telephone receiver to a small toy transformer and connecting the transformer to a wall plug of the ordinary 60-cycle house current. (Bunch, 1943).

Please do not try this at home!

Audiometric Technique

In Bunch's time, it was usual to seek threshold by systematically lowering the level of a continuous test tone until it was no longer heard, then increasing the level until the continuous tone was heard again. Indeed, Bunch's original pitch range audiometer, constructed during his

PhD degree program at Iowa, had a motor-driven oscillator, providing a continuously changing frequency across the entire range of testing. It anticipated, in this regard, the original automatic audiometer of Békésy in 1947 and the Grason-Stadler E800 automatic audiometer in 1958. The tonal level could also be swept continuously from high-to-low and from low-to-high. Bunch's training in psychology had made him acutely aware of the importance of attention when attempting to measure any kind of threshold. He included, therefore, an interrupter switch so that the test tone could be turned off as the level was changed from step-to-step. The fact that the control was labeled "interrupter" rather than "tone on" suggests, however, that in those early days of audiometry, the bias was toward a tone-on most of the time rather than a tone-off most of the time. As more experience was gained, Bunch realized that the onset of a sound is necessary to mobilize attention. In his words:

> The threshold of auditory acuity is the faintest sound which the listener can hear, not when he is reading a newspaper or enjoying a nap, but when his attention is focused on that particular sound (Bunch, 1943).

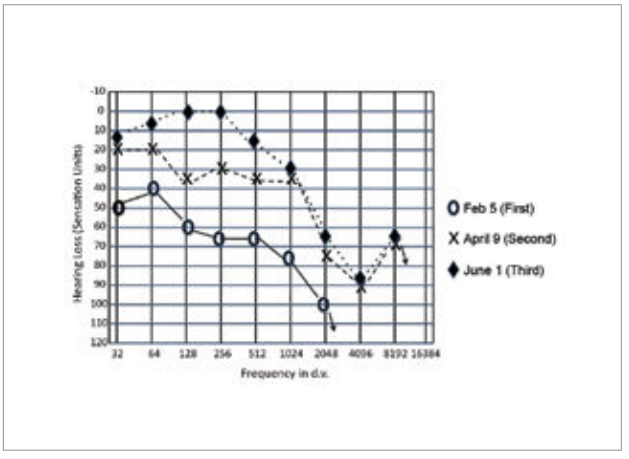


FIGURE 1: SUCCESSIVE AUDIOGRAMS SHOWING PARTIAL RECOVERY OF HEARING OVER A FOUR-MONTH PERIOD IN A 20-YEAR-OLD WOMAN WITH UNILATERAL SUPPURATIVE OTITIS MEDIA (MODIFIED FROM BUNCH, 1943).

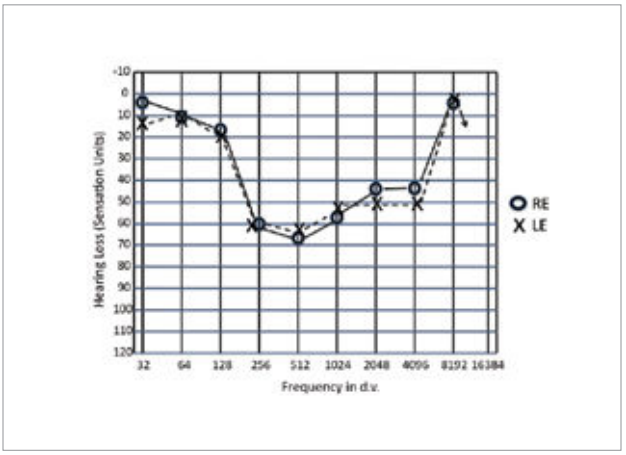


FIGURE 2: "COOKIE BITE" AUDIOGRAMS IN A 26-YEAR-OLD WOMAN WITH SUSPECTED LABYRINTHINE OTOSCLEROSIS.

Conductive Hearing Loss

Prior to the advent of audiometry, there was a long-standing dispute among otologists as to how conductive loss affected the frequency response of the total system. One school insisted that the greatest loss was in the low frequency region, with little or no loss at higher frequencies. The other school insisted that this was wrong, that the greater loss was at the higher frequencies. It is not recorded whether blows

were exchanged, but each school staunchly defended its firm belief. What Bunch learned from his patiently gathered audiograms was that both schools were correct. It depended on the cause of the conductive loss. Anything that increased the stiffness of the ossicular chain, such as otosclerosis, produced greater loss for lows while anything that loaded the system down with more mass produced greater loss for highs.

Bunch went on to show that in some patients there were high-frequency perceptive loss as well as conductive loss. Lacking calibrated bone conduction capability, he nevertheless reasoned it from the fact that, in cases treated for suppurative otitis media, the low tones recovered more rapidly than the highs. One such case is illustrated in FIGURE 1 of his book (modified from Bunch, 1943). Three successive audiograms showing recovery over a four-month period are shown. From these successive contours, Bunch reasoned that there might be a perceptive component in some cases of middle-ear disease. He wrote:

> The striking feature in these records lies in the fact that the recovery in the acuity for low tones took place much more rapidly than that for high. This phenomenon has been interpreted to indicate that a certain portion of the high tone loss was due to secondary involvement of the inner ear (Bunch, 1943).

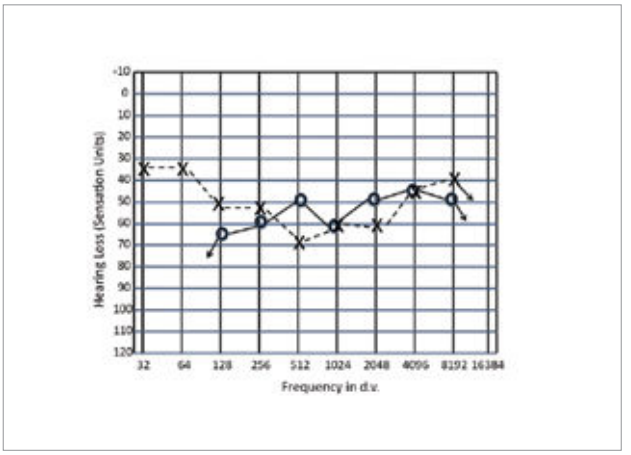


FIGURE 3: AUDIOGRAM OF A 42-YEAR-OLD MAN WHO COULD UNDERSTAND NO SPEECH THROUGH A HEARING AID (MODIFIED FROM BUNCH, 1943).

There had long been speculation among otologists that such secondary perceptive loss might be present in disease processes such as otosclerosis or otitis media, but Bunch was surely the first to demonstrate it audiometrically.

Perceptive Loss

It was generally accepted in otological circles that high-frequency losses tended to be perceptive rather than conductive, but Bunch's audiograms convinced him that there were at least two subtypes—abrupt and gradual. He linked the abrupt drops in the high-frequency range to trauma of some kind, and the gradually sloping losses to aging. Eventually, however, he noted what he believed to be yet a third type of perceptive loss based on the shape of the threshold contour. FIGURE 2 (modified from Bunch, 1943) shows the

> Indeed, Bunch's original pitch range audiometer, constructed during his PhD degree program at Iowa, had a motor-driven oscillator, providing a continuously changing frequency across the entire range of testing.

audiograms of a 26-year-old woman. This is neither a low-frequency nor a high-frequency loss. It extends from 256 d.v. to 4096 d.v. but disappears at very low and very high frequencies. While noting that this unusual shape was rare Bunch insisted that it be catalogued as a third type of perceptive loss. It has since been described as a "cookie bite" audiogram and has been associated with a form of otosclerosis that invades the inner ear while sparing the ossicular chain and stapes footplate. Many also associate the cookie-bite audiogram with congenital hearing loss. Bunch appears to have been the first to observe the "cookie bite" audiometric contour and to suggest its genesis.

If you only test down to 256 d.v., when you do audiograms, you will consistently miss such contours. Bunch thought it important to test as low as 32 d.v. Although thresholds at 32, 64,and 128 d.v. are usually redundant, here is a situation in which they are important to a full audiometric picture.

Hearing Aids

The late 1930s saw a minor revolution in hearing aids, with the introduction of the mini vacuum tube. Now the case could be reduced in size, and the sound quality was substantially improved. Bunch became an enthusiastic fitter, relishing the new insights he gained from interviews with his patients. One such interview, in 1938, reveals the extent to which Bunch sought to understand why some patients were helped less by hearing aids than others. FIGURE 3 (modified from Bunch, 1943) shows the audiograms for the two ears of a 42-year-old man with a relatively flat, bilaterally symmetrical, moderately severe loss. Bunch first suggested that the man procure, on a trial basis, an aid with a flat frequency response fitted to the right ear. The man complied and reported that it was wonderfully helpful. Bunch noted, however, that when he spoke with his back to the patient at a distance of only a few feet, there was no response.

Bunch next thought that sending the amplified signal to both ears, via a Y-cord, might produce a better result. The patient tried this and liked it so much that he purchased the aid. But alas he still could not understand speech when only a few feet from the talker. Bunch now decided that he needed to know more about this hearing loss than the audiograms could convey. He took the sensible step of asking the patient how the various test tones were actually perceived. He found that all tones up to 512 d.v. retained their natural tonal quality and were appropriately ordered in pitch. Surprisingly, however, all tones above 512 d.v. "*sounded alike and had no tonal quality*" (Bunch, 1943). The aid that he had purchased did help him to hear low frequency sounds, like the buzz of an airplane propeller, but he still could understand no speech. Bunch concluded that:

> Cases of this type are undoubtedly quite rare. The nature of the pathology is food for speculation. It is sufficient to say that, had simple speech tests been done, the discrepancy between his audiogram and his ability to understand speech could have been detected, and the patient saved the expense of purchasing a hearing aid which was of no practical value.

Of course, there was no such thing as standardized speech audiometry in 1938, but Bunch was prescient in anticipating the need for such measures.

We can discern, from the account of this patient, the principal reason that Bunch was able to publish so much on so many aspects of hearing loss. He talked to his patients. If they were having trouble he certainly wanted to help them, but beyond that he wanted to know why they were having trouble, and how he could use that knowledge to help future patients with the same complaints. He asked questions and carefully weighed the answers.

Today's students can learn a good deal from a study of C.C. Bunch, the first audiologist, and his remarkable book.

James Jerger, PhD, is the emeritus distinguished scholar-in-residence in the School of Behavioral and Brain Sciences at the University of Texas in Dallas, Texas.

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AN ENCOUNTER WITH KUMBUKA

BY SUMIT DHAR,
MARISSA RAMSIER,
AND CHRISTINE COOK

A PEDIATRIC AUDIOLOGIST AND BIOLOGICAL ANTHROPOLOGIST SHARE THEIR EXPERIENCES AT JACKSONVILLE ZOO AND GARDENS WITH A LOWLAND GORILLA. AFTER 21-YEAR-OLD KUMBUKA ARRIVED AT THE ZOO, STAFF OBSERVED SHE WAS HAVING DIFFICULTIES. EXPERTS PERFORMED A BASIC HEARING SCREENING AS WELL AS OTOACOUSTIC EMMISSIONS AND AUDITORY BRAINSTEM RESPONSE.

Sumit (SD): Thank you, Ms. Christine Cook and Dr. Marissa Ramsier, for agreeing to answer a few questions about your recent experience evaluating the gorilla Kumbuka's hearing and other issues related to primate hearing. Our publication is read primarily by audiologists and others associated with hearing health care. Your expertise and experience will be of great interest to our readers. I am also pleased to report that this conversation about Kumbuka's evaluation will be accompanied by a web feature about primate hearing in general. How about we start with brief introductions? Please tell us a little bit about who you are.

Christine (CC): I am a pediatric audiologist and supervisor of audiology at Nemours Children's Specialty Care in Jacksonville, Florida; I did my undergraduate and graduate studies at Arizona State University. I have been with Nemours for almost 17 years, but have been an audiologist for over 25 years. My interests include early identification of pediatric hearing loss and amplification.

Marissa (MR): I am a biological anthropologist at Humboldt State University in Northern California. I earned my PhD in anthropology at the University of California, Santa Cruz. One of my specialties is sensory ecology, specifically acoustic communication in primates. My colleagues and I have collected data on the hearing sensitivity of more than 30 primate species utilizing the minimally invasive auditory brainstem response method.

SD: A specific question for Professor Ramsier: how did you become interested in evolutionary sensory biology and then primate hearing?

MR: As a graduate student in anthropology at the University of California, Santa Cruz, I enrolled in a graduate seminar titled, *The Evolution of Human Sensory Systems*, by Nathaniel Dominy (now at Dartmouth College), who was to become my collaborator in this line of research. I became interested in the topic when I realized how very little we know about primate auditory sensitivity despite decades of extensive documentation of primate vocalizations—in fact, discussion of how well, if at all, various sounds are received by various primate species is basically absent in most of the literature on primate acoustic communication. I was hooked! I still remember the day I walked into Dominy's office and proposed the topic as the focus on my doctoral research. "It will be a long and challenging road," he said, "but an interesting one." He was right.

SD: Let us switch gears a little bit and talk about Kumbuka and her hearing evaluation. Let's start with a specific question—how did the two of you get pulled into the project? Walk us through the planning process. Any special considerations? Who else was on the team? How did you arrive at the final plan on what would be done, by whom, etc.?

CC: In early 2016, the Jacksonville Zoo and Gardens contacted Christine's department at Nemours and asked if one of their gorillas could be tested in any way due to their suspicion of her having significant hearing loss. Christine contacted the medical director to see if it would be possible for her to do this. He approved. Since Kumbuka would need to be sedated for the hearing testing, we would have to wait until her routine exam scheduled for 2017. In late 2016, the zoo contacted Marissa, having heard about her recent involvement with a similar procedure to test the hearing sensitivity of an orangutan at the Indianapolis Zoo. From there, we determined a date for the procedures that worked for all parties.

Initially Christine thought about doing OAEs, although wondered if an ABR would work with the human equipment. Unfortunately, there wasn't much information about testing hearing in gorillas upon which to base a protocol. At the same time, Marissa contemplated the potential success of her system for gorillas (her system is designed to work with various mammals). In theory, it would work fine with gorillas despite their considerable head size, but she had not yet had the opportunity to develop a protocol and setting based on a normal-hearing gorilla. After a few emails back and forth, we decided that we would compare results with both Christine's clinical system and Marissa's nonhuman primate system. Christine also spoke with Nemours' neuro-otologist, Dr. Drew Horlbeck, and we thought it would be beneficial to have him check Kumbuka's ears to be sure we weren't dealing with any cerumen impaction, as Marissa had encountered this in other nonhuman primates.

The game plan for the day of the procedure was to have Dr. Horlbeck check and clean out the ears, then for Christine to do tympanometry and DPOAEs (and possibly TEOAEs if DPs were present), and then for both Christine and Marissa to run at least a click ABR and compare results. We were limited as to how much time we would have, as Kumbuka was also having other procedures with her routine exam and cardiology. As was suspected, all results strongly suggested that Kumbuka had significant hearing loss in both ears.

SD: Let me back up a little bit. What does a gorilla's hearing range and sensitivity look like?

MR: Good question, and one we wish we could answer more fully. We do know that gorillas are able to detect the range of frequencies present in human speech, as evidenced by their interactions with keepers and researchers and by examining vocalizations of gorillas themselves. One could hypothesize, based on the aforementioned evidence as well as size and phylogeny, that gorillas likely can hear similarly to humans, with perhaps slightly better sensitivity to infrasound. However, there is no

A gorilla being hand fed at the Jacksonville zoo.

direct evidence as to the limits of their hearing range nor the frequencies they are most adept at detecting. To our knowledge, there are no existing comparative data on the auditory sensitivities of normal-hearing gorillas, but this is something we are actively working to resolve. We hope that working with Kumbuka will mark the beginning of this endeavor.

SD: How did the suspicion arise that Kumbuka might have a hearing loss?

CC/MR: The staff who routinely work with Kumbuka observed that her behavior was unusual compared to the other gorillas, and she was having difficulty socializing with the others. If someone or something was not in her line of sight, she often did not react or know what was going on in her surroundings. They also observed some behaviors very similar to those of humans with hearing loss. Kumbuka tended to be very vocal and louder compared to the other gorillas. She startled easily when other gorillas would approach out of her peripheral vision, sometimes prompting aggression. They also observed that Kumbuka would respond to things that created vibrations.

SD: Was anything done to formally evaluate Kumbuka's hearing before you arrived on the scene?

CC: Not that we are aware of. However, zoo staff felt her symptoms were consistent with those reported by other facilities working with hearing impaired primates. They had also mentioned that some of the "hyperactive" behaviors noted by her previous zoo may have been consistent with Kumbuka needing to compensate for using senses other than hearing to explore her environment.

SD: Given Kumbuka's age and other known facts about her health, could you anticipate the outcome of the investigation?

CC: Her age and health did not necessarily help us anticipate the outcome. Age-related hearing loss is documented in nonhuman primates, but gorillas are long-lived animals, and thus Kumbuka is not particularly old. We are not aware of anything in particular regarding her health that would lead to hearing loss. The observations of the staff that has been working with Kumbuka since she arrived at the Jacksonville Zoo were really the main influence for the anticipated outcome.

SD: Great. Walk us through the day and process, if you will. We have seen the many videos that are on various sites. Were there remarkable, unexpected, or funny events?

Both ABR and OAE responses were absent in both of Kumbuka's ears.

CC/MR: From both of our perspectives, the two weeks prior to the actual procedure day were a whirlwind of events. What started out as being thrilled just to be able to work with the gorilla, turned into a chance to partner with each other and learn from our respective expertise in clinical settings and working with nonhuman primates. The public relations department at Nemours really went above and beyond to produce informative videos of the day at the zoo, as well as the days leading up to it. And with the Today Show picking up the story, it was a chance to reach a large audience to raise awareness about hearing loss and how we can determine this in humans and nonhuman primates.

> "WE WERE SURPRISED BY HOW DIFFICULT IT WAS TO ACTUALLY SEE INTO THE EAR CANAL WITH THE OTOSCOPE, AS WELL AS WITH THE LIGHTED MICROSCOPIC GLASSES."

On the day of the procedure, we both arrived early and were able to check our equipment to see if the two systems would be compatible with respect to the electrodes, which they were. There were a couple hours of preparation, getting the room and staff wired up for sound and video, and also prepared for the various scheduled procedures. Both of us, as well as Dr. Horlbeck, were wearing Go Pro cameras, with hopes of getting some up-close footage. The procedure room was set and ready to go with many people on hand. We were all definitely out of our element with cameras and microphones following our every move…not something we normally encounter in the clinic or out in the field!!

After a pre-procedure briefing by zoo veterinarians as to the order all of the procedures for the day and some precautionary dos and don'ts, Kumbuka would be arriving

shortly from her enclosure, already sedated for transport. It took a team of people to carry Kumbuka in from the transport van to the procedure room and to get her up on the table. Things moved fairly quickly from there. As the anesthesia team got Kumbuka situated and stabilized on the table, it became apparent that Kumbuka would be on her side and not on her back as we are used to for ABRs both in human patients and normally with nonhuman ABRs. Since the goal was to not have Kumbuka under anesthesia for longer than two hours, the vet asked that we start our testing while they were doing other procedures and they would work around us and would keep quiet while testing was underway. We would do one side then the other when they were ready to turn her.

Dr. Horlbeck quickly got to work cleaning out any debris from Kumbuka's left ear canal. We were surprised by how difficult it was to actually see into the ear canal with the otoscope, as well as with the lighted microscopic glasses Dr. Horlbeck was using. There is an incredible amount of hair in the ear, which made visualization of the tympanic membrane challenging. Some cerumen was removed and it was time for Christine to do tympanometry. Using a basic handheld tympanometer, a normal tympanogram was obtained on the first ear. Since middle ear function appeared to be normal, OAEs were next. Christine started with DPOAEs and had some difficulty with noise in the room. Marissa had noise cancelling headphones which we placed over the ear and that allowed the OAEs to run beautifully. Of course, no OAEs were detected and now it was time to move onto the ABRs. We decided to start with Christine's human equipment first, using Marissa's needle electrodes. Although Kumbuka was still on her side, there was enough space to reach under Kumbuka's neck to get to the other ear and Marissa was able to place all three needle electrodes properly. We held our breath as Christine checked impedance, and all three electrodes read 3 ohms and we were good to go. Christine ran a click ABR at the equipment limits with insert earphones and saw no response. She adjusted gain a bit to see if this would change anything on the screen, but still no waveform was evident. She tried a couple tone bursts just to confirm and again saw no response.

Next, we quickly plugged the electrodes into Marissa's cable and she ran her ABR next, focusing on mid-range frequencies that, based on humans and other primates, should have evoked a strong response even if (typically high-frequency) hearing loss was present. Again, no response was evident. Since the ABR equipment designed for humans had not been run on a primate, and the primate system has not typically been utilized clinically, it was reassuring to see that both systems yielded the same results. Kumbuka was repositioned and we turned our attention to the right ear. We repeated the same

Tympanometry yielded normal results, but audiologist Christine Cook had to work her way through an hair and cerumen in the ear canal.

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*Rechargeable Hearing Aids Preference Survey, Hearing Tracker, August 2016

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sequence of testing and encountered the same results for all tests completed. One unexpected event that did occur during the procedure, was that Kumbuka began to stir when they were turning her over and all non-essential people were quickly escorted out of the procedure room until the anesthesia team got her settled again. Other than that, the procedures went according to plan, again with both of our results in agreement.

SD: So, Kumbuka did not have any appreciable ABR peaks suggesting a pretty large hearing loss.

CC/MR: That is correct. And although there are no baseline data to confirm protocols and settings for gorillas, the complete lack of response is highly suggestive of substantial hearing loss given that the ABR method works for humans, all other nonhuman primates tested with the system used, and also has been used on species across the animal kingdom. Furthermore, prior to starting the ABR testing, the absent DPOAEs suggested there was most likely at least a moderate hearing loss in both ears.

SD: Is there any way to know what kind of hearing loss she has?

CC: Well, since her tympanometry and otoscopic exam were normal, we can surmise that her loss is likely to be sensorineural in nature. Although we won't be able to determine cause or if the loss is congenital, the observations from Jacksonville Zoo's and previous zoos' staff tend to suggest this could possible by a long-standing hearing loss for Kumbuka.

> "MOST PRIMATE SPECIES EMIT AT LEAST SEVERAL DISTINCT VOCALIZATIONS THAT ARE USED TO COMMUNICATE SPECIFIC THINGS, SUCH AS THE PRESENCE OF FOOD SOURCES, THREATS, GROUP LOCATION AND MOVEMENT, AND POTENTIAL MATES."

SD: Is the zoo planning on doing anything different with Kumbuka going forward?

CC/MR: We hope that confirming what looks like a significant hearing loss for Kumbuka will help the staff to continue to modify their behaviors and interactions by using more visual cues during training. One of their goals is to help Kumbuka assimilate better socially with the other gorillas and eventually be bred.

SD: How does this experience with Kumbuka teach this or other zoos about primates or, for that matter, other aging animals?

CC/MR: This experience with Kumbuka is important for numerous reasons. First, it highlights the fact that hearing loss is something to which nonhuman primates and other animals are susceptible, not only as these animals age, but possibly also due to genetics, noise exposure, and pathologies. Luckily, the keepers and staff at the Jacksonville Zoo and Gardens recognized Kumbuka's situation and were already taking appropriate steps to ensure she received the most appropriate care. The zoo staff also pointed out, and we agree, that although the results of this experience will not likely result in correcting Kumbuka's impairment, that raising awareness may result in other facilities noticing behaviors that may indicate hearing loss, which could improve the situation for other animals. The media coverage of this event already have alerted us to the interesting fact that other facilities have previously attempted to utilize similar methods to test the hearing of gorillas, highlighting that there exists both a need and an interest in developing baseline hearing data and testing protocols for gorillas and other animals so that potential hearing loss can be fully evaluated. This is important not only for captive care, but also for beginning an exploration of potential causes for hearing loss in these and other animals, so that steps can be taken to prevent or minimize preventable cases such as those traced to noise exposure or even other medical interventions.

SD: Professor Ramsier, has this experience opened any new research questions for you that you plan to pursue?

MR: Yes. There is a small but growing number of researchers focused on furthering our understanding of hearing in nonhuman primates, not only for captive management, but for understanding how hearing and habitat acoustics may affect the survival of highly endangered primates in the wild. This experience highlights that there is a lot to be done, but also a lot of support for doing so. Although the results of the tests we ran suggest that Kumbuka has substantial hearing loss, this was my first chance to see these data in a gorilla. Establishing baseline data and best settings for working with gorillas and other animals will be an important next step. It was also fantastic to have the opportunity to work with Christine and Dr. Horlbeck. I am eager to further explore the use of otoacoustic emissions in nonhuman primates as an alternative or addition to ABR data – in addition to its use here, there are existing data that suggest it is a promising approach. It is also always a pleasure to work with facilities that take pride in excellent captive care and show a strong interest in species survival plans and conservation.

SD: Ms. Cook, are you going to do anything differently in your practice because of this experience?

CC: Not necessarily in my day to day practice, but I will always treasure the experience I had with testing a gorilla with the same equipment and protocols used with the children I see every day at Nemours. I look forward to partnering with Marissa again to test another gorilla in the future, if the opportunity arises.

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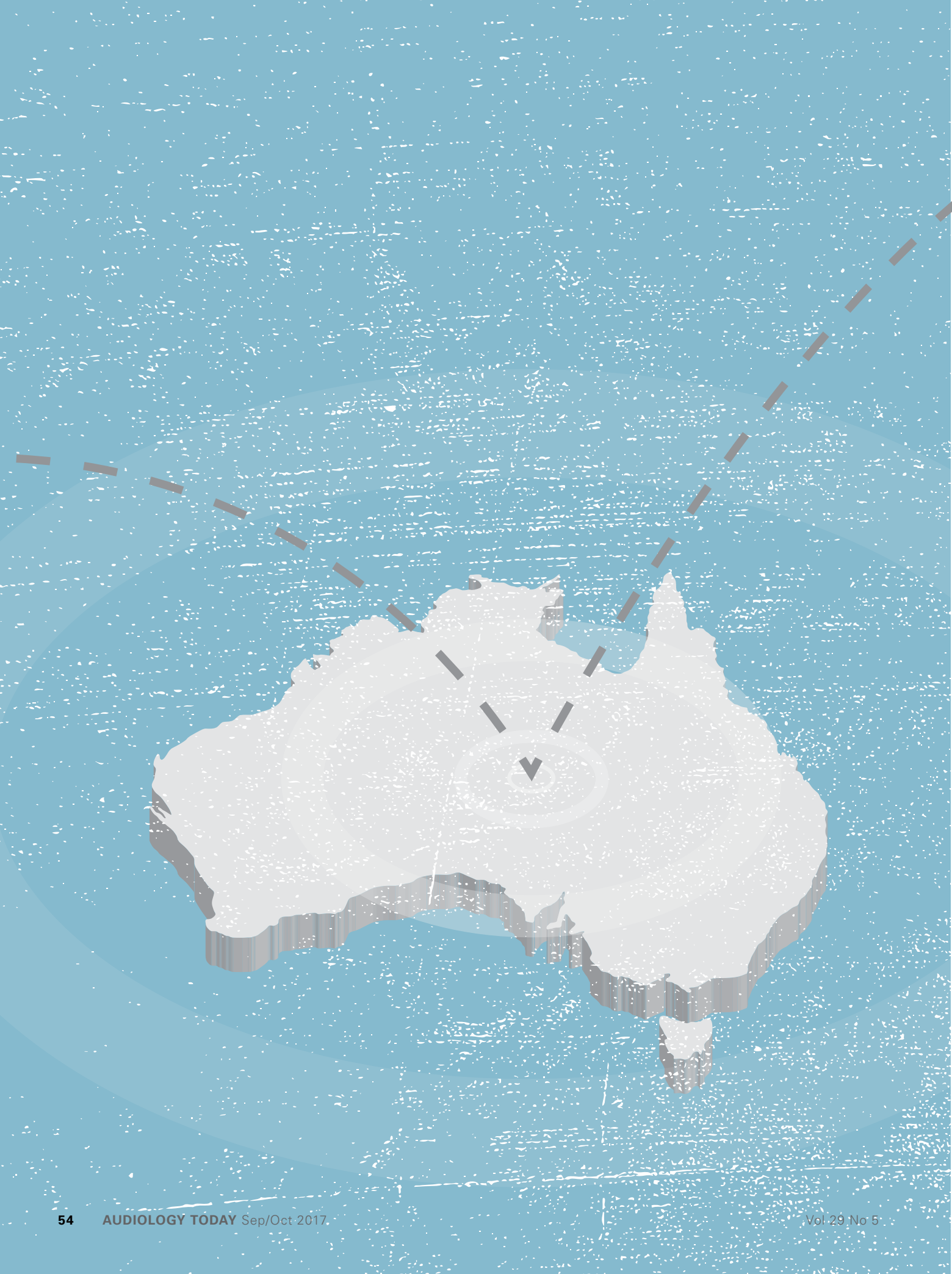

A Hearing Report from Australia

BY KING CHUNG, MARIAH CHEYNEY, JOHN NEWALL, AND LACI LE

Two faculty members, 11 doctor of audiology students, one undergraduate student, and two high school students travel to Australia for a two-week humanitarian service program to provide hearing services to students in a first-nations community.

Australia is the sixth largest country in the world by land mass, but is the 53rd largest by population. The majority of Australians reside in the coastal borders of the country, leaving the midland or "outback" with far fewer. Australia's population contains a large number of settlers from various countries as well as the first-nations peoples, i.e., Aboriginal Australians and Torres Strait Islanders, who arrived at the mainland and islands more than 50,000 years ago. The first-nations population take great pride in their unique and vibrant culture. Unlike the general Australian population, their resources are limited, including access to audiological services.

Audiology Educational System

Audiology and audiological education have a relatively long history in Australia, beginning in 1948 with the establishment of the Commonwealth Acoustic Laboratories (now the National Acoustic Laboratories and Australian Hearing). This organization was involved in training audiologists in the early years (Upfold, 2008) and continues to be internationally recognized as a premiere research organization. Programs to train master's level audiologists were established in the late 1970s and since 1999 have been a requirement for professional body membership. Australia has one the highest ratios of audiologists-per-capita in the world, with a smaller number of audiological technicians (audiometrists) also providing hearing aid related and diagnostic services to the community (Goulios and Patuzzi, 2008).

Currently, there are six masters' programs across Australia. They include Macquarie University, University of Queensland, Flinders University, Melbourne University, La Trobe University, and the University of Western Australia, which offers a joint master/PhD in clinical audiology. Masters' programs in Australia require graduates to meet a set of clinical competencies and to have completed 250 hours of clinical experience by graduation. There is also a requirement to complete a one-year clinical internship if the graduate wishes to provide services to clients in the large government-funded sector. During this year, interns are prepared for independent clinical practice under the supervision of an experienced audiologist. Once the internship is completed, new graduates are certified either by Audiology Australia or Australian College of Audiology, both are professional organizations representing audiologists in Australia.

At present, there is no national registration process for audiologists in Australia, meaning the profession is largely self-regulated. Although not mandatory, most audiologists belong to one or more professional bodies. These professional bodies provide the certification needed to access a key government-funded reimbursement program: the Australian Government Hearing Services Program. Audiologists must also complete a continuing professional development program to continue to hold this certification. In addition, all members of Audiology Australia are subject to the Code of Conduct (http://audiology.asn.au/index.cfm/consumers/code-of-conduct/) set forth by Audiology Australia (AudA), the Australian College of Audiology (ACAud), and the Hearing Aid Audiometrist Society of Australia (HAASA).

The Heart of Hearing Group (from left front) Kaitlin Anderson, Sarah Albelaikhi, Laci Le, Sara Graves, Sarah Du, Samantha Johnson, Jennifer Hwang, Felix Zheng, and Dr. King Chung. From left back: Kara Combs, Andrea Arns, Nada Alrawdhan, Cassie Bedore, Dr. Mariah Cheyney, Maria Matrosova, Daniel Romero, and Jacalyn Segura.

Hearing Health-Care System

The Australian hearing health-care system has elements of parallel (public and private system are available for the same service), co-payment (publicly-funded subsidies for services with private co-payments), and group-based (certain groups in the population are eligible for publicly funded services) approaches. The Office of Hearing Services provides public funding for diagnostic and rehabilitative services to those holding pension, disability, or veterans cards. These services are delivered by a range of government-approved providers. In the public system, when an audiologist identifies an individual with medically treatable condition(s), the audiologist would refer the individual to a general practitioner, who, in turn, refers the individual to an otolaryngologist. Otolaryngologists in Australia provide medical hearing care in a model similar to the United States.

Australian Hearing, a government founded statutory authority, is the largest provider of government-funded hearing services, and manages the hearing health-care needs of highly populated Australian cities as well as the sparsely populated areas of the country. The services are provided by government employees, and include audiologists as well as administrative professionals. Over 500 "hearing branches" are in place throughout the country, and each branch provides audiological diagnostic and treatment support as well as education and training to health-care professionals.

Australian Hearing is unique in that the program not only provides equipment and technology for those with hearing loss, but also has a strong focus on patient self-education, quality of life, and assuring skills are sufficient for independent living and maintenance of occupation. All children in Australia are eligible for hearing aid services through the age of 26, and adults are eligible if they can apply for a hearing-services voucher. Adult first-nations peoples over the age of 50 are eligible for hearing services and amplification devices, covering a vast majority of individuals in need of amplification. Funding for diagnostic audiological services can also be accessed by all Australian residents, with a co-payment needed in some cases, through the public health scheme—Medicare. For those individuals who are not eligible for assistance, a reduced cost hearing aid may be available through a hearing aid bank.

> In contrast to the widespread adoption of newborn hearing screening, universal school hearing screening programs are not common in Australia. Late-onset, progressive, fluctuating, or mild hearing losses missed by newborn screening are thus often only identified incidentally by caregivers or teachers.

Australian Hearing provides outreach services to more than 200 communities in urban, rural, and remote areas, and monitors individuals with chronic otitis media and other hearing disorders. Outreach services include hearing tests, advice,

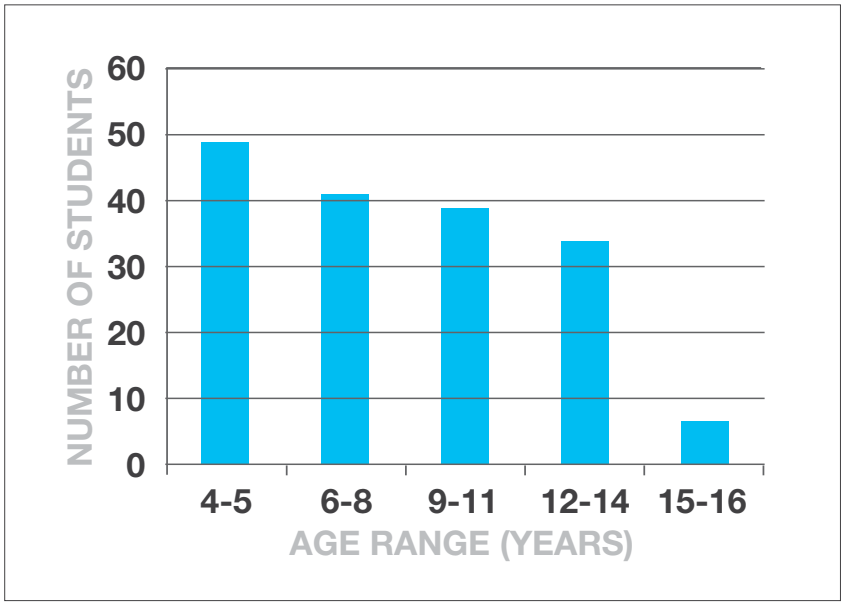

FIGURE 1. The age range of the first-nation children we tested.

and education on hearing loss, hearing awareness, and staff training, resulting in a program focused on patient care and preventative services, a concept so important in communities where environmental conditions can negatively affect hearing health.

Most states and territories have newborn hearing screening programs. These services are usually provided by public hospitals at no cost to the individual. The loss-to-follow-up rate is usually very low (Barker et al, 2013). Australian Hearing is the single national organization providing the majority of hearing rehabilitation services for children. Once identified with hearing loss, the Australian children receive some of the best, earliest, and most equitable services in the world once they are identified.

In contrast to the widespread adoption of newborn hearing screening, universal school hearing screening programs are not common in Australia. Late-onset, progressive, fluctuating, or mild hearing loss missed by newborn hearing screening are thus often only identified incidentally by caregivers or teachers. Staff who received training in hearing screening refer children in need of further assessment and/or amplification to Australian Hearing, which relies on referrals but does not provide regular school hearing screenings to identify children with hearing loss or with needs for medical intervention.

Although multiple government initiatives have been launched to provide financial assistance and health-care services, people in first-nation communities often depend on outreach services provided by non-profit organizations to receive hearing screenings, and primary ear and hearing care, especially those living in small, remote villages. Although the number of outreach visits by Australian Hearing and non-profit organizations continues to increase every year, access to otolaryngologists for medical check-ups or follow-ups is still challenging for many communities.

General health of first-nations people is poor when compared to the non-first-nations people. Life expectancy, a key health indicator, shows an approximately 10-year gap between the first-nations and non-first-nations Australians. Further, measures of infant mortality, another key indicator of health, suggest an incidence of 6/1000 in the first-nations community, compared to 4/1000 in the non-first-nations community (AIHW, 2014). The disparity exists across a wide range of health conditions, and first-nations people living in remote communities suffer a disproportionate burden of disease (Vos et al, 2009).

The incidence of otitis media is very high among the first-nations people, especially among children. As of 2014, the prevalence of otitis media within the total population of first-nations peoples is up to 15

percent (Khoo, 2014). They are the only population in developed countries having chronic suppurative otitis media prevalence rate exceeding four percent, the rate the World Health Organization defines as a massive public hearing-health problem requiring urgent attention. The origin of the high prevalence is not completely understood. Impedance data from the neonate population suggest genetics might be at play. Neonates who failed a test battery consisting of high-frequency tympanometry and distortion product otoacoustic emissions (DPOAEs) had lower wideband absorbance than those who passed, and first-nations neonates had lower wideband absorbance compared to Caucasian neonates (Aithal et al, 2014). High prevalence of otitis media among first-nations children combined with the lack of accessible medical services create a long-term hearing health-care problem that cannot be ignored.

Clinical Findings in a Queensland First-Nation Community

Two faculty members, eight doctor of audiology (AuD) students, and one undergraduate student from Northern Illinois University, three AuD students from University of Illinois Urbana—Champaign, and two high-school students, traveled to Australia for a humanitarian service program. During the two-week endeavor, we tested the hearing of students in a first-nations community in Far North Queensland, toured the Australian Hearing Hub, and visited local landmarks.

Our mission was to provide hearing services to students in a first-nations community. The hearing screening protocol included otoscopy, tympanometry, and DPOAEs at 1.5, 2, 3, 4, 5, and 6 kHz. As first-nations communities are known to have very high incidence of otitis media and hearing loss (Burns and Thompson, 2013), our screening protocol also included pure-tone testing so that we would not miss those with a low-frequency hearing loss. If the student had wax accumulation, the pure-tone tests were conducted after cerumen management.

We tested a total of 170 students aged between four and 16 years (FIGURE 1). Despite the prior knowledge that children in first nations have earlier onset, more frequent, more severe, and more persistent otitis media than the greater Australian population (Queensland Government, 2016), we were surprised to find that approximately 44.7 percent of the students failed the screening (FIGURE 2). Twenty-two (12.9 percent) students had normal hearing but had wax accumulation that would warrant professional cerumen management. Another nine students (5.3 percent) had wax accumulation and co-existing middle-ear disorders as documented by Type B Tympanograms. We removed the wax from 27 students and could not

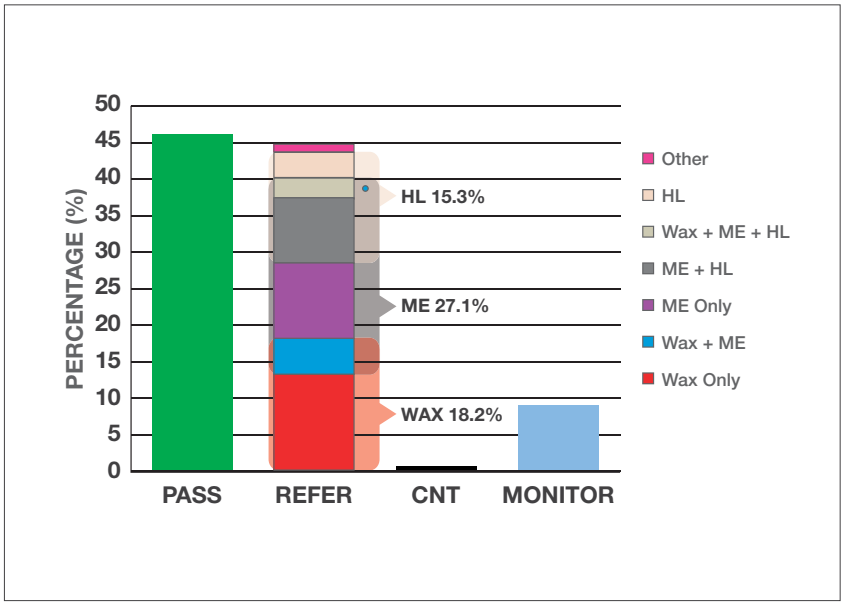

FIGURE 2. The hearing screening test results of the first-nations students (total N=170).

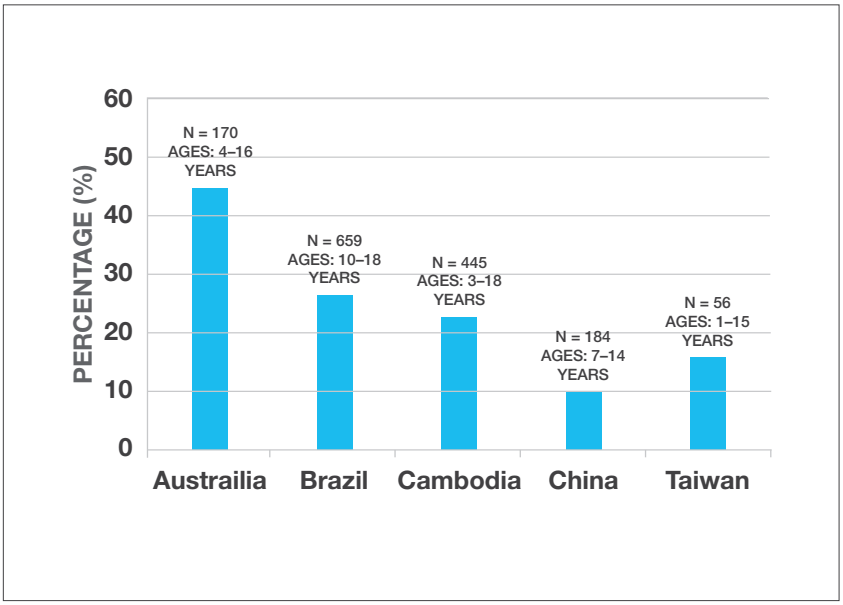

FIGURE 3. The referral rates for children tested in different countries/governing regions.

complete the work on four other students because they were absent from school, did not cooperate, or have deep-seated wax that needed further treatment to remove completely.

Middle-ear disorder is also a prominent problem among students in the first-nations community. In addition to the nine students with middle-ear disorders and wax accumulation, another 17 students had Type B tympanograms (10 percent, ME only in FIGURE 2), 15 students had Type B tympanograms with hearing loss (8.8 percent, ME+HL), and five students had Type B tympanograms, hearing loss, and wax accumulation (2.9 percent, Wax+ME+HL). As wax was removed before further testing, all of the Type B tympanograms are accompanied by either large ear canal volumes, i.e., perforated ear drums, or normal ear canal volumes, i.e., limited ear drum mobility likely due to middle-ear effusion or other middle-ear disorders. Fifteen students (8.8 percent) had Type C tympanograms, indicating they had negative middle-ear pressure, which could be a precursor to or a remnant of middle-ear problems.

Two students are classified as "other" because their hearing thresholds were within the normal limits and Type A tympanograms, but we removed a white paper clump near one child's ear drum and saw a white mass behind the ear drum of the other child.

We visited the first-nations community in August, which is the winter season in the southern hemisphere. The average temperature was between 20 and 30°C (i.e., 68-86°F). Discounting other co-existing disorders, approximately 27.1 percent of students had active middle-ear disorders or perforated ear drums, i.e., sum of ME = "ME only" + "ME+HL" + "Wax +ME" + "Wax+ME+HL" in Figure 2, and approximately 15.3 percent had some degree of hearing loss, i.e., sum of HL = "ME+HL" + "HL." The overall referral rate of 44.7 percent is so far the highest referral rate among children with normal development we tested during our annual humanitarian research and service trips in the last several years (FIGURE 3):

A. Aboriginal Orphans in *Taiwan* (Chung et al, 2010)

B. Students in an impoverished area in *Brazil* (Chung et al, 2013)

C. Students in a poor mountainous area in *China* (Chung et al, 2014)

D. Children in rural areas in *Cambodia* (Chung, 2016)

Integrating our knowledge of the children's living conditions and the clinical findings from multiple countries/governing regions, we wondered if the extremely high referral rate in the first-nations community in Australia cannot be entirely due to the students' social economic status or general living conditions. The Cambodian children

we tested lived in rural areas that were accessible only through dirt roads. Most of them lived in orphanages or in huts without doors. Yet the Cambodian referral rate was only 22.9 percent, which is significantly lower than that of the first-nations children with a comparable age range. These findings are consistent with the notion that first-nations children may be genetically pre-disposed to be more prone to have otitis media (Bhutta, 2015) and the lack of community hearing-care services exacerbated the problem.

Additionally, one of the staff in the school told us that some students have normal development and are otherwise competent, yet have a lot of difficulties understanding speech when there is background noise. The staff was wondering if we could test the students. The symptoms he described reminded us of the link between chronic otitis media and central auditory processing disorder (CAPD). Concerned about the validity of CAPD tests developed in North America for testing the first-nations students because of the American accents, we inquired the standard procedures for identifying and treating CAPD in Australia. Currently, such service is provided by private clinics for a fee of $400 AUD/person. The good news is that the research division of Australia Hearing, National Acoustics Laboratories recently have developed LiSN-S and LiSN-U for CAPD screening. Studies are underway to determine their applications to first-nations children.

Conclusion

Our ground contact, Mark Mitchell, hearing health project officer of the Queensland Aboriginal and Islander Health Council, used our clinical findings to advocate for the provision of ENT services for the first-nations community we visited. We hope the availability of hearing health-care service will not only help treat children with ear and hearing disorders, but also prevent the development of hearing loss or central auditory processing disorders that are associated with chronic otitis media.

More information on the Northern Illinois University Heart of Hearing Humanitarian Service Program to Australia can be found at www.researchgate.net/publication/311983053_2016_Heart_of_Hearing_Trip to Australia.

King Chung, PhD, is an associate professor of audiology at Northern Illinois University in DeKalb; Illinois. Mariah Cheyney, AuD, is a clinical assistant professor of audiology at Northern Illinois University in DeKalb, Illinois; John Newall, PhD, coordinates the master of clinical audiology program at Macquarie University in Sydney, Australia; and Laci Le is a third-year AuD student at University of Illinois in Urbana Champaign, Illinois.

> "Although multiple government initiatives have been launched to provide financial assistance and health-care services, resources in the first-nations communities are still limited compared to the general Australian population."

Acknowledgments

Sincere thanks to students at Northern Illinois University, University of Illinois Urbana-Champaign, Naperville North High School, and Stuart Country Day School, who worked very diligently during the two-week program. We also want to thank Mark Mitchell at QAIHC for providing ground support, Savana Bulmer at Gurriny Yealamucka Health Services and the school for coordinating the hearing screening, and Belinda Lesina and Clara Manhood at Australian Hearing at Cairns for following up with the students we identified during the trip. Many thanks to Gurriny Yealamucka Health Services and Australian Hearing Hub and Cochlear Corporation for giving us a tour of their facilities, to Etymotic Research for lending equipment, and to Oticon, USA for their generous monetary support.

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Of Heroes and Hearing

By Melissa A. Papesh and Stephanie R. Pesa

WELCOME BACK to an ongoing series that challenges the audiologist to identify a diagnosis for a case study based on a listing and explanation of the nonaudiology and audiology test battery. It is important to recognize that a hearing loss or a vestibular issue may be a manifestation of a systemic illness. Being part of the diagnostic and treatment "team" is a crucial role of the audiologist. Securing the definitive diagnosis is rewarding for the audiologist and enhances patient hearing and balance health care and, often, quality of life.

CSI Reference Guide: Visit www.audiology.org and search keywords "CSI Reference Guide."

Case History

A male veteran (MV) in his early 50s recently presented to a Veterans Affairs (VA) audiology clinic stating that he had noticed a substantial decrease in his hearing ability following his military service. The MV served in the Navy and in the Army National Guard for a total of 32 years, which included many domestic and international service missions. While deployed to Iraq, he was exposed to a total of three bomb blasts, the most severe of which occurred approximately six years prior to presenting in the VA audiology clinic.

During this incident, the MV was in a military convoy that struck an improvised explosive device concealed in the roadway. The blast exposure left him with a traumatic brain injury (TBI), as well as ruptured discs and vertebrae throughout his spine, a broken nose, permanent damage to his right arm and knee, and loss of multiple teeth. For this encounter, he was awarded a medal for exemplary service in combat. At the time, he was seen in the VA audiology clinic, he had previously undergone cognitive rehabilitation treatment through polytrauma and speech language pathology services for concerns related to cognitive difficulties.

His additional medical diagnoses included post-traumatic stress disorder (PTSD), anxiety, obstructive sleep apnea, chronic headaches, type 2 diabetes mellitus, sensitivity to light, colitis, chronic knee and back pain, hyperlipidemia, weakness and numbness of the right arm, and coronary heart disease. An intake interview revealed that his primary auditory complaints included difficulty hearing in noise and in the presence of multiple talkers, difficulty understanding on the telephone, problems paying attention to people speaking, and confusing similar-sounding words.

Audiometric Findings

- Otoscopy: clear ear canals with intact ear drums
- Tympanometry: normal ear canal volume, middle-ear pressure, and admittance in both ears (Type A)
- Acoustic Reflexes: contralateral and ipsilateral reflexes were present and within normal limits in both ears

- DPOAEs: present from 750 to 8000 Hz in both ears
- Audiogram: see FIGURE 1; SRT was consistent with pure-tone thresholds
- WRS: 100 percent correct in both ears

What Would You Do?

At first, the complaints reported by the MV were consistent with cochlear hearing loss likely due to the onset of presbycusis, noise exposure due to military service, or a combination of the two. However, the findings of normal audiometric thresholds along with present DPOAEs and excellent word recognition in quiet would appear to argue against cochlear dysfunction. Could the patient's complaints be due to lingering cognitive dysfunction, or perhaps from chronic emotional disturbances? Had his previous blast exposures and TBI caused damage to his central auditory system?

To evaluate these options, the MV was subsequently seen for additional testing for central auditory processing disorder (CAPD). Results of the SCAN-A (Keith, 1995), the Words-in-Noise Test (Wilson et al, 2007), and the QuickSIN (Killion et al, 2004) all revealed performance within the normal range, as did the Staggered Spondaic Words Test (Katz and Smith, 1991) and the Dichotic Digits Test (Musiek, 1983). However, tests of temporal processing, including the Gaps-in-Noise Test (Musiek et al, 2005) and the Pitch Pattern Test (Musiek, 1994), revealed abnormally poor performance in both the left and right ears.

These tests were followed up with an additional measure evaluating the MV's ability to benefit from having a spatial separation between a target talker and two distracting talkers. When the distracting talkers are located at 45-degree angles to the left and right of the listener and the target talker is directly in front, the average normally hearing listener can understand the target talker at a level approximately 10 dB below the level needed to achieve the same performance when the target and distracting talkers are co-located directly in front of the listener (Gallun et al, 2013). However, the MV received only a 3dB benefit from having the 45-degree spatial separation.

Behavioral CAPD test measures can be confounded by non-auditory variables such as distraction, poor concentration, or lack of effort on the part of the patient. Thus, behavioral testing was complimented with objective electrophysiological test measures. One of these measures included obtaining passive auditory cortical responses to a gaps-in-noise paradigm similar to the behavioral test paradigm. The stimuli consisted of a broadband noise with embedded silent gaps varying in duration from two to 20 ms. During this test, the patient was seated in a recliner inside a sound attenuating chamber and instructed to watch a closed-captioned movie and ignore the auditory stimuli that were presented over insert earphones. The results of this measure, shown in FIGURE 2, confirm that the MV's auditory cortex is

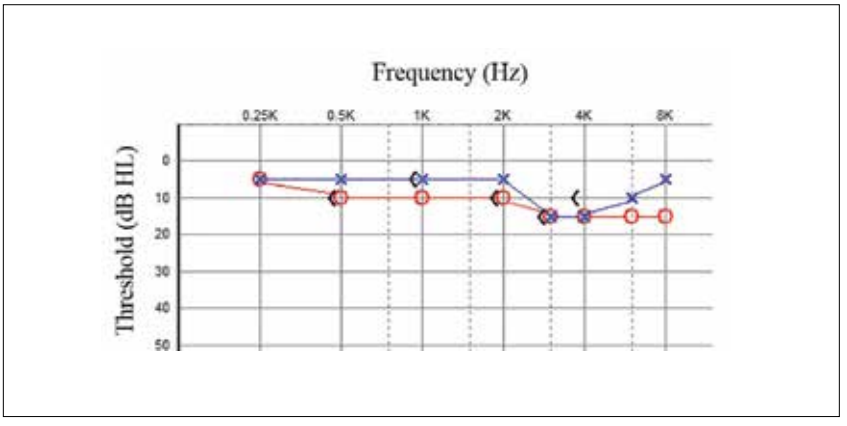

FIGURE 1. Audiometric findings completed at initial evaluation.

considerably less sensitive to even large gap durations when compared to a normally hearing listener of the same age but with no history of blast exposure or head injury.

Lastly, an auditory oddball P300 test was administered. For this test, the stimuli consisted of a 500 Hz "standard" tone presented during 80 percent of trials and a 1000 Hz "rare" tone presented randomly during 20 percent of trials. The MV was asked to silently count the number of deviant tones presented. Electrophysiological responses from the MV, as well as an age-matched individual with no history of blast exposure or head injury, are shown in FIGURE 3. Although the MV could achieve the same level of accuracy at detecting the deviant tone as the non-injured patient, the P300 response clearly demonstrates that his brain is processing changes in sound over time in a vastly different way.

Diagnosis: Putting It All Together

MV was subsequently identified as having difficulties with temporal processing. This conclusion was based upon his poor performance on the behavioral Gaps-in-Noise Test and the Pitch Pattern Test, and was augmented by electrophysiological findings indicating poor sensitivity to changes in sounds over time. The addition of electrophysiological test measures also helped to rule out the possibility that the MV's poor performance was due to cognitive deficits or to reduced effort. His reduced temporal acuity likely accounted for poor recognition of auditory temporal patterns, as well as lack of benefit that most listeners receive from spatial separation between talkers of interest and competing background sounds.

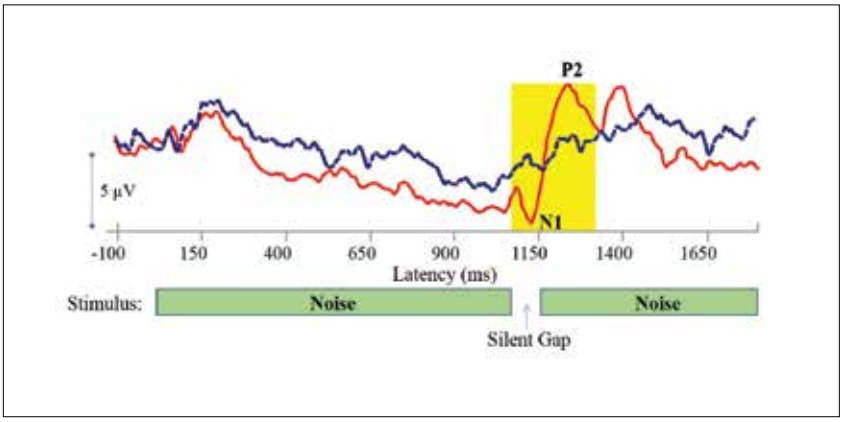

FIGURE 2. ELECTROPHYSIOLOGICAL RESPONSES TO A GAPS-IN-NOISE STIMULUS CONTAINING A 20 MSEC SILENT GAP EMBEDDED WITHIN A BROADBAND NOISE. The yellow area highlights the response of the auditory cortex (N1 and P2) to the presentation of the silent gap. Notice that while the age- and hearing-matched patient with no history of head injury (solid red line) shows a robust cortical response to the 20 msec gap, patient MV (broken blue line) shows a markedly reduced response.

The temporal smearing of sounds resulting from poor temporal acuity was likely responsible for his reported difficulties hearing in complex listening environments, on the telephone, as well as his confusion of various word sounds. Notice that these deficits would have been missed if the clinician had used only standard tests of speech-in-noise understanding that do not include natural features such as spatial separations between sound sources.

Course of Care

Overall, the MV's temporal processing impairment indicates that he requires a higher signal-to-noise ratio to understand speech in difficult listening environments compared to what a non-injured patient with normal hearing sensitivity would likely need to achieve the same performance. To improve his functioning, his audiologist prescribed a two-pronged approach including the use of low amplification hearing aids with a Bluetooth streaming system, as well as counseling on environmental modifications and communication strategies to improve signal-to-noise ratios during listening. The low-amplification hearing aids, including directional microphones and the Bluetooth assistive listening accessories would, in practice, increase the intensity of speech

without commensurate increases in the intensity of competing sounds. This effect would putatively assist in difficult listening conditions. Communication strategies discussed included counseling on the types of environments that are most conducive to listening, making his communication partners aware of his hearing issues and asking them to get his attention before speaking to him, conversing in well-lit areas where his communication partner's face could be easily seen, and recommendations to schedule important meetings earlier in the day when he is well rested and less likely to be fatigued.

Eight weeks later, the MV was seen for a follow-up visit. Datalogging indicated that he was consistently wearing his hearing aids an average of eight hours per day and he described them to be "perfect." Although it may be assumed that patients with normal hearing thresholds and PTSD would be poor candidates for low-amplification hearing aids due to their increased startle response, the MV stated that he felt his hearing aids provided him a better sense of his surroundings which reduced his overall level of anxiety and propensity to be startled. His responses on International Outcome Inventory for Hearing Aids (IOI-HA) (see TABLE 1) and the Client Oriented Scale of Improvement revealed significant improvements in his function in background noise and while on the telephone, and he reported less fatigue at the end of the day because it was "easier to hear." His family had also noted positive improvements, not only in his communication abilities but also regarding reduced frustration. Two years later, the MV is still wearing his hearing aids regularly.

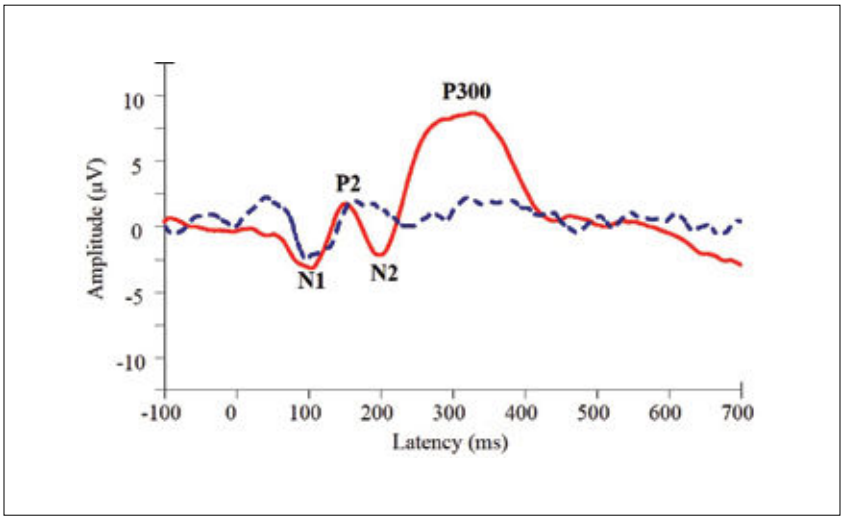

FIGURE 3. ELECTROPHYSIOLOGICAL RESPONSES TO THE RARE STIMULUS OF A P300 ODDBALL PARADIGM. While the age- and hearing-matched control patient with no history of TBI (solid red line) demonstrates a robust P300 response to the rare 1000 Hz tone, notice that the P300 response obtained in patient MV (broken blue line) is absent.

Discussion

MV's perceived benefit from hearing aids likely stems from multiple factors. First, the noise reduction algorithms and directional microphones employed by the hearing aids, as well as use of the Bluetooth assistive listening accessories probably resulted in a more favorable signal-to-noise ratio, thus reducing the MV's listening effort. Second, the nonlinear fast-acting compression characteristics of modern hearing aids, which favor amplification of low-level signals compared to higher level signals, have been shown to facilitate discrimination of speech signals from noise background and to improve listeners' ability to "listen in the dips" of fluctuating background noise (Gatehouse et al, 2003). Lastly, multiple lines of evidence suggest that higher signal levels and lower levels of background noise are associated with more robust and synchronous neural firing in response to auditory stimuli (Dallos and Cheatham, 1976; Billings et al, 2009). Thus, it is conceivable that the MV's temporal processing issues were somewhat ameliorated by the slight increase in signal levels provided by the mild amplification of the hearing aid as well as the improved signal-to-noise ratio.

QUESTION	RESPONSE
Hours of daily HA use?	four to eight hours
Perceived benefit of HA in difficult listening situations?	helped very much
Remaining problems in difficult situations even with HA?	slight difficulty
HA worth the trouble?	very much worth it
With HA use, does hearing loss still affect things you can do?	affected slightly
With HA use, were others bothered by your hearing loss?	bothered slightly
HA effects on enjoyment of life?	very much better

TABLE 1: INTERNATIONAL OUTCOME INVENTORY FOR HEARING AIDS (ABBREVIATED QUESTIONS).

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What Is the Social Security Number Removal Initiative and What Does It Mean to Audiologists?

By Sandra Reams

Unfortunately, identity theft is something that we all need to think about these days. Medical identity theft is defined by the Office of the Inspector General (OIG) as when someone steals personal information such as a name, a social security number, or a Medicare number and uses it to obtain medical care, purchase drugs, or submit fake claims to Medicare (https://oig.hhs.gov/fraud/medical-id-theft/).

The Bureau of Justice Statistics reports that identity theft of the elderly increased to 2.6 million people in 2014 (www.bjs.gov/index.cfm?ty=tp&tid=42). Some of us are old enough to remember when it was common to see our social security numbers on our driver's licenses. Now, that is an outdated practice.

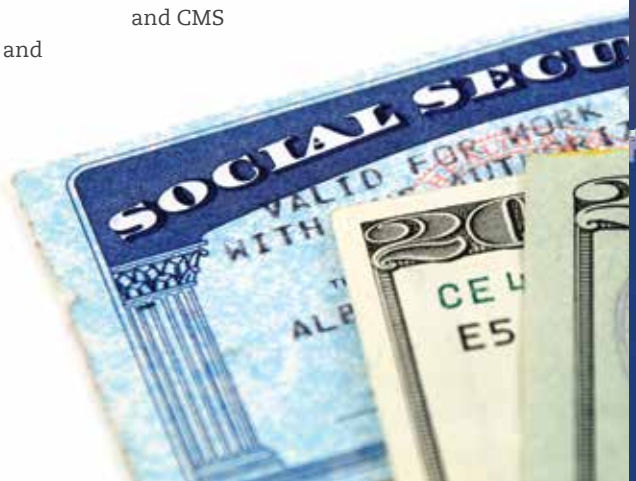
With the implementation of the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA), the Centers for Medicare and Medicaid Services (CMS) are now required to remove the social security numbers from the cards of their beneficiaries. This initiative falls under the "Protecting the Integrity of Medicare" provision of the MACRA law. This is an important measure because individuals are advised by CMS to always carry their member cards with them. Having social security numbers on Medicare cards opens seniors up for identity theft if their wallet is lost or stolen. Along with prohibiting the use of social security numbers on Medicare cards, there is also language in MACRA for CMS to consider the use of smart cards. This serves to fight against medical identity theft for people with Medicare, and to help protect both essential Medicare funding (by reducing fraudulent claims) and private health care and financial information of the beneficiaries. This process is something that has been asked of CMS for more than a decade.

What will CMS use to replace the social security numbers? The new Medicare Beneficiary Identifier (MBI) will replace the old numbers. The new numbers will have 11 characters. The current Health Insurance Claim Number (HICN) can have up to 11 numbers but is usually the member's social security number followed by a letter. The new MBI will not be based upon the member's social security number. It will be a unique, randomly assigned identifier comprised of numbers and letters. The new MBI will have some consistent properties:

- The second, fifth, eighth, and ninth character will always be a letter.
- The first, fourth, seventh, tenth, and eleventh character will always be a number.
- The third and sixth will be a letter or a number.

As you can imagine, this entire process is a daunting task for CMS and for those of us whom CMS refers to as its business partners. First, CMS must assign these new MBIs to approximately 150 million individuals, including 57.7 million active and 90 million deceased or archived individuals. Next, CMS expects to start mailing out new cards to members in April 2018, with plans to replace all cards by April 2019. Lastly, CMS and those of us who use these numbers to bill and process claims need to update and modify our systems to accommodate the new numbers.

What does this mean to CMS and to us, its business partners? The good news is that there will be a 21-month transition period during which CMS plans to test its systems. CMS will not be testing fee-for-service claims processing because providers will be able to use either the HICN or MBI during the transition period and CMS



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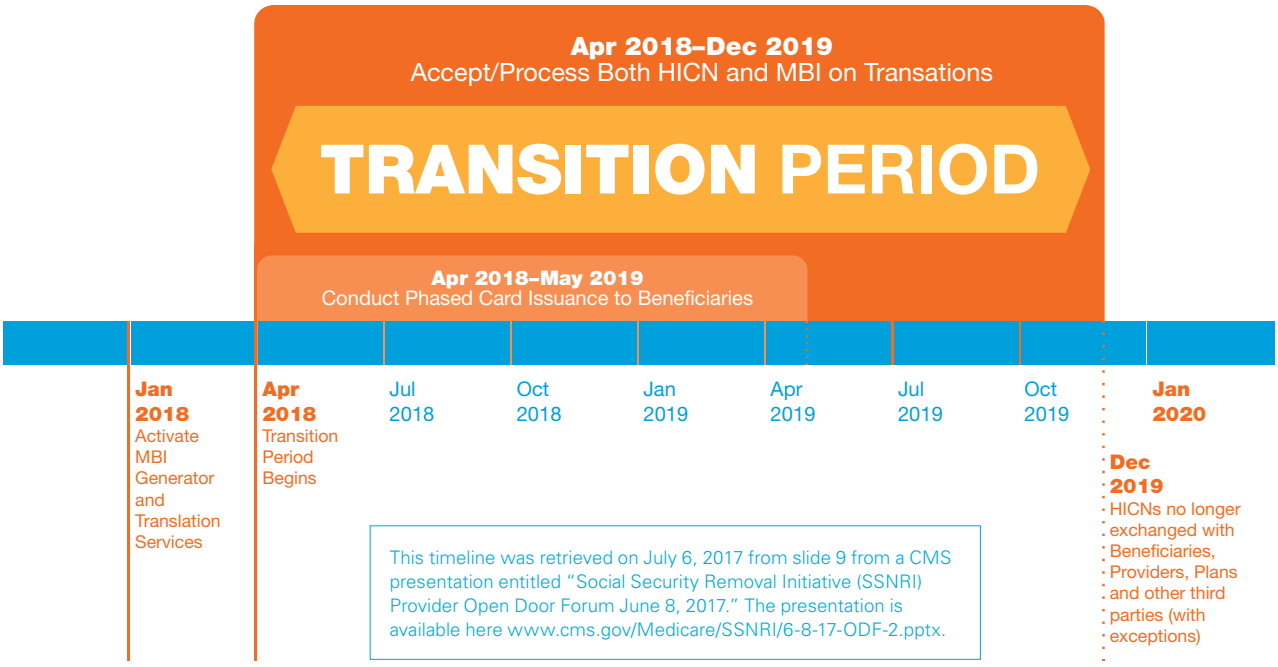

believes providers can use the live claims processing to make adjustments as needed. This transition period will begin no sooner than April 2018 and extend through December 2019. After January 2020, HICNs will not be accepted and MBIs must be used with a few exceptions. Please refer to www.cms.gov/medicare/ssnri for further information. One other piece of good news is that providers, including audiologists, will be able to sign up to look up an individual's MBI through a secure tool.

What should we do now? Audiologists should prepare by working with office software and billing vendors to make sure software systems will be able to handle the transition, including testing the systems to be sure they work correctly with the new identifiers. We should also verify that our patients' addresses match the addresses that Medicare has on record. If a discrepancy is found, ask patients or a representative to contact Social Security to update the address. Other tips and resources can be found on the Academy's website by searching keywords "New Medicare Cards" and/or by looking under the Reimbursement section of the website. Another resource is www.cms.gov/medicare/ssnri/providers/providers.html. As we get closer to April 2018, remind all of your Medicare patients to bring their new Medicare cards to their appointments.

What will happen during the transition period? Once we enter April 2018, your office software must be able to accept and use the MBI. During the transition period of April 2018 through December 2019, either the old HICN or the new MBI may be used to submit claims. Starting October 2018, if the HICN is submitted on a claim then CMS will enter BOTH the HICN and the MBI on the remittance advice form.

CMS says that it is committed to making sure that this change to more secure identifiers is successful. With the joint preparation by CMS and our office systems, it should go well. The Academy will do its best to assist its members during this transition. We also encourage you to sign up for the Medicare Learning Network newsletter to receive updates and current information from CMS.

Sandra Reams, AuD, Board Certified in Audiology, is an audiologist at Spaulding Rehabilitation Hospital in East Sandwich, Massachusetts, and serves as a member of the Coding and Reimbursement Committee.

Welcome New Foundation Trustees



The American Academy of Audiology Foundation is pleased and proud to announce the new Class of 2020 board of trustees, who will serve as the Foundation's governing body and custodians of the Foundation's mission.

Pictured from left to right: Shilpi Banerjee, PhD; Jane Kukula, AuD; and Mindy Brudereck Tanner, AuD, will be serving three-year terms as trustees to advance the Foundation's mission of promoting philanthropy in support of research, education, and public awareness in audiology and the hearing and balance sciences.

The Foundation Board also elected the following as executive officers for 2017–2019: Brenna Carroll, AuD, Chair; Georgine Ray, AuD, Secretary/Treasurer; and Eileen Rall, AuD, Development Committee Chair.

Thank you all for your commitment and dedication. We look forward to growth under your leadership and service.

The American Institute of Balance Celebrates Its 25th Anniversary

By Kimberly Barry

This year, the American Institute of Balance (AIB), one of the country's largest multi-specialty centers for the evaluation and treatment of dizziness and balance disorders, celebrates its 25th Anniversary. Founded in 1992 by Academy Past President Richard E. Gans, PhD, AIB has been a world-wide leader in patient care, research, and professional education in equilibrium disorders, evaluating and treating over 100,000 patients and educating over 7,000 audiologists, physical therapists, and physicians worldwide.

AIB's commitment to evidence-based care in balance health is reflected in their professional development programs and their support of innovative research. AIB helped fund the research of five recipients of the American Academy of Audiology Foundation's Vestibular Research Grant program, most recently that of two-time awardee, Choongheon Lee, doctoral student at the University of Nebraska—Lincoln for his project on the effects of pharmacologic agents on mammalian vestibular function. Lee, who will soon begin a post-doctoral position in the department of otolaryngology at the University of Washington, commented, "Research support in audiology is crucial in the pursuit of a lifetime of discovery and learning to help patients with hearing loss, dizziness, and communication disorders."

The Foundation applauds Dr. Gans and the AIB for their support of the Foundation's programs and initiatives, especially in the area of vestibular research.

Kimberly Barry, AuD, is a trustee of the American Academy of Audiology Foundation.

Negotiating Salary as a New Graduate and Its Impact on the Future of Our Profession

By Joshua Huppert

A Toxic Debt-to-Income Ratio

The fact that many students are now taking on upward of $100,000 in student loan debt to earn their doctoral degree in audiology (AuD) is no secret (Thompson, 2016). I, unfortunately, know this reality all too well, as I graduated in August 2017 with just shy of $250,000 in student loan debt—$180,000 of which was solely from my AuD. Based upon the amount of my accumulated student loan debt and the present interest rates associated with my loans, my monthly loan payments are projected to be between $1,300 and $1,500 per month, which, if I may point out, is equal to a mortgage on a relatively sizeable home.

Truth be told, the financial burden of maintaining such an exorbitant amount of debt would seem far less daunting if the student return on investment (i.e., starting salary) were commensurate with the actual cost of the degree earned; this, sadly, is not currently the case with the AuD.

Let's Talk Numbers

According to the U.S. Bureau of Labor Statistics, the mean annual wage for an audiologist was estimated to be $79,290 in 2016, regardless of an individual's experience in the field (U.S. Bureau of Labor Statistics, 2016); however, as disclosed in a similar study published by the American Academy of Audiology (the Academy), which conveniently accounts for total compensation across several demographic and institutional variables (e.g., years of experience, primary work setting, geographic region, etc.), the mean annual wage for an audiologist with an AuD and one to three years of experience was only estimated to be $69,845 in 2016 (Compensation and Benefits Report, 2016).

I was shocked that in my own job search, I did not see salaries near these reported means. I did not receive a single offer, before or after negotiations, at or above the estimated salary proposed by the Academy report, even at highly reputable institutions. What's more disappointing is that I know of students who were offered (and accepted) starting salaries as low as $48,000. Personally, I find these low salaries not only staggering, but insulting.

A Striking Realization Triggers a Necessary Call to Action

Thankfully, amidst my own negotiations for job offers, I was given insight into the hiring process, which I had not previously considered. In fact, this advice served as the very catalyst for this article. That insight was as follows,

> Starting salaries, especially for newly-graduated audiologists are low because students do not negotiate; in fact, you are the first student, at least in my tenure here at the hospital, to ever negotiate salary.

This window into the hiring process left me speechless; to be frank, I simply could not believe the words that were just spoken to me. Upon doing some research of my own following this revelation, I soon came to realize that this discouraging "trend" was not unique to audiology, but occurred across several disciplines.

According to a survey of nearly 8,000 college grads by NerdWallet, a personal finance website, and Looksharp, a job site targeting new graduates, only 38 percent of new college graduates who started working in the past three years negotiated their job offers (Marte, 2015). This caused a stark realization: we have no one to blame but ourselves.

A lack of negotiation of salary constitutes a key reason we cannot earn salaries that are more commensurate with the degree we will eventually or currently hold. Without striving to negotiate higher pay, we perpetuate these low wages not only for ourselves, but for new audiologists and those professionals who will come after us. These professionals who will become our colleagues are also hampered by our unwillingness to undertake courageous discussions and demand salaries that reflect our education and expertise. This realization, which puts so much weight on

the current generation of newly-graduated audiologists, also empowers these individuals to initiate the much-needed change.

I Got a Job Offer! Now What?

According to John Lees, a UK-based career strategist and author of *The Success Code*, "When an employer extends a job offer to you, he has, in essence 'fallen in love' with you… and psychologically committed to you" (Knight, 2017). Rejoice in the moments following your initial (and subsequent) job offer, as you have overcome one of—if not *the*—most difficult hurdle in the employment search process—getting the job.

Not only is it validating to be considered the most qualified candidate for a position, but it also greatly eases the underlying anxiety and fear of unemployment many new graduates face post-graduation. Lees goes on to say, "[Because you received the offer and the employer has determined that they want YOU]…you have more 'leverage' to shape your job description and improve your salary and benefits package" (Knight, 2017).

Now, however, comes the tough decision—deciding whether or not to accept the position. As you consider this decision, Jeff Weiss, president of Lesley University and author of the Harvard Business Review's *Guide to Negotiating*, advises you to "think about the offer in terms of your development, your quality of life, the variety of work you do, and finally, the trade-offs you are willing to make" (Knight, 2017).

In addition to Weiss' wisdom, I have included some helpful tips below to consider specific to negotiating salary and associated perks/benefits, particularly if you cannot reach your ideal salary. The tips offered below are certainly not "foolproof," as there are exceptions to every rule; however, I do hope they provide insight and perspective for new graduates to consider as they begin applying for and considering offers moving forward.

Helpful Tips to Consider When Negotiating

Know and Be Able to Articulate Your Value

As Lees mentioned, once you receive an offer from an employer, you have been "chosen" as the individual who they feel is best-suited for the job. In essence, the employer saw something unique and is invested in you over all other candidates interviewed for the position; use this to your advantage. You are in an exceptional position as this employer has already begun to invest in you. Ensure that investment can be valuable to you both by negotiating a sustainable salary that will encourage you to stay with this employer.

Talk about what you have done, and more importantly, what you *can do* for the employer based upon the experience you've gained throughout the course of your graduate program, specifically in your internship and externship experiences. Most clinical facilities have future goals for projects/programs that will help to improve current protocols and patient flow through the clinic and/or provide some aspect of patient care that is not currently available. After asking about or looking into some of the employer's goals, consider how you—from the experience you have gained—can help to contribute to or even lead some of these opportunities for future growth.

Note that this requires you to know your prospective employer well. Think forward toward this step in negotiations in earlier phases, such as the interview, to begin gathering these valuable insights. Not only will this make sure that you are well-prepared to negotiate a competitive and appropriate salary, it will also help you to become more intimately familiar with the organization to which you're applying. For example, perhaps the site is looking to expand upon or develop a new specialty program due to an identified need for services that are not currently available. Conveniently, you had exposure to said specialty during your externship and, based upon that experience, could offer valuable insight into better ensuring the program's success moving forward.

Showing interest in current and future initiatives and attempting to offer possible solutions not only demonstrates your initiative, value, and skills in problem-solving, but it also shows your willingness to collaborate with others which is inevitable and essential in thriving clinical settings, as you have likely seen during your clinical placements.

Research Salaries

In addition to using the salary information available on the U.S. Bureau of Labor Statistics and provided in the Academy Compensation and Benefits Report, also consider browsing sites like Payscale.com, Glassdoor.com, or Salary.com. As you're researching, be mindful of the fact that salaries often vary by state (some more dramatically than others) due to costs of living, supply/demand for jobs, etc.

I recommend either saving or printing out the salary data collected, as you may be asked to present your findings during negotiations. Also, consider reaching out to and utilizing your professional networks (e.g., other students, newly-graduated professionals, seasoned professionals, faculty, friends, colleagues, acquaintances, etc.), as these individuals may be willing to offer valuable insight

based upon their own experiences, particularly if they happen to be employed in a setting similar to that which you aspire to work.

Be courteous and respectful in your approach to discussions regarding salary, as some may consider this topic to be somewhat confidential. For example, instead of directly asking an individual to reveal his/her personal salary, you might ask, "What would you consider a reasonable salary for a newly graduated audiologist at (insert specific site and/or setting here)?"

Lastly, ask for a salary towards the top of the projected range based upon your experience, job setting, etc., as the employer will most certainly counter down from that value, and, if possible, ask for a very specific number. According to researchers at Columbia Business School, "when employees use a more precise number in their initial negotiation request, they are more likely to get a final offer closer to that which they initially wanted" (Muse, 2014).

It's Not Just About the Money

Rejection is something we all struggle to accept, as it toys with our internal confidence and self-validation, all of which have been influenced by the fact that society has "trained" us to believe that the word "no" is finite. Instead, consider the word "no" to be a catalyst through which conversation can ensue, as a true negotiation does not commence until there is actually something to *negotiate*.

That being said, understand that most salary negotiations will involve a tennis match of counter offers between you and the employer as you work collaboratively to settle on a number that satisfies you, and is also feasible for the employer. It is important to recognize that some employers have more flexibility in negotiating salary than others. For example, private practice settings generally have more flexibility because there are less "channels" through which the negotiations have to pass through before an alternative offer can be made and/or finalized.

By contrast, large institutions, namely, major medical centers, universities, etc., typically have less room for salary negotiations due to salary "ceilings" established by executive administration and/or internal equity within the department, which is a departmental policy that essentially ensures fair pay based upon professional experience, tenure within the establishment, and contributions between employees within the same department/organization. For this reason, if you cannot attain the desired salary you initially had in mind, there are many other aspects (i.e., perks) of the position that you can negotiate to help increase the overall value of the offer being made, many of which most employers tend to exhibit more flexibility with.

With this in mind, consider inquiring about obtaining moving expenses should the position be out of the state in which you currently reside, extra vacation time/additional time-off, the option to work remotely, a sign-on bonus, preference of schedule and/or flexibility in the types of appointments added to your schedule, a different title, and/or in some cases, alternative health benefits packages.

Finally, it is equally important at the beginning of negotiations that you also consider what you are willing to walk away from, as there may be other opportunities that will be better able to accommodate your needs professionally and financially. Trust that everything that is meant to happen, will, as difficult as that may be to believe at times: with diligence, it all works out in the end.

May the Force of Negotiations Be with You

In closing, I hope you find the information provided throughout the course of this article to be insightful as you go forth and become the audiologists of the future.

I also hope that it helps to instill within you a courage to hold bold conversations moving forward, particularly when they have potential to impact the future of our profession and how we, as audiologists, are viewed and respected as independent, doctoring-level professionals.

If we want to truly be seen as *the* primary providers of hearing and balance health care, we need to start taking ownership of our profession and helping both other professionals and the public understand the scope of our practice, the services we provide, and how those services help to positively increase patient quality of life.

Personally, I think this begins with a pointed petition to be respected and compensated for the education we earned, as we are truly, based upon the highly-specialized training we received, *the* expert authority of the ear. As the next generation of audiologists, the horizon is truly ours to shape as we see fit. So, I say we start thinking about what audiology *could be*, instead of what it presently is. Then, and only then, will our "ideal" audiology become a reality.

Joshua Huppert, AuD, is a pediatric audiologist at Children's Hospital of Colorado in Aurora, Colorado, and immediate past president of the Student Academy of Audiology (SAA).

New Members of the Student Academy of Audiology

Mariana Castle
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Megan Jacobs
Kelsey Mount
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Courtney Roth
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Haley Washowich

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Tinnitus Management: ABA's Newest Certificate Holder Program Launching this Fall!

Great Opportunities for You!

By Robert M. Traynor

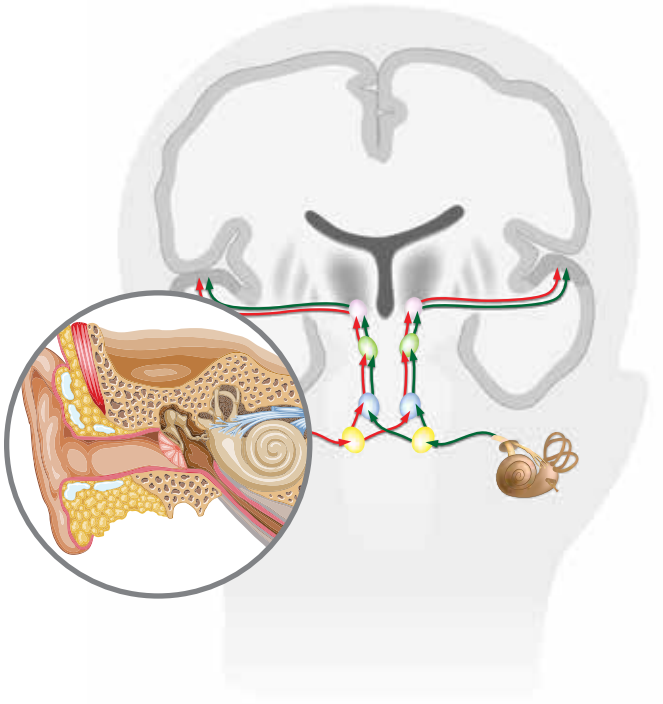
While some audiologists have been conducting tinnitus management since the 1970s, organized clinical tinnitus treatment programs are a relatively new specialty with an evolving literature base. There are clinical guidelines for managing patients with tinnitus; however, there remains a lack of standardization in the field and varied approaches to management.

Last fall, the American Board of Audiology (ABA) began the development of a comprehensive, assessment-based tinnitus management certificate program for audiologists. The new certificate program reflects the current evidence and experience of a diverse group of experts in the field, providing audiologists with the foundational knowledge needed to assess and manage patients with tinnitus and/or decreased sound tolerance (DST). The first part of the program releases this fall, and part two will follow by spring 2018. Successful completion of both parts will lead to the designation of Certificate Holder–Tinnitus Management (CH–TM) by the ABA.

Program Need

The prevalence of tinnitus indicates a need for audiologists to have adequate training in tinnitus management. The 2007 National Health Interview Survey (NHIS) found that among an estimated (SE) 222.1 (3.4) million U.S. adults, 21.4 (3.4) million (9.6 percent [0.3 percent]) experienced tinnitus in the past 12 months. (Bhatt et al, 2016). An earlier analysis of NHANES 1999–2004 survey data found that 25.3 percent (approximately 50 million adults) had experienced some form of tinnitus, with 7.9 percent (approximately 16 million adults) experiencing frequent tinnitus within the past year (Shargorodsky et al, 2010). The prevalence of tinnitus among children and adolescents is somewhat unclear due to variations in study populations and methodologies. The Hearing Health Foundation estimates that about one in three young people have awareness of tinnitus, and about one in 12 experience significant challenges from tinnitus. This data suggests a demand for a significant number of healthcare providers, notably audiologists, to have preparation in tinnitus management.

Anecdotal reports indicate that formal audiology education does not include sufficient content on tinnitus management to provide audiologists with the knowledge or confidence to include tinnitus management in their practices. Tinnitus sessions at the American Academy of Audiology's annual conference have been well-attended, leading to their recording and inclusion in the Academy's eAudiology library. In addition, an ABA needs assessment



survey of 801 audiologists indicated a need for focused training in tinnitus management and a desire for a recognized certificate.

The subject-matter expert (SME) work group convened for the program identified that no other comprehensive and unbiased certificate training program exists in tinnitus management. This work group includes distinguished researchers and clinicians whose collective experience in tinnitus management is represented in the comprehensiveness of the program's content. Contrary to other programs on the market, the CH–TM offers diversity of perspectives in the content and is an affordable option for audiologists seeking additional training in tinnitus management.

The Program

Delivered in a combination of video and interactive online learning through eAudiology, the CH–TM program consists of two parts.

Part One: Foundations of Tinnitus Management, launching this fall, provides an overview of tinnitus management and considerations for integrating tinnitus into an audiology practice. It includes three instructional modules. Part Two: Tinnitus Management Principles in Practice applies these foundational principles to practice. It will include four instructional modules. Completion of both parts earns the Certificate Holder–Tinnitus Management (CH–TM) credential. CEUs will be awarded upon completion of each part.

Part One: Foundations of Tinnitus Management

- **MODULE ONE—TINNITUS DEFINITIONS AND THEORETICAL FOUNDATIONS:** Identifies the different types and characteristics of tinnitus, its prevalence in the United States and globally, and different theories of its etiology.
- **MODULE TWO—MANAGEMENT OF THE PATIENT WITH TINNITUS:** Provides a snapshot of the experience of tinnitus, along with a broad synopsis of assessment approaches, intervention techniques, and practice management considerations.
- **MODULE THREE—BUSINESS MANAGEMENT CONSIDERATIONS:** Discusses the unique demands and business factors associated with integrating tinnitus and DST services into an audiology practice.

Part Two: Tinnitus Management Principles in Practice

- **MODULE FOUR—AUDIOLOGICAL EVALUATION OF THE PATIENT WITH TINNITUS:** Teaches how to assess the results of a comprehensive audiological evaluation as a basis for clinical decision-making for a patient with tinnitus.
- **MODULE FIVE—TINNITUS INTERVENTION TECHNIQUES:** Reviews varied approaches that may be used as intervention for patients with tinnitus, including indications for use, benefits, and limitations of each technique.
- **MODULE SIX—MANAGEMENT PLAN FOR THE PATIENT WITH TINNITUS:** Teaches how to educate and collaborate with patients and other providers to develop a management plan for a patient with tinnitus.
- **MODULE SEVEN—MANAGEMENT OF THE PATIENT WITH DECREASED SOUND TOLERANCE:** Summarizes the characteristics and prevalence of DST along with assessment approaches, treatment techniques, and practice management considerations for these patients.

Each module contains a toolbox with additional resources to enhance content and instruction. Sample toolbox contents may include:

- Tinnitus questionnaires
- Clinical practice guidelines
- Quick reference checklists
- Summaries of research findings
- Case-study synopses

Visit ABA's website at www.boardofaudiology.org for more information.

The Process

The ABA was able to establish a thorough development process, thanks to the program sponsorship support of Phonak Hearing Systems and the additional sponsorship by Plural Publishing. In December 2016, the ABA convened the SME group to draft an outline and the objectives for the critical content needed. Initially conceptualizing the program to include four modules, the ABA modified the program for more modules based on the recommendations of the SME group.

Following the SME group meeting, an instructional designer developed detailed content outlines built around the learning objectives laid out by the SME group. The detailed outlines for each module underwent review by both the SME group and an additional, independent validation panel of audiologists with experience in tinnitus management for

finalization, and then were adapted into a storyboard by the instructional designer. The storyboard also undergoes review before translation into an online, interactive educational module. This full process engages multiple content experts and allows for infusion of diverse perspectives into the program.

Certificate Programs

The ABA has a history in developing comprehensive certificate training programs as the Certificate Holder–Audiology Preceptor (CH–AP) training program launched in 2016. CH–AP is the first standards-driven, certificate training program for audiology preceptors. CH–AP is a voluntary training certificate program with four modules, developed by audiology SMEs. The goal of the program is to create a new cohort of highly-skilled and technically-excellent preceptors who are the best possible coaches, teachers, role models, evaluators, and mentors who will create the best possible field placement experiences for audiology students.

In developing CH–AP, it was recognized how important it is that curriculum content reflects current and best practices in audiology. It is equally important that the modules presented are authentic to clinical settings and spark a clinician's interest. The new tinnitus certificate program's interactive component will ensure that audiologists are engaged and motivated in their e-learning experience. With quality content and interactive design, CH–TM will provide an effective learning experience for audiologists.

Robert M. Traynor, EdD, MBA, Board Certified in Audiology, is adjunct professor of audiology at the University of Florida, the University of Colorado, and the University of Northern Colorado. Dr. Traynor is the 2017 chair of the ABA Board of Governors.

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AMERICAN ACADEMY OF AUDIOLOGY

An Open Letter

Dear Friends,

I want to inform you about a variety of changes that will take place at ACAE at the end of the year.

First, I will be stepping down as ACAE's executive director on December 31, 2017, after close to 15 years. Hard to believe—because it seems like yesterday that I assumed my responsibilities. Even though the road was arduous, it was filled with energy, excitement, and a true sense of purpose. I had incredible support from thoughtful, intelligent, and totally committed ACAE board members over the years. We worked non-stop to promote the quality and rigor that has been the hallmark of ACAE. I was deeply pleased to participate with countless audiology educators and practicing clinicians in raising the bar in educational standards.

To you, the ACAE Corner readers, I thoroughly appreciated the attention you gave to our column, was always eager to hear your comments, and find out what you wanted to read in the future. To the volunteer authors who wrote the ACAE Corner articles, I was grateful for the time, effort, and interest you had in conveying your ideas about higher education accreditation and audiology's future. To one and all, it has been my great pleasure to know such a special group of professionals and I thank you for the privilege of working with you side by side.

As I also reflect on highlights accomplished since January 2003 when we incorporated:

- Maintained a 501(c)(3) status,
- Wrote two sets of doctoral standards,
- Developed the first web-based integrated system for accreditation in the United States and possibly globally,
- Accredited strong doctoral programs in audiology,
- Were and continue to be recognized by the Council for Higher Education Accreditation (CHEA),

- Developed the first stakeholder survey about audiology education,
- Published ACAE Corner in Audiology *Today* since 2009,
- Presented annually at audiology conferences and external organizations,
- Traveled to South Korea to consult with Hallym University's audiology program,
- Developed the annual Clinical Education Forum at the AAA annual conference…
- and… enjoyed every minute.

> "I was deeply pleased to participate with countless audiology educators and practicing clinicians in raising the bar in educational standards."

Second, there is an exciting succession plan for ACAE and I am extraordinarily pleased to be part of making it happen. From the

executive director and Board leadership of the Academy, there has been demonstrable and renewed commitment to supporting ACAE. As a result, the ACAE is moving its operations to the American Academy of Audiology (the Academy) in Reston, Virginia, as of October 1, 2017.

ACAE will maintain its 501(c)(3) status and independence, meaning that all accreditation functions and programmatic decisions will be handled by the ACAE Board of Directors, as it has been since 2003. The new Director of Accreditation will be Meggan Olek, a professional who has been with the Academy for more than 18 years in a variety of positions related to education. She will be responsible for the daily operations of ACAE. Kitty Werner, vice president for Public Affairs at the Academy, will oversee the ACAE. Kitty came to the Academy in 2016 with extensive experience as an executive director in a nurse practitioner organization based in Washington.

The transition of staff leadership in ACAE is currently taking place and will continue through the end of the year. The ACAE Board of Directors are involved in the transition and look forward to taking ACAE to a new level.

As I recall why ACAE began, I think about the leaders in the profession who were passionate about audiology being in control of its own destiny, such as, being in charge of its educational standards and accreditation. The amazing ACAE chairs, Angela Loavenbruck, Ian M. Windmill, Lisa H. Hunter, and the soon-to-be chair Jay W. Hall, have been and continue to be strong leaders and role models for audiology education and the profession. I was honored to have been a part of their efforts. As I leave, I foresee a great strength in ACAE as it continues to grow its programs and promotes further integration of the didactic and clinical aspects of the AuD.

Au revoir, and I anticipate hearing about the success that will be ACAE's future.

Sincerely,

Doris Gordon
Executive Director

October Is National Audiology Awareness Month

Raise Awareness of Audiology and the Profession

By Vicki Bendure

Reaching out to media regarding hearing loss prevention, audiology awareness, and the importance of seeing an audiologist has been an exciting and eye-opening experience for our communications firm. Since we began working with the Academy to assist with media relations a few months ago, we have called on media across the country to pitch stories on hearing loss prevention and audiology. Just over the past few months, it has been an amazing and educational task. Media are excited to learn about audiologists and we're excited to explain the profession, as well as hearing loss prevention and the growing numbers of those experiencing hearing loss and how its impacting multiple generations, not just the aging. It's a case where the challenge has become the opportunity, as many top medical reporters don't really know what audiology is or what audiologists do.

We're on the tip of an iceberg and we need your help. While you may be extremely busy with your practice and may not think that one person can make a difference, you can. By helping to educate the tens of thousands of reporters across the United States, this will, in turn lead to public awareness and education as reporters begin to spread the word.

Social media has demonstrated the impact that sharing information can make as stories go viral across various social media platforms. It is possible to have an impact with social media and reach more people than traditional media ever has. As media moves from print to online, the lines between social media and traditional media have blurred with reporters blogging, Tweeting, and posting links on Instagram and Facebook.

Media stories don't typically just happen. Often, they are inspired by a pitch, a press release, or by a reporter hearing about something from friends, family, a neighbor or through other media channels. Proactive outreach to media is a key component to gaining story placement, brand awareness and positioning. Just one person reaching out to a reporter can make a tremendous difference. And, local media prefer to hear from those in their community. Your business, occupation and patient stories are of great interest to everyone around you, including the media.

One of the best ways to build awareness about you, your practice, and/or patient base is through story placements in local media outlets. This is not advertising, it's editorial which has 10 times more credibility than an advertisement, depending on how you measure—even in this era of "fake news."

As National Audiology Awareness Month approaches in October, you

should leverage the opportunity to promote your profession, your business, audiology, and hearing health. The Academy has developed a public relations tool kit that includes fact sheets and information on media outreach as well as templates that you can customize and edit for your own market. Local media typically prefer to cover businesses and experts within the community. These are outlets that are also most likely targeted at your prime stakeholder base.

To develop a successful campaign, first draft a plan. Decide what you'd like to accomplish with media outreach and plan to execute your strategy well in advance. Online outlets need two to three weeks, print magazines and monthlies need anywhere from three to nine months (start now for 2018 coverage if you're targeting longer lead print magazines). Fortunately, many magazines also have online coverage and that can happen quickly (allow two to three weeks lead time as a courtesy).

If you want to be most effective, think beyond media and social media coverage and consider partnering with an entity in the community and holding a special event or providing hearing checks for a population of the community that is in need. This may be a senior citizens center, a school, a local church, or synagogue. You may want to give a talk at a local school or community center on hearing loss prevention. If you're giving a talk, you might want to have a patient or two join you and tell their stories. If you decide to hold an event open to the public, let the media know well in advance so they can publicize it. You'll want to provide a "Calendar Release" that has all of the details—who, what, when, where (exact address location of event), and any other details. You can also make it an event on Facebook and track how many people are attending.

> **"One of the best ways to build awareness about you, your practice, and/or patient base is through story placements in local media outlets."**

If you do hold an event, invite the media to attend (be sure to get permission from the location where you're holding the event and any participants). This is to get actual media coverage of the event and is different from sending out the calendar listing information above. To get media to attend, you'll want to send a media advisory. Just like the calendar listing, a media advisory contains the information for who, what, when and where. If patients are involved, make sure they're willing to speak with media and let media know that you'll have patients. You can invite local health and wellness reporters and writers. Invite local television and radio outlets that have news. You may also want to pitch your local TV stations to see if any of them will have you in-studio as an interview guest. If so, you can talk about National Audiology Awareness

Month, the importance of seeing an audiologist, the profession and hearing health.

Even if you don't have an event, you can pitch the TV stations to see if they'll take you as an in-studio guest. Pitch them 2–3 weeks ahead of when you'd like to go on. Pitch local radio too, if they have news segments. Many markets have all news stations, NPR affiliate stations and local outlets that will do interviews. Some television stations have health reporters. If your local station has a health reporter, call him/her and see if they'd be interested in visiting your practice and doing a story on hearing health. In this case, the reporter would come out and tape a segment. Call your local health print and online reporters to see if they'd be interested in coming out and spending time with you to do a hearing health feature story. Between aging baby boomers and the wave of millennials—all dealing with hearing loss, there is greater interest in telling the story. Use statistics to get media interested and emphasize the growing number of those living with hearing loss. You can then tell your story and provide solutions for the public.

Patient stories are always of interest so be sure to line up one or two patients who are willing to speak with media and let the media know that they're available when you pitch them. If you specialize in one particular sector (infants, children, etc.), gear your pitch around your area of expertise. Because most coverage winds up online no matter what its initial format, the benefit in providing search engine optimization when potential patients are searching for hearing loss prevention or solutions is significant in bringing those needing help to your door. Be sure to post good information on your social media channels as well. As coverage comes in, use it on all of your social media channels to further broaden the audience reach.

Remember that it takes more than $50 million annually to launch an effective national consumer campaign and become a "household word." Without those types of resources, a grassroots campaign can be as effective if we all work together.

Vicki Bendure is president of Bendure Communications, Inc. If you have questions or need additional information, please e-mail her at vicki@bendurepr.com.

Vicki will also be conducting a Public Relations Media Training Workshop at AAA 2018 in Nashville, Tennessee, on Wednesday, April 18. For more details, visit, www.AAAConference.org.

You can also find several media resources including a Public Relations Tool Kit, press release templates, and more, on the Academy's website (www.audiology.org/get-involved/public-awareness).

OCTOBER IS NATIONAL **AUDIOLOGY AWARENESS MONTH**

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KEYWORDS: PUBLIC AWARENESS

AMERICAN ACADEMY OF AUDIOLOGY

Lessons Learned in Nebraska's Battle to Overturn Dual Licensure

By Joshua D. Sevier

As the field of audiology continues to grow and evolve, so does the need to examine existing policies and laws pertaining to the field that may be outdated. One such problematic policy that currently impacts many audiologists is dual licensure, which requires an audiologist to hold a state license in audiology and a separate state license to dispense hearing aids.

In Nebraska, the advocacy of hearing instrument specialists led to the passage of the Hearing Instrument Specialists Practice Act in 2009, which required licensed audiologists to also obtain a license to dispense. Laws such as this exist throughout the United States. Prior to the beginning of 2017, there were 16 states in the country that still required a second license for this purpose, according to the National Council of State Board of Examiners for Speech-Language Pathology and Audiology (NCSB, 2017).

Nebraska is the newest addition to the list of states requiring only a single license for an audiologist to be legally allowed to provide all services within their scope of practice, including dispensing hearing aids. The process that led to this achievement began in October 2016, following the start of my first full-time job at Boys Town National Research Hospital. Finishing my externship in Illinois, where an additional license was not required, I was surprised by this additional requirement following my move to Nebraska. The first step of the process was writing an e-mail to the state senator representing my district in the Nebraska legislature. The e-mail included the number of states not requiring a second license and how audiologists were impacted by additionally mandated continuing education units (CEUs).

Four weeks later, I received a response from my senator asking for a sit-down meeting with me to discuss the issue. Working through what the language of the law was at the time, we were able to write a draft that would be introduced with other occupational license reform efforts in the 2017 state legislature as LB 343. The bill, if passed, would amend the language of the existing 2009 Nebraska Hearing Instrument Specialists Practice Act to exempt the requirement for audiologists to also hold this licensure. At a public committee hearing, professionals from other occupations included in the bill expressed great opposition to their respective portions. The opposition resulted in a decision of LB 343 being tabled for the year and not going to the floor for a vote.

While the audiology community in the state felt defeated, we kept working. One week after the decision, a group of practitioners and students representing the Nebraska Speech-Language-Hearing Association visited the state capitol for the annual Legislative Day. We used this time to hear from local legislators about a broad range of issues. At the same time, a small group of those attendees were scheduling meetings and knocking on doors in an attempt to rid the state of the burden of dual licensure for audiologists.

After several rejections, we managed to get a meeting with a legislator willing to work with us. Nebraska State Senator Carol Blood (D-Bellevue) had authored a bill, LB 88 (Nebraska Legislature, 2017), that was aimed at easing licensure restrictions for moving military families with members practicing in a variety of health-care occupations.

Following our meeting, she agreed to include an amendment, AM810, to include language eliminating dual licensure for audiologists. Happily, I can report to you that the bill passed unanimously on April 24 of this year, with an emergency clause to help the military families. The following day, Governor Pete Ricketts signed the bill into law effective immediately.

Working successfully on the state level to remove the dual licensure requirement in Nebraska helped me realize that solutions to other key issues facing audiologists are obtainable with the proper advocacy and connecting with the right legislators. Remember, audiologists have a long history of advocacy dating back to 1973, when revised American Speech–Language–Hearing Association (ASHA) ethics guidelines prevented the sale of hearing aids for profit by audiologists. The right to sell hearing aids is something that the incoming generations of clinicians, including myself, may take for granted, but the inability to do so was a burden for our predecessors.

Groups formed within the field to advocate for change, but it wasn't until a 1978 Supreme Court ruling that this issue was alleviated. The ruling stated that a professional society's code of ethics could not prohibit competition among members. As a result of that ruling, the door was opened for the creation of the audiology private practice (USSC, 1978).

Working through the issues one step at a time will give our profession the autonomy that it is looking to achieve. It is my hope that this advocacy work will motivate others to continue the work of our predecessors in advancing the profession and eliminating dual licensure for audiologists nationwide. There is still much to do for the field of audiology to grow.

Joshua D. Sevier is a cochlear implant research audiologist at Boys Town National Research Hospital in Omaha, Nebraska.

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