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* Canadian Audiologist, VOL. 3, ISSUE 5, 2016, "A Canadian Evaluation of Real-Life Satisfaction of Hearing Aids in Challenging Environments", By Ryan Kalef, BSc, MSc, AUD(C), RAUD Carol A. Lau, MA (Aud), BA (Sp & H Th) Rachel Liu, AuD, AUD(C), Reg. CASLPO Melissa McFadden, MSc, Reg. CASLPO Andrew Sharpe, HIS

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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.

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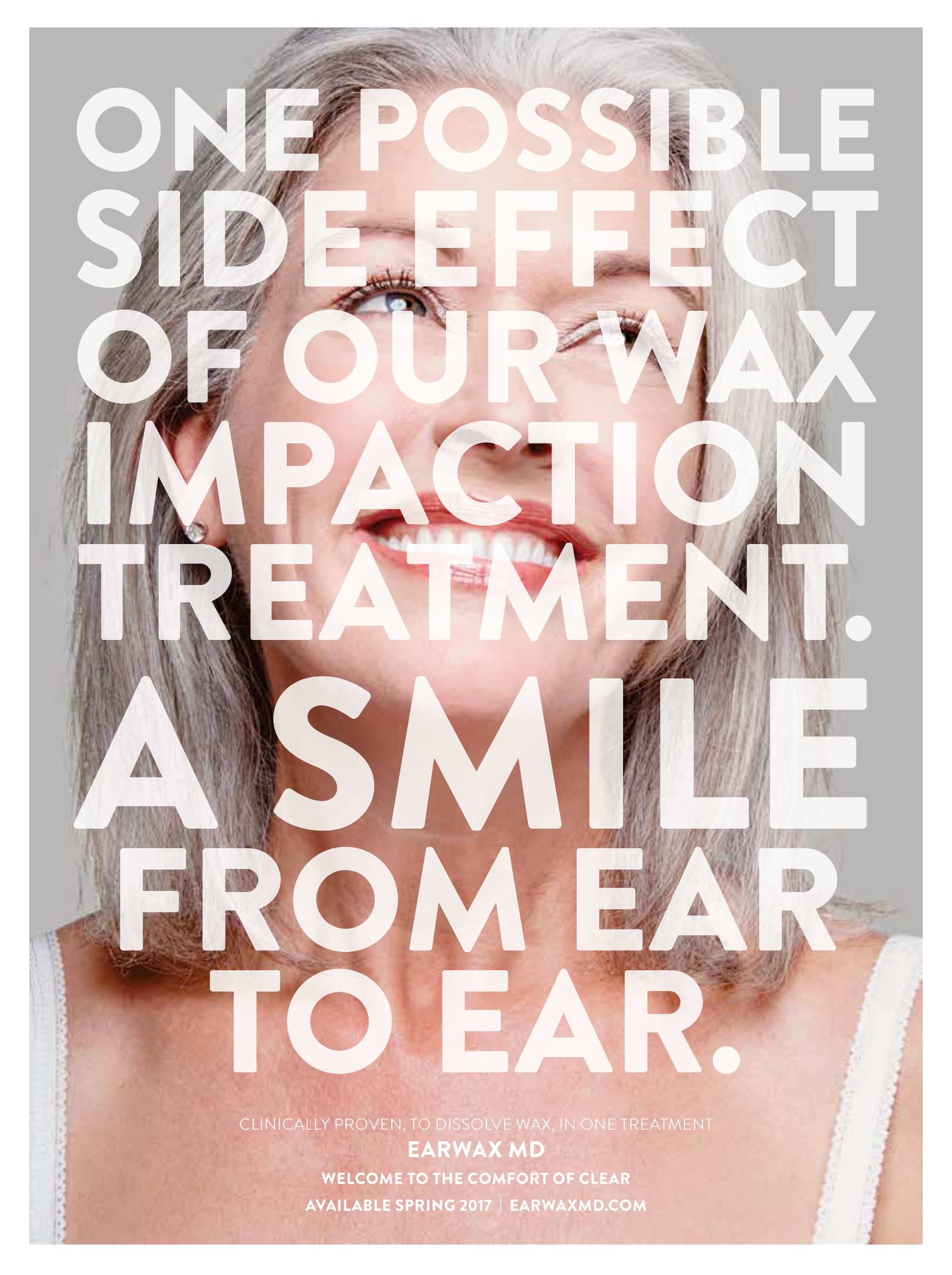
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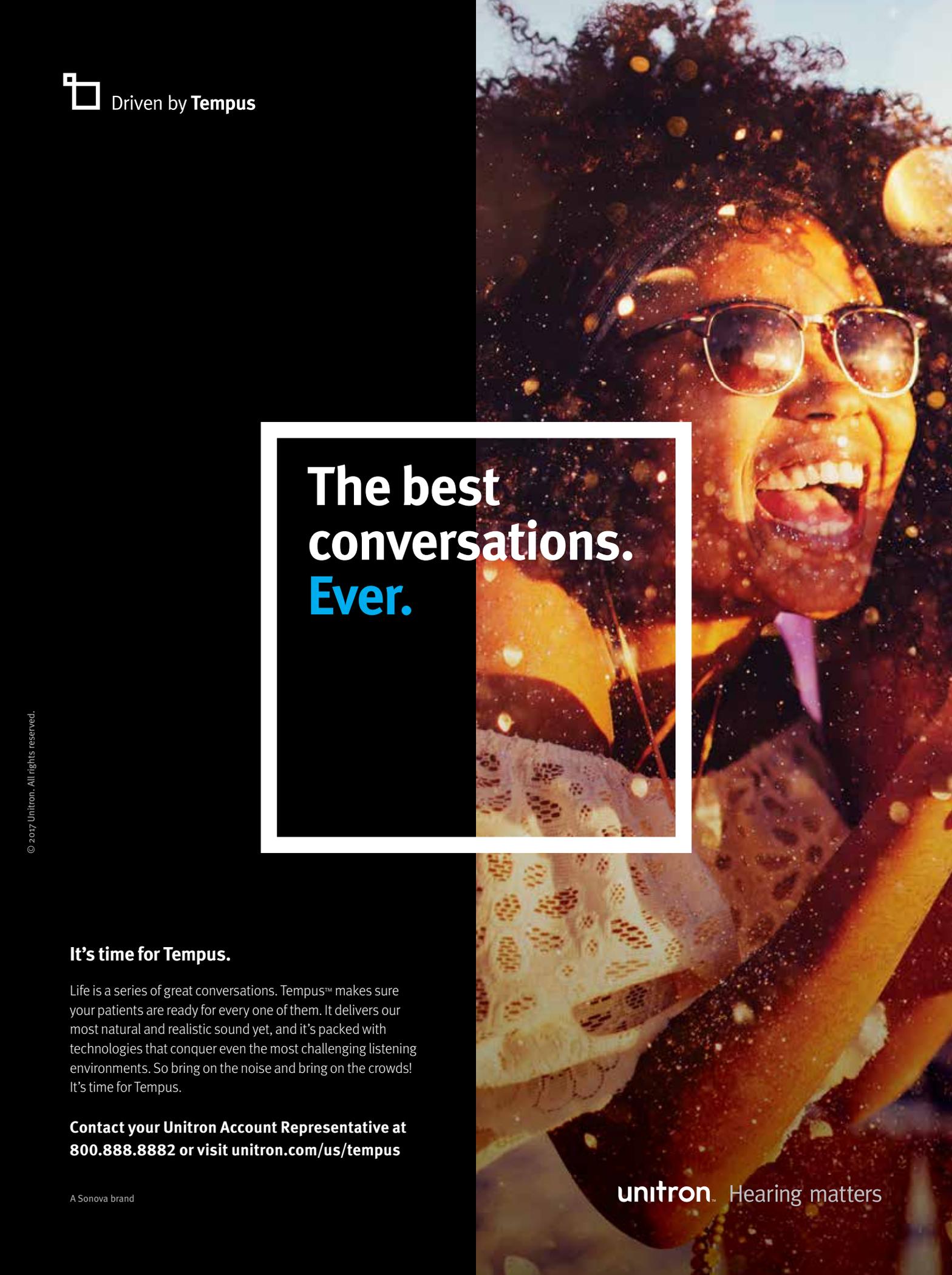
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Expanding Our Profession

The past 18 months have been

nothing if not interesting for our profession. Between PCAST, the FDA, and the National Academy of Sciences, there have been multiple recommendations and suggestions regarding improving the access to, and affordability of, hearing care. More recently, the FTC announced that they too would be reviewing the delivery of hearing care, from their perspective as a consumer protection agency. And a bill has just been introduced in Congress that directs the FDA to develop rules for an over-the-counter hearing device.

So where does this leave us? Like it or not, it is probable that regulations allowing OTC amplification devices will be issued. Whether these are categorized as hearing aids or PSAPs or something else entirely is still to be seen. And what impact this decision has on our various practices is also unknown. I am sure there are those of you who are fearful of the impact of OTC, particularly those of you who rely on product-based income streams.

Speaking of this fear, the facilitator at our strategic planning retreat last year made a curious observation. Paraphrased, he stated, "I've never seen a group spend more time preserving the status quo rather than seeking opportunities to expand their profession." In essence, we spend more time trying to keep what we've got, than we do trying to develop our profession.

There is a concept called "status-quo bias." Essentially, this concept states that individuals desire to

maintain the status quo if one of the alternatives to a proposal results in a loss. In this case, if the FDA promulgates regulations for an OTC device, one of the possible outcomes is that we lose patients, income, or even practices. Therefore, we need to fight against the regulations so that we "don't lose." Even though one of the alternative outcomes is more patients and income, the reaction to losing is more powerful than the possibility of winning, and therefore one attempts to maintain the status quo.

As we move forward, we have to spend at least as much time, energy, and resources on those alternatives that will be positive for the growth of our profession. For example, there is no reason we can't offer a full range of technologies in our practices—including PSAPs, OTC-type devices, and traditional hearing aids. Or we can take advantage of the recent evidence linking hearing loss to cognitive decline, as it opens the door for us to play a greater role in managing this large number of patients.

Some are suggesting that new technologies might be advantageous for children with autism or ADHD, both large populations to which our expertise can be meaningful. And as the experts in hearing loss, it would seem to be natural that we take the lead in preventative strategies, including prevention of hearing loss through pharmaceuticals. Or how do we provide hearing enhancement for those 10–12 percent of the population with normal hearing by pure tones



but with difficulty in various listening situations?

The message here is that we need to start thinking more about practice/financial/patient-care opportunities rather than a laser focus on current challenges. Sure, we do need to monitor and respond to developments in Washington, DC, but we also need to invest time and energy in expanding our profession. We have to invest in understanding innovative technologies, public policy, economics, and alternative delivery models of hearing care. We have to be innovative and creative in the development and implementation of new assessment and treatment possibilities. We have to get to the point of being able to demonstrate the value of audiology in health care across multiple platforms and specialties. And, we cannot be afraid to expand our scope of practice as required.

I often use the expression that we spend 95 percent of our time on five percent of the issues. Perhaps it is time to change that ratio and spend more of our time and resources on expanding our role in health care, rather than simply protecting it. 

A handwritten signature in black ink, appearing to read "Ian M. Windmill". The signature is fluid and cursive, with a large loop at the end.

*Ian M. Windmill, PhD
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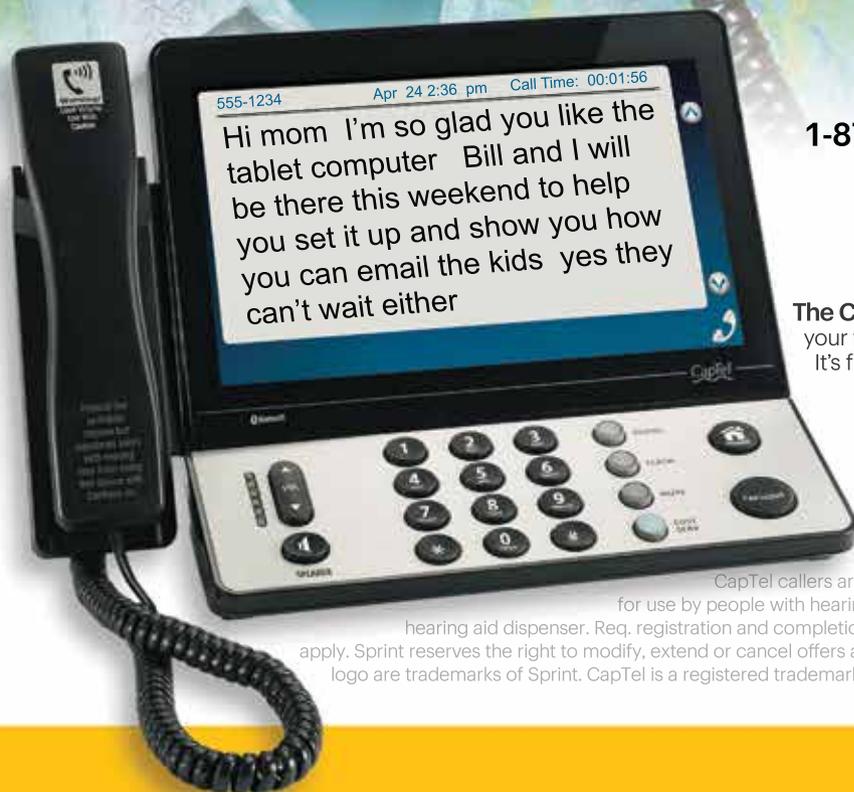
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Going Beyond Indulging

Regarding “The Impending Spondee Crisis,” by Frank Bialostzky (*Audiology Today*, Nov/Dec 2016, Vol 28, No 6)... I’ve heard of indulging the younger generation, but this goes beyond the pale. At the very experience of hearing those remarkably outdated words like “sidewalk, hot dog, hardware,” I can only empathize with the young woman shown on page 54. Poor thing; I too would squint and crinkle my nose if faced with a similar assault on my sensibilities.

Okay, spondee word lists aren’t phonetically balanced, and I admit “inkwell, hothouse, and whitewash” might be a bit 1950s-ish. So if one wants to replace those with “zipline, facebook, or Starbucks,” go for it! But let no one tell me millennials haven’t heard of sidewalks or hot dogs, or hardware stores. Why generalize about a whole generation?

The article then goes on to get “even better.” Millennials don’t like talking, right? So no, they shouldn’t have to actually answer you when you ask them to “Say the word...” Naw, just let them text their answers! Sorry, the only client I’d have answering this way would be someone who is truly unable to “say the word.”

Methinks the author doth protest too much. Oops, there I go again; I just outdated myself by saying words from Shakespeare who died hundreds of years ago....[🙄]

Ted Venema, PhD

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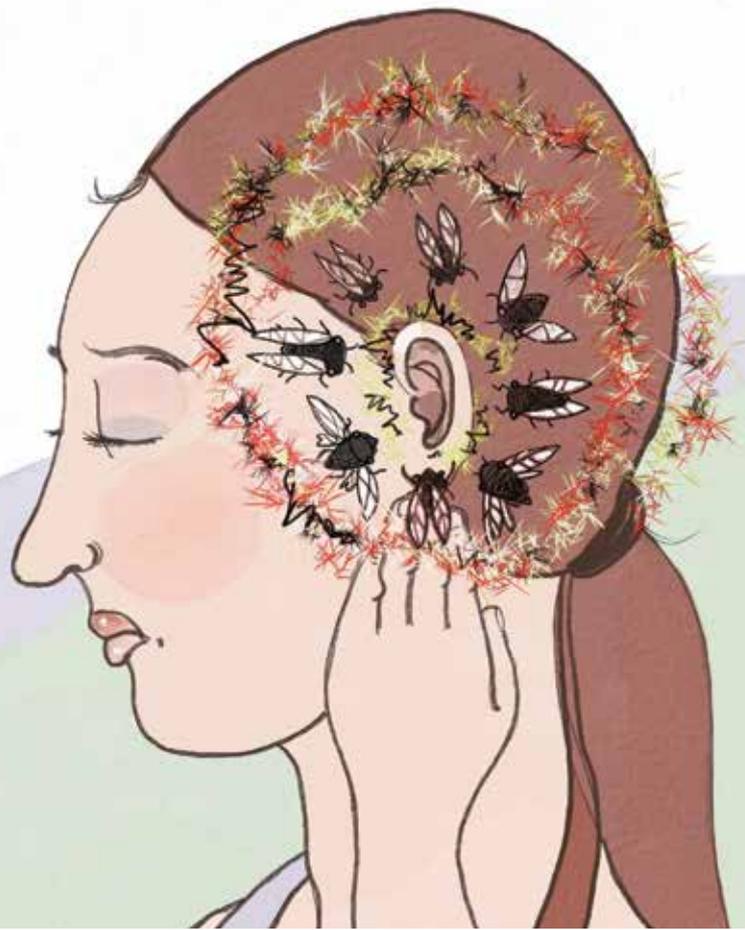
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Practice Differentiation Through Tinnitus Management

An Overview for Beginners

By Caitlin Turriff

With the changing landscape of hearing health care, many audiologists are seeking ways to distinguish themselves and their practices from other dispensing offices and big-box stores. One aspect of patient care that can help differentiate one's practice from the competition is tinnitus management.

Tinnitus, which is defined as a perceived sound that lacks an outside source, affects about 15–20 percent of the global population (Swain et al, 2016). Despite the large number of individuals who experience tinnitus, only about a quarter of those who report tinnitus feel it negatively

impacts daily life and actively seek out management options (Woelver et al, 2015). Upon first glance, tinnitus management may seem fairly straightforward—a typical visit could include a case history, audiological evaluation, tinnitus evaluation, and counseling. In actuality, there are diverse ways that tinnitus affects individuals resulting in the need for more comprehensive tinnitus evaluations and management options. This article will describe the different aspects of tinnitus evaluation, provide examples of tinnitus management, and examine ways to incorporate both into your practice.

Initial Evaluation

The first step of a tinnitus evaluation should include a detailed case history. To date, there is no definitive cause of tinnitus; however, it is commonly associated with hearing loss, noise exposure, head trauma, and infections/diseases of the ear (Swain et al, 2016). Because there is no universal cause, a thorough case history interview should educate the audiologist on the patient's perceived hearing ability, a description of the tinnitus, vestibular symptoms, current medications, and personal and family medical history. The information collected will help guide the hearing assessment and provide

clues as to what, if any, medical referrals are necessary.

In addition to the case history, it is important to consider the impact the tinnitus has on the patient's life and mental well-being. Using a screening tool may provide a more efficient and effective way of determining that impact. The Tinnitus and Hearing Survey (THS) is a ten-item questionnaire that helps determine whether the patient's complaints stem more from tinnitus or hearing loss (Henry et al, 2015a). Henry and colleagues (2015a) have divided the THS into two sections: statements relating to tinnitus and how it affects the patient's life (i.e. difficulty concentrating, difficulty sleeping, etc) and statements evaluating how hearing loss affects communication and listening (i.e. difficulty understanding the television, difficulty understanding in groups, etc). The patient's responses for each statement are rated on a scale of 0 (not a problem) to 4 (very big problem) and whichever section receives the higher score suggests it is the main contributor to the patient's complaints (Henry et al, 2015a). While no cutoff score is used to determine the direction of treatment, it allows the audiologist and the patient to discuss the root of the problem, how the tinnitus or hearing loss can be addressed, and enables the patient to make an informed decision regarding management. The THS can be used prior to other tinnitus questionnaires if the patient chooses to pursue tinnitus management (Henry et al, 2015a).

Whether used with or without the THS, different tinnitus questionnaires can provide additional information about tinnitus impact. One such questionnaire is the Tinnitus Handicap Questionnaire (THQ). The THQ is a self-report questionnaire that examines three

areas—social, emotional, and behavioral—hearing and tinnitus; and outlook on tinnitus (Kuk et al, 1990). The patient's responses to each of the 27 questions will provide information on the perceived severity of the tinnitus and how it affects daily life.

In addition to completing a tinnitus questionnaire, other measures of the patient's mental well-being could be considered. There is growing literature illustrating how commonly poor quality of life co-exists with tinnitus. A recent study found a relationship between tinnitus and both depression and perceived quality-of-life. As the severity, including perceived loudness, of tinnitus increases, quality-of-life decreases and the incidence of depression increases (Weidt, et al, 2015). Determining this information can help direct the course of tinnitus management and assist in determining if further referrals are necessary.

Examining what factors can both worsen and alleviate tinnitus could also be helpful in personalizing tinnitus management. Pan and colleagues (2015) studied this topic and discovered that these factors vary widely from person to person. Their research involved asking two questions: "What makes your tinnitus worse?" and "What makes your tinnitus better?" A closed set of answers were provided for both questions and the participants were instructed to choose the answer that best defined their experience. While there were many commonalities, such as a worsening of tinnitus in quiet environments or during times of increased stress, there were no definitive patterns. Some individuals found that being in the presence of background noise helped alleviate tinnitus while others felt it worsened tinnitus, and some felt that amount of sleep had an effect on tinnitus while others experienced

no relationship between tinnitus severity and sleep. Due to these differences, Pan and colleagues suggest determining subgroups of tinnitus and creating unique treatment plans for each (Pan et al, 2015).

The Evaluation

Once the intake interview and questionnaires are completed, it is time to begin the physical and auditory evaluations. Including all aspects of a typical hearing examination, i.e., otoscopy, immittance, speech and pure tone audiometry, and otoacoustic emissions, will provide information on overall ear health and hearing ability. These results will help determine whether any indicators of potential medical conditions are present and if a physician referral is warranted. Additionally, the findings of the hearing test will help guide the tinnitus evaluation (CPT Code 92599).

Evaluating tinnitus involves pitch matching, loudness matching, minimum masking level, residual inhibition, and loudness growth function (Henry and Meikle, 2000). The first four categories provide quantifiable measurements of tinnitus perception. Pitch and loudness matching will help determine at what frequency masking should be, and how the loudness of the tinnitus compares to hearing threshold. Residual inhibition and loudness growth function will establish the amount of white noise needed to mask the tinnitus, and whether masking can reduce the perception of tinnitus once that noise is silenced (Henry and Meikle, 2000).

An additional measure is the loudness growth function, which can provide information on the extent to which the patient is hypermonitoring their tinnitus (Carroll, 2013). The patient will rate the subjective loudness of his tinnitus on a scale of

one to 10, and then will rate the loudness of randomized presented tones, including the loudness match, on the same scale. The difference between the subjective loudness rating of the tinnitus and the rating of that same level on the randomized presentation will determine the extent of hypermonitoring (Carroll, 2013). For example, if the patient notes his tinnitus loudness is a seven, yet when presented with the loudness

further management is required, the audiologist may begin to discuss sound therapy and whether outside referrals are warranted.

Sound therapy is commonly used in tinnitus management and it can take several forms. The first, and sometimes simplest, form of sound therapy is use of a masking device. The sound can be generated from regular household items such as fans or a radio, to more expensive

This suggests that use of sound therapy can improve the negative effects of tinnitus.

Tinnitus Retraining Therapy (TRT) is used to make tinnitus a part of the subconscious. It was developed by Pawel Jastreboff and colleagues, and is based on the concept of neural plasticity and the ability of the brain to relearn how it interprets tinnitus. This approach achieves its goals in two ways: habituating both the reaction to and perception of the tinnitus (Jastreboff and Jastreboff, 2000). When a patient is receiving TRT, he uses sound therapy and receives counseling; the process may take up to 18-months. Despite this length of time, Henry and colleagues (2006) found that TRT may be a more effective approach for those suffering from severe tinnitus. They found, during an 18-month study, that the greater the perceived severity of tinnitus the better the results using TRT as compared to only receiving tinnitus masking (Henry et al, 2006).

Similar results were observed by Bauer and Brozoski (2011). They studied, over the course of 18 months, two groups of tinnitus sufferers who had normal hearing sensitivity through the speech frequencies. The two groups used sound generators and had three months of counseling but one group also received TRT. While both groups had statistically significant improvement, the group that also received TRT reported the greatest amount of benefit (Bauer and Brozoski, 2011). This suggests that the combined masking and counseling provided by TRT can alleviate negative tinnitus symptoms.

Cognitive Behavior Therapy (CBT) is another approach to tinnitus management. This treatment does require a referral as it can only be performed by a licensed therapist. The goal of CBT is to modify undesired behavior by changing behavior and cognitive

match he only rates it as a three, this difference in scores would suggest he is hypermonitoring his tinnitus. This result serves to both illustrate to the patient how loud his tinnitus actually is and to move the appointment toward the counseling stage.

Counseling and Management Options

Upon the completion of the examination, it is time to communicate the results with the patient. Counseling may be one of the most important parts of the tinnitus evaluation because it allows the audiologist to reassure the patient and to begin building the framework for a management approach. In some cases, discussing the results of the audiogram and tinnitus evaluation, and reassuring the patient, will be sufficient for managing the tinnitus. For others, a more involved discussion will be necessary. If

options like tabletop fountains and noise generators. The relief provided by masking tends to be immediate as it causes the ambient noise to rise enough to cover the tinnitus.

There is evidence in the literature that the use of masking devices can improve outcomes on tinnitus questionnaires. Henry and colleagues (2015b) studied the effects of using a hearing aid only versus wearing a hearing aid with sound generator on the results of the Tinnitus Functionality Index (TFI). Despite the different sound therapies, both groups received identical counseling and wore the devices for the same prescribed duration. At the end of the study, the researchers discovered both groups had significant reduction in mean TFI. The group using the device with sound generator showed a greater mean reduction in TFI, but the difference did not reach statistical significance (Henry et al, 2015b).

Various treatment options can provide relief to tinnitus sufferers, so continue to research the scientific literature and different treatment approaches.

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When the first hearing aid with direct audio streaming was introduced in 2014, it garnered significant attention and helped to de-stigmatize hearing aids. Unfortunately, this did not translate to a significant increase in hearing aid adoption. Audio streaming, direct or otherwise, was simply not that important.

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* Study conducted at the University of Northern Colorado, 2015, examined the effectiveness of the new features of primax by collecting and analyzing ongoing EEG data while subjects performed speech testing. For both primax features SpeechMaster and EchoShield, the objective brain behavior measures revealed a significant reduction in listening effort when the feature was activated.

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structuring (Andersson, 2002). Some examples of what may be included in CBT include exposing the patient to sounds, relaxation techniques, and the restructuring of beliefs and thoughts regarding tinnitus (Hesser et al, 2011). In addition to its positive effects on tinnitus, the benefit of CBT can spread to other areas that may have been suffering as a result of tinnitus, including anxiety and depression (Hesser et al, 2011). The relief gained from using CBT may be long lasting, but due to the potential complexity of the treatment the patient must be willing to put in the work required for achieving successful outcomes.

Putting It All Together

Tinnitus evaluation and management can be a complex process. The severity of the tinnitus, the presence of hearing loss, and the effect the tinnitus has on the patient's sense of well-being can vary widely. It is important for the audiologist to be educated on tinnitus evaluation and management. Various treatment options can provide relief to tinnitus sufferers, so continue to research the scientific literature regarding the different treatment approaches, obtain initial comprehensive and continuing education in tinnitus evaluation and management, and seek out professional relationships with audiologists who have already established a successful tinnitus program. Additionally, it is important to network with physicians and psychologists so referrals are quick and easy. Audiologists equipped with the proper knowledge, training, and resources in this area will be able to provide an added value for their patients who suffer from tinnitus. 🎧

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Illustration by Johanna van der Sterre.

References

- Andersson G. (2002) Psychological aspects of tinnitus and the application of cognitive-behavioral therapy. *Clin Psychol Rev* 22(7):977–990.
- Bauer CA, Brozoski TJ. (2011) Effect of tinnitus retraining therapy on loudness and annoyance of tinnitus: a controlled trial. *Ear Hear* 32(2):145–155.
- Carroll J. (2013) Hypermonitoring—measuring the perceptual mismatch in tinnitus in programmed serenade devices. Poster presented at the Sixth International NCRAR Conference, Portland, OR.
- Henry JA, Griest S, Zaugg TL, Thielman E, Kaelin C, Galvez G, Carlson KF. (2015a) Tinnitus and hearing survey: a screening tool to differentiate bothersome tinnitus from hearing difficulties. *Am J Audiol* 22:66–77.
- Henry JA, Frederick M, Sell S, Griest S, Abrams H. (2015b) Validation of a novel combination hearing aid and tinnitus therapy device. *Ear Hear* 36(1):42–52.
- Henry JA, Schechter MA, Zaugg TL, Griest S, Jastreboff PJ, Vernon JA, Kaelin C, Meikle MB, Lyons KS, Stewart BJ. (2006) Outcomes of clinical trial: tinnitus masking versus tinnitus retraining therapy. *J Am Acad Audiol* 17:104–132.
- Henry JA, Meikle MB. (2000) Psychoacoustic measurements of tinnitus. *J Am Acad Audiol* 11:138–155.
- Hesser H, Weise C, Westin VZ, Andersson G. (2011) A systematic review and meta-analysis of randomized controlled trials of cognitive-behavioral therapy for tinnitus distress. *Clin Psychol Rev* 31:545–553.
- Jastreboff and Jastreboff. (2000) Tinnitus retraining therapy (TRT) as a method for treatment of tinnitus and hyperacusis patients. *J Am Acad Audiol* 11:162–177.
- Kuk FK, Tyler RS, Russell D, Jordan H. (1990) The psychometric properties of a tinnitus handicap questionnaire. *Ear Hear* 11(6):434–442.
- Pan T, Tyler RS, Ji H, Coelho C, Gogel SA. (2015) Differences among patients that make their tinnitus worse or better. *Am J Audiol* 24: 469-476.
- Swain SK, Nayak S, Ravan JR, Sahu MC. (2016) Tinnitus and its current treatment—still an enigma. *J Formos Med Assoc* 115:139–144.
- Weidt S, Delsignore A, Meyer M, Rufer M, Peter N, Drabe N, Kleinjung T. (2015) Which tinnitus-related characteristics affect current health-related quality of life and depression? A cross-sectional cohort study. *Psych Res* (2016) <http://dx.doi.org/10.1016/j.psychres.2016.01.065>.
- Wolever R, Price R, Hazelton AG, Dmitrieva NO, Bechard EM, Shaffer JK, Tucci DL. (2015) Complementary therapies for significant dysfunction from tinnitus: treatment review and potential for integrative medicine. *J Evid-Based Comp Altern Med*. 2015:1–8.

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REVOLUTIONIZE VESTIBULAR TESTING

New Ways to Assess Patients with Central Disorders

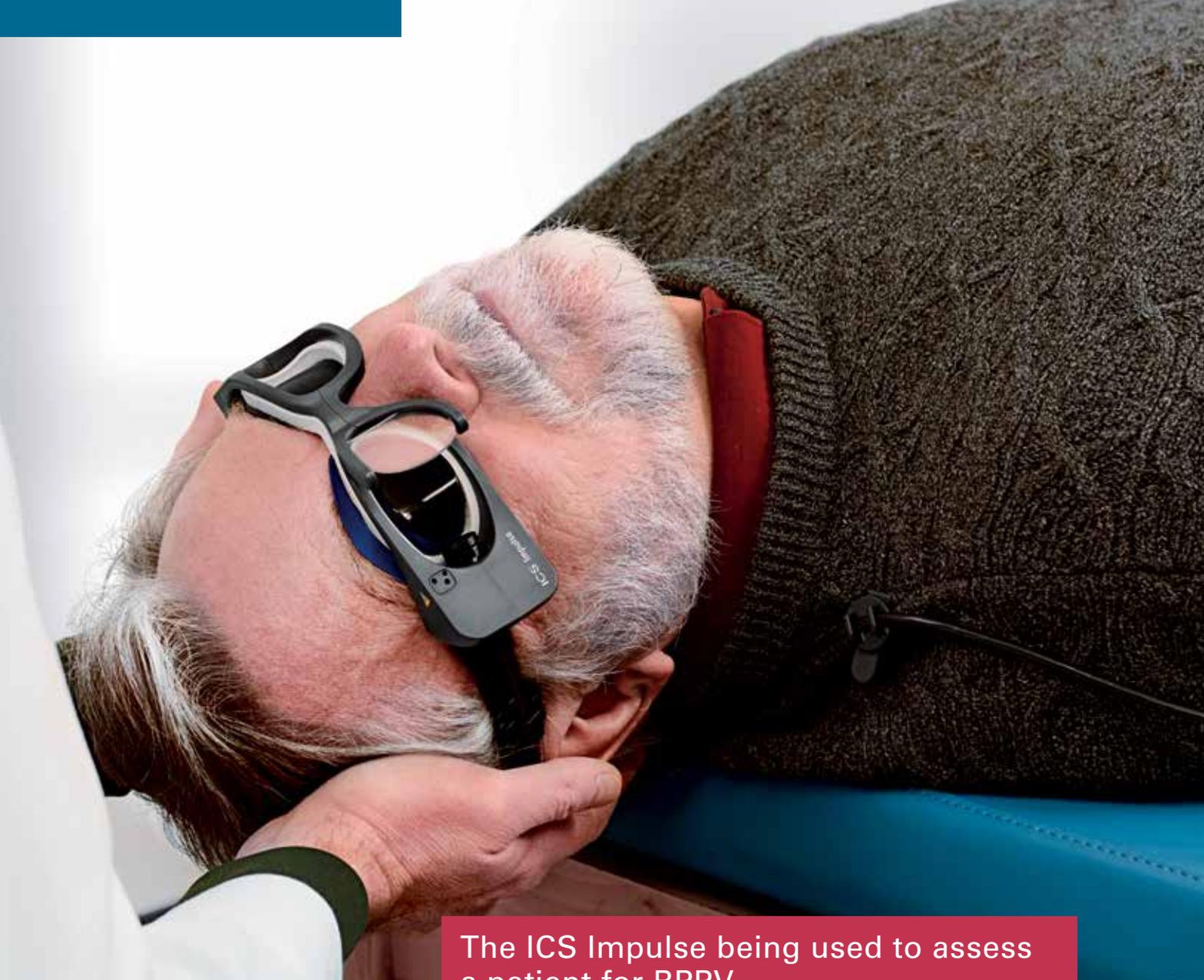
BY MAGGIE BOORAZANES AND BRIANNA YOUNG

Research-based updates to vestibular assessment protocols can increase workflow efficiency for patients with central vestibular disorders, which can lead to a faster diagnosis.

The patient journey for vestibular assessment can be a lengthy process. A 2011 survey by the Vestibular Disorders Association (VEDA) states that, on average, patients consult four to five doctors before receiving a diagnosis. Furthermore, it takes an average of three to five years for a person with a vestibular disorder to receive a diagnosis (VEDA, 2011). By applying new testing techniques, clinicians can scale down their workflow and obtain an accurate diagnosis in less time. The article, “A Streamlined Approach to Assessing Patients with Peripheral Disorders,” featured in the September/October 2015 issue of *Audiology Today*, presented a comprehensive review of the assessment process for peripheral vestibular disorders. The authors proposed management modification through changes to the current, widely accepted, protocols for testing that center around videonystagmography and electronystagmography (VNG and ENG, respectively).

The effectiveness of vestibular assessment has been improved by

technological developments such as the video head impulse test (vHIT) that can provide unique insights to differential diagnosis. The vHIT itself has been a major development in the area of vestibular development as it has allowed the evaluation of all six semicircular canals independently. The diagnostic utility of the vHIT has been further increased by technological advances allowing unique insight in the central vestibular function. Originally released in 2013 with only vHIT capability, the ICS Impulse® has since been enhanced with additional technological advances and made available to audiologists in the United



The ICS Impulse being used to assess a patient for BPPV.

States following Food and Drug Administration clearance of the ICS Impulse Oculomotor and Positional modules.

As recently as September 2016, the ICS Impulse was again updated to include the Suppression Head Impulse Paradigm (SHIMP), which was introduced at the Barany Society meeting in June, 2016. The SHIMP tracks the presence of anti-compensatory saccades after a head turn. These results can support residual vestibular function (MacDougall, et al, 2016). Initial reports of SHIMP results focuses on findings for those with normal vestibular function, unilateral

vestibular loss, and bilateral vestibular loss (MacDougall, et al, 2016) where, “in all participants, SHIMP [and vHIT] resulted in a reversed saccadic pattern.” This means that healthy controls with normal vestibular function showed few catch-up saccades with vHIT, whereas testing with SHIMP demonstrated large negative saccades. Conversely, patients with bilateral vestibular loss showed frequent overt saccades during vHIT but few saccades during SHIMP. In comparison, patients with unilateral vestibular loss demonstrated covert saccades when vHIT was performed to the affected side, with large

downward saccades to the healthy side during SHIMP. While more work needs to be done to better understand the clinical utility of SHIMP and its relation to the vHIT test, the initial results are indeed promising.

While peripheral vestibular disorders can commonly account for many causes of vertigo, as many as 23 percent of patients with dizziness in a recent study cohort had a central etiology to their vertigo (Mostafa et al, 2014). When considering the desired workflow for assessing a dizzy patient, the first step for many professionals is a thorough case history. Patients who likely have a central

etiology to their vertigo may present with the following: nystagmus (most often purely vertical or torsional) that does not suppress with visual fixation, short latency of nystagmus after provocation and nystagmus that is less prone to fatigability, a longer history of symptoms, possible loss of consciousness, other neurological symptoms, and possibly the absence of other otological symptoms (Jacobson and Shepard, 2009; Shepard, 2009). However, as discussed later in this article, symptoms such as the rapid onset of vertigo, motion intolerance, horizontal nystagmus, and fluctuating hearing loss can be found in both central and peripheral disorders, and does not make an initial impression abundantly clear (Kattah et al, 2009; Shepard, 2009). This ambiguity can only be resolved by a judicious use of clinical judgement and the latest diagnostic tools. The reader is directed to *Signs and Symptoms of Central Vestibular Disorders* (Shepard, 2009) for further information about determining central versus peripheral

etiology of vertigo. In the remainder of the article, we provide an in-depth review of the latest development in balance assessment technologies that are helping audiologists and other balance care professionals reduce the time it takes to test patients with Wernicke’s encephalopathy, Vestibular Schwannoma, and Vestibular Migraine, as examples of central pathology.

Wernicke’s Encephalopathy

Often associated with alcohol abuse or malnutrition, Wernicke’s encephalopathy occurs when thiamine (vitamin B1) deficiency causes patients to experience oculomotor abnormalities (including nystagmus), ataxia, and altered mental status (Kattah et al, 2013; Szmulewicz et al, 2011). However, it is possible for at least one of these to be absent (Szmulewicz et al, 2011). Patients with thiamine deficiency may report loss of weight over the past year, poor nutrition with high carbohydrate intake,

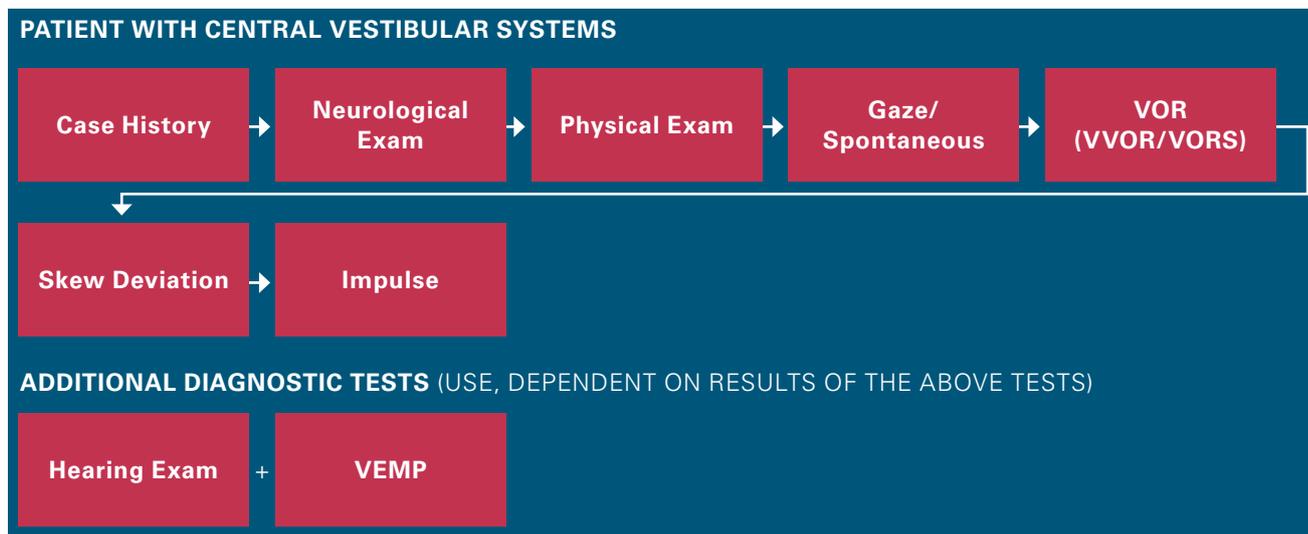


FIGURE 1. A modified, streamlined workflow for a patient with a suspected central disorder. If these tests were inconclusive, clinicians should consider additional tests (i.e., VEMP, vHIT, etc.). In the following figure, “Impulse” is used to refer to vHIT and SHIMP, for the purposes of ruling out peripheral involvement.



FIGURE 2. Modified workflow for Wernicke’s encephalopathy.

recurrent vomiting episodes over the past month, loss of appetite, fatigue, weakness, double vision, giddiness, insomnia, anxiety, difficulty concentrating, and memory loss (Kattah et al, 2013). It should be noted that in the referenced study, weight loss ranged from 120–157 pounds and was secondary to gastric bypass surgery for the three participants who had experienced weight loss, and the weight loss was not a symptom of its own or unrelated to a potential cause for malnutrition.

FIGURE 2 presents a modified workflow for Wernicke’s encephalopathy. Within each of these subtests, clinicians can expect the following findings:

- **Gaze-Evoked/Spontaneous Nystagmus:** A nystagmus pattern that supports central etiology (gaze-evoked nystagmus that is typically central positional horizontal nystagmus bilaterally, sometimes vertical nystagmus).
- **VOR:** Cerebellar damage will present as catch-up saccades to head movement at slow velocities and failure of VOR suppression (VORS).
- **Impulse:** vHIT will show catch-up saccades that may be present for all six semicircular canals, with abnormality more likely noted for the horizontal semicircular canals. However, if the patient has had thiamine repletion treatment, the abnormal vHIT may recover (Kattah et al, 2013).

Of note, Wernicke’s encephalopathy is one of three major differential diagnoses of cerebellar ataxia with neuropathy and bilateral vestibular areflexia syndrome (CANVAS). The clinical hallmark of this disorder would be impaired visual enhanced VOR (VVOR). These patients can also present with gaze-evoked horizontal or down-beat nystagmus, saccadic smooth pursuit, gait ataxia, dysarthria, and appendicular ataxia (Szmulewicz et al, 2011). A consideration for differentiating between Wernicke’s encephalopathy and CANVAS, based on the literature reviewed, is that all patients with CANVAS had catch-up saccades for both horizontal and vertical canal testing, whereas this was not as consistently presented with Wernicke’s encephalopathy (Kattah et al, 2013; Szmulewicz et al, 2011).

Vestibular Schwannoma

Vestibular schwannoma (VS) is a slow-growing and benign tumor that presents with unilateral progressive hearing loss, tinnitus, and dizziness, which can vary based on the size of the tumor. Furthermore, because

A recent study showed that patients who underwent unilateral vestibular deafferentiation surgery showed more covert saccades than overt saccades in their first week of recovery.

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the tumor is slow-growing, vestibular function diminishes but is often compensated for, and the perception of vertigo or vestibular dysfunction is more commonly seen in larger tumors (Batuecas-Caletrio et al, 2015). Patient symptoms will reflect the above clinical presentations (i.e., perception of asymmetric hearing loss).

FIGURE 3 illustrates the suggested workflow for vestibular schwannoma. One should expect the following findings:

- **Audiogram:** Unilateral sensorineural hearing loss to the side of the lesion.
- **Gaze-Evoked/Spontaneous Nystagmus:** Central nystagmus (gaze-evoked, upbeat, or downbeat nystagmus; or central positional horizontal nystagmus). Bruns nystagmus (slow and large amplitude nystagmus when looking toward the side of the lesion, and rapid, small-amplitude nystagmus when looking away from the side of the lesion). Hyperventilation nystagmus if present will beat toward the side of the VS (Minor et al, 1999). Paretic head-shaking nystagmus beating away from the side of the tumor.
- **VOR:** Catch-up saccades to head movement at slow velocities, if cerebellar damage has occurred.
- **Impulse:** Catch-up saccades during vHIT that can occur on the side of the VS, as well as some abnormal findings on the unaffected side. Gain is likely to be decreased on the side of the lesion and normal for the contralateral side. Patients may also undergo caloric testing, and are likely to present with unilateral

weakness on the side where the tumor is growing. The amount of canal paresis measured, as well as the gain asymmetry noted on vHIT, are both directly related to the size of the tumor (Batuecas-Caletrio et al, 2015).

Interestingly, patients who have undergone surgery for VS may not follow the pattern of results described earlier. A recent study disclosed that patients who underwent unilateral vestibular deafferentation surgery showed more covert saccades than overt saccades in their first week of recovery (Mantokoudis et al, 2013). This same study also showed that the intensity of the slow phase velocity of spontaneous nystagmus decreased within two days of the surgery, and that when present, vertical skew deviation that was present after surgery declined within the first five days after surgery. Another study has shown that patients who are younger (mean age of 47 years) and have more vestibular deficit before surgery have better post-surgical outcomes than those who are, on average, a decade older and had less vestibular deficit before surgery (Batuecas-Caletrio et al, 2013). This study also showed that for the younger patients, covert and overt saccades always occurred in an organized fashion, whereas the older patients would have more randomized findings.

Vestibular Migraine

The complex relationship between migraine and vertigo has been long recognized, and patients who have vertigo and migraine are prone to experiencing vertigo, BPPV, motion sickness, and Ménière's disease (Lempert and Neuhauser, 2009). A recent publication by the Barany Society in conjunction with the International Headache Society states that for patients to be diagnosed with



FIGURE 3. Modified workflow for vestibular schwannoma.



FIGURE 4. Potential workflow for suspected vestibular migraine. This is an exclusion diagnosis.

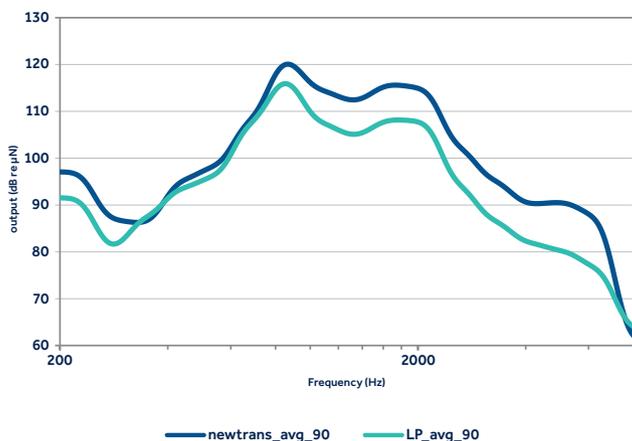
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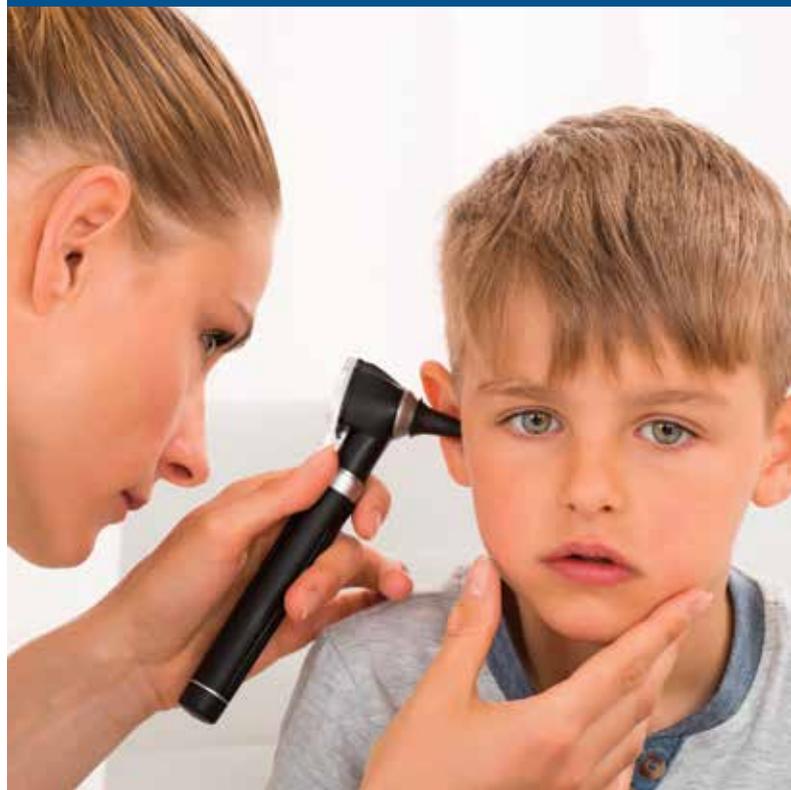
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vestibular migraine, they must meet certain criteria. These criteria include the following: at least five episodes with vestibular symptoms of moderate or severe intensity that can last from five minutes to 72 hours, current or previous history of migraine with or without aura, and one or more migraine features with at least 50 percent of the vestibular episodes (such as headache, photophobia, phonophobia); all of which are not accounted for by another

vestibular or International Classification of Headaches Disorders (ICHD) diagnosis.

Similarly, patients with probable migraine experience at least five episodes with vestibular symptoms that are not accounted for by another vestibular or ICHD diagnosis, as well as either a history of migraine or migraine features during an episode (Lempert et al, 2012). For further information on vestibular migraine diagnosis, please refer to the aforementioned document.

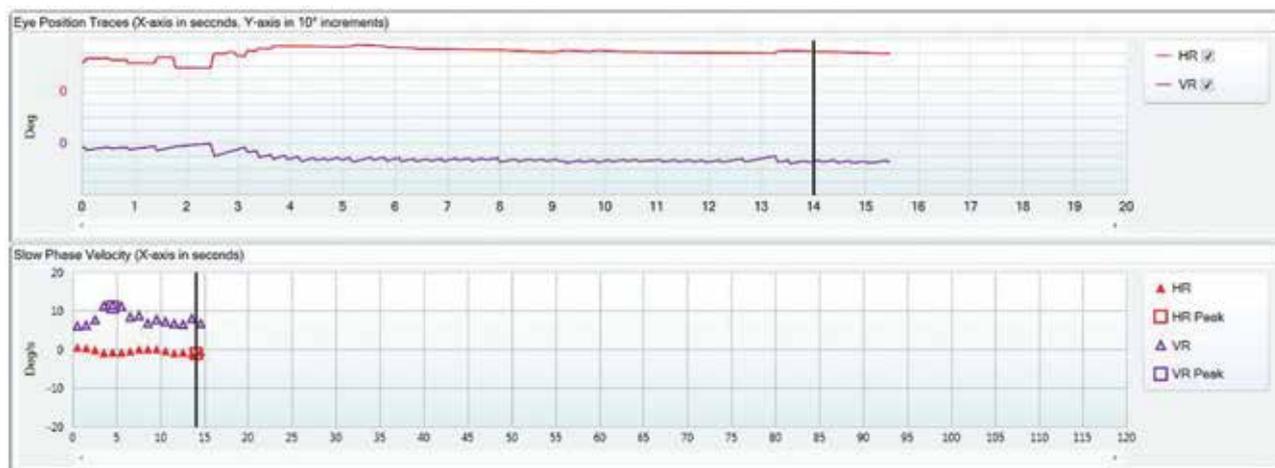


FIGURE 5. An example of a gaze response for vestibular migraine.

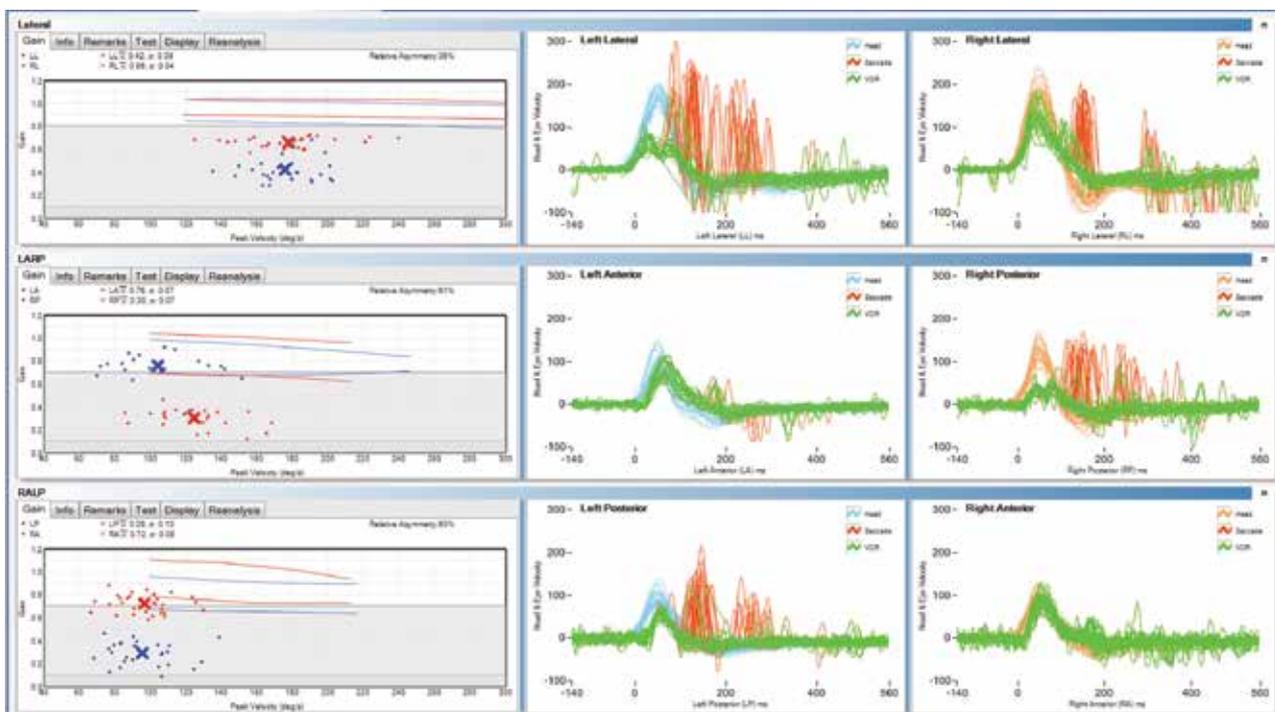


FIGURE 6. An example vHIT findings within normal limits for vestibular migraine.

Careful evaluation of the patient with vestibular migraine and monitoring over time can aid in differential diagnosis, as the potential for prolonged duration of vertigo as well as other symptoms including nausea, emesis, prostration, transient auditory symptoms, and susceptibility to motion sickness, can mimic Ménière’s disease. (Lempert et al, 2012; Cherian, 2013). FIGURE 4 demonstrates a modified workflow for assessing patients with suspected vestibular migraine.

Within each of these subtests, one should expect the following findings for a patient with vestibular migraine (Otometrics, 2015):

- **Gaze-Evoked/Spontaneous Nystagmus:** A central nystagmus, e.g., gaze-evoked, upbeat, or downbeat nystagmus, or a central positional nystagmus. Often saccadic pursuit is observed. See FIGURE 5.
- **Impulse:** Typically the response will be normal but peripheral vestibular deficits may be observed and

result in the presence of catch-up saccades (covert or overt). See FIGURE 6.

- **VEMP:** Within normal limits. Note: Some literature has reported a reduction in amplitude. See FIGURE 7.
- **Calorics:** Lempert and Neuhauser (2009) have reported caloric findings to show unilateral hypofunction in 10 to 20 percent of VM patients.

Conclusion

By using new testing techniques, clinicians can now streamline their workflow and obtain an accurate diagnosis in a shorter period of time. A streamlined process can not only increase access to care, but also provide patients the answers they need to better understand their diagnosis. We have attempted to demonstrate specific cases where the otherwise powerful V/ENG tool can be enhanced by incorporating advancements in vestibular testing into the clinical workflow. 🎧

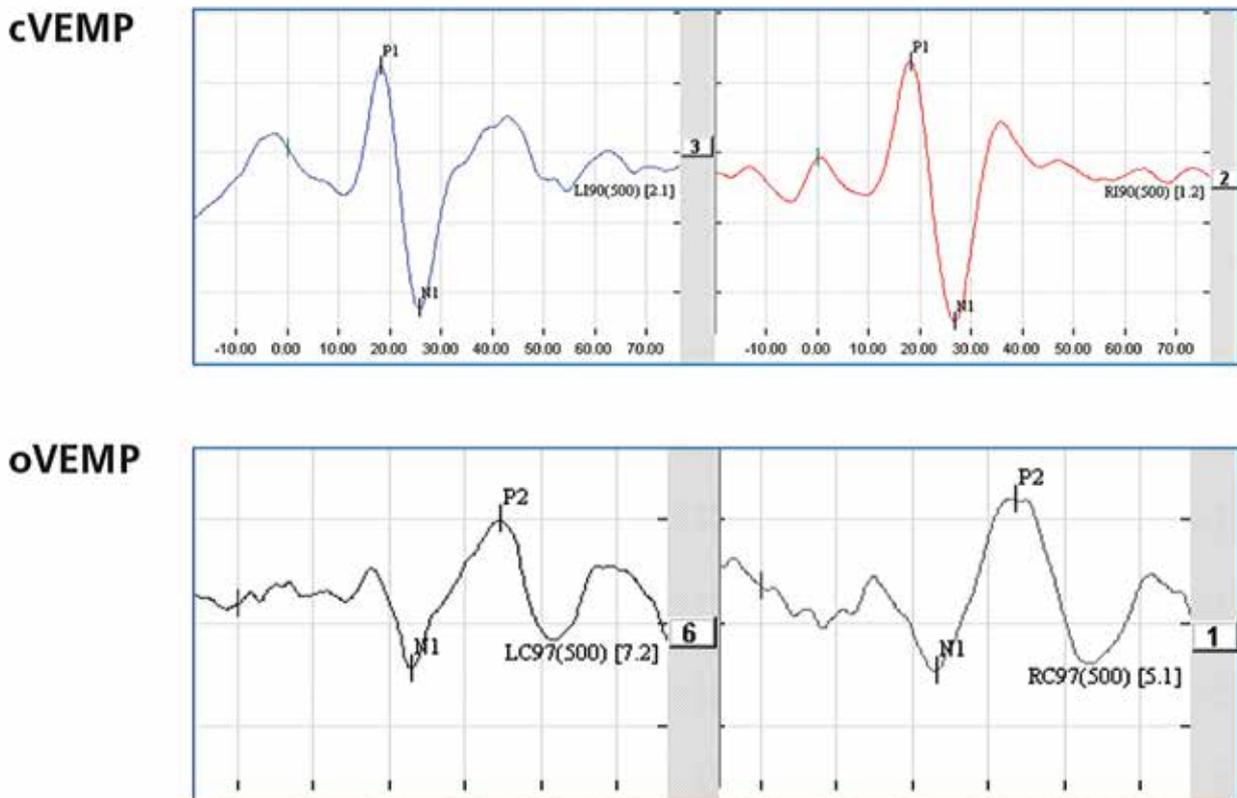


FIGURE 7. An example of normal VEMP findings for vestibular migraine.

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References

Batuecas-Caletrio A, Santa Cruz-Ruiz S, Munoz-Herrera A, Perez-Fernandez N. (2015) The map of dizziness in vestibular schwannoma. *Laryngoscope* 125(12):1–6.

Batuecas-Caletrio A, Santacruz-Ruiz S, Munoz-Herrera A, Perez-Fernandez N. (2014) The vestibulo-ocular reflex and subjective balance after vestibular schwannoma surgery. *Laryngoscope* 124(6):1431–1435.

Cherian N. (2013) Vertigo as a migraine phenomenon. *Current Neurolo Neuros Rep* 13(4):343.

Jacobson GP, Shepard NT. (Eds.) (2009) *Balance Function Assessment and Management*. San Diego, CA: Plural Publishing, Inc.

Kattah JC, Dhanani SS, Pula JH, Mantokoudis G, Saber Tehrani AS, Newman-Toker DE. (2013) Vestibular signs of thiamine deficiency during the early phase of suspected Wernicke encephalopathy. *Neurolo Clin Prac* 3(6):460–468.

Kattah JC, Talkad AV, Wang DZ, Hsieh YH, Newman-Toker D. (2009) HINTS to diagnose stroke in acute vestibular syndrome: three-step bedside oculomotor examination more sensitive than early MRI diffusion-weighted imaging. *Stroke* 40:3504–3510.

Lempert T, Neuhauser HK. (2009) Vertigo: Epidemiologic aspects. *Sem Neurol* 29(5):473–481.

Lempert T, Olesen J, Furman J, Waterston J, Seemungal B, Carey J, Newman-Toker D. (2012) Vestibular migraine: diagnostic criteria. *J Vestib Res* 22:167–172.

MacDougall HG, McGarvie LA, Halmagyi GM, Rogers SJ, Manzari L, Burgess AM, Weber KP. (2016) A new saccadic indicator of peripheral vestibular function based on the video head impulse test. *Neurol* 87(4):410–418.

Mantokoudis G, Schubert MC, Saber Tehrani AS, Wong AL, Agrawal Y. (2013) Early adaptation and compensation of clinical vestibular responses after unilateral vestibular deafferentation surgery. *Otol Neurotol* 35(1):148–154.

Minor LB, Haelwanger T, Straumann D, Zee DS. (1999) Hyperventilation-induced nystagmus in patients with vestibular schwannoma. *Neurol* 53:2158–2167.

Mostafa BE, El Kahky AO, Abdel Kader HM, Rizk M. (2014) Central vestibular dysfunction in an otorhinolaryngological vestibular unit: incidence and diagnostic strategy. *Int Arch Otorhinolaryngol* 18:235–238.

Otometrics. (2015, April) Assessing the Patient with Vestibular Symptoms.

Shepard NT. (2009). Retrieved July 11, 2016, from American Speech-Language-Hearing Association (www.asha.org/aud/articles/CentralVestib).

Vestibular Disorders Association (VEDA) 2011 Survey.

Szmulewicz DJ, Waterston JA, MacDougall HG, Mossman S, Chancellor AM, McLean CA, Storey E. (2011) Cerebellar ataxia, neuropathy, vestibular areflexia syndrome (CANVAS): a review of the clinical features and video-oculographic diagnosis. *Ann NY Acad Sci* 1233:139–147.

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DRUG SIDE EFFECTS ON AUDIOLOGICAL AND VESTIBULAR TESTING

BY ROBERT M. DISOGRA

CASE HISTORY AND ITS POTENTIAL IMPACT ON TESTING

WHAT MEDICATIONS DO YOU TAKE AND WHY?*

There are over 2,000 drugs and more than 400 side effects that could impact the accuracy of the audiometric or vestibular evaluation and the recommendations made for intervention and management (DiSogra, 2008, 2001).

During clinical trials, incidence figures of an adverse event (side effect) might be extremely low and reported as “rare” or “less frequent.” One person in 100 might report that their ears are ringing, however it could be reported as tinnitus, roaring, ear disturbances, or auditory hallucinations.

There is a wealth of drug information available on the internet, but it is incumbent on you to know what websites provide reliable, accurate, and up-to-date information especially reported adverse reactions or side effects.

Some websites that offer reliable drug information include (but not limited to): www.drugs.com, www.rxlist.com, www.earserv.com, www.drugs.com (audiology-specific side effects), and www.epocrates.com. The aforementioned websites do not represent an endorsement by the author or the American Academy of Audiology.

Audiology 101—The Case History

Typical case history questions to the patient are: “What medications are you currently taking?” “Why are you taking them?” “How long have you been taking them?” As simple as these questions are, it is the first step for possible problems.

A survey in the United States of a representative sampling of 2,206 community-dwelling adults (aged 62–85 years) was conducted by in-home interviews and use of medication logs between 2010 and 2011. At least one prescription medication was used by 87 percent of those surveyed. Five or more prescription medications were used by 36 percent, and 38 percent used over-the-counter medications (Qato, 2016). The Centers for Disease Control and Prevention (2016) estimated 75 percent of persons older than age 60 take two or more drugs, and those older than 90 take five or more medications.

In addition to pharmaceuticals, Kennedy (2005) reported that an estimated 38.2 million adults in the United States used herbs and/or supplements in 2002. Of interest is that only a third of the participants told their health-care provider about their herb or supplement use.

Medication side effects may influence an older patient’s understanding of your question(s) or test instructions and capacity to stay focused on the required task for a particular test. For example, some medications might have an obvious auditory side effect (e.g., tinnitus), might influence vestibular testing (e.g., oculomotor dysfunction), or have a cognitive side effect (e.g., confusion).

According to Rochon (2016), the possibility of an adverse drug event (ADE) should always be borne in mind when evaluating an older adult; any new symptom should be considered drug-related until proven otherwise. Pharmacokinetic changes lead to increased plasma drug concentrations and pharmacodynamics changes lead to increased drug sensitivity in older adults.

Clinicians must also be alert to the use of herbal and dietary supplements by older patients, who may not volunteer

SUGGESTED WEBSITES

www.rxlist.com
www.drugs.com

www.earserv.com/[drugs](http://www.drugs.com)
www.epocrates.com



this information and are prone to drug–drug interactions related to these supplements.

For drug–drug interaction information, go to www.drugs.com/drug_interactions.html. For drug–herbal interactions, go to www.rxlist.com/supplements/article.htm.

Timelines: Pharmacist/Audiologist Relationship

Whether you are conducting an audiometric evaluation, a vestibular study, or a tinnitus evaluation, establishing a timeline from when the symptoms first began and when the drug was started should be the focus of your case history and differential diagnosis.

Even if you believe that the patient is a good historian, memory impairment can be a drug side effect. A patient might report that he or she has been taking a particular drug for about a year. A phone call to the referring physician or pharmacist will help you get the start date (the patient might have been taking it for three years!). For

over-the-counter products, the store receipt is the only way to know—if the receipt is even kept.

Audiogram Accuracy: Pure Tones and Speech

So how do we really know that a pure-tone threshold is truly threshold for an older patient? We don't. For example, your 80-year old patient presents with a flat 70dB sensorineural loss with some high-frequency roll-off. But during the case history, she is not raising her voice or leaning in with behavior consistent with significant hearing loss. She is sitting four to five feet from you and is answering your questions appropriately even when your mouth is not visible to her.

Is that 70dB loss real? Or is it a 35–40dB loss influenced by poor listening skills or an inability to stay focused on the task because of an adverse drug reaction?

Another dilemma is when masking is introduced into the test protocol. Two competing stimuli might be an acoustic overload for an older patient. Are those air-bone gaps real?

TABLE 1. Reported auditory side effects of prescription medicines.

Auditory disturbances
 Carcinoma, ear
 Cerumen, increased
 Cochlear damage
 Cochlear lesion
 Deafness
 Deafness, transient
 Ear, discomfort
 Ear drainage
 Ear, congestion
 Earache
 Eardrum, perforated
 Ears, roaring
 Hearing, impaired,
 Hearing, loss of
 Nerve deafness
 Otitis externa
 Otorrhea
 Ototoxicity
 Pain, ear
 Phonophobia
 Tingling, ears
 Tinnitus

TABLE 2. Reported vestibular side effects of prescription medicines.

Balance, loss of	Ocular tension, increase	Unsteadiness
Balance disorder	Ocular toxicity	Vascular insufficiency
Diplopia	Oculomotor disturbances	Vertigo
Dizziness	Optic neuritis	Vestibular disturbances
Falling	Optic neuropathy	Vestibular dysfunction
Feeling intoxicated	Ophthalmitis	Vision, blurred
Equilibrium dysfunction	Ophthalmoplegia	Vision, complete loss
Eye movements, abnormal	Optic atrophy	Vision, double
Intraocular disorders	Optic disorders	Vision, loss of
Labyrinth disorder	Optic nerve damage	Vision, partial loss
Labyrinthitis	Optic nerve infarction	Vision, peripheral, decreased
Lightheadedness	Palsy, optic nerve	Vision, temporary loss of
Listlessness	Pupil enlargement	Vision, tunnel
Memory disorders, unspecified	Retinal artery occlusion	Visual acuity, decreased
Memory impairment	Retinal atrophy	Visual acuity, defects
Memory loss, short term	Retinal damage	Visual disturbances
Meniere's disease	Retinal degeneration	Visual disturbances, flashing lights
Meniere's syndrome	Retinal detachment	Visual field defect
Motion sickness	Retinal pigmentation disorders	Visual impairment
Motor skills, impairment	Retinal vascular disorder	Vitreous detachment
Movement, abnormal	Retinal vein occlusion	Vitreous disorder, unspecified
Movement disorder	Retinitis	Vitreous floaters
Myopia	Retinitis, bilateral	Vitreous opacity
Nausea	Retinopathy	Vomiting
Neuro-motor, unspecified	Scotoma/Scotomata	Walking disorders
Neuro-ocular lesions	Sensation, lightness	Weakness, feet
Ocular lesions	Sluggishness	Weakness, legs
Ocular palsies	Strabismus	
Ocular pressure	Swelling, peri-orbital	

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Difficulty hearing over the phone — with its resulting social isolation — is one of the most common issues faced by anyone with hearing loss. This isolation has a tremendous impact on quality of life and — even with the ideal instrument fitting — remains one of the most difficult issues for hearing health care professionals to help resolve. But now, there is an easy solution that all audiologists can bring to their patients. It's called Sprint CapTel.

Sprint CapTel is a leading telephone captioning service that enables patients to re-connect over the phone, hearing their calls with their residual hearing, but also reading real-time captions of their phone calls, displayed using existing Internet and telephone service. Patients love it because it supports individuals with nearly all levels of hearing loss, and it restores a second-nature action for many patients: picking up the phone to dial or to answer a call. The service quickly and easily restores telephone communication to people with hearing loss and reconnects them to family, friends, and businesses, all with the confidence that they are “catching” every word of the conversation.

While the service has been available from Sprint for more than 14 years, and is funded by the FCC, Sprint CapTel is still unknown by many who could benefit from it most. The company's new program for hearing healthcare professionals provides a complete, no-cost way for them to share the benefits of captioned telephone with their patients.

There is nothing to stock (no inventory), and no up-front costs or service charges. Sprint CapTel is provided at no cost for the practice and for patients.

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TABLE 3. Reported cognitive side effects of prescription drugs and herbal medicines that could affect audiometric/vestibular testing.

Prescription Drugs

Awareness, altered
 Cognition, decreased
 Cognition dysfunction
 Concentration, impaired
 Confusion
 Dementia
 Disorientation
 Forgetfulness
 Memory impairment
 Mental acuity, loss of
 Mental clouding
 Mental perception, altered
 Mental performance, impairment
 Mental slowness
 Mental status, altered
 Proprioception, loss of
 Sensorium, clouded/dull
 Sensory deficit
 Sensory disturbances
 Stupor
 Thinking, slowed
 Thinking abnormality

Herbal Medicine

Confusion
 Delerium
 Disorders of consciousness
 Drowsiness
 Dysphoria
 Hallucinations (auditory/visual)
 Manic behavior
 Stupor
 Sleep disturbances
 Thinking abnormality

TABLE 4. Reported vascular side effects of prescription drugs and herbal medications.

Prescription Drugs

Carotid artery occlusion
 Cerebral artery
 Cerebrovascular disorders
 Cerebrovascular insufficiency
 Circulatory depression
 Vascular collapse
 Vascular insufficiency

Herbal Medicine

Circulatory collapse
 Circulatory damage

TABLE 5. Reported neurological side effects of prescription drugs and herbal medicines.

Prescription Drugs

CNS reactions
 CNS stimulation
 CNS toxicity

Herbal Medicine

Abnormal reflexes
 Asthenia
 CNS disorder
 CNS stimulation
 Exhaustion
 Fatigue
 Heavy eyelids
 Irritability
 Nervousness
 Neurotoxicity
 Motor skills, impaired agitation
 Numbness in fingers
 Peripheral nervous system disorder
 Photosensitivity
 Tingling (includes fingers/toes/limbs)
 Toxicity (unspecified)
 Tremors

TABLE 6. Reported speech side effects of prescription drugs and herbal medicine.

Prescription Drugs

Speech, incoherent
 Speech, slurring
 Speech difficulties
 Speech disturbances
 Stuttering

Herbal Medicine

Compulsive speech

BY 2050, THE NUMBER OF PEOPLE AGE 65 AND OLDER WITH ALZHEIMER'S MAY NEARLY TRIPLE TO 13.8 MILLION, BARRING MEDICAL BREAKTHROUGHS.

We also rely on word recognition scores for many reasons, especially hearing aid candidacy. Therefore, we must recognize that there are many drugs that have cognitive side effects (See TABLE 2). The possibility exists that these medications might be influencing the test scores. Fatigue influences concentration. You may need to use a shorter word list. Subsequently, data can be misinterpreted as a “change”—but it might not be a true change.

Middle-Ear Side Effects

Aside from hearing loss and tinnitus, there are several drug effects that can affect the middle ear (congestion/pressure) or the facial nerve. Acoustic impedance and middle-ear muscle reflex testing can identify the presence of pathology.

Vestibular Side Effects

Fifty-five percent of the side effects listed in Appendix I and a third of the herbal medicine side effects in Appendix II can influence a vestibular study. Therefore, you need to explore the possibility that the patient’s current drug regimen might be the cause of their problem or influence your data and subsequent interpretation and recommendations. Establishing the time lines becomes very important.

In a personal interview (2016) with Dr. Richard Gans, Director of the American Institute of Balance, and an authority on balance testing, he noted that [when looking at a patient’s eye movements] saccadic pursuit, bilateral, bithermal caloric weaknesses or reduced gain using rotary chair is never a unilateral event. The conjugate movements of the eyes during active head rotation is never drug related. Dr. Gans also recommends a thorough review of the patient’s current drug and herbal medicine regimen and establishing symptom/drug time lines as a critical component of the case history.

Cognitive Side Effects

- Is your patient really a poor test taker?
- Or not cooperating?
- Are you suspecting malingering?
- What recommendations will be inappropriate if their drug side effects are not examined?

Humes (1996) reported that threshold elevation could account for nearly all of the changes in speech perception with age (in quiet or in less demanding listening environments).

Sweetow (2013) reported that the speed of word recognition is reduced with age, as is the patient’s working memory. There are also attention difficulties as well as a decrease in sentence identification because of changes in working memory.

Personal experience has shown that you may want to consider deducting 5-10dB from the reported threshold for elderly patients to compensate for the possibility, if not probability, that the audiogram is not accurate because of cognitive decline (i.e., poor listening). Over-fitting with hearing aids could occur if you take the audiogram at face value.

Confusion, as a side effect, can be exacerbated when masking is used during air or bone conduction testing as well as speech audiometry. If there is a decrease in the word recognition score, how sure are you that it is not from a drug side effect?

TABLE 3 shows the reported cognitive side effects of prescription medications (Kennedy, 2009) and herbal medications (Handler, 2008).

Confusing a Drug’s Name—Zocor® or Zolofit®?

It is not unusual for patients to confuse the names of the medications they take. For a complete list of sound-alike drug names that can be printed out for reference, go to www.ismp.org/tools/confuseddrugnames.pdf.

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Dementia Patients

According to the Alzheimer's Organization (www.alz.org) an estimated 5.4 million Americans of all ages have Alzheimer's disease in 2016. Of the 5.4 million Americans with Alzheimer's, an estimated 5.2 million people are age 65 and older, and approximately 200,000 individuals are younger than age 65 (younger-onset Alzheimer's). One in nine people age 65 and older has Alzheimer's disease. By 2050, the number of people age 65 and older with Alzheimer's disease may nearly triple, from 5.2 million to a projected 13.8 million, barring the development of medical breakthroughs to prevent or cure the disease.

According to the National Institutes on Deafness and Other Communication Disorders (2016), approximately one in three people in the United States between the ages of 65 and 74 have hearing loss, and nearly half of those older than 75 have difficulty hearing. Factor in the diagnosis of dementia, and more challenges face the audiologist in the evaluation process of a geriatric patient with this diagnosis. The primary caregiver now becomes your historian. Contacting the primary care physician or pharmacist will help with drug names and timelines if the caregiver is not able to provide you with the answers to the patient's drug history.

Tinnitus Side Effects

More than 220 drugs listed in the Physician's Desk Reference have tinnitus as a reported side effect (Kennedy, 2009). When did the symptom start? Was there a drug introduced or a dosage increase at the same time?

Vascular Side Effects

Auditory symptoms of such as fluctuating hearing levels and throbbing tinnitus strongly suggest a vascular problem. TABLE 4 shows the reported vascular side effects of prescription drugs (Kennedy, 2009) and herbal medications (Handler, 2008).

Neurological Side Effects

Medication side effects can also affect the brain, the spine, and the peripheral nerves, some of which could have an impact on our data collection and/or interpretation and recommendations. TABLE 5 shows the reported neurological side effects of prescription drugs (Kennedy, 2009) and herbal medications (Handler, 2008).

Speech Side Effects

Because our patient interaction requires our patients to give verbal responses (i.e. word recognition tests), consider the speech-related side effects of prescription drugs (Kennedy, 2009) and herbal medications (Handler, 2008)

that appear in TABLE 6. Assuming that the examiner has normal or near-normal hearing, an expressive speech side effect might have the audiologist interpret the response as an incorrectly spoken word.

Wrong Diagnosis Equals Wrong Intervention

Confidence levels must be very high when making recommendations for medical or surgical intervention or hearing aid intervention. Some questions to ask include the following:

- Do the test results support the patient's complaint(s)?
- Is the loss truly sensorineural, conductive or mixed?
- Are the abnormal eye movements truly peripheral or central in origin?

Look back at those patients who could not adjust to amplification. How well did we counsel them? Was it them or did you miss "something?" Did you interpret the audiogram at face value?

That something might be the accuracy of their test that might have been influenced by an adverse drug reaction in addition to their cognitive abilities.

Reporting Your Findings and Suspicions

Document everything and report your concerns about patient alertness, test accuracy, or other different or unusual observations before, during, and after the testing. Record the time of day that the testing occurred because some medications need to be taken at specific times. Report your discovery of any drug timelines. Note any observations of behaviors during the testing that you believe might have influenced the test results. If it's not documented, it didn't happen.

Contacting the Drug's Manufacturer

All drug manufacturers are required to collect post-Food and Drug Administration (FDA) approval for a period of 10 years. Side effects might emerge after FDA approval that might require a change in drug information in the literature.

Using the "Contact Us" tab on the manufacturer's website is the easiest way to express your concerns.

Sample email: "My name is _____ and I am audiologist. One of my patients, a healthy 50-year old female, began taking _____ exactly three weeks ago. She is now reporting tinnitus in both ears. The tinnitus started the first day she started the medication. I noted in your literature about this drug that tinnitus, or any other ear-related adverse event, was not reported during clinical trials. Do you have any post-FDA approval information about tinnitus as a new side effect?"

This type of inquiry will be answered within 24 to 48 hours by a pharmacologist who is a product specialist. He or she may have some additional information for you or send you paperwork to complete to report this new adverse event to the FDA's safety information and adverse event reporting program—MedWatch—www.fda.gov/Safety/MedWatch. There is also a section on reporting adverse events with dietary supplements.

Another reporting agency is the Institute for Safe Medical Practices (www.ismp.org). The same information can be reported for follow-up.

Conclusion

No one is knowledgeable of all of the FDA-approved drugs and their side effects; however, there are reliable (and valuable) websites available that provide accurate and up-to-date information about side effects. Contacting a drug's manufacturer is simple and you might find some additional information that could be helpful to you and your patient. If in doubt, call the patient's pharmacist. Incidence figures for some side effects can be very small but they must be considered when there are test discrepancies. Documentation of behaviors is very important. Discovery of and drug-symptom timelines might explain test discrepancies.

Suggestions to reduce the possibility of drug influences on audiological/vestibular testing include the following:

1. Spend more time in getting an accurate case history. If the patient cannot recall the name(s) of the drug(s) he or she is taking, call his or her pharmacist.
2. Reference www.rxlist.com, www.drugs.com, www.earserv.com/drugs or epocrates.com for side effects. Note: These websites are not an endorsement by the author or the American Academy of Audiology.
3. Establish "time lines" from when the problem began and when the drug(s) were prescribed (see #1).
4. Make certain that your patient understands the test instructions.
5. Never forget what you learned in Audiology 101 about test/retest reliability. 🎧

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The views and opinions expressed in this article are those of the author and do not necessarily represent the official policy, position, or opinion of the American Academy of Audiology; further, the Academy does not endorse any products or services mentioned in this article.

References

Centers for Disease Control and Prevention (www.cdc.gov), 2016.

DiSogra RM. (2008) Adverse drug reactions and audiology practice *Audiol T* 20(5): 60–70.

DiSogra, RM. (2006) Staying current: website and resources for pharmacological information, in *Pharmacology and Ototoxicity for the Audiologist*. Campbell, KCM, ed., Demler Learning.

DiSogra RM. (2001) Adverse drug reactions and audiology practice, *Audiol T* 13(5).

Gans R. (2016) *American Institute of Balance* www.dizzy.com, personal communication.

Handler SS. (2008) *PDR for Nutritional Supplements*, 2nd Edition, Thomson Reuters Healthcare: Montvale, NJ.

Humes L. (1996) Speech understanding in the elderly. *J Amer Acad Audiol* 7:161–167.

Kennedy B. (2009) ed., *PDR Guide to Drug Interactions, Side Effects, and Indications*, 64th Edition, 1847–1858, PDR Network, LLC: Montvale, NJ.

Kennedy J. (2005) Herb and supplement use in the US adult population. *Clin Therap* 27(11).

National Institutes on Deafness and Other Communication Disorders (www.nidcd.nih.gov) 2016.

Qato DM, et al. (2016) Changes in prescription and over-the-counter medication and dietary supplement use among older adults in the United States, 2005 vs 2011. *JAMA Intern Med* 176:473.

Rochon PA. (2016) Drug prescribing for older adults. www.uptodate.com

Sweetow R. (2013) Unique needs of elderly hearing impaired patients. Paper presented at the annual meeting of the American Academy of Audiology.

Appendix I and II are the collective side effects referenced in this article grouped by drug side effects and herbal medicine side effects.

Appendix I

Reported drug side effects that could affect audiometric/vestibular testing (Kennedy, 2009)

Drug Side Effects (N=155)

AUDITORY 31 (20%)

1. Auditory disturbances
2. Carcinoma, ear
3. Cerumen, increased
4. Cochlear damage
5. Cochlear lesion
6. Deafness
7. Deafness, transient
8. Ear, discomfort
9. Ear drainage
10. Ear, congestion
11. Earache
12. Eardrum, perforated
13. Ears, blocked
14. Ears, roaring
15. Hearing, impaired
16. Hearing, loss of
17. Nerve deafness
18. Otitis externa
19. Otitis media
20. Otorrhea
21. Ototoxicity
22. Pain, ear
23. Palsy, facial
24. Paralysis, facial
25. Paresis, facial
26. Phonophobia
27. Swelling, facial
28. Tingling, ears
29. Tinnitus
30. Tympanic membrane perforation
31. Tympanogram, abnormal

VESTIBULAR 85 (55%)

1. Balance, loss of
2. Balance disorder
3. Diplopia
4. Dizziness
5. Falling
6. Feeling intoxicated
7. Equilibrium dysfunction
8. Eye movements, abnormal

9. Intraocular disorders
10. Labyrinth disorder
11. Labyrinthitis
12. Lightheadedness
13. Listlessness
14. Memory disorders, unspecified
15. Memory impairment
16. Memory loss, short term
17. Meniere's disease
18. Meniere's syndrome
19. Motion sickness
20. Motor skills, impairment
21. Movement, abnormal
22. Movement disorder
23. Myopia
24. Nausea
25. Neuro-motor, unspecified
26. Neuro-ocular lesions
27. Ocular lesions
28. Ocular palsies
29. Ocular pressure
30. Ocular tension, increase
31. Ocular toxicity
32. Oculomotor disturbances
33. Optic neuritis
34. Optic neuropathy
35. Ophthalmitis
36. Ophthalmoplegia
37. Optic atrophy
38. Optic disorders
39. Optic nerve damage
40. Optic nerve infarction
41. Palsy, optic nerve
42. Pupil enlargement
43. Retinal artery occlusion
44. Retinal atrophy
45. Retinal damage
46. Retinal degeneration
47. Retinal detachment
48. Retinal pigmentation disorders
49. Retinal vascular disorder
50. Retinal vein occlusion
51. Retinitis

52. Retinitis, bilateral
53. Retinopathy
54. Scotoma/Scotomata
55. Sensation, lightness
56. Sluggishness
57. Strabismus
58. Swelling, peri-orbital
59. Unsteadiness
60. Vascular insufficiency
61. Vertigo
62. Vestibular disturbances
63. Vestibular dysfunction
64. Vision, blurred
65. Vision, complete loss
66. Vision, double
67. Vision, loss of
68. Vision, partial loss
69. Vision, peripheral, decreased
70. Vision, temporary loss of
71. Vision, tunnel
72. Visual acuity, decreased
73. Visual acuity, defects
74. Visual disturbances
75. Visual disturbances, flashing lights
76. Visual field defect
77. Visual impairment
78. Vitreous detachment
79. Vitreous disorder, unspecified
80. Vitreous floaters
81. Vitreous opacity
82. Vomiting
83. Walking disorders
84. Weakness, feet
85. Weakness, legs

COGNITIVE 22 (14.2%)

1. Awareness, altered
2. Cognition, decreased
3. Cognition dysfunction
4. Concentration, impaired

5. Confusion
6. Dementia
7. Disorientation
8. Forgetfulness
9. Memory impairment
10. Mental acuity, loss of
11. Mental clouding
12. Mental perception, altered
13. Mental performance, impairment
14. Mental slowness
15. Mental status, altered
16. Proprioception, loss of
17. Sensorium, clouded/dull
18. Sensory deficit
19. Sensory disturbances
20. Stupor
21. Thinking, slowed
22. Thinking abnormality

VASCULAR 7 (4.5%)

1. Carotid artery occlusion
2. Cerebral artery
3. Cerebrovascular disorders
4. Cerebrovascular insufficiency
5. Circulatory depression
6. Vascular collapse
7. Vascular insufficiency

NEUROLOGICAL 3 (2%)

1. CNS reactions
2. CNS stimulation
3. CNS toxicity

SPEECH 5 (3.3%)

1. Speech, incoherent
2. Speech, slurring
3. Speech difficulties
4. Speech disturbances
5. Stuttering

Appendix II

Reported side effects from herbal medicines that could affect audiometric/vestibular testing (Handler, 2008)

Herbal Side Effects (N=50)

AUDITORY 4 (8%)

1. Facial swelling
2. Hallucinations
3. Hearing loss
4. Tinnitus

VESTIBULAR 14 (28%)

1. Abnormal eye movements
2. Coordination impaired
3. Diplopia
4. Dizziness
5. Eye irritation
6. Eyelid swelling
7. Intoxicated state
8. Leg weakness
9. Loss of vision, temporary
10. Mydriasis

11. Nausea

12. Vertigo
13. Visual disturbance
14. Visual hallucinations

COGNITIVE 10 (20%)

1. Confusion
2. Delirium
3. Disorders of consciousness
4. Drowsiness
5. Dysphoria
6. Hallucinations (auditory/visual)
7. Manic behavior
8. Stupor
9. Sleep disturbances
10. Thinking abnormality

VASCULAR 2 (4%)

1. Circulatory collapse
2. Circulatory damage

NEUROLOGICAL 19 (38%)

1. Abnormal reflexes
2. Agitation
3. Asthenia
4. CNS disorder
5. CNS stimulation
6. Exhaustion
7. Fatigue
8. Heavy eyelids
9. Hyper-excitability
10. Irritability
11. Motor skills, impaired
12. Nervousness

13. Neurotoxicity

14. Numbness in fingers
15. Peripheral nervous systems disorder
16. Photosensitivity
17. Tingling (includes fingers, toes, and limbs)
18. Toxicity (unspecified)
19. Tremors

SPEECH 1 (2%)

1. Compulsive

VOLUNTEER

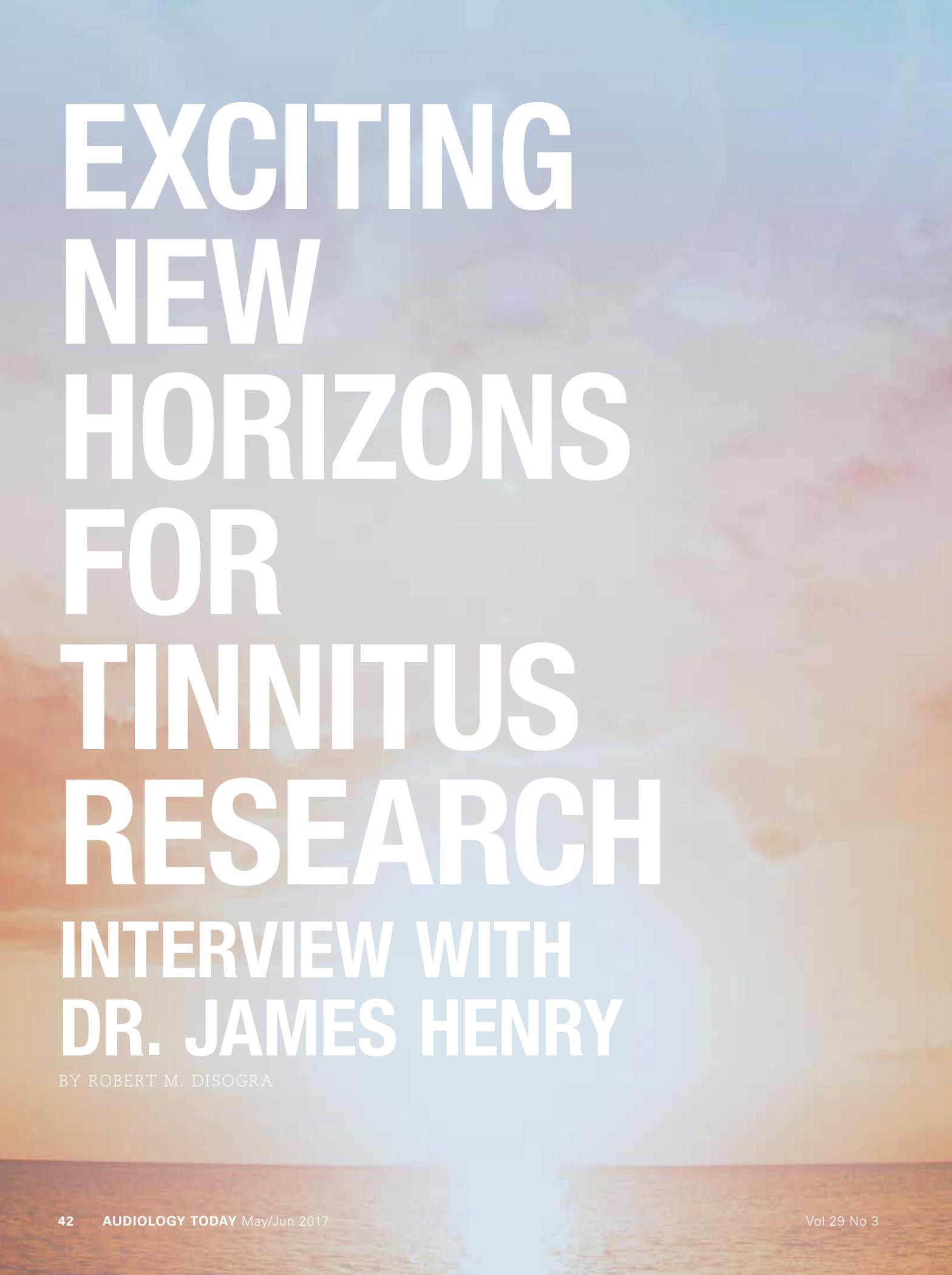
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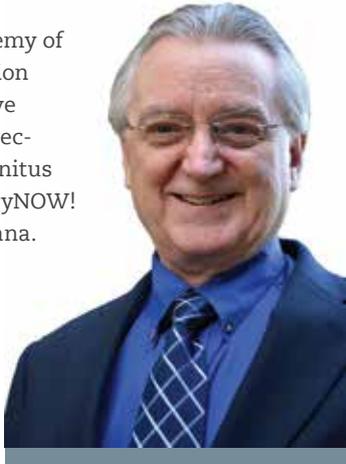
EXCITING NEW HORIZONS FOR TINNITUS RESEARCH

INTERVIEW WITH DR. JAMES HENRY

BY ROBERT M. DISOGRA

Dr. Robert M. DiSogra, a AAA Foundation trustee, had an opportunity to talk with Dr. James Henry, 2017 Topics in Tinnitus lecturer, about his life's work in the area of tinnitus.

The American Academy of Audiology Foundation was honored to have James Henry, PhD, as the lecturer for the Topics in Tinnitus Lecture Series at AudiologyNOW! 2017 in Indianapolis, Indiana. Dr. Henry is a research career scientist with the Department of Veterans Affairs (VA) Rehabilitation Research and Development Service (RR&D) National Center for Rehabilitative Auditory Research (NCRAR) in Portland, Oregon.



In addition to his role as a researcher at NCRAR, Dr. Henry is also a research professor in the Department of Otolaryngology/Head and Neck Surgery at the Oregon Health and Science University (OHSU), as well as an adjunct professor in the Department of Audiology at Portland State University. He is a recognized expert on tinnitus research with a focus on clinical aspects of tinnitus management. Dr. Henry was recognized at AudiologyNOW! this year with the James Jerger Career Award for Research in Audiology.

The Topic in Tinnitus Lecture Series is generously sponsored by Widex USA, Inc. and Widex A/S, Denmark. The AAA Foundation appreciates the philanthropic support from Widex and thanks them for their five-year commitment to high-level education on the topic of tinnitus. The 2017 edition of the Topics in Tinnitus Lecture with Dr. Henry is available (free of charge for three months) as a webinar on www.eaudiology.org.

Dr. Robert M. DiSogra, a AAA Foundation trustee, had an opportunity to talk with Dr. Henry about his life's work in the area of tinnitus.

Robert DiSogra: Dr. Henry, thank you for taking time from your busy schedule to speak with me. Let's start with how you became interested in the study of tinnitus, your path to the NCRAR, and your current and future research plans.

James Henry: Thanks, Bob, and please call me Jim. It's certainly a pleasure to be interviewed by someone who has done their own research on over-the-counter (OTC) tinnitus products. I was surprised by how many of these products are marketed to consumers!

That's correct, Jim. Over 80 products are out there and still counting! None of which, I might add, are FDA approved. *Caveat emptor!*

I'm happy to hear that you are lecturing on this to our colleagues. They need to know about the safety and efficacy of these products.

Thanks! Let's talk about how you became interested in tinnitus and your research.

My interest in tinnitus was not by design. After some years out of school pursuing other careers, I moved to Portland in 1984 so that my five-year-old deaf daughter could attend Tucker Maxon School, which specializes in teaching speech and listening skills to deaf children. I had already re-entered college prior to moving here. After getting settled, I visited Portland State University and wound up in the Speech and Hearing Department, where I met with one of the professors, Dr. Joan McMahan. When I left her office, I knew that I wanted to become an audiologist and I enrolled in their program. I completed a master's of science in audiology in 1987, and was hired by Drs. John McDermott and Steve Fausti at their VA auditory research lab in Portland to work as a research audiologist.

I soon realized that I wanted to do my own research, so I enrolled in the behavioral neuroscience doctoral program at OHSU in 1988. My research lab was at the Oregon Hearing Research Center (OHRC), which was run by Dr. Jack Vernon, and my research advisor was Dr. Mary Meikle. Dr. Vernon's Oregon Tinnitus Clinic was under the same roof. I spent six years in that program, receiving my PhD in 1994. All of my research at OHRC involved the evaluation of different methods of tinnitus measurement. Those six years were invaluable in preparing me to start a career in tinnitus research.

I knew Drs. Vernon and Meikle and I know you were very fortunate to spend all of that time under their tutelage.

I was indeed fortunate and owe a great deal to both of them, as well as to all of the staff who guided me through my doctoral program.

So how did your career in tinnitus research start after you completed your PhD?

During those six years in the doctoral program, I continued to work half-time at the VA in Portland. I assisted Drs. McDermott and Fausti in all aspects of their research, and became more and more involved with scientific writing of research articles and grant proposals. This was another form of mentoring that I received and I am also grateful for that opportunity. Shortly after completing my doctoral program, I went to work writing a grant proposal to study a new technique for tinnitus measurement using computer automation. That proposal was funded in 1995, and that's when my independent tinnitus research began. By the way, the NCRAR started here in 1997, so I was involved in that whole start-up process.

What, specifically, were you studying in the beginning?

The perception of tinnitus has sound-like qualities. Different procedures had been developed, by Drs. Vernon and Meikle, and by others, and Dr. Fausti had the idea that these procedures could be conducted entirely by a computer. We worked with an engineer to develop such a system, and it worked quite well. The first system obtained tinnitus loudness matches, tinnitus pitch matches, and measures of tinnitus "mask-ability" and residual inhibition.

Matches of loudness and pitch attempt to replicate the sound of a person's tinnitus. Mask-ability is the level at which broadband noise completely covers or "masks," a person's tinnitus. Residual inhibition is the common (80–90 percent of patients) effect of reduction in tinnitus loudness following one minute of listening to sound at a level higher than that at which tinnitus is masked.

Where has this research led you and your team?

We have since received four consecutive grants to continue this work of tinnitus measurement. Each grant has resulted in an updated version of the testing system, and we are currently funded through 2018, so the work is ongoing. Our current project is focusing on establishing normative standards for these tinnitus measures, as well as other measures, in a large number of people with tinnitus.

The caveat is that these measures have not been particularly useful for clinical purposes, other than to serve as a counseling tool for patients. Our goal is to create a clinically viable system that will obtain these measures rapidly and reliably, and that the measures will have clinical utility with respect to assessment and intervention for tinnitus.

So measuring tinnitus with your research methods, at least currently, has limited value in the clinic. What would you suggest be done to assess the patient who reports tinnitus?

The first thing to be aware of is that the majority of patients complaining of tinnitus also have hearing loss. Therefore, these patients should receive a full hearing evaluation by an audiologist. Patients who are candidates for amplification should receive hearing aids. If the tinnitus is bothersome to the patient, then the hearing aids may be effective both for improving hearing and for mitigating effects of tinnitus. We have recently completed two randomized controlled trials (RCTs) that demonstrated the effectiveness of hearing aids for this purpose.

Can you tell us a little about those studies?

Certainly. The first was funded by Starkey Hearing Technologies (Henry et al, 2015). We recruited 30 hearing aid candidates who also had bothersome tinnitus. All participants wore Starkey's combination instruments for three months. (Combination instruments are hearing aids that include the option for a noise stimulus to help mitigate the awareness of the tinnitus.) All of the participants had the hearing aids adjusted for optimal hearing based on standard clinical fitting procedures.

Participants were then randomized such that half had the sound generator (noise stimulus) adjusted for maximum tinnitus relief (again based on standard clinical procedures), while the other half did not have the sound generator activated—they simply used the devices to treat the hearing loss. Both groups showed significant improvement overall in their report of tinnitus (decrease), based on the Tinnitus Functional Index (TFI) and there was no significant difference between groups (Meikle et al, 2012). This means that treating the hearing loss not only helped the subjects with their hearing, the amplification helped reduce the effects of the tinnitus!



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I'm glad to see this study and the results that you got. We need controlled studies verifying what audiologists already know from experience and that is hearing aids are often effective both for improving hearing and for mitigating effects of tinnitus. What did the second hearing aid study reveal?

The second study was similar to the first, but included a third group. The third group wore deep-fit, extended-wear hearing aids (Lyric). These hearing aids were of particular interest because audiologists fitting them were receiving reports from their patients that they seemed to be particularly effective for providing relief from tinnitus. Such benefit seemed logical because these hearing aids are worn 24/7, thus they can provide "sound enrichment" 24/7.

It is generally thought that sound enrichment from hearing aids is what mitigates reactions to tinnitus; having sound enrichment round-the-clock would seem to optimize this effect. The other two groups in this study again wore combination instruments, i.e., one group had the sound generator (noise stimulus) activated and the other group did not have it activated. This study was funded by Phonak, LLC, and all of the devices were supplied by the company.

What were the results?

The results were similar to the first study—combination instruments with the sound generator activated versus un-activated both provided significant benefit (report of reduced effects of tinnitus), and the benefit was comparable between groups. The deep-fit extended-wear device did equally well, indicating that this type of device can also be helpful for tinnitus.

Now we have two randomized-controlled trials showing that hearing aids and combination devices (with the sound generator) are useful for tinnitus management. Has anyone else done a similar RCT? To my knowledge, there is only one other such RCT, which was published by dos Santos et al in 2014 (Dos Santos et al, 2014). Their study showed results very similar to our own. So, there are now at least three RCTs demonstrating the effectiveness of combination instruments and of hearing aids for tinnitus.

This is certainly something that audiologists should be aware of. The use of these devices for managing tinnitus would now be considered evidence-based. We were talking about assessment of the tinnitus patient when we got off on this tangent. Can you tell me more about how tinnitus patients should be evaluated?

I mentioned the TFI (Tinnitus Functional Index), which was used in both of our hearing aid studies. The TFI is a tinnitus outcome instrument that has been shown to be responsive to effects of intervention. Development of the TFI was a rigorous project driven by Dr. Meikle over a four-year period (Meikle et al, 2012). The TFI has been adopted internationally by numerous researchers and clinicians, and is being translated into at least 15 languages.

We need a standard outcome measure and the TFI has the potential to meet this need. One caveat with using the TFI, or any tinnitus questionnaire for that matter, is that some patients who have both hearing loss and tinnitus tend to blame their tinnitus for their hearing difficulties. When this happens, they will respond to questions about how their tinnitus affects them with respect to how they are bothered by their hearing problems. These kinds of responses will result in a questionnaire score that indicates the tinnitus is more of a problem than it really is. It is difficult to determine if these patients need intervention specific to their tinnitus or not.

How do you make this determination?

This was a problem for us in our early days of conducting RCTs. To screen for appropriate research participants, we would ask the questions from a tinnitus questionnaire over the telephone. If the score was high, then we figured they had enough of a problem with their tinnitus to warrant the intervention that was offered. They would then be scheduled for a full assessment, which typically took two hours or more. We had numerous candidates who had a significant hearing problem, but a minimal tinnitus problem, despite their high score on the tinnitus questionnaire. We had to send those people home and tell them to consider getting hearing aids for their hearing loss. This cost us valuable time and we realized we needed to find a way to screen more efficiently over the telephone so that the candidates who showed up in our lab were more likely to qualify as needing intervention for their tinnitus.

Did you find a way to address this problem?

Our solution was to develop a screening questionnaire just for this purpose. The questionnaire needed questions about the effects of tinnitus that would not be confused

with hearing problems. Similarly, it needed to have questions about hearing loss that would not be confused with tinnitus. We wrote four items for each, and this has worked remarkably well for our screening procedures. The screening instrument is called the Tinnitus and Hearing Survey, and it has been validated and published (Henry et al, 2015).

Is the Tinnitus and Hearing Survey useful in the clinic?

Yes. We recommend that the basic assessment for the patient with tinnitus is a diagnostic hearing evaluation to include the Tinnitus and Hearing Survey. These procedures will normally provide all of the information necessary to determine the patient's needs, with respect to both hearing and tinnitus. If the patient is a hearing aid candidate, then that person should receive hearing aids (or combination instruments) and should have the Tinnitus and Hearing Survey re-administered in a few months to determine if the tinnitus has been helped.

If the person still has a tinnitus problem, then the hearing aids have not been sufficient in resolving the problem and tinnitus-specific intervention should be considered. That would be the point at which the TFI, or any tinnitus questionnaire, should be completed. The TFI score will serve as a pre-intervention (for tinnitus) baseline that can be used to assess post-intervention outcomes.

So, you are recommending use of the survey and not a tinnitus questionnaire, such as the TFI, as part of the initial tinnitus assessment, correct?

That's correct. Only the hearing evaluation and the Tinnitus and Hearing Survey are normally needed for basic assessment of a person complaining of tinnitus.

And you're saying only use the TFI if the patient will be receiving intervention, which will be the baseline measure against which to measure outcomes?

Correct.

Okay. If the person needs intervention, what's the next step?

The decision to receive intervention should really come from the patient. The audiologist facilitates that decision by explaining test results and offering realistic expectations for what type of intervention would be appropriate.

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There are many methods of intervention for tinnitus. How do you know which is best for the patient?

I would start by recommending that audiologists become very familiar with the tinnitus practice guideline that was published in 2014 by the American Academy of Otolaryngology/Head and Neck Surgery (Tunkel et al, 2014). I was on the committee that developed these guidelines and I can attest to the rigorous process that was employed in developing them. Their exhaustive review of the literature revealed that Cognitive-Behavioral Therapy (CBT) had the strongest evidence base for tinnitus intervention. They also recognized that sound therapy can be effective, but only suggested sound therapy as an “option” for intervention. This was based on the fact that there was not much evidence in the published literature to support the use of sound therapy. We recently completed four RCTs, each with a sound therapy component, so we have provided evidence for sound therapy that did not exist when the guidelines were being developed.

Did these four studies include the other hearing aid RCTs that you have already described above?

Yes, plus two others that involved Progressive Tinnitus Management, or PTM. All of the research that we have done has culminated in the development of PTM, which is a structured, stepped-care method of tinnitus management.

And can you tell me briefly about the two PTM studies?

Sure. PTM involves five levels of management, and patients progress only to the level that meets their needs.

Level 1: Referral Level—Depending on the patient’s symptoms, they may be referred to audiology, mental health, otolaryngology, or emergency care. As I’ve already mentioned, every patient reporting tinnitus should have a hearing evaluation and tinnitus assessment using the Tinnitus and Hearing Survey, which is part of PTM Level 2: Audiologic Management.

Level 2: Audiologic Management—This also includes hearing aids or combination instruments, if indicated. After completing Level 2, patients requiring tinnitus-specific intervention are offered PTM Level 3: Skills Education.

Level 3: Skills and Education—With this level, our approach is to teach patients the skills they need to self-manage their tinnitus problems. We combine teaching them about different forms of sound therapy (by an

audiologist) along with CBT taught by a mental-health provider. As you can see, Level 3 is interdisciplinary. Our studies and clinics that use PTM have shown that most patients who receive Level 3 intervention have their needs met to the degree that they do not desire or need further services.

Those relatively few patients who do need further services are offered the PTM Level 4: Interdisciplinary Evaluation.

Level 4: Interdisciplinary Evaluation—This level involves an in-depth evaluation by both an audiologist and a psychologist. Based on the outcome of this evaluation, it should become clear why the patient is still so bothered by tinnitus and what might be the most appropriate form of intervention. If intervention is still needed, then these patients are offered PTM Level 5: Individualized Support.

Level 5: Individualized Support—This level involves one-on-one services by an audiologist and/or a mental-health provider. The audiologist typically covers sound therapy skills in greater detail, while the mental-health provider typically expands on the CBT that was provided in Level 3. Other forms of tinnitus therapy can also be offered at Level 5.

And what about the two PTM studies?

One was a clinical effectiveness study of PTM that was conducted in two VA audiology clinics—one in Memphis, Tennessee, and one in West Haven, Connecticut. Patients who came to the clinics signed up for the study if they felt that the PTM Level 3 intervention might be helpful for them. Half were enrolled to attend the Level 3: Skills Education classes and half were placed on a six-month wait list. The PTM group showed significantly greater benefit than the wait list group. There were 300 veterans in this study (Henry et al, 2017).

The second PTM study was motivated by the fact that so many VA patients have experienced a traumatic brain injury and many have bothersome tinnitus. We used the counseling from PTM Level 3: Skills and Education, and it was administered to participants over the telephone by both an audiologist and a psychologist. Participants were located all over the United States and they were randomized to either receive the telephone counseling for six months or to be put on a six-month wait list. The Tele-PTM group showed significant improvement (reduction in effects of tinnitus), while the wait list group did not.

Dr. Henry, this has been a most illuminating discussion and we are sure the reader has a much greater appreciation of all of the research and work you and your team have done in the areas of tinnitus evaluation and intervention. Can you provide us with a summary of your recommendations at this point?

We have 10 recommendations based on our work, as follows:

1. Clinical services for tinnitus should be progressive. Every patient is different, and the level of care he or she receives for his or her tinnitus should be based on his or her level of need.
2. Three disciplines should be involved in tinnitus management: audiology, otolaryngology, and psychology.
3. All patients with tinnitus should have their hearing tested by an audiologist.
4. Determine if the tinnitus is bothersome or not. If so, then tinnitus-specific intervention should be offered.
5. The best way to determine if intervention is needed is to complete the appropriate tinnitus questionnaires.
6. Make sure the tinnitus problem is not a hearing problem by using the Tinnitus and Hearing Survey up front.
7. The first step in tinnitus management is for patients to be informed and educated. This may include dispelling some myths, particularly with regard to all of those OTC products that purport to “cure” tinnitus. This information is empowering and will enable a person to make informed decisions.
8. Patients are best served if they learn coping skills. Just like any other chronic condition, tinnitus needs to be managed and people need to learn what to do to manage their tinnitus.
9. People should learn how to use sound effectively to manage tinnitus. There are many ways sound can be used, and as I mentioned earlier, there is no proof that any one method works better than any other.
10. Tele-health works, if the provider has the necessary expertise. The beauty of this method is that patients would not have to leave their homes—they just pick up the phone and talk.

Thank you, Dr. Henry. As a reminder, Dr. Henry’s Topics in Tinnitus lecture from AudiologyNOW! 2017 is available now through eAudiology.org.

Robert M. DiSogra, AuD, is an audiology consultant in Millstone Township, New Jersey. He is also a board trustee of the American Academy of Audiology Foundation.

References

- dos Santos GM, Bento RF, de Medeiros IR, Oiticica J, da Silva EC, Penteado S. (2014) The influence of sound generator associated with conventional amplification for tinnitus control: randomized blind clinical trial. *Trends Hear* Jul (23):18.
- Henry JA, Frederick M, Sell S, Griest S, Abrams H. (2015) Validation of a novel combination hearing aid and tinnitus therapy device. *Ear Hear* 36(1):42–52.
- Henry JA, Griest S, Zaugg TL, Thielman E, Kaelin C, Galvez G, Carlson KF. (2015) Tinnitus and hearing survey: a screening tool to differentiate bothersome tinnitus from hearing difficulties. *Am J Audiol* 24(1):66–77.
- Henry JA, McMillan G, Dann S, Bennett K, Griest S, Theodoroff S, Silverman S, Whichard S, Saunders G. (2017) Tinnitus management: Randomized controlled trial comparing extended-wear hearing aids, conventional hearing aids, and combination instruments. *J Am Acad Audiol*. (in press).
- Henry JA, Thielman EJ, Zaugg TL, Kaelin C, Schmidt CJ, Griest S, McMillan GP, Myers P, Rivera I, Baldwin R, Carlson K. (2017) Randomized controlled trial in clinical settings to evaluate effectiveness of coping skills education used with Progressive Tinnitus Management. *J Speech Lang Hear Res*. (in press).
- Meikle MB, Henry JA, Griest SE, Stewart BJ, Abrams HB, McArdle R, Myers PJ, Newman CW, Sandridge S, Turk DC, Folmer RL, Frederick EJ, House JW, Jacobson GP, Kinney SE, Martin WH, Nagler SM, Reich GE, Searchfield G, Sweetow R, Vernon JA. (2012) The Tinnitus Functional Index: A new clinical measure for chronic, intrusive tinnitus. *Ear Hear* 33(2):153–176.
- Tunkel DE, Bauer CA, Sun GH, Rosenfeld RM, Chandrasekhar SS, Cunningham ER Jr, Archer SM, Blakley BW, Carter JM, Granieri EC, Henry JA, Hollingsworth D, Khan FA, Mitchell S, Monfared A, Newman CW, Omole FS, Phillips CD, Robinson SK, Taw MB, Tyler RS, Waguespack R, Whamond EJ. (2014) Clinical practice guideline: tinnitus. *Otolaryngol Head Neck Surg* Oct;151(2 Suppl):S1–S40.



The Use of [OUTCOME MEASURES] in Clinical Practice

BY JOHN E. TECCA AND
KRISTY K. DEITERS

[PART 1]

**THIS ARTICLE
DISCUSSES THE
DEVELOPMENT OF
A NEW OUTCOME
SURVEY AND ITS
IMPLEMENTATION AS
PART OF THE ROUTINE
PROTOCOL FOR
SERVICE DELIVERY IN
A PRIVATE PRACTICE.**

Surveys designed for use in audiological practice have been available for many years. Possibly beginning with the Hearing Handicap Scale (High, 1964), surveys have been developed for varied applications, such as quantifying handicap or disability and for documenting outcomes of rehabilitation. The modern era of surveys for audiological practice arguably began in the early 1980s. There followed a proliferation of surveys for use in both pre- and post-hearing aid fitting applications. Dillon (2012) devoted an entire chapter of his text, *Hearing Aids II*, to this topic which included more than 35 surveys available at that time. Other articles are available to help audiologists with the selection of an

appropriate survey to their clinical needs (Bentler and Kramer, 2000; Humes, 2004).

There are many reasons to use outcome measures in clinical practice (Dillon, 2012). For example, a practice may wish to document the benefit of their hearing aid fitting program, to determine perceived benefit of some circuit option, to provide efficacy data to some third-party payer or perhaps to follow best practice guidelines. Kochkin, et al (2010) found that as more elements of best practices were incorporated into the hearing aid fitting process, including outcome measures, benefit significantly increased. Outcome measures are now considered a component of hearing aid related best practices by

A stylized illustration of a hand holding a pencil, positioned on the right side of the page. The hand is rendered in shades of orange and brown. In the background, there is a horizontal ruler with a yellow bar chart above it. The bar chart consists of several vertical bars of varying heights. The entire scene is set against a light yellow background.

two major organizations representing audiologists (Valente, 2006; ASHA, 1998). However, two surveys of clinical practice indicate that only 30–40 percent of audiologists make use of outcome measures (Lindley, 2006; Brook, 2013).

Several years ago, we committed our practice to include outcome measures for evaluating results of our hearing aid fittings. Quite simply, we wanted to determine if our hearing aid fittings were successful from the patient perspective. Cox, et al (2016) stated, “In the long run, it is the performance in daily living in the circumstances of the particular listener that determines the usefulness of a hearing aid fitting.” Dillon (2012) stated, “Outcome measures keep us grounded as to what we are, and are not, really achieving, from the perspective of the client.” We had no evidence that we were actually doing as good a job as we thought. Experience has taught us that in a small number of cases, problems become apparent over a period of time. Some patients will not ask for help, either believing nothing can be done or not wanting to be a bother. Using an outcome measure makes us proactive.

As mentioned before, there were many outcome measures available for us to consider. These measures differ in their focus (e.g., use, benefit, satisfaction, etc.), length, complexity, and ease-of-use. It became apparent from the outset that we needed to clarify both our clinical goals and the requirements of our practice for routine use. Human nature being what it is, any change that is not easy to implement will quickly fall into disuse.

We wanted a survey that included domains of use (e.g., hours per day, ease of handling, comfort of fit), benefit (e.g., hearing conversation in quiet situations, noisy situations, TV) and overall improvement in quality of life. The survey had to be brief with simple wording suitable for self-administration in a paper and pencil format. Also, the survey had to allow efficient review by audiologists without computer input. Despite the wide variety of excellent questionnaires considered (e.g., Cox and Alexander, 1995; Cox and Alexander, 1999; Cox, Alexander, and Xu, 2014; Dillon and Ginnis, 1997; Giolas, Owens, Lamb and Schubert, 1979; Walden, Demorest and Hepler, 1984; Ventry and Weinstein, 1983) we did not find one that met all of our needs. Perhaps we suffered from

the “Goldilocks syndrome,” finding the porridge too hot or too cold, but we ignored the cautions of Bentler and Kramer (2000) and set out to develop a scale based on the above objectives. This project has been approved by the Human Subjects Institutional Review Board of Western Michigan University.

Development of the Hearing Aid Follow-Up Survey

We drew on the extensive body of literature of previously developed surveys and our own years of clinical experience to begin constructing the survey. For many years, we have used a checklist to structure our in-office post-fitting visits. It addresses essential use factors (e.g., hours of daily hearing aid use; ability to change the battery; comfort of the ear mold) and common hearing situations (e.g., ability to converse in a small group; ability to hear in an auditorium or church). Much of the content of this checklist was adapted from the HAPI (Walden et al, 1984) and it has served us well. With this as our starting point, we added items that reflected the most common difficulties expressed by our patients while being mindful that aspects of use, benefit/satisfaction, and quality of life were included. It is a minimalistic survey in that it does not contain multiple items for a given situation. Revisions were made until we felt the survey met our goals.

The final survey includes 18 items. An initial item inquires about frequency of hearing aid use and offers four responses ranging from, “I wear my hearing aids most of the day” to “I rarely wear my hearing aids,” similar to the item used by Nabalek et al (2006) in research on the Acceptable Noise Level Test. Each subsequent item requests a response on a seven-item alpha scale (A through G) anchored by “strongly agree” and “strongly disagree,” similar to the APHAB. We did provide a “not applicable” (N/A) response option, as some patients simply do not experience the full range of situations addressed. There are no reversals of response direction such that strongly agree is always a positive response and strongly disagree is always a negative response. The final version of the Hearing Aid Follow-Up Survey (HAFUS) is shown in APPENDIX A.

Protocol

We established a protocol for incorporating this survey into our hearing aid fitting and follow-up service. The survey was mailed to patients two to three months post fitting, a sufficient time to allow for possible acclimatization effects (Cox and Alexander, 1992; Humes, 1996) and to give ample time for patients to experience a diverse array of listening conditions. Once each month, a designated

member of our staff used our practice management software to retrieve the demographic information on patients who had purchased hearing aids within this time frame. The information was merged to a letter sent to each patient along with a copy of the HAFUS. The letter stated our goal that they be satisfied with their hearing aids. It requested that they complete the enclosed survey addressing common concerns with hearing aids so that we could provide assistance, if needed. A stamped and addressed envelope was also enclosed. We did not send the survey to patients believed to be unable to respond independently (e.g., dementia). Also, in cases that the fitting process was still in progress, the mailing of the survey was delayed one month. If a response was not received after about one month, a prompt was sent with a second copy of the survey.

Each response was logged into our database by a member of our staff. All responses were reviewed by the audiologist/case manager. If the responses indicated problems or seemed inconsistent with the degree of hearing loss, the patient was contacted by phone for clarification and additional appointments were scheduled as appropriate. As we gained confidence in the survey and our protocol, we began compiling the results, except as our clinical or administrative responsibilities precluded these activities.

Over a period of about two-and-a-half to three years, we sent surveys to 473 consecutive patients during time periods that resources were available to analyze results. During this timeframe, there were 47 consecutive patients that completed surveys that were not analyzed for reasons noted above. We obtained a 74.2 percent response rate (351/473) considering both the initial and second mailing.

Our initial review of the responses was very positive. In fact, we were concerned about ceiling effects on some items and began looking for explanations. Several patterns became apparent. There were some patients who chose the same response for all items. There were some patients who responded more positively to the benefit of the hearing aids in difficult listening conditions than in easy conditions, clearly an invalid pattern. There were some cases where so many items were left unanswered that it was impossible to judge outcomes. Also, we felt that item 9, hearing one other person in quiet, was a universal item that applied to all and its completion was required. Surveys reflecting any of the above conditions were not considered in the subsequent analysis. Consequently, we disqualified 48 surveys from further consideration. It was our belief that eliminating these patients would give a more valid indication of hearing

aid outcomes. A comparison of the entire group and the “scrubbed” group showed nearly identical mean responses with the largest changes being 0.14 in mean and 0.06 in standard deviation. The remaining 303 surveys (303/473 equals 64 percent) were analyzed.

The test-retest reliability of the HAFUS was also determined. For a group of 50 consecutive patients who returned the scale, it was sent to them again about one month later. Responses were obtained from 33 patients. Three were eliminated based on the rationale described above. This left 30 surveys (60 percent) available for analysis.

Scoring

For scoring, alpha responses for individual items were converted to numbers 1 through 7 with A equals 1; B equals 2, etc. A lower score on the HAFUS indicates a better outcome. In routine clinical use, we generally do not average the item scores and simply review the entire form looking for responses greater than B and reading patient comments. As problems are identified, we contact the patient to attempt to resolve problems.

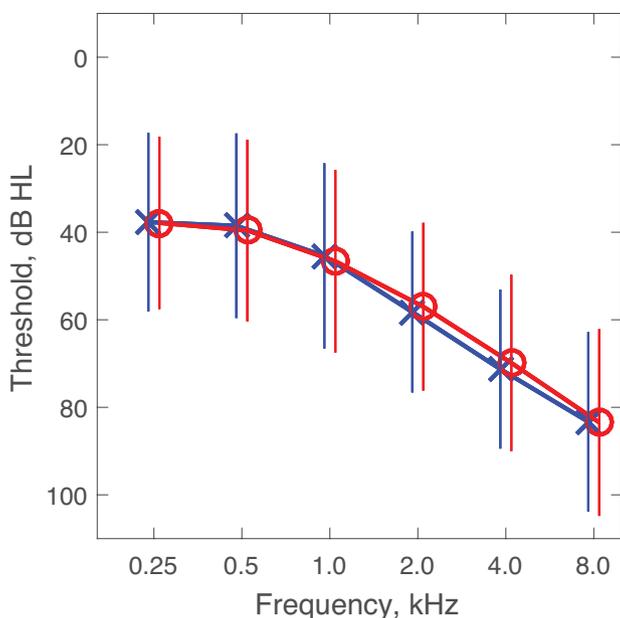


FIGURE 1. Mean audiometric thresholds and standard deviations for 303 patients (O=right ear; X=left ear).

Patients

Our analysis included 303 patients fit with new hearing aids over a period extending slightly longer than 2.5 years, from November 2010 to June 2013. There were 159 females and 144 males. Age ranged from 18 to 100 with a mean of 76 years (SD 14.4). All patients had a complete hearing evaluation prior to hearing aid selection and fitting. The average hearing of our patients was a gradually sloping moderate to severe bilaterally symmetrical sensorineural loss (FIGURE 1).

As this was inclusive of our patient load, there were a small number of patients with conductive and mixed hearing loss. The four-frequency average (0.5, 1, 2, 4 kHz) was 53 dB HL for right and left ears, respectively. Nearly all (over 99 percent) of the fittings were verified using real ear measures with the Audioscan Verifit Speech Map module referenced to National Acoustics Laboratory NL1 or NL2 targets.

There were 217 patients obtaining replacement hearing aids and 86 obtaining their first hearing aids. Binaural aids were purchased by 171 patients. Of the remaining patients, 86 were monaural wearers and obtained one new hearing aid (43 left; 43 right) while an additional 46 patients obtained one new aid but had an aid on the opposite ear. Considering both new and old hearing aids, there were 217 (72 percent) binaural wearers and 86 (28 percent) monaural wearers. All styles of behind the ear and in the ear hearing aids were represented, including open fit models.

Insurance contributed at least some part of the purchase price for 148 (49 percent) patients while 155 (51 percent) were entirely self-pay. There were 12 patients who purchased hearing aids on more than one occasion during the analysis time interval. As these patients completed the HAFUS for each post-fitting occasion, they were treated as separate cases.

All patients were fit with digital WDRC hearing aids with a wide variety of features that were available between 2010–2013. The aids ranged from basic (four band; four channel; omnidirectional or manually selectable directional microphone) to high end (20 band; 20 channel; auto switching from omnidirectional through several levels of adaptive directionality and digital noise reduction).

Results

Data was analyzed using Excel 2010 and IBM SPSS Statistics 24. Although the survey responses are arguably ordinal in nature, they were analyzed with parametric methods as with other recent studies (Cox et al, 2016; Smith et al, 2013). The overall pattern of results indicates

that the average patient in our practice wears his or her hearing aids most of the day with little difficulty. Wear time is nearly all day or whenever needed by 99 percent of respondents (291/293). Hearing is improved in nearly all situations although benefit is not as good in situations with groups or background noise as in quiet. It is of interest to note that improved quality of life was reported by 97 percent of those responding (285/294), despite acknowledging continued difficulty in several situations. Descriptive statistics are reported in TABLE 1.

Responses tended toward the extreme positive end of the scale on items that did not include background noise. This is consistent with our clinical impressions with the results of hearing aid fittings in our office. As a

research tool, ceiling effects are not desirable. However, as a clinical outcome measure, most audiologists would expect their patients to be very successful except in more challenging situations.

It was our hope that routine review of patient surveys could be accomplished with an eye ball method. That is, a quick scan down the survey looking for items that were beyond some cutoff point. A frequency distribution of responses to each item is shown in TABLE 2. For simplicity, we suggest using a response poorer than “C” for any item as a reason to look more closely at the case. These points roughly approximate the ninetieth percentile suggesting that only 10 percent of the cases perform better. Realistically, one should anticipate responses of “A” or “B”



TABLE 1. Descriptive statistics for the original data set. Q1...Q18 refer to the items on the HAFUS that are available in Figure 1. Quiet refers to the subscale including items 9 and 11. Noise refers to the subscale including items 10, 12, 15, and 16.

	Age	PTA4	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
N	303	303	293	302	298	297	282	290	290	287	303	294
Mean	76.01	50.76	1.16	1.49	1.61	1.64	2.07	1.85	1.63	1.81	1.28	2.52
SD	14.36	14.21	0.39	0.87	1.00	0.90	1.38	1.29	0.90	1.05	0.57	1.24



TABLE 2. Number of responses for each item with cumulative percentage in parentheses. Quiet refers to the subscale including items 9 and 11. Noise refers to the subscale including items 10, 12, 15, and 16.

Response	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
A	248 (84.6)	200 (66.2)	191 (64.1)	167 (56.2)	129 (45.7)	157 (54.1)	164 (56.6)	146 (50.9)	235 (77.6)	63 (21.4)
B	43 (99.3)	74 (90.7)	59 (83.9)	86 (85.2)	75 (72.3)	77 (80.7)	85 (85.9)	84 (80.1)	54 (95.4)	102 (56.1)
C	2 (100)	18 (96.7)	31 (94.3)	33 (96.3)	40 (86.5)	28 (90.3)	30 (96.2)	30 (90.6)	12 (99.3)	70 (79.9)
D	0	5 (98.3)	12 (98.3)	7 (98.7)	19 (93.3)	12 (94.5)	7 (98.6)	23 (98.6)	2 (100)	36 (92.2)
E	0	3 (99.3)	1 (98.7)	2 (99.3)	10 (96.8)	8 (97.2)	3 (99.7)	1 (99.0)	0	18 (98.3)
F	0	1 (99.7)	4 (100)	2 (100)	3 (97.9)	2 (97.9)	0 (99.7)	3 (100)	0	4 (99.7)
G	0	1 (100)	0	0	6 (100)	6 (100)	1 (100)	0	0	1 (100)
NR	10	1	5	6	21	13	13	16	0	9
Total Responses	293	302	298	297	282	290	290	287	303	294

on most items with scores of “D” on the more difficult items (10, 12, 14, 15, 16).

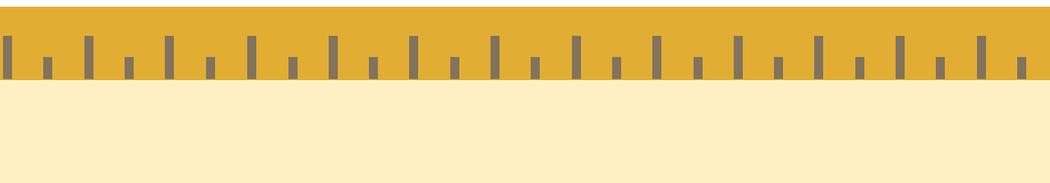
Better precision may result from combining items. Based on item content, it seemed reasonable to create subscales for quiet communication situations (items 9 and 11) and noise/reverberation situations (items 10, 12, 15, 16). While we do not routinely calculate subscales clinically, it can be useful in comparing conditions or to previous research. The mean score for the quiet subscale was 1.47 (SD 0.63) while the noise/reverberation subscale was 2.71 (SD 1.18). The corresponding 90th percentiles are “B” and “D,” respectively. The use of these subscales was supported by principal component analysis. After varimax rotation, the loadings for the quiet subscale were

0.71 and 0.65 for items 9 and 11 while the loadings for the noise subscale were 0.81, 0.89, 0.76, and 0.86 for items 10, 12, 15, and 16, respectively.

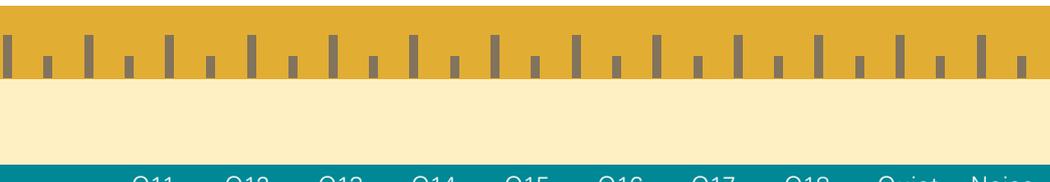
Reliability

The HAFUS has satisfactory reliability. Internal reliability as measured by Cronbach’s alpha was 0.89. Alpha did not drop below 0.88 when any individual scale item was deleted. Corrected item-total correlations ranged from 0.42–0.71, except for item 1 (wear time) which is -0.01.

Test retest reliability as indicated by individual scale item Pearson product moment correlations ranged from 0.39–1.0, except for item 11 (hearing conversation in a small group in quiet) which was 0.24. However, the low



Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Quiet	Noise
290	282	295	284	280	286	293	294	303	295
1.66	3.04	1.71	2.30	2.33	2.95	1.96	1.57	1.47	2.71
0.83	1.45	0.92	1.51	1.26	1.41	1.16	0.88	0.63	1.18



Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Quiet	Noise
152 (52.4)	38 (13.5)	155 (52.5)	114 (40.1)	84 (30.0)	41 (14.3)	131 (44.7)	177 (60.2)	161 (53.1)	39 (13.2)
96 (85.5)	73 (39.4)	90 (83.1)	70 (64.8)	89 (61.8)	79 (42.0)	85 (73.7)	80 (87.4)	107 (88.5)	98 (46.4)
30 (95.9)	79 (67.4)	36 (95.3)	48 (81.7)	64 (84.6)	79 (69.6)	53 (91.8)	28 (96.9)	30 (98.4)	85 (75.3)
12 (100)	54 (86.5)	11 (99.0)	26 (90.8)	28 (94.6)	51 (87.4)	13 (96.2)	6 (99.0)	5 (100)	46 (90.9)
0	14 (91.5)	1 (99.3)	11 (94.7)	6 (96.8)	18 (93.7)	5 (98.0)	1 (99.7)	0.00	17 (96.6)
0	18 (97.9)	2 (100)	8 (97.5)	7 (99.3)	12 (97.9)	4 (99.3)	1 (100)	0.00	8 (99.3)
0	6 (100)	0	7 (100)	2 (100)	6 (100)	2 (100)	1	0.00	2 (100)
13	21	8	19	23	17	10	9	0.00	8.00
290	282	295	284	280	286	293	294	303	295

correlations may be attributed to the relatively limited range of variability among patients (Hyde, 2000). As an alternative measure of reliability, the intraclass correlation for the test retest data has been used (Smith et al, 2013). The overall intraclass correlation was 0.93.

From a more clinically relevant perspective, the audiologist should want to know how many scale units does a response have to change on any given item to conclude that a true difference has occurred. It was found that 90 percent of the absolute test-retest differences were separated by no more than one scale point. Critical differences were calculated to determine the change required to determine that a true difference has occurred between two scores for the same individual (TABLE 3). For the 90 percent critical difference, these values ranged from 0–0.69, in agreement with the above analysis of the distribution. The 95 percent critical differences ranged from 0–0.84. We feel it is reasonable to conclude that using an item score change of more than plus or minus one scale point represents a true change.

Validity

We believe the HAFUS has good face validity. The average pattern of response was consistent with our expectation from patients in our office. It was our impression that our patients wore their hearing aids most of the time with little difficulty in handling the devices, in comfort of fit, or in hearing-in-quiet circumstances. We fully expected patients to report more difficulty hearing in challenging listening conditions. Despite this limitation, improved quality of life is reported by the vast majority of our patients. This is the pattern of results that is demonstrated by the mean item scores shown in TABLE 1.

Results from the HAFUS were compared to the revised APHAB norms (Johnson, 2010). Both scales use seven-point response scales. However, the APHAB assigns percentages to each point (e.g., A equals 99 percent) whereas the HAFUS provided only anchors of “strongly

agree” and “strongly disagree” at the extremes. It seemed likely that patients may respond differently to these descriptors so only a qualitative comparison was made.

We compared the APHAB subscales for quiet, noise/reverberation (combined), and aversiveness to the HAFUS subscales for quiet, noise and the single item (5) dealing with aversiveness. Our patients reported better performance on both subscales but the relation between hearing in quiet and noise/reverberation situations was very similar. Each scale found that performance with noise/reverberation was reported as about 1.5 scale units worse than performance in quiet situations. Considering sound aversiveness, the HAFUS response averages one scale unit less than the quiet subscale while the APHAB aversiveness subscale is about two scale units less than the quiet subscale. We feel that these similarities support the validity of the HAFUS.

Conclusion

This article describes the integration of an outcome measure into the hearing aid fitting program in our office. Procedures were developed for support staff and audiologists to participate in the process. Minimal time is required for the audiologist to review completed surveys. We feel that use of the HAFUS has had a very positive effect on our practice.

We now have objective data to support our subjective impressions of the success of our hearing aid program. We can respond with confidence to many questions asked by new patients. For example, nearly everyone seems to have a family member or friend who does not wear their hearing aids. We can honestly state that 99 percent of our patients report wearing their hearing aids all of the time or whenever needed. We are often questioned about whether the hearing aids will help in background noise. We can respond that generally there is improvement yet not as much as in quiet situations. We have data that demonstrates that the nearly all of our patients (97

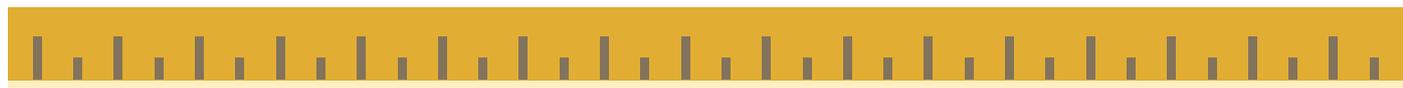


TABLE 3. Critical differences for individual HAFUS items. Quiet refers to the subscale including items 9 and 11. Noise refers to the subscale including items 10, 12, 15, and 16.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
90% CD	0.00	0.25	0.26	0.41	0.58	0.35	0.30	0.34	0.18	0.57
95% CD	0.00	0.30	0.31	0.50	0.71	0.42	0.37	0.41	0.21	0.70

percent) feel we have helped improve the quality of their lives. This can be very valuable information as independent practices are now forced to compete with big box stores, the internet, or “value added” programs incorporated into insurance benefits.

We chose to develop a new outcome measure rather than use one of the many tools currently available. The HAFUS touches on areas of use, benefit, and quality-of-life that we consider important for a successful outcome. It is not intended to probe deeply into any one area. Rather, it is a more general measure that may indicate problems that require further attention. We look forward to receiving the completed surveys from our patients. They let us know that we are really accomplishing our objectives and, at times, that we are failing. In the latter case, we have the opportunity to contact the patient to address, and hopefully correct, the problem before it festers. In many cases, our patients write heartwarming comments at the end of the survey that make us happy to be audiologists!

The normative data that we presented for the HAFUS is specific to our practice. We believe that our patients are typical of the cases that would be seen in other private practices of a similar nature. However, the outcomes are likely to vary according to the procedures that are used for hearing aid selection, fitting, and follow-up care. For example, nearly 100 percent of our fittings are verified with real ear probe tube measures, while in general this is true for only about 30 percent of dispensers (Mueller, 2014). Practices that do not use similar techniques may have different outcomes (Kochkin et al, 2010). It would be desirable for a practice to generate local norms that are based on their own procedures. If this is not practical, one of the other scales with normative data gathered from many practices should be considered.

Part Two of this article discusses the relation of some of the patient and hearing aid variables to HAFUS scores, and some of the ways that we have expanded the use of this survey. 

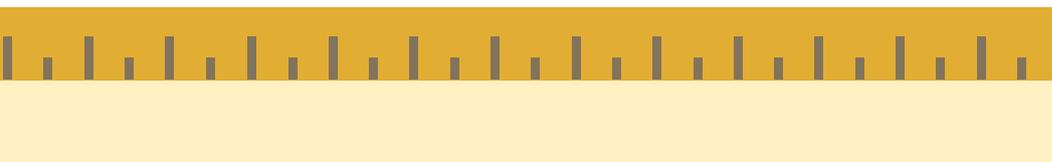
John E. Tecca, PhD, is a practicing audiologist and owner of Hearing Services and Systems in Portage, Michigan. During the course of this project, he was also adjunct professor of audiology at Western Michigan University in Kalamazoo, Michigan.

Kristy K. Deiters, AuD, is a practicing audiologist at Hearing Services and Systems in Portage, Michigan, and research project coordinator at Western Michigan University in Kalamazoo, Michigan.

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References

- American Speech-Language-Hearing Association (ASHA). (1998). Guidelines for hearing aid fitting for adults (Guidelines). Available from www.asha.org/policy.
- Bentler RA, Kramer SA. (2000) Guidelines for choosing a self-report outcome measure. *Ear Hear* 41(4):37S–49S).
- Brook G. (2013) Audiology survey report: Clinical focus patterns 2006–2012. ASHA May 2013.
- Cox RM, Alexander GC. (1992) Maturation of hearing aid benefit: subjective and objective measurements. *Ear Hear* 13(3):131–141.
- Cox RM, Alexander GC. (1995) The abbreviated profile of hearing aid benefit. *Ear Hear* 16(2):176–186.



Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Quiet	Noise
0.42	0.62	0.43	0.47	0.40	0.69	0.51	0.29	0.30	0.57
0.52	0.76	0.53	0.57	0.49	0.84	0.62	0.35	0.37	0.70

Cox RM, Alexander GC. (1999) Measuring satisfaction with amplification in daily life: the SADL scale. *Ear Hear* 20(4):306–320.

Cox RM, Alexander GC, Xu J. (2014) Development of the device-oriented subjective outcome (DOSO) scale. *J Am Acad Audiol* 25(8):725–736.

Cox RM, Johnson JA, Xu J. (2016) Impact of hearing aid technology on outcomes in daily life: the patients' perspective. *Ear Hear* 37:e224–e237.

Dillon H. (2012) *Hearing Aids* (2ed.). New York: Thieme.

Dillon H, Ginis JA. (1997) Client oriented scale of improvement (COSI) and its relationship to several other measures of benefit and satisfaction provided by hearing aids. *J Amer Acad Audiol* 8(1):27–43.

Giolas T, Owens E, Lamb S, Schubert E. (1979) Hearing performance inventory. *J Speech Hear Dis* 44:169–195.

High WS, Fairbanks G, Glorig A. (1964) Scale for self-assessment of hearing handicap. *J Speech Hear Dis* 29, 215–230.

Humes L, Halling D, Coughlin M. (1996) Reliability and stability of various hearing aid oriented outcome measures in a group of elderly hearing-aid wearers. *J Speech Hear Res* 39, 923–935.

Hyde ML. (2000) Reasonable psychometric standards for self-report outcome measures in audiological rehabilitation. *Ear Hear* 21(4):24S–36S.

Johnson JA, Cox RM, Alexander GC. (2010) Development of APHAB norms for WDRC hearing aids and comparisons with original norms. *Ear Hear* 31(1):47–55.

Kochkin S, Beck DL, Christensen LA, et al. (2010) Marke Trak VIII: The impact of the hearing healthcare professional on hearing aid user success. *Hear Rev* 17(4):12–34.

Lindley G. (2006) Current hearing aid fitting protocols: Results from an online survey. *Aud Today* 18(3):19–22.

Mueller HG. (2014) 20Q. Real-ear probe-microphone measures—30 years of progress? *Audiol Online* Article 12410 www.audiologyonline.com (accessed Jan 2014).

Nabalek AK, Freyaldenhoven MC, Tampas JW, Burchfield SB, Muenchen RA. (2006) Acceptable noise level as a predictor of hearing aid use. *J Amer Acad Audiol* 17(9):626–639.

Smith SL, Ricketts T, McArdle RA, Chisholm TH, Alexander GA, Bratt G. (2013) Style preference survey: A report on the psychometric properties and a cross-validation experiment. *J Amer Acad Audiol* 24(2):89–104.

Valente M. (2006). Guideline for audiologic management of the adult patient. *Audiol Online* www.audiologyonline.com/articles/guideline-for-audiologic-management-adult-966. (accessed July 2006)

Ventry I, Weinstein B. (1983) Identification of elderly people with hearing problems. *ASHA* (July): 37–42.

Walden BE, Demorest ME, Hepler EL. (1984) Self-report approach to assessing benefit derived from amplification. *J Speech Hear Res* 27(1):49–56.

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Appendix A. The Hearing Aid Follow-Up Survey (HAFUS)

Please take a moment to respond to each item with the answer that best reflects your circumstances. Your answers let us know how your hearing aids help and situations where you are having difficulty. (You will not hurt our feelings if there are problems.)

Hearing Aid Follow-Up Survey

Q1. Please select the item that best describes how you use your hearing aids:

- ___ I wear my hearing aids most of the day.
- ___ I wear my hearing aids whenever needed.
- ___ I wear my hearing aids occasionally.
- ___ I rarely wear my hearing aids.

Please circle the answers that come closest to your everyday experience. For example, if you strongly agree with a statement, circle "A" for that item.

Q2. My hearing aids are comfortable.

ABCDEF G N/A

Q3. My hearing aids are easy for me to handle.

ABCDEF G N/A

Q4. My hearing aids are loud enough for most conversation.

ABCDEF G N/A

Q5. My hearing aids keep sound that is already loud (door slam; dog bark) from becoming uncomfortable.

ABCDEF G N/A

Q6. My hearing aids do not squeal/whistle after they are seated in my ears.

ABCDEF G N/A

Q7. My hearing aids have a natural sound quality for other people's voices.

ABCDEF G N/A

Q8. My hearing aids have a natural sound quality for my own voice.

ABCDEF G N/A

My hearing aids allow me to hear clearly when:

Q9. talking to one other person in a quiet room.

ABCDEF G N/A

Q10. talking to one other person in a noisy room.

ABCDEF G N/A

Q11. talking to a small group in a quiet room.

ABCDEF G N/A

Q12. talking to a small group in a noisy room.

ABCDEF G N/A

Q13. talking to one other person in a car.

ABCDEF G N/A

Q14. talking on the telephone.

ABCDEF G N/A

Q15. at a meeting or in church.

ABCDEF G N/A

Q16. in a busy restaurant.

ABCDEF G N/A

Q17. watching TV.

ABCDEF G N/A

Q18. My hearing aids have improved my quality of life.

ABCDEF G N/A

Please add any comments:

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BY REBEKAH CUNNINGHAM



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Wednesday

We kicked off the conference on Wednesday with many educational and social events to include the ninth annual Academy Research Conference (ARC), focusing on Pediatrics: Advancements in Assessment and Rehabilitation.

Chaired by Dr. Anne Marie Tharpe, the research conference provided attendees with cutting-edge research from highly-knowledgeable professionals and researchers in the field who presented information on assessing speech perception in infancy, binaural and special hearing benefits, fatigue in children with hearing loss in the classroom, and overall best practices for the assessment and intervention of children with hearing loss. Attendees were provided with excellent research outcomes and encouraged to return to their clinics to implement. There were 230 attendees this year, anxious to hear leading researchers discuss some of the hottest topics in pediatric audiology.

Learning Modules also began on Wednesday this year, as did Featured Sessions. The Academy Board of Directors (BOD) hosted the Annual Membership Meeting, whereby candidates for president-elect and members of the BOD spoke to the assembled group regarding their visions for the Academy. Immediately preceding the Annual Membership Meeting, the BOD fielded questions during the Academy Team Huddle.

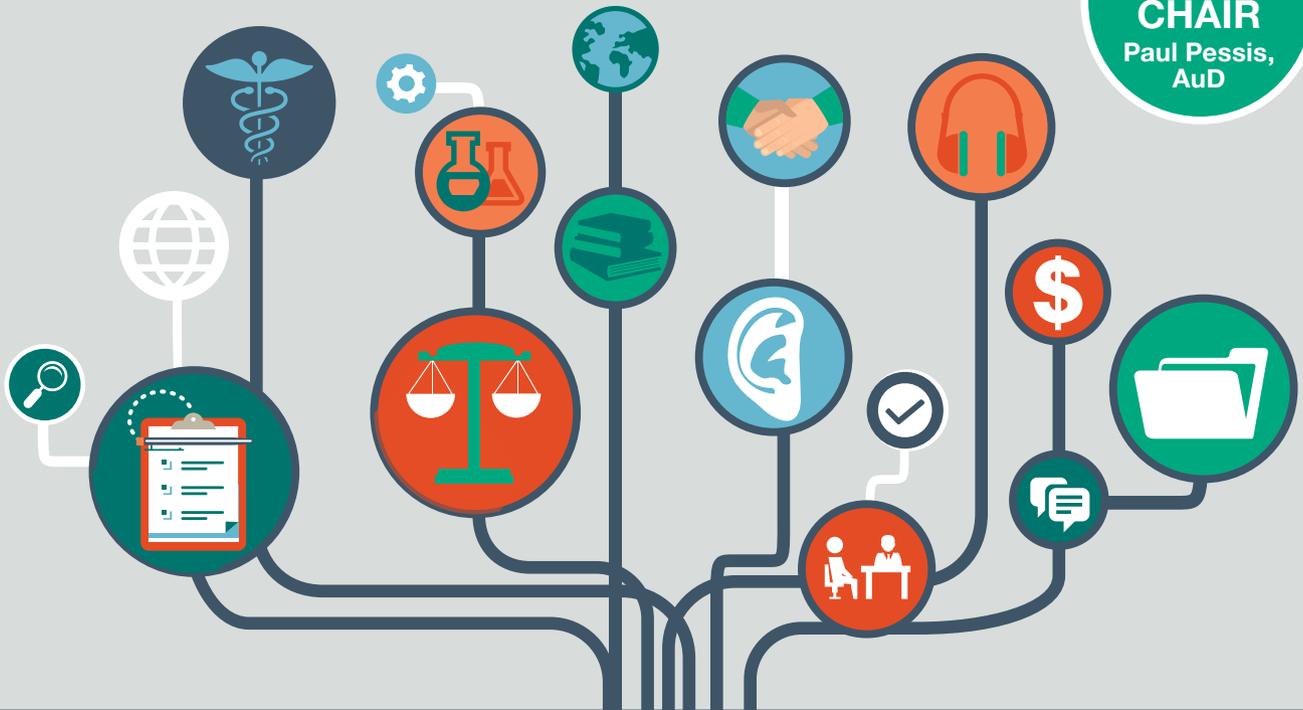
The First-Time Attendee Orientation was packed and provided "newbies" with critical information needed to navigate AudiologyNOW! The Industry Symposium, sponsored in part by ReSound, discussed the future of smart hearing and drew a full room on Wednesday afternoon.

Student education and events were abundant throughout the conference, starting with the Student Academy of Audiology (SAA) Mix and Mingle (sponsored in part by Audigy Group) and the SAA Cheers for Ears (sponsored in part by Oticon, Inc., Phonak, LLC, and Starkey Hearing Technologies) on Wednesday evening, and into the next few days with student-specific workshops and the SAA Conference culminating on Saturday (sponsored in part by Starkey Hearing Technologies).



Navigating the Dynamic Complexities of Practice Management

CHAIR
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AuD



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Wednesday evening featured Celebrate Audiology (sponsored in part by Hamilton CapTel), which drew people to the exhibit hall, where they enjoyed food, drink, and entertainment while meeting with exhibitors and reconnecting with old friends. Many open houses were also well attended that evening, with 10 universities hosting gatherings for their students, faculty, staff, and alumni.

Fellow AAA Foundation supporters enjoyed time together at the annual AAA Foundation Happy Hour Benefit (philanthropic support provided in part by Phonak, LLC) at the unique Crowne Plaza Downtown Union Station, where a real train sits and has been converted into hotel rooms!

Thursday

The day started off bright and early with a 5K Run/Walk (sponsored in part by Oticon, Inc.), where nearly 100 runners came together, braved the cool temperatures, and supported the Academy's PAC and AAA Foundation. Luckily, early morning Coffee Meet-Ups were bountiful, so many runners and attendees could partake and get their days started!

New this year, the General Assembly started earlier, at 8:00 am, and offered attendees continuing education credits. With tradition, the Audiology Chorus led off the assembly with their inspiring rendition of the *National Anthem*. As program chair, I was honored to thank the over 100 Academy volunteers and the Program Committee chairs, as well as Academy staff, whom made AudiologyNOW! 2017 possible. Many volunteers supported the conference and the Academy as a whole with hours of dedication, which assures a successful organization and sustains the profession.

General Assembly continued with President Dr. Ian Windmill addressing the membership about tackling timely and difficult issues that audiologists face today and addressing the need for change within our profession.

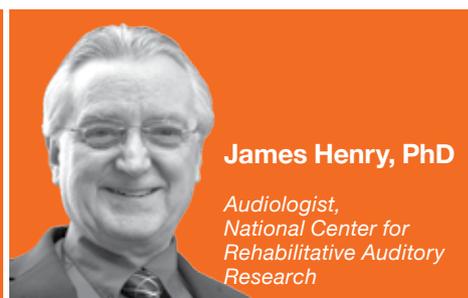
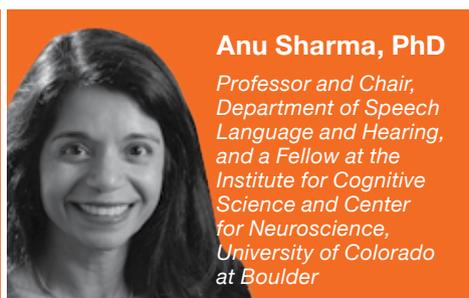
President-Elect Dr. Jackie Clark announced the Academy Honors and Awards Recipients and shared her vision for the future of audiology. This year's keynote speaker, Dr. Shelly Chadha, from the World Health Organization, provided a timely and engaging message regarding the state of hearing health around the world and how to become involved to assist those in need.

The assembly closed with next year's Program Chair Dr. Eileen Rall presenting a video featuring beautiful Nashville, Tennessee, the site for AudiologyNOW! 2018, April 18-21.



LECTURE SERIES

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Thursday continued with the opening of the exhibit hall and learning opportunities including Research Podiums, Student Workshops, Exhibitor Courses, the PhD Program Fair, more Industry Updates (including Novel Technologies!) and the first of the two-day Poster Sessions (half on Thursday and the other half on Friday).

Over 300 posters were chosen this year for display. The James and Susan Jerger Awards for Excellence in Student Research were presented to six students for their outstanding posters. Additionally, a ribbon was given to an outstanding professional poster in each of the fifteen poster categories.

“Perk the PAC,” a recurring coffee-break opportunity to support the Academy’s Political Action Committee (PAC), took place both Thursday and Friday. HearCareers, also open Thursday and Friday, provided dedicated space for free headshots, private interviews, review of job postings around the country, and areas for employers and those seeking employment to connect with each other.

The AAA Foundation’s Auction 4 Audiology, which opened before AudiologyNOW! 2017, featured unique and much sought-after items and raised more than \$22,000 to support research, education, and public awareness in audiology and hearing science. Auction items that were not sold will be available once again. Visit the AAA Foundation’s website (www.audiologyfoundation.org) for more details.

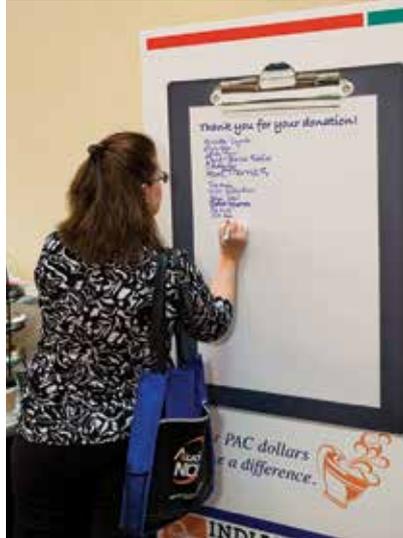
The AudiologyNOW! Mobile App was again a must have! With the app, attendees were able to view posters and presenters’ slides from their mobile devices. They could even take notes in the app or highlight the information during presentations. The app also allowed attendees to report CEU data right into the Academy’s CEU Manager System, making tracking CEUs incredibly easy. But of course, the CEU Manager station was open every day to support attendees in their reports of learning.

Rolling into Thursday afternoon, the American Board of Audiology (ABA) held a Speed upDating event (sponsored in part by Starkey Hearing Technologies), which drew a huge crowd of attendees who probed the minds of leading audiologists about hot topics in the profession.

Learning Modules continued Thursday afternoon, including a special session in which the 2017 Academy Honorees were asked to share their personal stories of success and achievements. An ABA Certificate Holder Mixer took place and the Honors and Awards Banquet (sponsored in part by Phonak, LLC) was held that evening.

Following the banquet, the International Reception recognized the Academy’s international partners. Dine-Arounds on Thursday evening were popular and allowed professionals to network with peers and experience the amazing Indianapolis restaurant scene!





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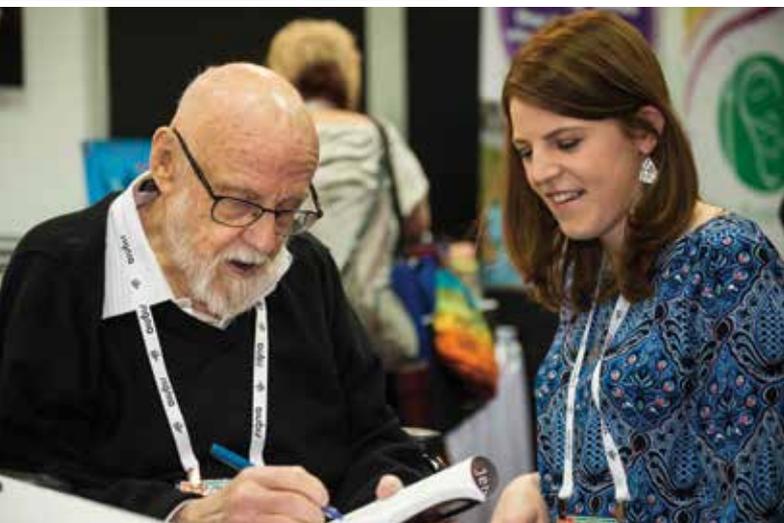
Friday

Friday began bright and early again with Sunrise Yoga, which quickly sold out in advance of the conference! Coffee Meet-Ups occurred again, and the day started off with more Learning Modules and Featured Sessions. Student Workshops continued and the exhibit hall was busy from open to close. The Product Theater was a hit and Exhibitor Courses continued, as did Research Podiums. For the second year, the State Fair (sponsored in part by Sprint CapTel) drew many visitors as individual state audiology associations showed off members and creativity! The Student Research Forum (philanthropic support provided in part by Plural Publishing) provided an opportunity for the best and brightest students in audiology to present research with clinical implications for practicing audiologists. Friday night was complete when more than 500 attendees visited Victory Field, consistently ranked in the top 20 Minor League Baseball ballparks in the country, to watch the Indianapolis Indians take on the Toledo Mud Hens.



Saturday

Saturday morning began with the ACAE/CAPSCD Clinical Education Forum, which drew educators from many universities as well as attendees with a passion for audiology education. Saturday also opened with this year's Learning Labs and the SAA Fifth Annual Conference, which drew a record attendance of nearly 300 students! In acceptance of an invitation from the Academy, the Academy of Rehabilitative Audiologists (ARA), the Council for Accreditation in Occupational Hearing Conservation (CAOHC), and the Association of VA Audiologists held meetings for their members.



Summary

Throughout all of this year's AudiologyNOW!, outstanding educational opportunities, including Tier 1 and Ethics sessions, were offered for all interests and learning levels of professionals and students. The meeting was full of social engagements to support professionals and students, establish connections, and renew old friendships. While impossible to report on every activity that took place, be assured AudiologyNOW! 2017 was truly innovative and highly valuable to all attendees. The backdrop of downtown Indianapolis proved to be an exceptional venue for an amazing experience.



Rebekah Cunningham, PhD, was the program chair for AudiologyNOW! 2017. 🍷

PRODUCT THEATER

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This open-sound experience gives patients the ability to have access to multiple speakers in complex listening environments and choose where to focus. The successful effects of this technology have been documented and, now, more patients can experience these benefits. The Oticon Opn™ family of instruments continues to expand with more styles and features. Join us to hear how the open sound paradigm can open up the world to more of your patients!

Signia Introduces the Only Made for iPhone Hearing Aid with High-Definition Binaural Hearing



At AudiologyNOW! 2017, Signia introduced its new hearing aid—Pure 13 BT, which incorporates the industry's broadest and most innovative use of Bluetooth, together with high-definition binaural hearing, to deliver better than normal hearing with a direct connection to iPhone. Based on Signia's e2e wireless 3.0™ and Bluetooth wireless technology, the Pure 13 BT is the only hearing aid in the world that can simultaneously exchange data between the hearing aids and transfer audio signals from external audio sources directly into the hearing aids. It is also the first and only hearing aid to use Bluetooth wireless technology in conjunction with iPhone's motion sensors to adapt to various listening situations when the wearer is on the move.

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Your patients will receive a CapTel phone, in-home installation, and one-button access to Customer Service. Best of all, it's FREE for your practice and patients!

The ZPower Rechargeable System for Hearing Aids



The only rechargeable battery solution that provides all-day power and the flexibility to interchange ZPower batteries with disposables. All with safe and 100 percent recyclable silver-zinc batteries small enough to be used with today's most popular hearing aids.

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.”



You Only Have One Chance to Make a Good First Impression

By David Fabry

Case History

The patient presented to the clinic as a blind 45-year-old male with bilateral, symmetric severe sensorineural hearing loss. He was currently wearing binaural full-shell, custom, in-the-ear (ITE) hearing aids that were approximately eight years old. Despite numerous attempts to discuss new devices, the patient had been resistant to consider new technology, despite the fact that third-party pay would offset the majority of the cost. In addition, the patient had suffered panic attacks during the previous two clinic visits when discussing the need for replacement.

First Impressions

The patient was already quite anxious and agitated by the time I saw him, as he had been waiting for some time to be seen. Further, his service dog was restless, lending to the sense of urgency. Audiometric findings revealed no change since his previous examination two years ago (FIGURE 1), but once again, the patient was extremely resistant to discussion of new devices, despite the fact that the current ones were in need of replacement. Monosyllabic word recognition was bilaterally symmetric, at approximately 50 percent for recorded stimuli. Immittance

showed no evidence of middle-ear or retrocochlear pathology.

Electroacoustic evaluation and real-ear measurements revealed that the patient's ITE aids were providing appropriate gain and output for his hearing loss, and the patient was generally satisfied with their performance. Physical inspection of the devices, however, revealed them to be in poor working order, with apparent visual wear-and-tear on the rotary volume controls, plus cerumen impaction in both receiver ports. Review of the patient's insurance indicated that he was eligible for new hearing aids at no cost to him through state third-party insurance programs. When this was discussed, however, the patient immediately became quite agitated, instead insisting that we clean and repair these devices.

Pop Quiz: What Is/Are Your Clinical Impressions?

- A. Patient is a "power junkie," who is resistant to give up his linear, peak-clipping devices.
- B. Due to his blindness, patient does not want behind-the-ear (BTE) or receiver-in-the-canal (RIC) devices, which would be more appropriate for his hearing loss. In addition, his comfort with existing controls (traditional volume control wheel) likely makes him reticent to switch products.
- C. Patient has not been properly counseled regarding the significant advances that have taken place with hearing aid technology during the past decade.

D. All of the above.

E. None of the above.

The correct answer is "E," although I will admit that my first impression was likely a combination of A, B, or C. For some reason, despite the fact that I was in the middle of a very busy clinical day, I (for once) resisted the temptation to begin solving the problem before I learned more about it.

I asked for his permission to ask a couple questions about why he was so attached to these particular devices. He granted permission, and said that he found custom devices easier to insert, remove, and operate than BTEs (which he had tried). I agreed, and informed him that we could find other custom devices that worked for his loss.

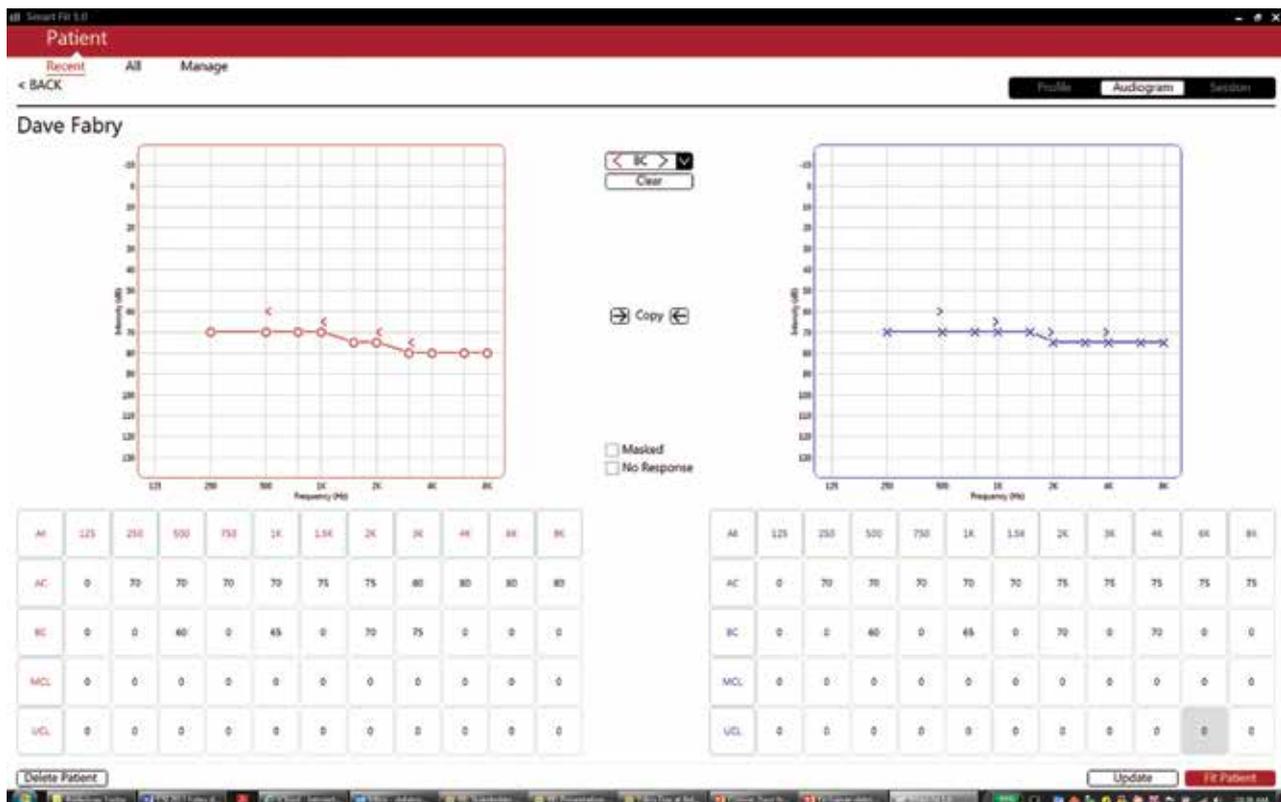


FIGURE 1. Audiometric findings for patient.

The second objection related to the fact that he preferred to use a traditional analog (hard “stop”) rotary volume control, rather than a button or remote control. While I concurred that it was increasingly challenging to find “non-digital” volume controls, I also discussed the advantages of modern wireless hearing aids that provided more control options (binaural controls, separate left/right controls) and the patient seemed intrigued about the new features.

So far, so good. We also addressed that although non-linear hearing aids may not initially sound as loud to him as his linear devices, we would work towards optimizing benefits with lower overall output levels, which would prevent over-amplification. Additionally, we discussed directional microphone devices not only to address communication in noisy listening environments, but also stressed the importance of preserving spatial awareness, given that his blindness prevented visual cues to assist him with localization.

Feeling victorious, I suggested that we proceed with ordering a new set of devices, but the barriers went up and the patient’s anxiety increased to full-blown panic attack levels.

Now What?

Pop Quiz: At This Point, What Would You Do?

- Refer the patient to psychological counseling to address his panic attacks.
- Schedule an appointment in one week to continue discussion regarding options.
- Repair the patient’s eight-year-old hearing aids.
- Employ motivational engagement counseling strategies.
- Something else.

Any of the above options may be reasonable options, but my attitude was that simply repairing his current devices would ultimately be a disservice to the patient. I had recently been involved with the development of the Ida Institute’s second seminar series that focused on “motivational engagement” as a patient-centered approach to behavioral change (http://idainstitute.com/about_ida/seminars/motivation/).

Eager to use the tools that I had been teaching, I calmly proceeded with guiding the patient through a more comprehensive analysis of benefits/liabilities of the status quo versus seeking change to new devices. The central tenet of motivational counseling as a strategy is that it empowers the *patient* to come to the best decision by addressing their own fears regarding change.

In the process of employing the tools, we learned that the underlying issue was not fear of new technology, different form factors, or different gain/output settings. Rather, we learned that the fundamental issue was that every clinician he had seen in the past immediately started the process of otoscopy, inserting otoblocks, and making earmold impressions, without considering the resulting claustrophobia for a severely hard-of-hearing, blind person who was subject to panic attacks!

When I suggested that we do one ear at a time, with the hearing aid work in the other ear so that I could communicate throughout the process, the patient was agreeable, but apprehensive. After an agonizing five minutes (thankfully the first impression on that ear was a good one), we repeated the process for the other side. I ordered new hearing aids and two weeks later fitted the patient with new devices that he loved.

Moral of the Story

Until I learned to use my two ears and one mouth in direct proportion to *listen more and talk less*, I couldn’t really uncover the root cause of the patient’s anxiety. In fact, until he uncovered it for himself, he didn’t really realize it either, and we both learned a lesson that day.

In my 35 years in the profession, I have always been drawn to the more challenging cases. Despite the temptation to review the audiometrics and

Blindness and Low Vision Stats

American Academy of Ophthalmology

<https://www.aao.org/newsroom/eye-health-statistics>

National Eye Institute

https://nei.nih.gov/eyedata/pbd_tables

start “solving” problems, we cannot really understand and address individual patient issues until we learn more about the person. Counseling tools like motivational engagement are a great way to assist with the discovery process and sort out whether a patient really isn’t motivated to act versus struggling with the normal cognitive dissonance that grips many first-time hearing aid users.

The final lesson from this case related to the fact that although audiologists often become frustrated with the comparisons between hearing and vision, there are significant comorbidities in the aging population between hearing loss and visual impairment. The prevalence of myopia (nearsightedness) in persons aged 12–54 years old is approximately 42

percent, and has risen over the last 30 years (Vitale, Sperduto, Ferris, 2009).

Furthermore, the prevalence of cataract, age-related macular degeneration, and open-angle glaucoma increases with age, and affects nearly 8 percent of those over age 80 in the United States. Overall, the incidence of all conditions leading to “low vision” or “blindness” is 23.7 percent of the U.S. population older than 80.

Increasingly, the aging Baby Boomer population will present with both hearing and “non-correctable” visual impairments, and increasingly clinicians will need to address specific issues related to form factors, technology, user controls, and signal processing strategies for this population. In addition, be sensitive to the specific issues of vulnerability

that may accompany the patient with hearing and vision loss as they navigate through the process of hearing aid diagnosis and treatment. ❏

David Fabry, PhD, is the vice president of medical affairs with GN Hearing and ReSound and the editor-in-chief of Audiology Today and www.audiology.org.

Reference

Vitale S, Sperduto RD, Ferris FL. (2009) Increased prevalence of myopia in the United States between 1971–1972 and 1999–2004. *Arch Ophthalmol* 127(12):1632–1639.

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“Content was helpful and gave a balanced overview for preceptors.”



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Communication with the Coding and Reimbursement Committee

How Members Contribute to Payer-Policy Advocacy

By Kate Thomas

Many of you may be familiar with, or may have even used, the Academy's e-mail box for submitting coding, reimbursement, and compliance-related questions. This centralized mailbox (reimbursement@audiology.org) allows the Academy's Coding and Reimbursement Committee (CRC) to review and discuss all inquiries posed to the Academy. The CRC is able to research, discuss, and vet responses to questions received. Having a centralized system for answering questions serves many purposes. It allows the CRC to identify trends in coding and reimbursement, develop coding and reimbursement resources, and engage in advocacy with payers regarding concerning policies.

As a national professional association, the Academy cannot become directly involved or provide legal opinions for individual-level disputes regarding contracts between members and insurance providers. However, we can identify problematic payer policies that affect audiologists nationally, and work with payers to modify those policies. In the past year, the CRC has been active in monitoring, updating, and addressing both Medicare and private-payer policies based on member concerns.

On January 1, 2016, CPT codes 92537 and 92538 replaced CPT code 92543 (Caloric vestibular test, each irrigation, with recording). Shortly after the effective date for the new

caloric codes, the Academy received numerous reports of denials from audiologists across the country. Audiologists reported that when they attempted to use the new codes, they were denied because the new codes did not appear on the Audiology Code List provided by the Centers for Medicare and Medicaid Services (CMS). The Academy investigated further, and reached out to CMS on behalf of audiologists to remedy this issue and add the new caloric codes to Audiology Code List. CMS did make the change, and the Academy subsequently contacted all of the Medicare contractors to ensure they were aware of the update in order to prevent further denials. Though this particular issue was the result of an administrative oversight and easy to remedy, the error caused many issues for providers. Being able to track member concerns and identify the underlying issue based on national member feedback, allowed the CRC to act quickly regarding this policy issue.

The Academy's CRC has also identified issues related to the ICD-10 transition. At the end of 2015, the Academy received reports from audiologists reporting denials for pertinent and appropriate ICD-10 codes that supported medical necessity for the audiology procedure codes being billed. Upon further research, the Academy discovered that the Novitas Medicare Local Coverage Determination (LCD) for Vestibular and Audiologic Function

Studies was missing key audiology-specific ICD-10 codes, including the codes for conductive hearing loss, and R42, dizziness and giddiness, one of the diagnosis codes in the denominator for PQRS Measure #261, Referral for Otologic Evaluation for Patients with Acute or Chronic Dizziness. The Academy's CRC submitted a reconsideration request to Novitas, requesting the addition of these codes. In February 2016, Novitas released a revision of this LCD, which included the addition of many new ICD-10 codes, including the conductive hearing loss codes. In their correspondence with the Academy, Novitas informed us that more revisions were scheduled for release. In April 2016, Novitas issued another revision of this LCD to include R42 (dizziness and giddiness). The CRC continues to regularly monitor all audiology-related Medicare LCDs.

As a result of their regular monitoring and communication with members, the CRC most recently identified concerns with the Palmetto GBA Medicare LCD for Vestibular Function Testing. In reviewing the ICD-10 updates that went into effect on October 1, 2016, the CRC noticed that, again, there were key ICD-10 codes describing conductive hearing loss and mixed hearing loss that did not appear on the Palmetto GBA LCD for Vestibular Function Testing. The CRC wrote to Palmetto GBA and asked them to include the ICD-10 codes for conductive hearing loss (H90.0, H90.11,

H90.12, H90.A11, and H90.A12) and mixed hearing loss (H90.71 and H90.72). In their correspondence with Palmetto GBA, the CRC discussed that these were appropriate ICD-10 codes that can support medical necessity for the audiology procedures being billed. At the time of publication, the Palmetto GBA contacted the Academy stating that the ICD-10 codes for conductive and mixed hearing loss would be added to the LCD as requested. The CRC will monitor the LCD and inform member when these codes have been officially added.

The examples provided describe the CRC's involvement in updating CMS-related policies, but the committee also intervenes with private payers when appropriate. Currently, the CRC has been working to address a recent change to Humana's coverage policy on Chronic Vertigo Evaluations and Treatments (Policy Number: HGO-0471-009). The change in the coverage policy went into effect on June 23, 2016, and has resulted in the Academy receiving numerous reports of denials from audiologists across the country with reports of multiple denials in Indiana and Florida. In their updated policy, Humana has categorized caloric testing (CPT codes 92537 and 92538) as integral to the basic vestibular evaluation or office visit. As such, Humana has deemed caloric testing as not separately reimbursable. Humana also references other types of vestibular evaluations described in their coverage policy as being integral to a basic vestibular evaluation or typical

office visit, and therefore not separately reimbursable. The Academy's CRC reviewed this issue and has contacted Humana about reversing their policy, citing that vestibular testing is medically necessary for a number of reasons and is critical to assist with the diagnosis and treatment of a hearing and/or balance disorder. Caloric vestibular testing, ENG, and VNG are distinct procedures that should remain separately reimbursable. These procedures are outside of what is typically performed during an office visit and should remain separately covered services. The CRC will continue to inform

Academy members of any changes to Humana's policy.

The Academy's CRC encourages all Academy members to continue to submit coding questions and concerns to reimbursement@audiology.org. The CRC will continue to work to modify problematic payer policies and advocate on behalf of audiologists and the patients they serve! 📧

Kate Thomas is the senior director of advocacy and reimbursement for the American Academy of Audiology.



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“Balance” Is Revolutionizing Audiology

By Daniel Deems

The profession of audiology is on the forefront of a major transformation. In a world of declining reimbursements, increased competition, and ever-evolving regulations, audiologists are seeking new ways of generating revenue. An innovative opportunity has just been introduced: treating balance.

For years, balance patients have been tossed around from PCPs, ENTs, audiologists, PTs, and really, so many of these practices don't have the tools or knowledge to help these patients. This population represents a massive unmet need. Over 63 million people are in critical need of balance therapy because of balance or vestibular dysfunctions. Every 11 seconds, an older adult is treated in the ER for a fall.

Recently, physical therapists and otolaryngologists have taken a major step towards helping these patients by adding balance to their practices and employing physical therapists. They are seeing tremendous success for their patients and their businesses. Audiologists around the country are recognizing what is taking place, and are now building balance centers within their audiology practices, realizing the considerable opportunity to help so many existing patients, while generating passive income in the process.

The organization assisting audiologists and ENTs is FYZICAL, the world's fastest growing health-care franchise. FYZICAL provides proprietary knowledge, programs, and plans to assure success in today's health-care environment, while allowing business owners to remain 100 percent independently owned. If you are looking into adding balance therapy to your practice, this program offers proven business systems and world renowned therapy protocols.

To discover more, you're encouraged to attend an Audiology Revolution event, where you'll explore the “business of balance.” At this event, you will discover the systems, operating procedures, and exact steps on how to quickly address your patient's balance and dizziness needs, and how to turn your existing patient base into highly profitable ancillary income. Visit www.innovativeaudiologist.com for upcoming events.

CONTENT PROVIDED BY FYZICAL.

Daniel Deems, MD, PhD, FACS, is an otolaryngologist with FYZICAL in Sarasota, Florida.

Tinnitus Therapy Development Leads to Benefits for Tonal Tinnitus

By Vickie Stubbs

A six-year-old therapy is making waves in the industry, as it is shown to significantly improve tonal tinnitus symptoms through a 36-week treatment. These quiet, yet audible, tones are programmed according to the innovative Coordinated Reset (CR) algorithm and directed to neurons that are hyperactively firing in the auditory cortex causing the tinnitus. These tones are designed to fade into the background, allowing the patient to continue with their daily activities.

In recent studies, neuroscientists were able to show that neuronal hyperactivity in tinnitus-related brain areas was disrupted by the targeted therapeutic tones. While standard masking has been found to offer some short-term relief of tinnitus symptoms, patients using CR neuromodulation typically experience long-lasting improvement in symptoms, such as loudness and annoyance (Hauptmann et al, 2015).

Patty Kalmbach, AuD, a “Desyncra™ for Tinnitus-certified” audiologist reports that, “Patients within the first three weeks of starting treatment are reporting significant improvement, with a decrease in their awareness and disturbance of tinnitus, and in their Tinnitus Reaction Questionnaire score. At eight weeks, all five patients currently using CR neuromodulation remain in treatment and are showing improvement. This new therapy is proving to be a valuable tool in tinnitus treatment options in our clinic.”

CR neuromodulation is a scientifically proven approach to relieve the symptoms of annoyance and loudness of tinnitus that is only available through the “Desyncra™ for Tinnitus” therapy provided by certified audiologists.

Hauptman C, Ströbel A, Williams M, Tass PA. (2015) Acoustic coordinated reset neuromodulation in a real-life patient population with chronic tonal tinnitus. *BioMed Res Intl* (January):3-4.

CONTENT PROVIDED BY DESYNCRATM INC.

Vickie Stubbs, MS, is a manager with Desyncra™ Inc., and contributor Patty Kalmbach, AuD, is an audiologist at Colorado Hearing and Tinnitus Center Inc. in Denver, Colorado.





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12

1. The AAA Foundation's Board of Trustees gathered at their Board Meeting in Indianapolis. From left to right: Therese Walden, Foundation Chair; Rissa Duque-Yangson, Foundation Manager; Kimberly Barry; Laura Ann Wilber; Lawrence Eng, Academy Board Liaison; Tanya Tolpegin, Academy Executive Director; Steven Gianakas, Student Liaison; Jason Galster, Secretary/Treasurer; Eileen Rall; Richard Roberts; Georgine Ray; Robert DiSogra; Kristiina Huckabay; David Zapala; Deb Abel; Carrie Dresser, Academy Senior Director of Business Development; Brenna Carroll, Development Committee Chair; and Sandy Fulgham, Academy Senior Director of Finance and Administration.
2. Foundation Trustees presented Dr. Barbara Balik with an award for her Improving Patient Care Through Innovation in Workplace Management Lecture. Philanthropic support for lecture was provided by Phonak, LLC. From left to right: Brenna Carroll, Therese Walden, Georgine Ray, Richard Roberts, Barbara Balik, Robert DiSogra, Laura Ann Wilber, and Deb Abel.
3. Students enjoyed time with colleagues at Punch Bowl Social during the SAA Cheers for Ears benefit.
4. The Foundation's Auction 4 Audiology featured a guitar signed by the American Authors band, original artwork, and more!
5. Attendees grabbed coffee while raising funds for the Foundation at the "Coffee for a Cause" benefit before the Marion Downs Lecture.
6. Foundation Trustees presented Dr. Anu Sharma with an award for her Marion Downs Lecture. Philanthropic support for the Marion Downs Lecture was provided by Oticon Foundation. From left to right: Brenda Ryals, Therese Walden, Don Schum, Anu Sharma, Georgine Ray, Brenna Carroll, and Richard Roberts.
7. Foundation Trustees presented Dr. James Henry with an award for his Topics in Tinnitus Lecture. Philanthropic support for the Topics in Tinnitus Lecture was provided by Widex. From left to right: Brenna Carroll, Georgine Ray, Therese Walden, James Henry, Francis Kuk, and Kristiina Huckabay.
8. Christine Ulinski; Kimberly Barry, Foundation Trustee; and Joscelyn Martin enjoyed catching up at the Foundation's Happy Hour Benefit.
9. The Academy's first 5K Run/Walk was an energizing way to start the day in Indianapolis. Philanthropic support for the 5K was provided by Oticon, Inc.
10. The Foundation's Executive Committee presented Bryan Wong with one of the six 2017 James and Susan Jerger Awards for Excellence in Student Research.
11. The 2017 Student Research Forum awardees paused for a photo with the underwriters. Philanthropic support for the Student Research Forum was provided by Plural Publishing, Inc. From left for right: Valerie Johns, Plural Publishing Executive Editor; Angie Singh, Plural Publishing President and CEO; Sarah Faucette; Ivy Schweinzger; Erin Dula; Kaitlyn Wenrich; and Kristen Benjaminson.
12. Gary Rosenblum, Oticon, Inc., generously presented a \$25,000 check for the Empowering Students Scholarships to the Foundation and SAA Board. From left to right: Therese Walden, Georgine Ray, Paige Waddell, Gary Rosenblum, Arun Joshi, Laura Ann Wilber, Brenda Ryals, Eileen Rall, and Brenna Carroll.

Pursuing Specialty Certification

By Arun Joshi

For many students, the prospect of graduation can mean several things—the end of their tenure in academia, or perhaps the beginning of a fulfilling, lifelong career. If you ask me, I am looking forward to the focus on clinical service provision in contrast to meeting capstone deadlines, writing term papers, and studying for examinations. In reality, however, as a health-care professional, you have committed yourself to lifelong learning because audiology is a profession that is founded upon evidence-based practice. By providing evidence-based diagnostic and treatment services, you offer to your patients reliable, effective, high-quality health care. Thus, in a way, you become a student for life.

As industry, technology, and hearing health care continue to evolve, it is much to your benefit as an audiologist to also practice continuous quality improvement—holding yourself to high standards, committing to being the hearing expert, and adapting to the needs of your patients and the market. One method to demonstrate this commitment to excellence and lifelong learning comes in the form of voluntary specialty certifications. In particular, the American Board of Audiology (ABA) has created two specialty certifications in pediatrics and cochlear implants that allow passionate professionals to set themselves apart from other general practitioners.

The Cochlear Implant Specialty Certification (CISC) and Pediatric Audiology Specialty Certification (PASC) are awarded through a meticulous evaluation process, which mandates the ability to pass a rigorous examination and a minimum number of years practicing as an audiologist. Audiologists who have obtained the CISC and/or PASC have acquired advanced knowledge in their respective areas of focus and have demonstrated themselves as experts in pediatric audiology and/or cochlear implants. These specialty certifications, although not a guarantee of any particular skill or competency, exemplify a dedication to high standards, ongoing education, and best practices.

As a soon-to-be or recent graduate, you might be looking for ways to stand out from the crowd. Whereas licensure is required of us to practice audiology, specialty certification is voluntary—the decision to obtain this title is up to you. By pursuing these designations, you are signaling to your peers, patients, and potential employers your pledge to high-quality hearing health care. Obtaining the PASC and/or CISC is certainly not a task that can be completed overnight. As mentioned previously, the evaluation process is challenging and requires passion, persistence, and patience—but it is certainly not impossible. Are you up for the challenge?

Dr. Shelley Moats, AuD, PASC, member-at-large on the American Board of Audiology Board of Governors, and Fellow of the Academy, shared her insight on the specialty certification.

Arun Joshi: Why did you pursue a specialty certification?

Shelley Moats: For me, the PASC is a rigorous mechanism to demonstrate knowledge in the field of pediatric audiology. To adequately serve kids and families, the breadth and depth of required knowledge is astounding. The scoring mechanism indicated relative areas of strength and weakness, which I could then use as a tool to increase my capacity to serve.

What are the benefits of pursuing specialty certification? More importantly, what are your perceived benefits?

I am currently the only PASC recipient in the state of Kentucky. Families know this and gravitate towards our agency as a result – they know that they can expect nothing less than best practice care from our staff. Referral sources are also aware of this and I believe it has impacted the number of referrals we receive. In general, pediatric audiologists should strive to earn the PASC credential because it demonstrates a commitment to excellence and expertise in the field. Kids are not little adults, and most AuD programs do not have a sufficient pediatrics focus/experience component for new graduates to come out as “experts” in this area. For those interested in a career in pediatric audiology, the PASC requirements provide a framework for gathering the necessary knowledge and experience.

For new graduates who might be interested in pursuing specialty certification what advice or insight could you offer?

SM: I feel the PASC sets me apart from other providers of pediatric audiology services in my area because I'm not simply calling myself a "pediatric audiologist"—I have actually demonstrated that I have the knowledge and skills to best serve this very special population. Preparing for and taking the exam

was a great learning opportunity for me, as well. As a profession, we need to hold certifications that are rigorous and meaningful—that is an important way of demonstrating our value in hearing health care.

For more information about specialty certification, check out the ABA website: www.boardofaudiology.org.

Arun Joshi is a fourth-year AuD student at the University of North Texas in Denton, Texas. He currently serves on the national Student Academy of Audiology (SAA) Board of Directors as treasurer and chair of the SAA Conference Committee.

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New Members of the Student Academy of Audiology

Skylar Abbott
 Marwa Abdrabbou
 Alyssa Adamec
 Elizabeth Agboola
 Jaslean Ahuja
 Kate Allen
 Nicklaus Arra
 Greer Bailey
 Julia Benner
 Erica Bennett
 Kristina Bevill
 Alex Boudreaux
 Bonnie Brown
 Andrew Bryant
 Elizabeth Bryant
 Emily Burakiewicz
 Chelsea Campbell
 Steven Carter
 Heather Chandler
 Hannah Chapin
 Alyssia Chung
 Aryn Clark
 Kelly Cook
 Kayla Copperthite
 Julia Cote
 Morgan Crumbaugh
 Cody Curry
 Sophia Dillon
 Shannon Doolittle
 Stephen Dougherty
 Elise Drager
 Erin Dula
 Hannah Famili
 Megan Farina
 Jade Faulkner
 Clare Gallagher
 Gina Gates
 Katherine Gill

Jessica Goble
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 Marissa Highberger
 Ashley Hinton
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 Leah Horn
 Kirsten Horner
 Emilee Hudgens
 Claire Hug
 Caitlin Hull
 Laura Hunt
 Kendra Huskey
 Maribiliz Irizarry
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 Allison Trine
 Stephanie Trippel
 Jennifer Tyler
 Mercy Vega
 Emily Walczak
 Abby Waldo
 Bria Watson
 Ellen Watson
 Marti Weiner
 Ashtyn Whyte
 Michelle Wong
 Desiree Wood
 Andrew Yenish
 Keonseok Yoon
 Meagan Young
 Sabina Yungert
 Tess Zaccardi
 Beatrice Zamfir

Stand Out from the Crowd

Become Board Certified in Audiology

By Robert M. Traynor

In an economy that necessitates careful consideration of expenses, it is understandable that health care professionals need to question the value of obtaining credentials. What is the value-added benefit for spending extra money to obtain a certification credential beyond a professional degree? If someone is in private practice and does not have to prove anything to employers, why should he or she worry about being board certified? Why does it really matter to have the privilege of listing *Board Certified in Audiology* after my name?

Board Certification Makes Good Sense

The dismissive nature of these very questions suggests a lack of understanding of the business of health care in society today. Health care is business, and to thrive in it the clinician must possess a synergy of strong business and clinical skills. The needed business acumen includes attention to the practicalities of operations and strategic management. Moreover, it

necessitates demonstration of strategic leadership (BE Smith Team, 2017) and emotional intelligence (Warren, 2013). As well, it is an appreciation of a core element of business: public relations.

At a time when they face huge competition, professionals across the health disciplines must further define and distinguish themselves. Unskilled workers across the health-care disciplines have assumed increasing numbers of tasks once limited only to professionals. (Nancarrow and Borthwick, 2005). As the lines blur within the health-care workforce, it becomes all the more essential for the qualified providers of hearing health care to take steps to define his or her professional role... and to actively promote it.

In the world of hearing and balance care, audiologists must distinguish what makes them the provider of choice. Other providers and workers may provide similar services, but the audiologist uniquely offers the full spectrum of services for hearing and balance care. The audiologist has the formal education

and clinical experience to benefit the patient. Through the board certification designation, audiologists both elevate their role and personal dedication. The credential offers credibility within and beyond the profession.

Credibility with Peers

Board certified status represents to others that the individual is compliant with the American Academy of Audiology's *Standards of Practice* (2012) relative to licensure and adheres to the most stringent standard of continuing education requirements. Each health-care discipline monitors itself for quality assurance, notably meeting professional standards. Although it may be defined differently across disciplines, the board certified credential has a common denotation of the highest level of quality assurance. Obtaining the Board Certified in Audiology designation offers reassurance to peers within the profession, and in other disciplines, that the individual meets the highest standards for practice and continuous practice improvement. As well, the

credential distinguishes the audiologist as a role model for colleagues and for students.

Credibility with Employers

Many employers use certification as a way to assess whether an individual possesses the skills and knowledge required for successful clinical performance. They are seeking the most qualified individuals for their audiology positions, and the ABA board certified credential offers unparalleled quality assurance, suggesting that this individual can advance positive patient outcomes. The message that employers derive from seeing the certification credential is that a third party has verified that the individual has met higher standards. As well, the credential conveys a commitment by the individual to continuous learning, professional development, and maintaining quality work. Being Board Certified in Audiology may improve career opportunities and advancement.

Credibility with Patients

Perhaps above everything, the audiologist needs to consider the value of the credential to the patient. Most patients do not have the knowledge or skill to assess providers. The board certified credential resonates with the patients as a quality measure. Making the investment into attaining and maintaining the board certified credential demonstrates to patients a commitment to professionalism and quality hearing and balance care. Additionally, the credential can be helpful in marketing

to the public by distinguishing the practitioner from other audiologists and differentiating this practice from others in the market.

Credibility with One's Self

The professional audiologist deserves recognition and appreciation. Like most professionals, the audiologist embraces lifelong learning and seeks the opportunities for ongoing, meaningful professional development. By becoming Board Certified in Audiology, audiologists set themselves apart from others in the profession, as well as the technicians involved with hearing and balance health care. The successful attainment of the credential serves as an impartial third-party endorsement of preparation, experience, and continuing education.

Why the ABA?

While offering another method of differentiation for a practice or securing a new position, the ABA's Board Certified credential has only been adopted by 10 percent of the members of the American Academy of Audiology. In today's highly competitive environment for independent audiology practice, as well as competition for those coveted positions in other area of the field, Board Certification, developed by and for audiologists, can be the credential that allows an individual to stand out from the crowd of practices or applications. Beyond any other audiology certification credential, board certification in audiology by the American Board of Audiology is the highest level of recognition that can be attained within our field. Stand

out in the crowd, make your practice different: meet the challenge of Board Certification in Audiology! 

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

References

- American Academy of Audiology. (2012) *Standards of Practice*. Available at: http://audiology-web.s3.amazonaws.com/migrated/StandardsofPractice.pdf_539978afe9df91.82779963.pdf
- BE Smith Team. (2017) Industry Report: The Healthcare Executive of Tomorrow. www.besmith.com/Pages/ArticleDetails.aspx?id=1452 (accessed February 21, 2017).
- Nancarrow S, Borthwick AM. (Nov. 2005) Dynamic professional boundaries in the healthcare workforce. *Soc Heal Ill* 27(7):897-919.
- Warren B. (May 2013) Healthcare emotional intelligence: Its role in patient outcomes and organizational success. *Becker's Hospital Review* www.beckershospitalreview.com/hospital-management-administration/healthcare-emotional-intelligence-its-role-in-patient-outcomes-and-organizational-success.html.

Audiology Education

Innovative International Initiatives

By James W. Hall III

A two-part series of ACAE Corner articles in 2015 was devoted to the topic of global audiology education. The first article provided an international overview of audiology educational models and programs in different countries and geographical regions (Hall, 2015a).

As noted at the outset of the article, over 90 percent of the world's population has little or no access to hearing health care. The Middle East was identified as one region with woefully inadequate audiology services. The follow-up article in *Audiology Today* addressed "emerging strategies and efforts to expand and

enhance the quality of audiology education around the world" (Hall, 2015b). Two examples of emerging strategies and efforts were cited. One was an audiology program in development then at American University of Beirut. The other was an online master's degree program in audiology at Salus University. I am happy to report that both of these examples of emerging strategies were implemented within the past two years.

The American University of Beirut (AUB) is a rather unique educational institution. Founded 150 years ago by American missionary Dr. Daniel Bliss as Syrian Protestant College, AUB (www.aub.edu.lb) adheres closely to the American model for higher education while enjoying a world-class international reputation. The beautiful campus sits high on a hill overlooking the Mediterranean Sea within an historical part of Beirut and adjacent to the first-class AUB medical center. For 30 years, from 1975 to 2006, Lebanon was in and out of wars. The population was left with tremendous physical and emotional scars, and a high prevalence of hearing impairment and balance disorders. However, before 2015 only three formally educated audiologists were providing services to a population of five million. In 1998, Dr. Kim Smith Abouchacra moved to Lebanon from the U.S. to establish audiology services at AUB Medical Center. In 2009, she was joined by Solara Sinno, a Lebanese audiologist who joined the AUB audiology team and is currently pursuing a PhD in vestibular assessment.



The first cohort of audiology students in the Medical Audiology Sciences program at the American University of Beirut with Visiting Professor James W. Hall III, PhD, during an auditory electrophysiology class in January of 2016.

Together Kim and Solara began development of an audiology educational program in 2010, and in 2013 the program was approved by the New York State of Education Department and the Lebanese Ministry of Education. Approval and implementation of the audiology program would not have been possible without the efforts and support of Dean Iman Nuwayhid of the Faculty Health Sciences, Dean Mohamad El Sayegh of the Faculty of Medicine, and Dr. Georges Zaytoun, a well-respected otolaryngologist who completed his otology fellowship at Massachusetts Eye & Infirmary and who was then-chair of the Otolaryngology Head & Neck Surgery.

The Program of Medical Audiology Sciences (MAS) was justified at the bachelor level because it would assist in fulfilling an urgent need for qualified audiologists in Lebanon and the surrounding region. It now plays a pioneering role in expanding audiology in Lebanon and in improving the standard of care in the Middle East. Among prerequisite requirements are 10 hours of coursework in the natural sciences plus courses in Arabic and English. The curriculum includes typical basic science and clinical audiology courses, and over 300 hours of supervised direct patient care. The MAS program at AUB “prepares students for a successful career in audiology by providing them with a foundation in liberal arts education, coupled with a high-quality clinical education that is underpinned by the fundamental sciences of audiology and a rigorous scientific approach.” The long-term goal is to develop a U.S.-accredited graduate program at AUB.

Salus University’s Osborne College of Audiology recently introduced an international master’s of science (MSc) in Clinical Audiology program (www.salus.edu/audiology). Dr. Giri Sundar, director of Distance Education Programs in the Osborne College of Audiology, played the key role in designing the curriculum and assembling a top-notch faculty with expertise in all areas of audiology. The MSc in clinical audiology degree is a post-professional degree intended for working audiologists who have completed a four-year undergraduate degree in audiology (or its equivalent), and who have provided full-time clinical audiology services for no less than two years. The MSc program of study is both competency- and skills-based. Integrating an online and hands-on educational approach, the program is designed to develop in practicing audiologists outside of the U.S. competence in specialized areas of audiology.

To complete all requirements for the international MSc in clinical audiology program at Salus University, students are required to

1. Complete all the mandatory courses.
2. Complete three clinical skills training practicum.
3. Choose two fellowship programs in topics such as cochlear implants or vestibular sciences and disorders.

Each fellowship program is composed of didactic courses in the specialty area of study, two hands-on workshops, and 150 clinical hours under the supervision of a college-approved preceptor. The first cohort of students enrolled in the Salus University MSc in clinical audiology program consists mostly of audiologists practicing in the Middle East.

Efforts to educate the first generation of audiologists are underway in many countries. That dream is now a reality at AUB in Lebanon. Newly developed on-campus audiology educational programs, in combination with innovative options for formal post-bachelor’s degree education for practicing audiologists like the online MSc in audiology program at Salus University, are sure to improve hearing health care and quality of life for large numbers of children and adults worldwide. 🌐

James W. Hall III, PhD, Board Certified in Audiology, has 40 years of experience in audiology as a clinician, administrator, teacher, and researcher. A founder of the Academy and vice-chair of the ACAE Board, Dr. Hall is a professor at Salus University and the University of Hawaii.

References

- Hall JW. (2015a) Thinking globally about audiology education. *Aud Today* 27(3):72–73.
- Hall JW. (2015b) Expanding and enhancing audiology education globally. *Aud Today* 27(4):70–71.

Ohio Students Head to Capitol Hill in Recognition of World Hearing Day

By Adam Finkel

The World Health Organization has designated March 3 as World Hearing Day. With this year's theme addressing the economic impact of untreated hearing loss, a group of 31 audiology students from the Ohio State University and the Northeast Ohio AuD Consortium (NOAC) came to Washington, DC, to deliver this important message to lawmakers and to discuss other issues impacting the profession of audiology. The timing of this Hill day was especially important given that March 3 was early on in the new Congress—an essential time to

engage new and returning members of Congress and their staff and build relationships with these individuals.

During an incredibly productive and busy day that included 19 meetings with key legislative staff members, the students were able to draw attention to the World Hearing Day message and connect the theme of the economic impact of hearing loss to two key Academy legislative priorities: the Early Hearing Detection and Intervention (EHDI) Act and the Hearing Aid Assistance Tax Credit Act.

Students met with congressional offices, including Senator Rob Portman (R-OH) and Senator Dean Heller (R-NV), as well as a number of House offices from Ohio, Nevada, Pennsylvania, and Delaware.

Senators Portman and Heller are known champions within the hearing health community, with Sen. Portman being the lead sponsor of the EHDI bill and Sen. Heller being the lead sponsor of the Hearing Aid Assistance Tax Credit Act.

For many of the students, this was their first experience directly lobbying their elected officials on the importance of audiology issues. After the experience, Donna Green, a first-year audiology graduate student from Ohio

State noted, "I really enjoyed getting to share my field with different representatives. I felt like I was really making a positive impact. Getting to meet with other audiology students gave me a great perspective on the different views and styles of the field. I am so glad that I was able to expand my horizons."

First-year Ohio State audiology student Jillian Chapman agreed after reflecting on the experience. "Advocacy is something that I'm very passionate about, and this was such a wonderful opportunity to represent the profession of audiology. It was great to feel like my voice was being heard by my representatives."

Having audiologists and audiology students visit Washington is critical to ensuring that the Academy is successful on Capitol Hill in promoting our public policy agenda. Congress started the legislative session in January with a significant number of broad issues on their agenda. These issues have ranged from the more mundane, such as several of the cabinet nominations and other administrative posts, to the possibility of some bipartisan consensus, like tax reform, to the hyper-partisan, such as the future of the Affordable Care Act.

Having the students from Ohio State and NOAC come to Capitol Hill also provided a significant boost to the Academy's legislative portfolio this session by allowing us to cut through some of the greater noise and meet with Congressional representatives on issues that are important



to our members and to the hearing health community as a whole.

Tracy Hoepfner, a third-year audiology graduate student from Ohio State, witnessed the importance of citizen activism to the audiology community. “My second trip to Capitol Hill was an amazing experience! I felt really empowered talking about a field I am passionate about to legislators who really value opinions from their constituents. It’s so exciting to be on the forefront of audiology standing alongside other audiology students who feel the same as me. I hope to continue this tradition for years to come, especially when I’m a practicing audiologist. I’m so thankful for the experience and recommend it to every audiology student!”

Angela Koenig, another third-year audiology graduate student from Ohio State agreed. “One of the largest accomplishments of our Student Academy of Audiology Advocacy trip to DC was having a greater understanding of the issues that will be impacting our field. Throughout our preparation for the trip, we learned about pieces of legislation that were introduced last year as well as what to look out for in the future. One of the best parts of this trip was seeing how much more confidence my fellow classmates gained as we went through our meetings. I am proud to be a part of a group that spoke with such poise and passion for the well-being of our patients and the field of audiology.”

The Academy’s Government Relations Department strongly encourages other student groups and members to get involved in advocacy and plan a visit to Washington, DC. As stated by Nicole Greenwalt, a first-year audiology graduate student from Ohio State, “Advocating on Capitol Hill was such a motivating experience! It is important that students, as future

clinicians, embrace the responsibility of working with and educating our legislators on the issues impacting the profession of audiology. We must continue to foster these relationships to ensure our field, and the patients we serve, remain well-represented in Washington.”

The Academy has set up a grassroots network to help cultivate member interest and participation in the political process. All Academy members are encouraged to join the grassroots network. This network will help audiologists to develop connections with key members of Congress, engage on important legislative issues, and increase awareness of the profession on Capitol Hill and within the political arena. Grassroots involvement is critical if we want to see important legislation like the EHDI bill and the Hearing Aid Assistance Tax Credit Act become law this legislative session.

“Being graduate students, it’s easy to get caught up in coursework and either accept or become complacent with the issues and legislation within our profession,” said Jon Dirks, audiology graduate student and NOAC trip coordinator. “This trip to Capitol Hill was a great way for us to not only educate our congressional representatives about hearing loss and current issues, but also to educate ourselves. As the future of the field, I believe that advocating for our patients and our profession is of utmost importance. Expressing our concerns and letting our voices be heard was incredibly motivating and rewarding, and I can’t wait to take part in many more advocacy initiatives!” 

Adam Finkel is the Academy’s associate director of government relations. For more information on becoming involved at a grassroots level, please contact Adam at afinkel@audiology.org.

New Members of the American Academy of Audiology

- Stacy Borden, AuD
- Emily Bunce, AuD
- Erin Cipriano, AuD
- Christy Connor, AuD
- Angela Costanzi, AuD
- Lee Cottrell, AuD
- Regina Gillison, AuD
- Tricia Gross, MA
- Steven Hamlett, AuD
- Patrice Marshall, MA
- Raymond Miner, MA
- Michele Phillips, AuD
- Andrea Plotkowski, AuD
- Bethaney Tessitore, AuD
- Michelle Tewell, AuD
- Christian Thorup
- Hillary Toennies, AuD
- Samantha Wallenstein, AuD
- Marina Walls, MS
- Eunyoung Won, AuD

Audiology Technicians in the Academy

The Justification for Creating a New Membership Category

By David Jedlicka

The Support Personnel Subcommittee of the American Academy of Audiology was formed in 2015 to evaluate the need for a new membership category. A survey conducted by the American Academy of Audiology in 2012 found that 87.9 percent of audiologists believe that audiology technicians have a role in supporting patient care. There was also strong support for audiology technicians to work under a standard scope of practice and to participate in continuing education. The subcommittee is proud to announce that the audiology technician membership category is now available for enrollment.

The strong support for inclusion of audiology assistants in the clinic encouraged this subcommittee to explore other professional organizations that have successfully implemented an assistant membership category with clearly defined clinical roles for these assistants. Such organizations include the American Optometric Association and the American Physical Therapy Association.

The subcommittee also investigated the current use of technicians in audiology clinics to determine their appropriate role while maintaining the highest levels of patient care. We found the Veterans Administration's (VA) use of audiology technicians to be the best model of appropriate clinical implementation. In addition to being one of

the largest employers of audiology technicians, the VA has established its own scope of practice that helped to guide the subcommittee in its recommendations.

In 2016, the Support Personnel Subcommittee submitted recommendations to the Academy's Board of Directors. These recommendations were based on both responses from audiologists and research regarding the role of health technicians in other professional organizations. The subcommittee recommended the creation of an audiology technician membership category and suggested that an audiologist must sponsor the technician for membership. The sponsoring audiologist is required to directly supervise the technician to ensure that the technician is working within his or her scope of practice. This recommendation was to ensure that we continue to provide high-level, appropriate care for our patients.

As the demand for audiology services continues to increase, we believe it is time to expand the Academy and grow our profession by including and supervising audiology technicians. Audiology technicians can increase an audiologist's availability to provide the services expected of a doctoral-level professional. This will add value to the services we provide while increasing the opportunities to evaluate, diagnose, and treat a greater number of individuals. Providing a clear role for



audiology technicians and embracing them as a new, separate membership category within the Academy is a needed step to strengthen the future of our profession.

For more information about this membership category, visit www.audiology.org and search keywords "audiology technician." 

David Jedlicka, AuD, is chair of the Academy's Support Personnel Subcommittee and a member of the Academy's Membership Committee.

Acknowledgments: Thank you to the following committee members who helped work on the development of this new membership category: Cara Michaux, Julie Verhoff, Kelly Jahn, Nichole Kingham, Margaret Kettler, Kathryn Schwartz, and Natalie Feleppelle.

Ethical Practices

2016 Case Summaries

To aid in the understanding of how the Academy's Code of Ethics (COE) is applied and interpreted, the Ethical Practices Committee (EPC) periodically publishes a summary of cases. Following is a summary of cases reviewed by the EPC from June–December 2016. Identifying information has been removed. In addition to these published summaries, the EPC also reviewed and responded to numerous general inquiries by members during this time.

14-02: A consumer complaint by parents was filed against a member, questioning accuracy and thoroughness of pediatric test results, hearing aid selection and verification, intervention, and follow-up recommendations. A second opinion was sought by the parents, with different test results and additional follow-up recommendations not offered by the respondent. The EPC communicated with the respondent for additional information regarding potential non-compliance with the Academy's COE. The case is still open, pending outcome of legal resolution by a governmental consumer protection agency.

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A M E R I C A N A C A D E M Y O F A U D I O L O G Y

14-03: A complaint was filed by the parents of a severely disabled child who was seen by a member for the purposes of audiological evaluation and treatment. The complainants reported that the member violated their privacy, inflicted emotional distress, and retaliated against them for disagreeing with the member's recommendations regarding hearing aids, medical intervention, and educational programs, and by reporting false information in contradiction to the child's other medical providers. Because of the rigorous investigation and legal closure of this case by the state's consumer protection agency, the case was closed without action.

14-04: A member requested an opinion regarding the potential conflicts between the Academy's COE and contractual requirements of a specific buying group and its contracted members, including those who

might be members of the Academy. Inasmuch as this case did not name a specific member, and given the more global issues of this case and the inability of the EPC to sanction non-members of the Academy (including individuals and organizations), this case was originally referred to the Board of Directors in 2014. After reviewing the original complaint again in 2016 under new EPC structuring, the case is pending EPC response, to include reference to EPC Advisory Opinions regarding buying groups and guidelines regarding relationships with industry.

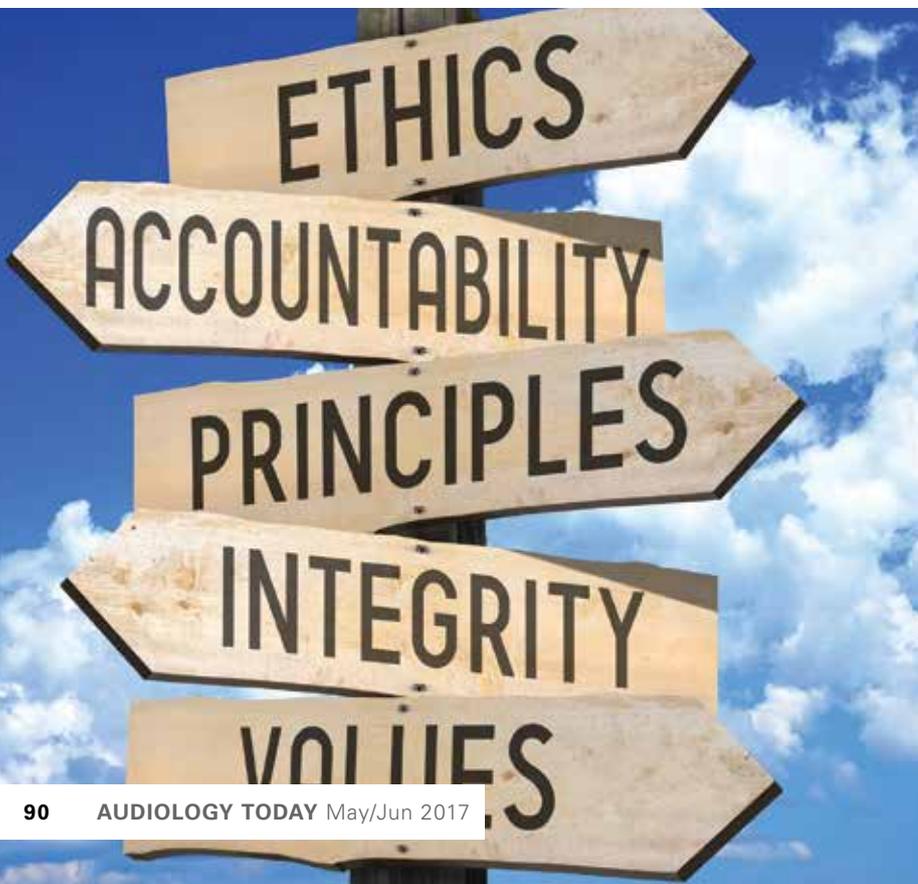
15-01: A complaint was filed against a member regarding reported use of ethnically offensive language during testing. The member denied the details of the accusation and has filed suit against the complainant, who had also posted a negative review on social media. The case is

still open, pending outcome of legal action filed by the member.

15-02: A complaint was filed that questioned the honesty of a member regarding charges for hearing aid parts replacement. After extensive review of the case, the EPC determined that the fees charged were reasonable for the time, expertise, and services that were rendered, and that the member complied with ethical standards of practice. An explanatory letter was sent to the complainant, as well as recommendations to the member to consider providing additional written material to patients that review the specific services and parts provided and their costs, including a request for patient signature to confirm understanding. The case was closed without violation.

15-03: A complaint was filed alleging discriminatory, abusive, demeaning and insulting behavior of a member, noting that the member provider refused to see patient for testing and hearing aid adjustment because his hearing aids were purchased from an internet company (unknown by the providing office at the time of appointment booking). The complainant subsequently billed the member for travel time to the office, wait time in the office, mileage, and late payment penalty. The complainant also posted derogatory remarks on the web regarding the member. After review of communications with both the complainant and respondent, this case was referred to the Academy's BODs for guidance and is still pending.

For more information about the Ethical Practices Committee or these case summaries, please contact the committee at ethics@audiology.org.



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For more information about the program, contact Alyssa Hammond at ahammond@networkmediapartners.com.

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