Clinical Education in Audiology: A Case of the Emperor’s New Clothes

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Clinical Education in Audiology: The Emperor’s New Clothes  Many of us feel a bit like the emperor and his subjects when it comes to clinical education in audiology. We have a nagging feeling that the whole enterprise does not quite make sense.
By Virginia Ramachandran

A Quick Look at Ocular Vestibular-Evoked Myogenic Potentials  In the mid–1990s, several investigators observed that particular neurons in the vestibular system of cats, called “irregular neurons,” were activated by low-frequency acoustic stimulation. This led some to investigate the possibility of using acoustic stimulation to measure the function of the vestibular system.
By Devin L. McCaslin and Erin G. Piker

Myth Busters: Can You Unbundle and Stay in Business?  Learn more about the myths related to hearing aid billing practice models including an introduction to new evidence related to unbundled billing.
By Stephanie Sjoblad and Barbara Winslow Warren

Limitless Wires in a Wireless World  It is so easy to get swept up in the swift current of technology, lose your bearings, and wind up floating aimlessly in an uncharted ocean. It is time to analyze what it takes to fit the ever advancing and supremely complex hearing instruments and accessories.
By Bre Myers

Evaluating Speech Perception Performance  While studies often report speech perception performance, there is no general agreement regarding choice of test material, sound intensity levels at which to test, or how to interpret test results.
By Jane R. Madell, Emily J. Klemp, Reva Batheja, and Ronald Hoffman

Educating Our Patients About Falls Risk  As audiologists who treat at-risk seniors, we too need to take a patient-centered approach and act as advocates for fall prevention.
By Jeffrey L. Danhauer, Carole E. Johnson, Craig W. Newman, Victoria A. Williams, and Dennis Van Vliet

AAA Foundation Research Spotlight  This spotlight article features Tiffany Johnson, PhD, a 2007 recipient of a New Investigator Award.
By David Fabry, Richard Danielson, and Kathleen Devlin Culver
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The American Academy of Audiology promotes quality hearing and balance care by advancing the profession of audiology through leadership, advocacy, education, public awareness, and support of research.

Content Editor
David Fabry, PhD | dfabry@audiology.org

Executive Editor
Amy Miedema, CAE | amiedema@audiology.org

Editorial Advisors
Mindy Brudereck
Paul Pessis
Christopher Spankovich

Editor Emeritus
Jerry Northern, PhD

Web Manager
Marco Bovo

Advertising Sales
Heather Troast | heather.troast@theygsgroup.com | 800-501-9571 ext. 124

AMERICAN ACADEMY OF AUDIOLoGY OFFICES
Main Office
11730 Plaza America Drive, Suite 300
Reston, VA 20190
Phone: 800-AAA-2336 | Fax: 703-790-8631

Capitol Hill Office
312 Massachusetts Avenue, NE
Washington, DC 20002
Phone: 202-644-9334

AMERICAN ACADEMY OF AUDIOLoGY MANAGEMENT

Executive Director
Cheryl Kreider Carey, CAE | ckarey@audiology.org

Deputy Executive Director
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Senior Director of Finance and Administration
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Senior Director of Government Relations
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Director of Industry Services
Shannon Kelley, CMP, CEM | skelley@audiology.org

Director of Education
Meggan Olek | m ole@audiology.org

Kathleen Devlin Culver, MPA, CFRE | kculver@audiology.org

Torryn P. Brazell, CMP, CAE | tbrazell@audiology.org

Editorial Advisors
Mindy Brudereck
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What Sets Us Apart?

Even if you don’t follow popular music closely, you’ve probably heard of Lady Gaga. Besides a catchy stage name, she has set herself apart from many of the other contemporary performers and has “branded” herself and her music quite well. Lady Gaga has set herself apart from the rest.

What sets audiology apart? How are we branding ourselves and our profession? What are we doing to ensure that audiologists are known as the preferred health-care provider for hearing and balance wellness? The profession has come a long way since its “birth” during World Wars I and II. In an excellent monograph published in Audiology Today in January 2002, Moe Bergman, EdD, provided a detailed and illustrative historical record of the “origins of audiology.” This is a must-read for everyone in the field. Decades later, from these auspicious beginnings, the profession of audiology is still “fashioning itself as a service profession” (to paraphrase Dr. Bergman!).

That’s who we are, what we do—we provide a service. Whether that service is as a clinician, a researcher, an academic, a hearing conservationist, a hearing scientist, etc., we provide a valuable and necessary service to our customers. To continue to build on our reputation as a “service profession” we must continue to brand ourselves and the service we provide. How do we do that? Let me point out a few ways we achieve audiology branding.

First: Education. We do this really well from student to seasoned professional. We have rigorous, competitive academic training programs in place throughout the country to generate educated, prepared young clinicians and scientists. After the formal coursework, we have a dedicated lifelong continuing education mandate. We read journals, attend conferences, engage in on-demand learning with a plethora of Academy eAudiology options, and we attend the premier continuing education event of all—AudiologyNOW! We set ourselves apart through education.

Second: Publications. Our own peer-reviewed audiology publication, the Journal of the American Academy of Audiology is a highly respected journal that has broad appeal to clinicians and researchers alike and our Audiology Today magazine is contemporary, informative, and award-winning! We set ourselves apart through publications.

Third: Advocacy. We have a vibrant and growing PAC (Political Action Committee) that is dedicated to helping our elected (federal) officials understand the importance of unfettered accessibility to audiological services for their constituents. We have a State Leaders Network and many state audiology organizations that work on the local level to educate elected officials about the importance of the provision of audiological care.

We have increased our voice and presence within the federal legislative and regulatory entities that help define how we provide our service to our patients. We set ourselves apart through advocacy.

Finally: You and Me. We have each other. Each time we diagnose a treatable hearing loss in a three-month-old, each time we hold the hand of an Alzheimer’s patient and help guide the hearing aid into his or her ear, each time we perform the balance assessment that aids in the diagnosis of a debilitating vestibular disorder, and each time we activate the newly implanted cochlear implant and see the tears stream down the patient’s face, we set ourselves apart. No one can do what we do as audiologists. No one.

Therese Walden, AuD
President
American Academy of Audiology
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a dynamic and sometimes confusing aspect of billing for audiology services. Thus, the Academy is launching a series of coding and reimbursement Web seminars (live and on-demand) through eAudiology...your CEU source. Debra Abel, AuD, Academy staff, and a well-known expert on the topic will host this series from 1:00 to 2:00 pm ET on the second Tuesday of odd-numbered months, beginning in September.

By purchasing the $89 eAudiology package with membership renewal, Academy members can participate in these five sessions—plus an unlimited number of on-demand sessions. We’ll let you calculate the savings, as these initial five, one-hour sessions alone would cost $150, if purchased individually.

The following sessions have been designed with you in mind.

**September 13—Unbundling and Itemizing Hearing Aid Services**

Unbundling or itemizing hearing aid devices/supplies and procedures will likely increase hearing aid reimbursement. Stephanie Sjoblad, AuD, and Debra Abel, AuD, will illustrate how you can implement this process in your own facility today...for greater reimbursement tomorrow!

**November 8—Medicare Enrollment and Regulations**

In response to the Centers for Medicare and Medicaid Services (CMS) tightening the requirement for revalidation of all Medicare providers by March 23, 2013, the enrollment process will be reviewed by Debra Abel, AuD. Updates in Medicare policies will also be discussed.

**January 10—Coding Changes for 2012**

The new year will bring the addition of and change to several audiology procedure codes, as well as to the annual Medicare Physician Fee Schedule. Join Debra Abel, AuD, to review these changes for compliance and correct coding practices.

**March 13—Insurance 101**

With an increase of audiological and hearing aid services offered by commercial payers, join Frieda Toback, AuD, and Debra Abel, AuD, in a discussion of what to ask your payers as you navigate the muddy waters and chart the course for fair reimbursement.

**May 8—Preparing for the ICD-10 Code Transition**

With the ICD-10 code transition set to begin on October 1, 2013, join Kyle Dennis, PhD, and Debra Abel, AuD, to prepare for the first coding change in the United States in 30 years.

Take advantage of this valuable coding and reimbursement resource. Invite your peers to do the same.

Cheryl Kreider Carey, CAE
Executive Director
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*Independent testing performed October 23, 2009 in compliance with JIS Z 2801 standards.
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Do you provide an exceptional customer service experience to your patients? Have you considered the impact of the front desk staff on your patients' satisfaction? The front desk staff is providing your patients' first impressions of your practice. According to an article published in JAMA (Kenagy et al, 1999), “the initial direct interactions with patients tend to strongly shape the experiences and emotions that will follow. When this initial moment of truth goes well, a positive cycle begins between the customer and the organization; when it goes poorly, it may be difficult to recover.” A knowledgeable staff can grow the practice and should be an integral component to the patient journey.

Evaluate how a patient flows through your office. What is the first impression a patient will form when he or she calls your office to schedule an appointment? Is the phone interaction positive, courteous, and responsive to the patient’s needs? Is the patient greeted warmly when visiting your practice and acknowledged when leaving? What is your protocol for answering the phone? If your office does not have a protocol, a phone script can be developed to provide the following: a universal greeting, a method for answering questions, and a standard of care that is expected of the staff. Use examples to demonstrate appropriate phone interactions. Consider how the following interaction could be changed to improve the patient’s first impression of the office:

Front desk: “ABC Audiology, please hold” (followed by a two-minute wait). “How can I help you?”

Ask your staff how they would feel if they were the caller? What could be changed about this interaction to improve the first impression? Small changes in the interaction lead to exemplary customer service.

Front desk: “Good morning, thank you for calling ABC Audiology. This is Jane. How can I help you?” After listening to the request, “I would be happy to help you with that, may I place you on hold for just a moment?”

Discuss potential challenges front desk staff may encounter when
answering the phone and working with patients. Train your staff to address patient questions and solve problems with knowledgeable and courteous answers. Be open to suggestions and change. Facilitating an environment of change requires the ability of staff to evaluate their performance and make changes to improve first impressions. Defining the expectations and working as a team to develop the necessary skills is important. You can facilitate this change by implementing some of the following:

- Maintain good communication through open, honest, and constructive discussions.
- Schedule monthly or quarterly meetings to review performance.
- Record phone calls for training purposes and discuss the interactions to promote continuous improvement.
- Evaluate the performance through the patient perspective using a patient survey.

Change does not happen overnight; it is a process that requires continuous evaluation and consistent communication with the staff. Regular meetings offer the opportunity to open the lines of communication to ensure all employees are happy and providing the best service possible.

In the ever-changing economy where medicine has progressed to a business model, we can no longer rely on our skills as health-care providers alone. The impressions that are formed by our patients go far beyond the tests we complete or services we provide. Patients are looking at the experience as a whole when deciding to allow us the opportunity to improve their lives. In the article, “Improving Service Quality in America: Lessons Learned” (Berry et al, 1994), the authors review the benefits of good service and note that

Excellent service is a profit strategy because it results in more new customers, fewer lost customers, more insulation from price competition, and fewer mistakes requiring the reperformance of services. Excellent service can also be energizing because it requires the building of an organizational culture in which people are challenged to perform to their potential and are recognized and rewarded when they do so.

Having a courteous staff is a reflection of you and the mission of the practice. It can create a positive work environment for both employees and patients. Your patients have a choice on where to receive and maintain their services. Patient loyalty is earned and not given. A life-long customer can grow your practice through word of mouth marketing. In contrast unhappy customers can lead to the demise of your practice. You may be amazing, but the overall service provided by all team members is what will set you apart from others. Strive for great first impressions, customer service and watch your practice grow through patient satisfaction.

Tracey Irene, AuD, is a senior audiologist with Professional Hearing Services, a division of Moreland Ear, Nose, and Throat Group, LTD, in Milwaukee, WI. She is also a member of the Academy’s BEST Committee.

**Illustration by Johanna van der Sterre.**

**References**


**ALSO OF INTEREST**

“When It Comes to Satisfaction, the Patient Experience Matters” by Gyl A. Kasewurm (*Audiology Today, Jan/Feb 2009*)

Visit www.audiology.org and search keywords “patient experience” or use the QR code to view the PDF of this article on your mobile device.
### SEPTEMBER

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<tr>
<td>21</td>
<td>eAudiology Web Seminar: Vestibular Grand Rounds (.2 CEUs)</td>
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<td><a href="http://www.eaudiology.org">www.eaudiology.org</a></td>
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<td>22–24</td>
<td>California Academy of Audiology 12th Annual Conference</td>
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<td>Anaheim, CA; <a href="http://www.caaud.org">www.caaud.org</a></td>
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<td>29–October 1</td>
<td>Alabama Academy of Audiology 2011 Convention</td>
<td>Sandestin, FL</td>
<td><a href="http://www.alaudiology.org">www.alaudiology.org</a></td>
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<td>29–October 2</td>
<td>Scott Haug Hill Country Audiology Retreat</td>
<td>New Braunfels, TX</td>
<td><a href="http://www.scotthaug.org">www.scotthaug.org</a></td>
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### OCTOBER

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<td>Hearing Restoration Initiative 2011 Summit Deafness Research Foundation</td>
<td>New York, NY</td>
<td><a href="http://www.drf.org/hri">www.drf.org/hri</a></td>
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<td>14</td>
<td>Central Auditory Processing Disorder: From Science to Practice to Community, Children’s Hospital &amp; Research Center Oakland</td>
<td>San Ramon, CA</td>
<td>Contact Anne Togneri at <a href="mailto:atogneri@mail.cho.org">atogneri@mail.cho.org</a></td>
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<td>26–28</td>
<td>Fifth Biennial Pediatric Audiology Symposium, Sixth Annual Investing in Family Support Conference, Fourth Southeastern Regional EHDI Conference</td>
<td>Raleigh, NC</td>
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100 Sounds to See: Interview with Author Marsha Engle

Otoacoustic Emissions, Mis-Match Negativity, and Hearing Screenings: Interview with Rebekah F. Cunningham, PhD

To learn more, visit www.audiology.org and search by the interviewee’s name, or use the QR codes to view the interviews on your mobile device.
REGISTRATION OPENS NOVEMBER 1

Noise-induced hearing loss affects 10 million Americans and up to 30 million may be routinely exposed to dangerously loud noise. Researchers in this critical public health area will present the latest findings during this one-day conference that will help audiologists translate new knowledge into new treatments.

www.AcademyResearchConference.org
Many of us feel a bit like the emperor and his subjects when it comes to clinical education in audiology. We have a nagging feeling that the whole enterprise does not quite make sense.
Once upon a time, two men of poor character were hired to make an emperor a new suit of clothes. The suit of clothes was said to be made of a magnificent fabric, invisible to those who were intellectually challenged, incompetent, or unfit for their position. Naturally, the emperor’s advisors and subjects, as well as the emperor himself, all professed to see the fabric, which in truth, did not exist. Only a small child possessed the naivety to proclaim the emperor’s nakedness as he paraded down the street in his new finery. And in the end, everyone kept up the pretense, even though all secretly knew the truth.

Many of us feel a bit like the emperor and his subjects when it comes to clinical education in audiology. We have a nagging feeling that the whole enterprise does not quite make sense, even though we have all been through it at one point or another. Whether you are a student, a clinician, a clinical educator, or an academician, if you have thought this, you are not alone.
Clinical education involves numerous factors, each of which has evolved substantially in the past decade or two. So it is no surprise that we may feel a bit uneasy when it comes to understanding clinical education today. Some major challenges of clinical education include models for clinical education, credentialing of audiologists, and accreditation of academic programs.

The Evolution of the Master’s Degree to Doctoral Degree

Prior to the past decade, of course, a master’s degree was the entry level for clinical practice in audiology. An audiology student would take courses in audiology and would receive some clinical instruction. Most students would graduate from a college of liberal arts and sciences or a college of education, generally from a joint speech-language-pathology and audiology department. The degree would be non-descriptive, meaning that it did not designate that students were educated as audiologists. Instead, they would receive a degree such as master of arts, master of science, or master of communication disorders (MA, MS, MCD, etc.).

At the time that students graduated, it was generally agreed upon that they did not yet possess sufficient clinical skill to be qualified for independent practice. In order to complete their clinical education, the graduates would complete a clinical fellowship year (CFY). The purpose of the CFY was to allow the students to obtain clinical experience under the instruction and supervision of qualified audiologists.

The problem with the master’s model was that the quality of postgraduate training could differ tremendously. In addition to differences in clinical experiences and environments, the level and quality of supervision could vary. And in the end, there was no measure to ensure that the CFY student had, in fact, become a skilled clinician; there was merely an attestation by the clinical supervisor that the requisite number of supervised hours had been completed.

By the 1990s audiologists were recognizing that they were not uniformly graduating with what they felt was sufficient didactic or clinical education to be autonomous members of the health-care profession. Thus began the movement toward the clinical doctorate (the AuD) as the entry level for clinical education.

The doctoral model moved the responsibility for clinical education from the CFY clinical preceptor to the university, which provided at least some assurance that someone was watching over clinical education, even when it was not being provided by the university program directly.

Today when students graduate, they have an AuD (doctor of audiology) degree. The name of the degree signifies that the course of study was in audiology. In addition, the degree has been designed to entirely prepare students for entry-level clinical practice. In contrast to the master’s model, the AuD student is meant to be prepared to practice independently upon graduation.

The Evolution of Credentialing

At the same time that changes were occurring in the educational programs, changes were also occurring in the credentialing of audiologists. Historically, the primary credential used to indicate that one was qualified as an audiologist was the Certificate of Clinical Competence in Audiology (CCC-A), conferred by the American Speech-Language-Hearing Association (ASHA). The requirements for certification are developed by the Council for Clinical

### Table 1. Audiology Education Models

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<th>Master’s Model</th>
<th>AuD Model</th>
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<tr>
<td>Credentialing</td>
<td>Certification</td>
<td>Licensure</td>
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<tr>
<td>Degree</td>
<td>Numerous (MA, MS, MCD…)</td>
<td>Single degree designator (AuD)</td>
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<tr>
<td>Clinical Education</td>
<td>CFY model</td>
<td>All clinical education during graduate program</td>
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Audiology Education Models
Certification (CFCC). This credential was granted following the completion of the CFY.

Recall that at this point in the history of our profession, clinical education was not complete upon graduation. Certification was the vehicle by which audiologists could indicate that not only had they completed their academic preparation, demonstrated by their degree, but that they had completed a postgraduate period of clinical training as well. Because no other credential was available to indicate this, certification was necessary to establish the individual as a qualified audiologist among peers and consumers.

Over time more and more states began establishing licensure for audiologists. Licensing boards set standards for acquisition and maintenance of the professional license. By and large, the state licensing standards mirrored, and in some cases exceeded, the standards for ASHA certification in audiology. Licensure, rather than certification, provided audiologists the legal right to practice (see Table 1).

Currently, licensure for audiologists exists in every state. It is the standard credential necessary for clinical practice. Because audiologists now receive all clinical training during their doctoral program, students in nearly every state can graduate with their diploma, obtain a license in their state, and begin practicing. Certification has become an optional, adjunct credential, not necessary for clinical practice or reimbursement.

The Evolution of Accreditation
Another major factor in clinical education is the accreditation of academic programs in audiology. Accreditation is a process by which academic programs are evaluated to ensure that they have met certain quality standards. The accreditation of an academic program is technically voluntary, but because audiologists must have graduated from accredited programs in order to obtain licensure or certification, the programs have a de facto obligation to obtain and maintain accreditation.

Historically, all audiology programs have been accredited by ASHA’s Council on Academic Accreditation (CAA). As audiology programs began to change from master’s level to doctoral level programs, changes needed to be made to the requirements for accreditation of audiology programs to reflect the goal of greater academic and clinical preparation of students.

Many in the audiology community felt that the changes made to the CAA accreditation standards for clinical doctoral programs lacked the rigor necessary to substantially and meaningfully elevate the performance...
Clinical Education in Audiology

Academic accrediting organizations obtain their authority to accredit programs from two main sources, the U.S. Secretary of Education and the Council for Higher Education Accreditation (CHEA). The CAA is recognized by both. The ACAE is recognized by the U.S. Secretary of Education and is currently undergoing initial review by CHEA.

**Requirements for Clinical Education**

One of the biggest challenges in audiology clinical education is that the standards differ depending on who you ask. It is the job of university programs to educate students. In order to do this, they create standards and curriculum for the education of their students.

In theory, the accrediting body ensures that the university program is meeting certain widely accepted standards through the accreditation process. So the accrediting body has a separate set of standards.

For CAA-accredited programs there is a third level of standards, that of certification of the clinician. Why does certification play a role in clinical education requirements at the level of the university program? Well, the answer is that it should not.

Typically, certification is a credential that is earned through additional study and skill development, beyond that required for graduation from the academic program and entry into the profession. Think of the board-certified otolaryngologists with whom you may have worked. Following completion of their graduation from medical school, where they earn their doctor of medicine (MD) degree, they complete rigorous residency and fellowship training programs, at the end of which they may become board certified in otolaryngology. The same model holds true for most professions, including speech-language pathology, wherein certification is granted only following postgraduate clinical instruction in the form of the CFY. This also used to be the case in the master’s-degree model for audiology education.
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Why does certification play a role in clinical education requirements at the level of the university program?

Well, the answer is that it should not.

With the advent of the AuD degree, the most common certification in audiology, the CCC-A, has become redundant with academic requirements for graduation. In other words, in order to graduate and earn a diploma in audiology, the audiology student must necessarily have completed the requirements for certification.

So how did CCC-A certification go from being a postgraduate credential to being redundant with the diploma? The answer lies in the CAA’s standards for clinical education. Specifically, the CAA (2011) states that “the program must ensure that students … qualify for relevant state and national credentials.”

This CAA standard raises a few questions. One question regards what exactly is meant by “national credentials.” There is no state-level certification of audiologists, so presumably “state credentials” refers to licensure. There is no national audiology license, so national credentialing is presumably certification. But what form of certification is necessary? There are numerous potential certifications available to audiologists, including the American Board of Audiology (ABA) certification, various specialty certifications, and ASHA certification. Must students qualify for all of these national certifications? Or perhaps one? Which one(s)?

Because answers to these questions are not clear, university programs are left to guess at how they might fulfill this requirement. Most university programs assume that the answer is that students must be eligible for ASHA certification in audiology upon graduation. Those few programs that do not require students to fulfill this particular certification requirement generally have students sign a waiver indicating their awareness that they will not have completed these requirements upon graduation.

Another important question is “Why would audiology students be required to be qualified for certification when they graduate?” In the past, audiologists used to be eligible for certification only following additional postgraduate study. Speech-language pathologists, whose programs are also accredited by the CAA, are only eligible following postgraduate study. This is the case in nearly every other profession.

So why would qualification for audiology certification be necessary upon graduation? There is no clear answer to this question, although we might find some clues in the CFCC requirements for certification in audiology. One major requirement for CCC-A certification is that “applicants for certification must complete a program of study that includes academic course work and a minimum of 1,820 hours of supervised clinical practicum” (CFCC, 2011). The requirement further states that “the supervision must be provided by individuals who hold the ASHA Certificate of Clinical Competence (CCC) in Audiology” (CFCC, 2011). In addition, the CFCC has clarified that these clinical education requirements must be completed during the student’s academic program (personal communication with chair of CFCC). According to the current requirements, if the student does not qualify for certification upon graduation, they never will.

So, university programs that follow the assumption that students must be eligible for ASHA certification upon graduation are compelled to ensure that their students receive 1,820 hours of clinical education provided by ASHA-certified audiologists (see FIGURE 1).

A Bottleneck for Clinical Education

The de facto “requirement” that university programs must provide clinical education from individuals who hold the CCC-A creates a number of problems for clinical education. One problem is that it creates a bottleneck for access to clinical education for audiology students. Audiologists no longer need certification to practice. Therefore, many audiologists may choose not to maintain or pursue certification for various reasons. This is
especially likely to be true for new audiologists, who are graduating into a profession of licensure and have never had the experience of needing certification to practice. And because the requirements for certification are redundant with the graduate's diploma, entry-level certification does nothing to set the audiologist apart from peers. So they may see little value in paying additionally and annually for the certification.

Unfortunately this means that a large number of audiologists are ineligible to provide clinical training for the 1,820 hours that the CFCC requires for certification of audiologists. This situation has created a strain on the abilities of university programs to find sufficient numbers of high-quality clinical education sites; a situation that is likely to worsen in the future.

A recent Internet-based survey completed by the author and colleagues was distributed to the clinical education coordinators, those people responsible for the external clinical education experiences of audiology students, at 71 AuD programs in the United States. The goal of the survey was to understand the thoughts and experiences of these professionals as they tackle the difficult task of recruiting and maintaining appropriate clinical educators.

Encouragingly, when asked whether they felt that their students currently had sufficient access to quality external clinical education placements, 91 percent responded affirmatively. However, 70 percent of these same respondents reported that they are also concerned about maintaining or obtaining sufficient access to quality external clinical education placements in the near future. And 38 percent of respondents reported that they have recently noticed decreases in the number of external clinical placements available to their students.

One important reason that many university programs may be experiencing decreases in the number of clinical placements is the CFCC requirement for clinical educators to maintain the CCC-A. When asked whether there were external clinical placement sites that the clinical education coordinators felt would provide fruitful learning experiences for students, but which were not utilized solely due to the requirement...
Clinical Education in Audiology

Certification has become an optional, adjunct credential, not necessary for clinical practice or reimbursement.

for ASHA-certification of clinical educators, 56 percent of respondents said, “yes.” Fifty-six percent of our university programs are reporting that they are being forced to choose between quality clinical education and certification, and they are choosing certification.

A Lack of Evidence
If certification of the clinical educator ensured quality clinical education for the student, the requirement would be justified regardless of the bottleneck that it creates. However, it is clear to most that generalist certification does nothing to ensure quality for clinical education.

When the clinical education coordinators mentioned previously were asked whether they believed that the requirements for obtaining ASHA certification in audiology, beyond the requirements necessary for licensure in their state, helped to prepare audiologists to be effective clinical educators, the response was overwhelmingly “no” (75 percent).

The CFCC requirements make no mention of training or study in the art and science of clinical education, for either obtaining or maintaining certification (CFCC, 2011). And the question is really intuitively simple. If you are a great clinical educator and decide to drop your certification, does this automatically make you a poor clinical educator? If you are a poor clinical educator, does the decision to pay for your certification annually transform you into a good clinical educator?

Furthermore, there is little to no evidence to support the notion that certification does anything to make one a competent clinical educator, yet it is the single most utilized qualification for clinical educators, not formal training in methods and theory of clinical education; not review of the literature on clinical education; not mentorship by university faculty or experienced clinical educators; not even an arbitrary number of years of clinical experience. The most universal requirement for a clinical educator is possession of entry-level certification in audiology.

Indeed, the reliance on generalist, entry-level certification as a qualification for clinical educators is also troublesome because it lulls us into believing that we have a meaningful method for choosing and evaluating who will provide clinical education to our students, when this is far from the case.

A Conflict of Interest?
We have no meaningful reason to believe that requirements for clinical educators to have entry-level certification improve clinical education. In fact, they may have a negative impact by limiting the number of qualified clinicians available to provide clinical education. Given this situation, we must wonder why the “requirement” for ASHA certification of clinical educators exists.

ASHA’s CAA standards for students to graduate prepared for national certification and ASHA’s CFCC requirement that students must graduate having had clinical supervision provided by an ASHA-certified audiologist in order to qualify for certification has every appearance of a conflict of interest. We must ask ourselves, “Is the CAA working together with the CFCC to use the clinical education of students as a means to maintain audiology certification by ASHA?”

If not, why is certification treated so differently by the CFCC for audiology and for speech-language pathology? For decades, certification was treated similarly for these two professions, with applicants able to obtain certification following postgraduate training. This model is still utilized by speech-language pathology, but now audiology applicants may not obtain clinical training as a postgraduate for this purpose. The training must occur during the academic program. What rational explanation can there be for this? Could it be that ASHA-certified audiologists who are not under the purview of the university, who provided postgraduate training for years, are no longer capable of doing this? Could it be that the CFCC views ASHA-certified speech-language pathologists as fit to provide postgraduate training but certification has become an optional, adjunct credential, not necessary for clinical practice or reimbursement.
ASHA-certified audiologists as unfit? Or could it be that by forcing university programs to provide ASHA-certified clinical hours, rather than allowing students to choose this particular training qualification for themselves, the CFCC and CAA are seeking to compel audiologists, who might otherwise not, to obtain and maintain certification, simply for the purpose of having the option to provide clinical training to students?

We might also wonder why the CFCC requires that, after January 1, 2012, audiologists who drop their certification for any period of time will be required to have a doctoral degree for reinstatement of certification. If you are a qualified master’s-level audiologist and you choose not to maintain your certification, why would you be considered unqualified for entry-level practice upon choosing to reinstate your certification? If you are competent to practice today, why would you be incompetent a year from now simply because you decided not to pay for the certificate? Could the purpose for these particular changes be to scare audiologists into maintaining their certification and to scare young audiology students into pursuing a certificate?

We have a right to expect clear and legitimate answers to these questions.

**Looking Forward**

Whether you are a current or former student, a clinical educator, or an academic instructor, if you have been confused by the process of clinical education, it is with good reason.

The goal of good clinical education is not merely a nice wish, important only to current students and academic faculty. The ability to demonstrate consistency and effectiveness in clinical education is an absolute necessity for continued recognition as an autonomous and serious health-care profession. We all have a stake in ensuring excellence in clinical education, and we can all contribute to the improvement of clinical education in audiology.

Clinical educators can insist on clear information from university programs regarding the goals and expectations for students entering and exiting their clinical training sites. This will, at the very least, provide direction to the clinical education of students. Importantly, clinical educators can also insist on being included in the national discussion on clinical education. Clinical education standards and methods have traditionally been decided upon by academic institutions, with little input from those who are actually providing the bulk of clinical education—and who are almost invariably volunteering their time and efforts. Clinical educators have a primary commitment to their patients and practices. There are certain real-world realities that clinical educators must face, including billing issues, attitudes and behaviors of the Millennial-generation students, and time constraints, to which university programs simply must be responsive.

University programs can insist on clear information from accrediting bodies. University faculties are a powerful force in our profession. When the requirements of accrediting agencies conflict with the ability of university programs to provide the best clinical education for students, they must hold accrediting agencies accountable rather than submitting to unproductive standards.

All of us, students, clinicians, and faculty, can ask questions of ourselves, our institutions, and our national organizations. We can also insist that priority be given to establishing an evidence base for clinical education outcomes and processes for the purpose of establishing meaningful and effective standards and methods.

We cannot afford to stand by, failing to notice our own nakedness, while the procession goes on.

Virginia Ramachandran, AuD, is senior staff audiologist in the Division of Audiology, Department of Otolaryngology—Head and Neck Surgery at Henry Ford Hospital.

**References**


A Quick Look At

Ocular Vestibular-Evoked Myogenic Potentials

By Devin L. McCaslin and Erin G. Piker
In the mid-1990s, several investigators observed that particular neurons in the vestibular system of cats, called “irregular neurons,” were activated by low-frequency acoustic stimulation. This led some to investigate the possibility of using acoustic stimulation to measure the function of the vestibular system.

In the mid-1960s, a group of investigators headed by Dr. Thane Cody reported, in response to high intensity click stimulation, that it was possible to record an evoked potential with an active electrode placed at the occipital protuberance. The response had all of the characteristics of a sound-evoked muscle reflex, i.e., a sonomotor response. Most interestingly, the response could be recorded in anacusic patients but could not be recorded from individuals with profound vestibular system impairments (Bickford et al, 1964). For these reasons the investigators felt that the response, called the “inion potential,” emanated from the peripheral vestibular system. However it would be three decades before vestibular evoked myogenic potentials would become clinically useful.

Background of the oVEMP
In the mid–1990s, several investigators observed that particular neurons in the vestibular system of cats, called “irregular neurons,” were activated by low-frequency acoustic stimulation (McCue and Guinan, 1994). The irregular neurons were mainly found in the otolith organs—the saccule and utricle. This led some to investigate the possibility of using acoustic stimulation to measure the function of the vestibular system. Colebatch
and colleagues published some of the first VEMP findings in 1992 and 1994 wherein they described a click-evoked response emanating from a contracted sternocleidomastoid muscle (SCM). The response was recordable in patients with severe sensoneural hearing loss (SNHL) and intact vestibular function, and absent in individuals who had undergone vestibular nerve section. They concluded that the response was not cochlear but of vestibular origin. Given the fact that the otolith organs could be activated with sound and the saccule had specific projections to the SCM, they concluded that this vestibular evoked myogenic potential (VEMP) recorded from the SCM (cervical VEMP or cVEMP) was generated by the saccule. A simple method to assess the saccule and inferior vestibular nerve appealed to many clinicians and the cVEMP quickly found its place in the contemporary balance function examination.

While the cVEMP grew in popularity, VEMPs recorded from other muscles, e.g., extraocular muscles, masseter, trapezius, received little attention. In 2004, a VEMP recorded from electrodes placed beneath the eyes, the ocular VEMP (oVEMP), was introduced at the XXIII International Congress of the Barany Society as a possible clinical test of vestibular function. However, journal reviewers were skeptical as to whether the response was myogenic or neurogenic, vestibular or cochlear, or an artifact of the eye blink reflex. It took another three years before the first research paper on the oVEMP was published (Todd et al, 2007). Like the cVEMP, the oVEMP was present in deaf individuals with normal vestibular system function and absent in individuals with normal hearing who had undergone vestibular nerve sections. The oVEMP represented a novel way to assess the vestibular system and researchers now wanted to know how to record this new vestibular evoked response, what was its normal appearance, its peripheral and central origins, and how it would contribute to vestibular electroneurodiagnostics.

Our lab was also interested in this and in 2008 we began a project examining the normal characteristics of the oVEMP across age groups.

**Recording oVEMPs**

To record an oVEMP, the non-inverting (active) electrodes are placed beneath the eyes. The ground is placed at Fz and the inverting (reference) electrodes can be placed directly beneath each non-inverting electrode (see FIGURE 1), or conversely, in a neutral location such as the chin. The stimulus can be the same as that used to evoke the cVEMP, e.g., 95 dB nHL 500 Hz tone burst, but the bioelectrical activity must be amplified by a factor of 100k (as

**FIGURE 1:** A seriously impaired subject prepped using the common recommended infra-orbital bipolar electrode derivation used to record an oVEMP. The subject is asked to gaze upward for the duration of the recording.

**FIGURE 2:** Two-channel recording of an oVEMP waveform in response to a 500 Hz tone burst presented to the left ear. Channel one is recording from beneath the contralateral eye and channel two is recording from beneath the ipsilateral eye. This patient shows both a contralateral and ipsilateral oVEMP, but the contralateral waveform is significantly larger in amplitude.
opposed to ~5k for the much larger cVEMP). The response can be extracted from the background interference in as little as 100–200 sweeps. However, the response is greatest in magnitude when the patient gazes at an upward target placed ~30 degrees above midline during signal averaging. The upward gaze brings the inferior oblique muscle closer to the location of the infraorbital active electrode.

We recorded oVEMPs from the ipsilateral and contralateral inferior oblique muscles in 50 otologically and neurologically normal adults and children (Piker et al, 2011). The oVEMP began between 10–12 msec as a negative-positive going waveform. The first negative peak was labeled N1, i.e. some investigators label it N10 to correspond to the peak’s median latency, and the following positive peak, which occurs around 15–17 msec, is labeled P1, i.e. some label this peak P15. Compared to the cVEMP, the oVEMP was small, i.e. mean amplitude = 5µV ± 3, and was best recorded from the contralateral inferior oblique muscle, e.g. stimulus presented to the right ear with the response recorded best from beneath the left eye. Only 25 percent of subjects generated an ipsilateral response.

Response Characteristics of oVEMPs
FIGURE 2 shows an example of an oVEMP recorded from an individual who generated both a contralateral and ipsilateral oVEMP, though the contralateral is significantly larger in amplitude. The upper limit of oVEMP amplitude asymmetry between ears, defined as the mean plus two standard deviations, was 34 percent (mean = 14 percent, sd 10 percent). We also found that test-retest reliability was acceptable. oVEMP amplitude was found to have excellent reliability whereas oVEMP latency measures, threshold, and interaural amplitude asymmetry measures were found to have fair-to-good reliability. oVEMP responses were present in both ears in 90 percent of our subjects. Others have reported 90–100 percent response rates, though each of these studies was limited to a small number of subjects, all less than 35 years of age. When we examined our younger cohort we found a 100 percent response rate for subjects younger than age 50, whereas the response rate was only 77 percent for subjects over the age of 50 years. Further, the amplitude of the response significantly decreased while the threshold significantly increased with increasing age, i.e., similar to the age effects seen with the cVEMP. The greatest age effects were observed in subjects 50 years and older.

Another goal of our study was to examine whether or not reference contamination in the oVEMP recording occurred using the commonly recommended electrode derivations such as that shown in FIGURE 1. Ideally, the

A: Caloric Asymmetry 100%

B: Ocular VEMP Asymmetry 100%
(Contralateral Eye)

C: Cervical VEMP Asymmetry 100%

FIGURE 3: Summary of quantitative balance function tests from a nine-year-old patient with a left-sided peripheral vestibular system impairment affecting the utricle and horizontal semicircular canal, or, more likely, the superior vestibular nerve. The caloric (A) and oVEMP examinations (B) demonstrated significant asymmetries, while the cVEMP examination (C) was symmetrical within normal limits.
reference, i.e., inverting, input in a bipolar derivation should contain none of the evoked potential, i.e., the signal. The purpose of the reference electrode input is to record only non-stimulus related distant common electrical noise, e.g., 60 Hz interference, that is “viewed” with identical phase and amplitude at the two inputs of a bipolar recording. “Reference contamination” occurs when the reference electrode is located within the electrical field of the evoked potential. When this occurs, the stimulus-related electrical activity—both positive and negative in polarity—will algebraically add and subtract with activity that is recorded from that active electrode input. In the extreme, if both the active electrode and the reference electrodes record the evoked potential with equal phase and magnitude, a cancellation of the response will occur. In these situations, the reference electrode is not a neutral “indifferent” electrode.

For the oVEMP, it has been a common recommendation, e.g., Todd et al, 2007, for the active (non-inverting) input electrode to be placed infraorbitally and the reference (inverting) input electrode to be placed two to three cm inferior to the active electrode (FIGURE 1). Using this recommended bipolar montage we found evidence of reference contamination. The mean oVEMP amplitude in a sample of 10 young subjects when the -1 cm infraorbital electrode was referenced to the -3 cm infraorbital electrode was 6.85 µV and significantly increased to a mean of 9.64 µV when a chin reference was employed. As such, the chin or a non-cephalic reference may represent a more indifferent reference location, particularly in cases where the amplitude of the oVEMP is small.

Our findings suggest that the oVEMP is well-tolerated, simple to administer, and present in the majority of normal subjects, i.e., at least under the age of 50. Both the saccule and utricle are activated with intense acoustic stimulation and several investigators have recently argued that the oVEMP most likely represents a stimulus synchronized increase in EMG activity from the inferior oblique muscle. The peripheral end organ of the oVEMP, i.e., utricle, saccule, or both) is still being debated.

Table 1. Nine Patterns of Abnormality

<table>
<thead>
<tr>
<th>Type</th>
<th>Caloric</th>
<th>cVEMP</th>
<th>oVEMP</th>
<th>Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>None</td>
</tr>
<tr>
<td>2</td>
<td>Abnormal</td>
<td>Abnormal</td>
<td>Abnormal</td>
<td>Large end organ, or SVN and IVN</td>
</tr>
<tr>
<td>3</td>
<td>Normal</td>
<td>Abnormal</td>
<td>Normal</td>
<td>Saccule or IVN</td>
</tr>
<tr>
<td>4</td>
<td>Abnormal</td>
<td>Normal</td>
<td>Abnormal</td>
<td>SVN &amp;/or hSCC and Utricle</td>
</tr>
<tr>
<td>5</td>
<td>Abnormal</td>
<td>Normal</td>
<td>Normal</td>
<td>hSCC</td>
</tr>
<tr>
<td>6</td>
<td>Normal</td>
<td>Normal</td>
<td>Abnormal</td>
<td>Utricle</td>
</tr>
<tr>
<td>7</td>
<td>Normal</td>
<td>Abnormal</td>
<td>Abnormal</td>
<td>Utricle + saccule and/or IVN</td>
</tr>
<tr>
<td>8</td>
<td>Abnormal</td>
<td>Abnormal</td>
<td>Normal</td>
<td>hSCC + saccule, and/or IVN</td>
</tr>
<tr>
<td>9</td>
<td>Normal</td>
<td>Abnormal</td>
<td>Abnormal</td>
<td>SSCD Syndrome</td>
</tr>
</tbody>
</table>

SVN = superior vestibular nerve  
IVN = inferior vestibular  
hSCC = horizontal semicircular canal  
SSCD = superior semicircular canal dehiscence
While the cVEMP grew in popularity, VEMPs recorded from other muscles, e.g., extraocular muscles, masseter, trapezius, received little attention.

oVEMPs as an Additional Measure of Utricular Function

While it is widely accepted that the caloric examination is a measure of horizontal semicircular canal (SCC) and superior vestibular nerve function, and the cVEMP measures the integrity of the saccule and inferior vestibular nerve, there is still debate in the literature regarding the precise peripheral generators of the oVEMP, i.e., the utricle, saccule, or both. It has been generally accepted that oVEMPs elicited with a bone conduction or vibratory stimulus emanate from the utricle (for review see Curthoys, 2010). The responsiveness of the utricle to air conduction stimuli has not been researched as thoroughly as the saccule, and the origins of the air conduction oVEMP are still questioned by some (Welgampola and Carey, 2010). However, Curthoys and Vulovic (2010) recently showed definitively that neurons in the utricle do in fact respond to acoustic stimulation. Further, the utricle has strong projections to the extraocular muscles, whereas the saccule has few projections to these muscles. Additionally, accepted measures of utricular function seem to correlate with the results of the air conduction oVEMP. For example, in patients with vestibular system pathologies the rate of abnormal oVEMPs is very similar to the rate of abnormal SVV tests (Govender and Rosengren, 2011). The subjective visual vertical (SVV) test is a technique that employs rotational testing to assess the functional integrity of the utricle. Along these lines, patients with superior vestibular neuritis who have normal cVEMPs, i.e., normal inferior vestibular nerve, tend to have abnormal caloric exams and abnormal oVEMPs, both of which rely on an intact superior vestibular nerve. In other words, patients with abnormal utricular examinations, e.g., SVV, or abnormalities affecting the superior vestibular nerve, e.g., caloric exam, also have abnormal oVEMPs, suggesting that the tests are measuring the same thing, i.e. utricular and/or superior vestibular nerve function. Interestingly, in several recent studies, it has been shown that oVEMPs correlate poorly with cVEMP test results, showing that patients with abnormal saccule and/or inferior vestibular nerve function often have normal oVEMP responses. This is additional evidence indicating that oVEMP responses provide unique information relative to the other diagnostic vestibular tests available in the clinic (Govender and Rosengren, 2011; Lin and Young, 2011; Valko et al, 2011).

The oVEMP’s Role in the Contemporary Balance Function Examination

The studies previously described make a strong case for the oVEMP being an appropriate technique to evaluate the functional integrity of the utricle and superior vestibular nerve. With the addition of the oVEMP to the vestibular test battery, a new and unique piece of information is now available to the clinician assessing the dizzy patient. This recent addition to the balance function test battery affords the examiner the ability to evaluate three of the five vestibular end-organs, i.e., the horizontal semicircular canal, utricle, and saccule, thereby providing a level of detail not previously possible. For example, when the responses derived from quantitative balance tests, i.e., cVEMP, oVEMP, and caloric testing, are absent in a patient, it can be inferred that the patient suffers from impairments of the horizontal semicircular canal, utricle, and saccule, or, inferior and superior vestibular nerves, i.e. the caveat being that middle ear function must be normal and the patient has to be neurologically intact. Additionally, the presence of a normal cVEMP with absent caloric and oVEMP responses suggests that there is an impairment affecting the superior vestibular nerve (or, less likely, an end organ impairment that selectively affects the utricle and horizontal semicircular canal, FIGURE 3).

Conversely, an absent cVEMP with a normal caloric test and normal oVEMP suggests an impairment of the saccule or inferior vestibular nerve. When these three tests of balance function are evaluated there are potentially nine different variations or diagnostic “types” depending on the location(s) of the impairment (See TABLE 1). In fact, our clinic has documented all nine different patterns of abnormality. It is interesting that, over the
past two years, there has been an increase in interest over “diagnostic patterns” that are formed by the results of caloric, cVEMP and oVEMP test results (Manzari et al, 2010; Manzari et al, 2010a; Manzari et al, 2010b; Murofushi et al; Jacobson et al, 2011). For instance, in a recent report by Jacobson et al. (2011), the authors illustrated the most common cVEMP, oVEMP, and caloric patterns of abnormality. The authors presented three case reports that described one patient with a vestibular nerve section, a patient with a superior vestibular neuritis, and a patient with a diagnosis of Meniere’s disease affecting, at least, the saccule. For the second and third cases they showed that the cVEMP and oVEMP can vary independent of one another, and in that way provide topological information about the sites of impairment. It was their contention that with caloric, oVEMP, and cVEMP tests, it is possible to augment the diagnostic information that balance clinics currently provide regarding the location or locations of vestibular system impairment.

Conclusion

Even though the peripheral origins of the air conduction oVEMP are currently somewhat controversial (Curthoys, 2010; Rosengren et al, 2010) numerous studies have provided evidence in which oVEMP results in response to air conduction stimulation differ from cVEMP results in response to air conduction stimulation but were consistent with results from a caloric examination. These findings suggest that air conduction oVEMPs measure a part of the peripheral vestibular system different from that measured by cVEMPs, perhaps the utricle, and similar to that measured by caloric testing, the superior portion of the vestibular nerve. The oVEMP test is easy to administer and interpret, provides valuable diagnostic information, and is quickly finding its place in the contemporary balance function examination.

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Devin L. McCaslin, PhD, is associate professor and associate director of audiology at Vanderbilt Bill Wilkerson Center in Nashville, TN. He is also a member of the Academy board of directors and the deputy editor-in-chief for JAAA. Erin G. Piker, AuD, is a PhD student at Vanderbilt Department of Hearing and Speech Sciences, Nashville, TN.

References


Over 10 years ago, we began to ponder the myth that unbundling is bad for business. The literature on the topic of unbundling dates back over a decade. Toni Gitles discussed the consumer’s view of the audiologist as one of a sales or service person, not a professional (1999a). Today, there are more hearing aid distribution channels than ever before. Many of these channels suggest to consumers that the professional expertise of the audiologist is unnecessary. The most popular method of billing in audiology has certainly not helped to separate the importance of the professional from the limitations of the device.

In 2003, Dennis Van Vliet, stated, “bundled pricing does not offer a full accounting of the clear scope of our services” (Van Vliet, 2003). In 2009, Robert Sweetow led an American Academy of Audiology task force to look at current hearing aid delivery models. In a two-part article, featured in Audiology Today, he discussed the advantages of unbundling and the ability to use a fair and yet unbundled-only schedule to promote professional and specialized services. The task force also suggested that unbundling could be used to argue for proper reimbursement, which would differentiate audiologists from non-audiologists who dispense. Finally and perhaps most importantly, the task force emphasized that audiologists...

Learn more about the myths related to hearing aid billing practice models including an introduction to new evidence related to unbundled billing.
should never give away professional services for the purpose of selling a product (Sweetow, 2009b).

While the topic of hearing care billing practices has been discussed with many arguments in favor of an unbundled model, published data related to successful unbundling has been sparse...until now. The audiology community has seen little, if any, data related to clinical practice that might entice one to adopt a new billing model, especially a model that many perceive would adversely affect business. We hope to dispel some of the main concerns or "myths" related to unbundling hearing aid prices by sharing 10 years of data from the University of North Carolina at Chapel Hill's Hearing and Communication Center (UNC-HCC).

Disclaimer: This exercise has been completed by trained professionals. Do not attempt to unbundle if you have not read this entire article. All kidding aside, we must clarify that the UNC-HCC is a non-profit clinic and although a university training clinic for doctoral students of audiology, the clinic is self-supported. The clinic is located in the community and receives no state funding, thus it functions essentially like a private practice clinic. The UNC-HCC has its own budget, and must pay rent, overhead, salaries, etc. The UNC-HCC is facing the same economic challenges as clinics in the private sector, and the training program is becoming more reliant on revenue generated by clinical services to help off-set academic program expenses.

Thoughts to Ponder
When we began to think about our billing practices, we had several discussions that led to the following questions:

- Why do we have days where we see fifteen patients, but bring in no revenue?
- Why are we often reluctant to charge patients for our time and expertise?
- How should we handle the patient who purchased hearing aids on the Internet and now wants us to program them?
- What is our time was worth?
- We began to wonder, “Is there a better way to bill for services that will assign value to what we do as audiologists?”

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**FIGURE 1.** Academy Hearing Aid Billing Practices Survey—Does your clinic bundle services?

**FIGURE 2.** Academy Hearing Aid Billing Practices Survey—How long are professional fees included?

- The duration of the "trial" period
- The duration of the original manufacturer warranty period
- The duration of the optional extended warranty period
- The lifetime of the hearing aid(s)
- Other
**Survey Says**

In collaboration with the American Academy of Audiology, we developed the *Hearing Aid Billing Practices Survey*, which was distributed to the entire membership in January 2011. There was a 10 percent response rate warranting 1,589 responses from across the country. From this national effort we learned, to no surprise, that 80 percent of clinicians continue to bundle professional services into the cost of the hearing device (FIGURE 1). Only 20 percent of respondents indicated that at least some portion of professional services were separate from the cost of the hearing aid(s). In a survey of dispensers conducted in January 2004, by The Hearing Journal and Audiology Online, 86 percent of 666 respondents said they include service charges in the cost of the hearing aids they sell, while 14 percent said they charge separately for services. Ninety-three percent of hearing aid specialists said they bundled, compared with 84 percent of audiologists in general and 87 percent of audiologists in private practice (Nemes, 2004). In the seven years between these two surveys, there seems to be more buzz surrounding the topic of unbundling, however, there appears to be no significant movement toward unbundling in the audiology community.

To further understand the current hearing aid delivery models, the Academy Hearing Aid Billing Practices Survey asked the following question: If your clinic does bundle services, for what period of time are the professional services included? Interestingly, 39 percent responded that services are included in the price of the device for the life of the hearing aid(s) (FIGURE 2). This indicates that once a hearing aid is dispensed, the patient can come back as often as he or she would like without paying for services or parts. Whether it be two times per year or 15 times per year, the audiologist does not collect another penny, until that patient is ready to purchase a new set of hearing aids.

Over the years, anecdotal discussions suggest several obstacles faced by the professional when moving from a bundled to an unbundled billing model. Some common concerns associated with changing billing structure include:

- The majority of individuals in clinical practice are not unbundling service fees from the cost of the product.
- It is simpler to bundle all fees into the price of the product.
- The clinic will lose money and go out of business.
- Unbundling is a new phenomenon that requires some homework.
- The audiologist may be unsure of how to determine the cost of doing business and establish a price structure/super bill.
- The audiologist may be unsure of how to bill for services separately.
- Patients are comfortable with the current model and will not return if one makes changes and assigns fees for needed services.

![FIGURE 3](http://example.com/figure3.png)

**FIGURE 3.** Academy Hearing Aid Billing Practices Survey—Obstacles to Unbundling
Myth Busters: Can You Unbundle and Stay in Business?

The 2011 Hearing Aid Billing Practices Survey asked audiologists to rank the obstacles associated with unbundling or itemizing professional services from the acquisition cost of hearing aids from most to least significant (FIGURE 3). The survey found that the majority of individuals believed the two most significant obstacles were:

1. Patients will not return to the clinic for the needed services if there was a charge involved.
2. Audiologists report it simpler to bundle all fees into the price of the device.

Testing the Myth
To establish whether unbundling can be successful without the clinic going bankrupt, without losing patients, and regardless of whether the competition is unbundled, it seems prudent to outline the steps that allowed the UNC-HCC to move to an unbundled model. The move to unbundling in this scenario was a slow process over a long period of time.

Step One: Charging a Hearing Aid Dispensing Fee
The first step was to start charging a fee for the hearing aid dispensing process. Prior to 2001, if a patient returned the hearing aid(s) at the conclusion of the “trial period” we retained nothing for the services rendered during the “trial period.” We arbitrarily chose the rumored going rate of $200 for this dispensing fee. This move was prompted in part as the move to the professional doctorate was picking up speed. We were in the planning stages for our first clinical doctoral cohort at UNC-Chapel Hill. As a group, we felt it was absurd not to charge for our time if the patient chose not to keep the hearing aids as valuable services had been rendered.

Step Two: Charging for Services Following the Warranty Period
The next step we took was to cease giving away services once the manufacturer’s warranty period had concluded. At our clinic, the purchase agreement clearly outlined the duration of covered services. However, we sometimes had a hard time charging patients once the manufacturer’s warranty expired. A discussion with a patient of ours who was a retired faculty dentist encouraged us to recognize that our services had value, and we should not hesitate to charge our patients. At this point, we arbitrarily chose an hourly rate and began to apply to all patients coming to the clinic for service and in-house repairs. The hourly rate we chose was concomitant to a recent visit from the plumber who seemed to have no problem charging $80.00 to walk in the door to diagnosis a plumbing problem.

FIGURE 4. Patient Retention—10 years of practice at the UNC Hearing and Communication Center.
I just got monthly payments as small as my hearing aid.

ChaseHealthAdvance now offers patient financing for Audiology Practices.

You can now offer your patients no interest financing from a name they know and trust – Chase. Our clear and simple monthly payment plans make it easy for patients to get started with the hearing care you recommend right away.

- 12, 18 and 24 month no interest plans
- Convenient online application
- Generous credit lines for comprehensive care
- No Surprise financing

NEW EXTENDED PAYMENT PLAN RATE FOR PATIENTS
STARTING JULY 21, 2011

Give your patients a trusted payment option to start their care:
AdvanceWithChase.com/Hearing
1-888-388-7633
Step Three: Charging for the Hearing Aid Evaluation Appointment

The next step was to start charging for the hearing aid evaluation (HAE) appointment (92590/92591). There was much discussion about this among the audiology team at our clinic. Some of our senior clinicians were used to “bundling” the HAE into the hearing aid price. However, the bottom line was if the patient did not purchase the hearing aids, then we gave them an hour of services for free. How could we, as a training clinic, suggest to our students that they are becoming doctors of audiology to “give away their services?”

Step Four: The Unbundling Begins

In 2005, we were inspired by Patricia Gans’s partially unbundled model. This unique model included services for the duration of the “trial period” then fee for service henceforth (Nemes, 2004). In this model, the patient pays upfront professional fees that include quality assurance, the initial fitting, and two to three follow-up visits within the first 45 days. We agree with the argument that a completely unbundled model may lead to less than optimal fitting should a patient forego certain procedures or visits in an effort to save money. Therefore, we have a clinic policy regarding key services that are non-negotiable (i.e., electroacoustic analysis, probe-mic measures, etc). When fitting hearing aids, we look to the Guidelines for the Audiologic Management of Adult Hearing Impairment established by the American Academy of Audiology (Academy, 2006). We find that when patients are informed of best practice and evidence-based measures, they are agreeable to undergo the necessary procedures and return for the follow-up visits. We also find it quite natural to charge patients for all visits because we are using evidence-based practice. The partially unbundled model has proven to be a happy medium. It separates the fee for services from the device, establishes value for the professional expertise of the audiologist, and sets the stage for a successful fitting.

Let’s take a moment now to dispel a myth that patients will not return to the clinic if they are charged for services outside of the purchase price of the hearing aid. We pulled 15 patient charts at random from our database and evaluated the number of times each person visited our clinic every year (Figure 4). Prior to unbundling, the average number of visits across our patients through the 2004 fiscal year was 6.06 visits annually. We then averaged all patients following the move to an unbundled billing model in 2005 and calculated the average to be 6.79 visits per year between 2005 and 2009. This myth is busted!

We have not seen a decrease in the number of patient visits at the UNC-HCC when fees are collected for professional service outside of the purchase price of the hearing aid.

Step Five: The Functional Communication Assessment

In 2008, we moved from a hearing aid evaluation appointment to a functional communication assessment (FCA), using both objective and subjective methods for developing a treatment plan for the patient (Sweetow, 2007). We were already billing patients separately for this service, but adopted a more scientific basis to the selection of the hearing instruments and the development of a treatment plan beyond amplification. We also began to charge for earmold impressions (V5275) and earmolds (V5264) at the HAE/FCA appointment. This was to ensure that if patients elected to cancel the hearing aid order, we had collected the fees for the service of taking the impression and the non-refundable earmolds.

Step Six: Calculating Break-Even (better late than never) and Creating a Superbill

In 2010, five years after unbundling, we calculated the cost of doing business and determined our break-even hourly rate. Sadly, we wish this step had been completed at the beginning of the process. Therefore, our advice to anyone considering unbundling, is to start with step six. It is not advisable to set a fee schedule until one has established what it cost to run the business. Also in 2010, we created a new superbill, using proper codes for everything related to hearing aid delivery and audiological rehabilitation. Audiologists can use both CPT (current procedural terminology) codes and HCPCS (Health Care Current Procedure Coding System) codes when establishing a fee schedule. Throughout this article we have included some of the relevant codes for hearing aid services.

As one works to create a superbill and determine the price for hearing aid(s) and services, one must realize that the invoice cost for the hearing aid(s) is not the actual cost. There are other direct and indirect product costs. All audiologists should calculate a break-even analysis for their practice and determine how much money it takes per hour to simply keep the doors open. Then one can establish the fees for services and determine the hearing aid prices that will allow the business to prosper.

Calculating the Cost of Doing Business

According to the 2011 Hearing Aid Billing Practices Survey, only 43 percent of audiologists surveyed have calculated...
break-even analysis to determine what it costs to run their practice, thus 57 percent are either arbitrarily choosing rates or using the going rate in the area or some other method. With or without a business major, it is fairly simple to calculate the cost of doing business (Foltner, 2009).

Establish Annual Contact Hours
- Determine how many hours per week one can see/bill patients. Although the practice may operate 40 hours per week, one must consider the time that is related to direct patient contact.
- Calculate the number of weeks per year that one actually sees patients (factor in holidays, vacation, sick and professional leave).
- Determine the number of providers in the practice.
- Multiply the hours per week by weeks per year by the number of providers (See FIGURE 5).

Calculate the Operating Costs for the Practice
Ideally this would be broken down into several different expense categories, including:
- personnel (salary/benefits),
- clinic expenses (rent, utilities, phone, advertising, etc.)
- cost of goods (all things you buy for resale).

Determine the Break-Even Hourly Rate
- Subtract the cost of goods from total annual clinic expenses, and divide the remaining amount by the ‘annual contact hours’ established in step one.
- This is the break even hourly rate in an unbundled model. (See FIGURE 6).

Add in Desired Profit
- Take annual expenses less cost of goods, add desired profit and divide this number by the annual contact hours.
- This is the hourly rate including the desired profit. (See FIGURE 7).

In the unbundled model, the cost of goods has been excluded from the equation, as it is expected one will collect, at a minimum, dollar for dollar on the cost of goods.
products. In most clinics, there will be a markup over the invoice cost to cover situations when one cannot collect the hourly rate. An example of this is Medicare’s coverage of a comprehensive hearing evaluation. While one’s fees should reflect the hourly rate, the reimbursement from Medicare rarely covers the cost of doing business.

**Unbundling Is Bad for Business**

The UNC-HCC has been partially unbundled since 2005. Over the past six years, we have continued to tweak our billing structure and improve consistency in billing practices among providers. We have updated our superbill to allow the use of proper codes and we have implemented a policy that every patient checks out with the superbill circled, indicating all services rendered. Our office manager generates an invoice for every single patient to take home that lists all the services provided and collects full payment the day the service is rendered. If the patient is within the 45-day evaluation and adjustment period, the invoice details all the services rendered and has a zero dollar amount as these services were pre-paid in the professional fees at the time of the fitting. We believe it’s critical for the patient to see what services have been provided each time he or she sees the audiologist. **FIGURE 8** is an example of one week’s revenue depicting services by CPT and HCPCS codes. Though there were days when no hearing aids were dispensed, the clinic brought in revenue every single day as a result of the unbundled billing model. Thus, we no longer have days where we see fifteen patients and collect no money.

The original myth in question stated that unbundling is bad for business. A graph showing revenue generated from hearing aids and professional services over a 10-year period shows that unbundling has been a very favorable
model for the UNC-HCC clinic (See FIGURE 9). Our move to unbundling has not only grown our patient base by 450 percent but also increased our revenue over the past ten years by 178 percent. The myth is busted! We have been the only clinic in our area with this model for the past six years and our business is thriving. We have successfully taken on the challenge of making the impossible happen.

Convinced? What Can You Do Tomorrow Morning?

While there will always be some who choose to stay with the time-honored, and more traditional way of billing hearing care, we hope many of you are encouraged that unbundling can serve the audiology professional and the patients quite well. As you contemplate whether this is the right model for your clinic:

- Be confident in the good work you do as an audiologist.
- Evaluate each service for which you are presently not charging and determine if it is truly a pre-paid service.
- Utilize a superbill with each patient. Circle all appropriate services regardless of whether there is a charge and send an invoice home detailing the services provided.
- If not presently implementing Academy Task Force recommendations for the fitting of amplification, strongly consider how this can add value to your practice and justify charging for services. These practices set you apart from the competition, who may not be using evidence based practice—your patients will hear the difference.

When you are ready to unbundle:

- Determine the costs to run your practice and use your calculated hourly rate to set your fees for service. You will set your practice up for success should the day come when you can no longer depend on hearing aid sales for the bulk of your revenue.
- Continue to educate yourselves at AudiologyNOW!, at other meetings, and through journals articles. Stay current with best practice procedures as well as coding and billing. You cannot be successful unless you are well-informed and up-to-date on what is happening in the field. Yesterday’s solutions may not be adequate for tomorrow’s challenges.

References


Limitless Wires in a Wireless World

BY BRE MYERS
It is so easy to get swept up in the swift current of technology, lose your bearings, and wind up floating aimlessly in an ocean of uncharted territory. It is time to analyze what it takes to fit the ever advancing and supremely complex hearing instruments and accessories.

A Brief History
Digital hearing aids were just beginning to emerge when I began my career as an audiologist. Most adjustments were still being made by handy little screwdrivers, which could also tighten the glasses of my patients. Then, in the mid 1990s the “HIPRO” (Hearing Instrument Programmer)
A box was developed. Several proprietary programming boxes for specific hearing aid manufacturers were also created around this time. The HIPRO allowed audiologists to connect and directly program hearing instruments settings. These new hearing aids were considered “digitally programmable.” Audiologists were able to change gain in measurable quantities. We could also change the crossover frequency and threshold knee points. The higher the technology the more frequency bands to which you had access. All of the huge specification binders, which had taken up shelf space, were soon placed in storage. By now they have surely been tossed in the trash, although I have a sneaking suspicion that a few still survive.

The computerized technology allowed for more versatile instruments and specification documents within the software. Digitally programmable soon gave way to the first generation purely digital hearing instruments. The difference being that digitally programmable aids maintained an analog output, whereas the newer digital aids actually digitized the sound signal. The digitized sound could be “cleaned up and modified” as much as the researchers and developers imagination and ingenuity would allow. The first and second generation digital hearing instruments are mere skeletons compared to the digital processing available in today’s hearing instruments.

Setting Standards
According to their Web site, www.himsa.com, HIMSA was founded in 1993 to help standardize hearing aid fitting software through one common interface program, NOAH. HIMSA, although privately owned, is made up of 99 members. Member categories include manufacturers of hearing instruments and audiological equipment, office automation system suppliers, hearing instrument dispensing chains, NOAHlink member companies, and ear impression scanner manufacturers. Approximately 90 percent of members are hearing aid manufacturers. These members are responsible to make software that allows the dispensing audiologist to use one database of patient information that is “easily shared” between different fitting modules. Modules include the hearing aid fitting software and measurement modules that connect to real ear, hearing aid test boxes, and audiometers.

Although the database is shared, each manufacturer requires a different set of wires to connect to their individual software. Very few can be used interchangeably. Long wires, that tangled themselves behind my back, began to pile up in drawers, hang on hooks on the back of doors, or even in plastic tackle box organizers. Battery pills, behind the ear (BTE) boots, three and four gold strip connectors sit amongst used batteries, screw drivers, cleaning tools, tube pullers on virtually every dispensing audiologist’s desk. Multiply that by two, three, or four manufacturers and you are literally up to your ears in it. Even Martha Stewart would have a difficult time organizing the clutter that comes with dispensing digital devices.

A few years later, the NOAH Link was developed. This device connects via Bluetooth and allows the patient to move freely around the office. Presumably so that the patient feels less tethered, and depending on office setup, real time changes can be made with the patient in sound field. The NOAH Link also offered higher speed transmission of data, as the internal workings of advancing technology in hearing aids required larger amounts of information to pass.

The goal of NOAH is to allow the clinician to collect and store the data from the testing equipment and choose virtually whatever manufacturer they wish to fit without re-entering data. In theory this interface can increase office productivity and allow Audiologists to explore different manufacturers and what their products have to offer. The most current version, NOAH 4, was beta tested and released in early spring 2011. Licenses for the product can be purchased and the software downloaded from the HIMSA Web site. Technical support, however, is not handled by a HIMSA representative, but by one of its member’s technical support departments. In short, if you have difficulty with HIMSA software, you would call either a hearing aid or equipment manufacturer and speak to their technical support department. From personal experience these are the most underappreciated people in our field. They have talked me out of the bell tower on more than one occasion.

The Rate of Change
It used to be that audiologists received annual product updates, typically announced around the date of
the American Academy of Audiology’s convention, AudiologyNOW! Manufacturer representatives would make sure that you received your software upgrade; some would even visit your office and help you install it. Fast forward to today where nearly every other week our office receives a new software upgrade or patch from at least one manufacturer. I am sure that I am not the only dispensing audiologist who has ordered a new product from a trusted manufacturer, only to realize that I do not have the most current software loaded to program it. Most downloads are available online, however in some cases downloading takes an hour or more; not something you want to do with the patient sitting in the waiting room.

Of course, in a perfect world you have preprogrammed and verified the device function days before the patient’s appointment.

Currently, we are seeing the addition of wireless programmers adding to our already cluttered desks, and taking over our USB ports. We can’t really replace the wall of wires, as many of our patients wear hearing aids we fit a short time ago that still require those cords and battery pills. Fortunately I have a very large desk, so that the multiple wireless programmers are able to sit neatly in a row.

I do wish that they could be made in the shape of bobble heads, instead of trying to look like monolithic book ends.

The Day the Computer Died
I have come to realize as a private practice owner that “I don’t know what I don’t know.” As I mentioned before, I like to think that I have a firm grasp on technology, computers in particular. I have never had to call the “geek squad.” I did have a friend, a computer engineer, set up our original office network, as I thought my time was better spent on other projects.

Our office network began simply enough, one all-in-one fax/printer/copier, one computer for reception, and one computer for the back office to handle the hearing aid programming, word processing, and accounting software. As we grew we added more diagnostic equipment, and upgraded software as needed. Fast-forward five years and our simple network is not so simple. Our practice has grown to include a pc-based audiometer and OAE, and a pc-based VNG, 3 laptops, and 2 iPads, in addition to original computers. The addition of new equipment went beyond what a local IT specialist could handle.

We consulted with several different computer specialists, but inevitably there were always “compatibility issues” and problems “they had never encountered before.” Because we were working with local computer specialists with little or no knowledge of audiology,
For a month, I prayed that my patients would come in needing tubing changes or receiver replacements, ear mold impressions, anything but “fine tuning adjustments.”

Limless Wires in a Wireless World

hearing aids, or NOAH, our growing network turned into a nightmare of wires and monitors that could connect to the internet, but never to each other.

It seemed with each change of pc-operating systems came a host of issues. Move too fast, i.e., getting a 64-bit computer, and your old software can’t function. Move too slow and the new software won’t work without installing “patches.” Although we knew what devices should be networked, software glitches and compatibility issues prevented us from fully integrating our office the way we first envisioned. In our minds, our office would run like “The Jetsons,” while in reality we were closer to “The Flintstones.” Our audiologists still hand-write audiograms even though our pc-based audiometer is theoretically networked to the pc that holds our NOAH database. It should be simple enough, yet full integration and optimal performance is always just a patch, or compatibility issue away. All this, although frustrating, was somewhat manageable.

Being a busy practice owner, rarely do you get the luxury of free time to investigate the internal structures of your network. Then the unthinkable happened. The main computer, which stored our NOAH database, scheduling and accounting software, and every Word document we created in the past three years, crashed. Fortunately we had backed up most of the information on an external hard drive. Still our office was limping by, using our back-up laptops to program hearing aids, and relying on a very tolerant secretary who kept the schedule going for what seemed like an eternity. For a month, I prayed that my patients would come in needing tubing changes or receiver replacements, ear mold impressions, anything but “fine tuning adjustments.” Stress took on a whole new meaning and it became apparent that we had to completely unravel and organize the chaos. It seemed the more we fixed, the more we found wrong. Several well-intentioned, computer-savvy colleagues left our office feeling defeated by our computers. We uninstalled and reinstalled software repeatedly and spoke to virtually every technical support department in our industry before finally our “new network” was usable once more.

Conclusion

I continue to have mini-panic attacks every time the computer takes a little longer than normal to boot up, but I am grateful for the wake-up call I received through this experience. I realized that I had taken for granted how dependent I had become on technology to help my patients. I should have taken a more active role and worked with those who are familiar with all of the components to help me build my office system. I should not have assumed I could fit hearing aids without knowing anything about the system and the equipment necessary to program those aids. When our profession relies so heavily on applying technology, it is our duty to keep as up-to-date and knowledgeable as possible. Inevitably,
computers will crash and systems will go down. When these types of events occur, it is how we handle ourselves that truly define our character. There is no question in my mind that with improved technology we will continue to edge closer to our ultimate goals as a profession. Our patients will benefit from the advancements and our skills. Computers and programs meant to work together will one day access each other and simultaneous sync without humans having to touch a button. Maybe the last one is still a few years away, but you get where I am going with this.

As a profession, audiologists are undeniably tied to technology. This begs the question, how much does the dispensing audiologist need to know about technology to optimally function? How is this topic supported in our audiology and hearing science programs or in our continuing education courses? How many of the practicing audiologists took a required computer programming course as an undergraduate student and if a course was offered or required at that time, would it still be pertinent today? Today, there are courses available to highlight manufacturer software, however few audiologists take courses regarding the systems that interface with the software and how to problem-solve when computers difficulties arise.

If we truly want technology to work for us, we need to start addressing this ever changing knowledge base somewhere in our training. Another concern raised by an esteemed colleague is the virtual monopoly HIMSA has on the market when it comes to integrating databases, manufacturers, and patient management software. Is it time to start thinking in a different direction? Would it be better to have choices in this matter, or do we take the 99 consortium members of HIMSA at their word? Tough questions with no easy answers.

Even with my newfound appreciation of technology, I will still have moments of wistfulness. A line from Wordsworth’s “Daffodils” poem I had memorized in high school floats to the front of my memory. “For oft when on my couch I lie in vacant or in pensive mood, they flash upon that inward eye which is the bliss of solitude.” I open my desk drawer and look longingly towards my trusted screwdriver and think of simpler days.

Bre Myers, AuD, is co-owner of Berks Hearing Professionals in Birdsboro, PA, and is an adjunct faculty member at Salus University, Elkins Park, PA.

Reference

Evaluating Speech Perception Performance

BY JANE R. MADELL, EMILY J. KLEMP, REVA BATHEJA, AND RONALD HOFFMAN

While studies often report speech perception performance, there is no general agreement regarding choice of test material, sound intensity levels at which to test, nor how to interpret test results.

Speech perception testing is considered a critical part of audiological evaluations. Speech perception performance is used to assess candidacy for and benefit from hearing aids, FM systems, and cochlear implants, to identify auditory processing disorders, to determine the need for speech, language, and functional listening therapy, and to monitor improvement in performance over time for children and adults.

Variability in performance for patients with hearing loss is the result of multiple factors. Residual hearing is a significant factor in determining access to audition. Generally, the more residual hearing, the better speech perception skills will be. Age at which a person is fit with appropriate technology can be a significant factor in speech perception performance. Connor et al (2006), Sharma et al (2005), Nicholas and Geers (2007), and others have demonstrated that earlier cochlear implantation results in improved speech perception. Auditory based therapy is known to be a factor in auditory skills development (Geers et al, 2002; Nicholas and Geers, 2006). Patients whose hearing loss is caused by auditory neuropathy spectrum disorder frequently have poorer speech perception than patients with hearing loss from other etiologies. (Hayes and Sininger, 2008) A variety of developmental issues can also cause speech perception skills to be delayed.

There are no consistent clinical guidelines for speech perception testing or for reporting speech perception performance. Katz et al (2009) reports that many audiologists label word recognition scores as excellent, good, fair, or poor but there is little agreement about the score boundaries for these designations. Martin and Clarke (2008) suggest the following guidelines:
Normal  90–100 percent
Slight difficulty  75–90 percent
Moderate difficulty  60–75 percent
Poor recognition  50–60 percent
Very poor recognition  less than 50 percent

While studies often report speech perception performance, there is no general agreement regarding choice of test material, sound intensity levels at which to test, nor how to interpret test results. Accordingly, there are no standards to determine if an individual is performing well. Without standards, clinicians are left to make individual decisions about how a patient is performing and whether he or she is a cochlear implant candidate or whether changes should be made in hearing aid fitting, cochlear implant programming parameters, auditory therapy, or educational placement.

Survey
A survey (see APPENDIX A) was conducted to assess the qualifiers used to describe speech perception performance (Excellent, Good, Fair, Poor); the levels at which speech perception was tested and the types of noise used when testing speech in noise. Responders were asked whether qualifiers should differ when describing performance of individuals with normal hearing and those with hearing loss. The survey was conducted using web based Survey Monkey sent to cochlear implant audiologists in the United States and a paper survey distributed to pediatric audiologists at a Pediatric Audiology conference. It is estimated that 300 audiologists had access to this survey. One hundred forty seven people responded (49 percent).

Results
Speech Perception Qualifiers
FIGURE 1 shows the percentage word score associated with each qualifier. One hundred twenty two (83 percent) respondents reported that excellent scores were between 90 and 100 percent. The range was between 70 and 100 percent. Eighty-eight of the respondents (60 percent) considered “good” to be 80–89 percent. The range was between 40 and 89 percent. Thirty-two respondents (22 percent) considered 70–80 percent as “fair,” and 38 respondents (26 percent) categorized 60–79 percent as “fair.” The range for “fair” was 20 to 80 percent. Thirty-four respondents (23 percent) reported “poor” as less than 70 percent, and 40 respondents (27 percent) reported less than 60 percent as poor. The range was for poor was <20 to < 75 percent.

Test Levels Used to Evaluate Speech Perception
Forty-eight percent of audiologists responded that they measure speech perception at 50 dB HL and 38 percent responded that they test at 35 dB HL with the range from 25-60 dB HL (see FIGURE 2).

Types of Noise Used
Forty-eight percent of responders report that they use speech noise, 41 percent used four-talker babble, 10 percent used 12 talker babble and one percent reported “other” (see FIGURE 3).

Qualifiers Used to Describe Performance of Normal Hearing and Hearing Impaired People
Eighty-three percent of recipients reported that the same qualifiers were appropriate in describing performance for normal hearing and hearing impaired people. Seventeen percent disagreed.

Discussion
The results of this survey highlight a troubling and pervasive problem. There is no uniformity of agreement on methods of evaluating speech perception and on the definition of commonly used qualifiers. As a result, a patient with a score of 40 percent would be described as “good” by some audiologists and “poor” by others. The audiologist who considered the score “good” would likely not feel the need to modify hearing aid settings, cochlear implant map settings, suggest changes in technology such as considering a cochlear implant, or to refer the person for additional therapy. Audiologists who consider the score “poor” would likely seek the reason for the “poor” performance and try to modify the conditions affecting performance. The audiologist who considers 40 percent good would be satisfied. It would be useful to develop more uniformity in describing performance, and in test protocols.

Recommended Qualifiers
We recommend that the following qualifiers be used to describe speech perception performance.

<table>
<thead>
<tr>
<th>Qualifier</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>90–100 percent</td>
</tr>
<tr>
<td>Good</td>
<td>80–89 percent</td>
</tr>
<tr>
<td>Fair</td>
<td>70–79 percent</td>
</tr>
<tr>
<td>Poor</td>
<td>&lt;70 percent</td>
</tr>
</tbody>
</table>

Use of consistent qualifiers will make it easier to evaluate testing between centers and to compare patient
### Appendix A

**EVALUATING SPEECH PERCEPTION**

1. Please check all that apply to describe your profession:
   - [ ] Audiologist
   - [ ] SLP working with children with HL
   - [ ] AVT/LSLS
   - [ ] Teacher of the deaf
   - [ ] Educator
   - [ ] Other

2. Work setting:
   - [ ] Hospital
   - [ ] Clinic
   - [ ] Private practice
   - [ ] School for the Deaf
   - [ ] ENT office
   - [ ] CI Center
   - [ ] Regular education

3. Please fill in percentage range based on how you evaluate the following:

   - Excellent speech perception
   - Good speech perception
   - Fair speech perception
   - Poor speech perception

4. Are the above categories (Excellent, Good, Fair, Poor) different if the child has normal hearing vs hearing aids vs cochlear implants?
   - [ ] Yes
   - [ ] No

5. Please check all levels at which you test patients with technology at evaluations:

   - 60 dBHL
   - 55 dBHL
   - 50 dBHL
   - 45 dBHL
   - 40 dBHL
   - 35 dBHL
   - 30 dBHL
   - 25 dBHL

6. If you test in competing noise, please check all levels at which you test:

<table>
<thead>
<tr>
<th>SNR</th>
<th>60 DB HL</th>
<th>55 DB HL</th>
<th>50 DB HL</th>
<th>45 DB HL</th>
<th>40 DB HL</th>
<th>35 DB HL</th>
<th>30 DB HL</th>
</tr>
</thead>
<tbody>
<tr>
<td>+15 SNR</td>
<td></td>
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<tr>
<td>+10 SNR</td>
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<tr>
<td>+5 SNR</td>
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<tr>
<td>0 SNR</td>
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<tr>
<td>-5 SNR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

7. If you test in noise, check the type of noise used:
   - [ ] Speech noise
   - [ ] 4 talker babble
   - [ ] 12 talker babble

8. If you test in noise, what patient position do you use?
   - [ ] Speaker 0° azimuth
   - [ ] Speaker 45° azimuth
   - [ ] Speaker 90° azimuth
FIGURE 1. Speech perception qualifiers.

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- Call for our new brochure at 1-800-525-7936
Evaluating Speech Perception Performance

More significantly, accepted standards should encourage audiologists and other clinicians working with people with hearing loss to look closely at performance and to try and determine if modification of performance is possible. Fabry et al (2009) suggested a test protocol for assessing performance in adult cochlear implant patients. This protocol might be considered as a way of developing a more uniform test protocol for adults. No such suggested protocol is, as of yet, available for testing children.

**Recommended Test Conditions**

It would be useful to have uniform standards for testing speech perception. To determine how a person is performing in everyday situations, it would be useful to test at normal conversational levels, at soft conversational levels, and in competing noise. We are recommending the testing be conducted at following levels:

- **Normal conversational level**: 50 dB HL
- **Soft conversational level**: 35 dB HL
- **Normal conversational level with competing noise**: 50 dB+5 SNR

We suggest 4-talker babble, as the noise source that is most like the noise typically interfering with listening and should be used.

---

**FIGURE 2.** Speech perception test levels.

**FIGURE 3.** Types of “noise” used in speech-in-noise testing.
Jane R. Madell, PhD, is director at Pediatric Audiology Consulting; Emily J. Klemp, AuD is audiologist at the New York Eye and Ear Infirmary; Reva Batheja, MA, is an audiologist with the Children’s Hospital of Philadelphia; and Ronald Hoffman, MD, is medical director of the Ear Institute, New York Eye and Ear Infirmary.

References


Hayes D, Sininger YS. (2008) Identification and Management of Infants and Young Children with Auditory Neuropathy Spectrum Disorder; Children’s Hospital-Colorado; Aurora, Colorado.


An Open Letter to Dennis:

We Can Do More to Educate Our Patients About Falls Risk

BY JEFFREY L. DANHAUER, CAROLE E. JOHNSON, CRAIG W. NEWMAN, VICTORIA A. WILLIAMS, AND DENNIS VAN VLIET
Dear Dennis,

I got your message and was so sorry to hear that your dad passed away yesterday after a recent fall. Lately, I have been hearing a lot of similar stories from colleagues, family, friends, and patients. This caused me to do some research on the topic of falls risk. I discovered that each year in the United States, nearly 20,000 elderly persons die as a result of falls (Centers for Disease Control and Prevention, 2011a). Of course we know that many falls go unreported and more than a third of the people 65 years of age and older will fall this year, and the prevalence increases with age (Centers for Disease Control and Prevention, 2011a). As you recall, my dad was one of those statistics a couple years ago. He had fallen several times before, but the last one finally took his life too. He was only one month shy of 95 and lived alone. Dad was in reasonably good health, aside from a severe hearing loss for which he refused to use hearing aids, despite the fact that my wife, son, and I provided him with the best devices on the market on several occasions. His falls history included a broken leg when he fell on his front porch a few years earlier. For years, we tried to get dad to use the ambulatory devices (e.g., canes and walkers) we bought for him, but his excuse was always the same—he did not need them and would not use them.

In this country, more money is spent on health care in the last few weeks and days of one’s life than during an entire lifetime. Often this results from falls, many of which might have been prevented. Physicians alone cannot be expected to do it all. As audiologists who treat at-risk seniors, we too need to take a patient-centered approach and act as advocates for falls prevention.
We can do more to Educate Our Patients about Falls Risk

because they made him look old! He had driven his car right up until his last fall—very scary! But he, like so many seniors, refused to give up that hallmark of freedom and independence. My dad lasted about one week in the hospital after his last fall, during which time a parade of physicians and physical, speech, and occupational therapists among others ran every test imaginable on him. He was in a coma, and all these specialists were able to get about as much response from him as they could have from the chair in his hospital room! All that finally came to a halt when I told them they could keep testing, probing, and billing him, but only if they could assure me that he would someday get up and walk out of the hospital and have a good quality of life. Of course they could not do that and seemed embarrassed for their efforts.

Unfortunately, in this country, more money is spent on health care in the last few weeks and days of one’s life than during an entire lifetime (Centers for Disease Control and Prevention, 2011b). Often this results from falls, many of which might have been prevented. This is an anthem that I hear families voice almost daily. I believe that all those professionals could have done so much more for my dad if they had simply counseled him enthusiastically and forcefully years earlier about falls prevention and ways to avoid checking out of this world in the fashion that he did and that so many other seniors will do. On the other hand, I cannot lay all the blame on physicians, because I know that our entire family enthusiastically and forcefully counseled dad over the years, as you did your father. We continually asked him to use his walker, and brought his physician into the discussion. He either forgot or made conscious decisions to ignore that advice, depending on when and where he was. The fact is that our counseling is ineffective much of the time when we have patients who are rightfully allowed some degree of autonomy. All of this was not news to our family since my wife's grandmother endured multiple falls, broken bones, and convalescent center stays until she too took a final fall that proved to be her demise.

In falls prevention, as with hearing problems and hearing aids, we audiologists know that many seniors will fail to take steps to deal with their balance problems until their family physicians finally provide concrete recommendations and guidance about falls prevention.

Appendix A

WEBSITES, ITEMS TO INCLUDE IN A CASE HISTORY, AND FACTORS TO MONITOR ON A REGULAR BASIS

**Web Sites**


Fall Prevention Center of Excellence: [www.stopfalls.org](http://www.stopfalls.org)

NIH Senior Health, Falls and Older Adults: [http://nihseniorhealth.gov/falls/toc.html](http://nihseniorhealth.gov/falls/toc.html)


**Items to Monitor on a Regular Basis**

1. Grooming and personal hygiene
2. Cognitive ability and short-term or working memory
3. Gait and mobility
4. General health and any changes since last visit
5. Living arrangements
6. Medications taken
7. Ability to keep scheduled appointments
8. Ability to wear hearing aids regularly (if needed), change hearing aid batteries, and care for, clean, and know when hearing aids are functioning properly
### Questions That Audiologists Need to Ask on a Case History

1. Do you have a hearing problem? When was the last time you had your hearing checked?

2. Do you routinely use hearing aids? If so, do you have them cleaned and checked regularly?

3. Can you hear smoke detectors, alarms, door bells, and phone rings?

4. What medications are you currently taking? What is your daily alcohol consumption, and do you use it with medications?

5. Have you had any change in hearing, ringing in the ears (tinnitus), or dizziness that might be related to new prescriptions or changes in dosages of previous medications?

6. Do you have a vision problem? When was the last time you had your vision checked?

7. Do you need and use eyeglasses for any vision problems?

8. Have you fallen recently? If yes, when was the last fall?

9. How many times have you fallen in the past year?

10. Have you ever been injured, broken bones (e.g., hips, arms, legs), or lost consciousness as a result of a fall?

11. Do you have osteoporosis, weak bones, or back, leg, or hip problems?

12. Do you have any difficulty walking and getting around? If so, do you need assistance? Do you routinely use a cane, walker, wheelchair, or other assistive device?

13. Do you have peripheral neuropathy or numbness in your feet or legs?

14. Do you live alone? If so, do you have a support network of family, friends, and neighbors that looks in on you regularly?

15. Do you have a phone or cell phone located within easy reach of the chair you usually sit in to view television?

16. Do you have a television remote control located within easy reach of the chair you usually sit in to view television?

17. If you have a hearing loss and use hearing aids, are they equipped with t-coils? Is your home looped for television and telephone use with your hearing aids?

18. Do you routinely use a First Alert or similar system for emergencies?

Other questions should be added as appropriate.

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American Academy of Audiology
We Can Do More to Educate Our Patients About Falls Risk

Physicians have enormous power here, much more than families and loved ones who can nag for years to get the individual to seek help or comply with recommendations. Unfortunately, physicians have less and less power when patients have to take steps to pay for and follow their recommendations. I realize that physicians alone cannot be expected to do it all. The phrase “It takes a village” really applies in reducing falls risk. As audiologists who treat these often “hard-headed,” at-risk seniors, we too need to take a patient-centered approach and act as advocates for falls prevention. We need to remind our physician colleagues who treat the elderly that they should recognize and exercise their power to influence older persons’ lives sooner. If so, then many years of frustration with inadequate communication skills and potentially fatal falls could be avoided or delayed, and a better quality of life could be maintained.

In over 35 years of working with patients, I have witnessed an increasing number of them fall, break a hip, and end up in a convalescent hospital for the rest of their lives. This seems to happen more and more frequently—or maybe it is because I am just getting older and am more sensitive to this issue. The thing that my dad dreaded most was ever having to be moved to a nursing home; his fall took his life, and he never had to experience that fate, but many seniors find themselves in unfamiliar and undesirable places as a result of their falls, especially if they have no family that can or will take care of them in their homes. Even elderly persons living in nursing homes where full-time care is available are not exempt from falls. Annually, about half of the nation’s 1.7 million nursing home residents will fall at least once, and one out of 10 of these falls will end in serious injury. Dad’s death happened at a time when Carole Johnson, Craig Newman, Victoria Williams, and I were preparing an article on the topic of falls risk. The article has since been published in the *Journal of Family Practice* (Johnson et al, 2009). We wrote the article for a medical journal to help remind physicians about the need for them to screen for hearing loss and falls risk in their elderly patients. Along with other information on the topic, the article provided physicians with a convenient checklist of items that they should cover in their visits with the elderly and their families. The need to assess patients’ hearing was at the top of the list, because if patients cannot hear what physicians are saying, then questions and information covered in the rest of the visit may be rendered useless. Physicians should be sure that their elderly patients have their hearing aids on and working, and consider having a PocketTalker or similar device available in their offices for those who do not use but need amplification. Similar checklists and Web sites are provided here for audiologists to use with their patients (see APPENDIX A) and other stakeholders (see APPENDICES B and C) to remind them of the important roles they need to play in this area as well.

Just after completing the *Journal of Family Practice* article, Carole Johnson’s father also began suffering from a series of falls that have ultimately forced him to leave his comfortable home of over 40 years and take occupancy in an assisted-living facility where he can easily migrate to more continuous care and convalescence as they become necessary. This same scenario played out with Carole’s aunt who recently passed away in a similar manner.

Dennis, these stories are not unique to us; it is shocking how many people have their own similar experiences to share. I was relaying the story of your father’s fall and passing to one of my patients and his wife this morning, and they both nodded and smiled. Their eyes welled up with tears as they informed me that both of their fathers had passed away just last month as a result of falls they suffered, even though they had been in reasonably good health. More and more, we find that social discussions with family and friends turn to some tragedy or another relating to an elderly person falling. The problem is

All audiologists should check to see that questions about falls are included in their case history forms and that they include discussions about fall risk in their counseling with patients.

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One-third of all seniors fall every year. The following are things you can do to prevent falls.

**HEARING:** Get your hearing checked regularly!
- If you use hearing aids, wear them and have them cleaned and checked regularly
- Consider use of hearing aids with t-coils and looping your home, or hearing aid technologies that provide connectivity to telephones, televisions, and other devices via Bluetooth or similar circuitry

**VISION:** Get your vision checked regularly!
- If you need glasses, wear them regularly!
- Ensure adequate lighting when walking, both inside and outside of the home. If you go out and will be returning after dark, be sure to leave a light on. Do not try to save on electricity by not using good lighting. Remember, the costs of injuries due to falls from inadequate lighting far outweigh the savings on electricity that might be had from not using lights! Carry a small flashlight or keychain light so you can see to unlock doors.

**BONES:** Keep your bones strong!
- Have your bone density monitored
- Take calcium supplements if your physician recommends them
- Exercise regularly
- Avoid getting up too quickly to answer the door or telephone, especially after sitting for long periods when leg muscles can go to sleep or cramp

**HAZARDS:** Safeguard your home!
- Remove throw rugs, clutter, and other obstacles from your floors
- Ensure adequate lighting both inside and outside, especially on porches and walkways
- Install handles and railings, especially in bathrooms and on porches
- Be sure to check for pets or children under foot
- Avoid wet spots both inside and outside, especially rain and ice
- Make sure to wear shoes with a sturdy, flat sole that make good contact with floors and other surfaces; avoid use of slippers and flip-flops
- Always use a walker or wheelchair if appropriate; canes may help, but be aware that they mainly only prevent falls in one direction—walkers are superior
- Get and use a First Alert or similar system for use in emergencies
- Make sure your neighbors, physicians, and audiologists have a list of family or other contact persons in case of emergencies

**MEDICATIONS:** Ask your physician or pharmacist about drugs causing dizziness!
- Know which of your medications (singularly or in combination) cause dizziness or vertigo, ringing in the ears (tinnitus), hearing loss, and/or cognitive impairment
- Investigate alternative medications with your healthcare professional(s)
- Avoid using alcohol with medications
- Keep an updated list of your medications with you
- Do not self-medicate

**SEDENTARY LIFESTYLES:** Stay active!
- Join an exercise or swim class
We Can Do More to Educate Our Patients About Falls Risk

ubiquitous. You and I have been seeing patients and conducting research on elderly persons for many years now. I am always taken aback to realize that we are now them! Although our minds lead us to believe that we are still as young and vibrant as ever, we are now over 60! Like it or not, this puts us in the elderly category in spite of catchy phrases like “the 60s are the new 40s” or “we are only as young as we feel.” In case our hips, knees, backs, skin, and hair fail to remind us, one look in the mirror is an instant wake-up call that we too need to be careful. While I like to think that I am as capable as ever and am actively pursuing my P90X workouts, I must admit to having noticed some unsteadiness when I jump on and off of my tractor on Saturdays. I have even fallen off a ladder in the past couple of years. I have a few close friends that have fallen off the roofs of their houses recently; these once vital, accomplished athletes, while still young in their minds, are now well over 60 and need to be reminded about the risks of falling by their health-care providers (i.e., physicians and audiologists)! As audiologists, we can and need to play a greater role in helping our patients, friends, and families be more aware of and prepared for falls risk. It seems that our elderly female patients are even more likely to sustain falls than males. Whether we choose to practice vestibular testing and/or rehabilitation like some of our colleagues who excel in that area (e.g., Jacobson, Kileny, Shepard, Worthington, Gans, Akins, and others), we at least need to know when to make referrals to them. We especially need to keep an eye on our elderly patients who are frail and live alone. In addition to their primary care physicians, we audiologists might be the only ones who see these patients on a consistent basis. How many patients have we seen transition in a very short time from being able-bodied, active seniors enjoying their retirement to stooped-over, fragile individuals who are more and more unsteady with each and every visit to our offices? The checklists and Web sites in Appendix A can be used by audiologists to help them with this process.

All audiologists should check to see that questions about falls are included in their case history forms and that they include discussions about falls risk in their counseling with patients. However, because case histories may only be updated every few years, we should pay more attention to the general well-being of our patients as they come in for hearing aid repairs, batteries, or checkups. We audiologists need to be observant and have prevention discussions with our once-bouncy and energetic patients who now shuffle their feet and touch the walls of the hallway on the way to our exam rooms and attempt

- Walk every day
- Discuss any peripheral neuropathies (e.g., numbness and tingling in feet, legs, or arms) with your physician and audiologist
- Maintain a good sense of humor, be with other people, laugh a lot, and have fun
- Take extra care driving, avoid driving at night or in inclement weather, and know when it is time to pass over the keys and give up driving

Be sure to contact your primary care physician if you have any sudden onset of dizziness, unsteadiness, or lack of mobility.

If you should have an accident, be sure to report it and any injuries immediately to your family, your physician, and your audiologist.

Do not get in the habit of falling and not telling anyone!

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Do not get in the habit of falling and not telling anyone!
We can do more to Educate Our Patients about Falls Risk

compensation via increased proprioceptive input. We and our office personnel should be alert for sudden changes in our patients’ personal grooming, weight, and ability to get around that might signify that they are becoming unable to manage their own lives. For example, if once punctual patients fail to show up for appointments, we should call them or family members to make sure that they are okay because many seniors who live alone fall at home, cannot get up, and may go for days before being discovered. It is important for our offices to maintain a list of names and telephone numbers of family members who can be contacted in these situations. We should also encourage families to obtain First Alert or similar devices for their elderly loved ones. We had just purchased a First Alert contract for my dad the day he fell, but we were too late, and he never got a chance to use it. Families should be advised that they need to get these devices and have elderly loved ones begin using them well ahead of an emergency. We all remember seeing and joking about the elderly lady in the television ad a few years ago where she was seen shrieking, “Help! I’ve fallen and can’t get up.” Although the ad was somewhat humorous, it did make the point and seems to be more on target with every passing year. Carole Johnson recently related to me how her aunt had fallen and failed to answer the phone for a few days until it was discovered that she had fallen and could not reach the phone. This scenario might be avoided with the First Alert type systems that I see more and more patients using. These devices allow the elderly to maintain some degree of independence while providing assurance to family members. Routine checking for changes in vision, loss of weight and/or bone density, decrease in physical activity, and side effects of medications can often uncover potential problems that could lead to falls, as well as tinnitus and hearing loss.

When I see that there might be a problem in this area, I find that it is helpful to introduce the topic of falls risk by giving patients and their families the handout in Appendix A and telling them about my dad and others who have succumbed to untimely accidents. Such mishaps could often easily be prevented by use of ambulatory assistive devices like walkers; making sure that shoe

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What are some statistics on senior citizens falling?
- One-third fall every year
- 20,000 per year will die as a result of falls
- Falls risk can be reduced
- Falls prevention programs work

Who is at risk for falling? Everyone, but especially those who are ...
- Over 80 years of age
- Female
- Prone to osteoporosis or other physical problems
- Dependent on ambulatory assistive devices (e.g., wheelchairs, canes, etc.)
- Taking certain prescriptive medications, especially when used with alcohol
- Known to have a history of falling

What are components of a falls prevention program?

Staff Involvement and Education
- Ongoing in-services providing knowledge and skills
- Participation
  - Taking special precautions for at-risk residents
  - Reporting and documenting all falls, especially noting any injuries
  - Enacting precautions for falls prevention
    ▪ Eliminating environmental hazards
    ▪ Reminding residents of potential hazards

Safety Audit of the Environment:
Patient Rooms and Public Spaces
- Removing potential obstacles (e.g., electrical cords, throw rugs)
- Installing skid- and slip-proof surfaces (e.g., avoiding floor polish, wax, or puddles; securing carpeting, non-skids mats/appliqués in bathrooms, etc.)
- Ensuring adequate lighting
  - Avoiding glare
  - Using contrasting colors (tape on steps/ furniture and carpeting)
- Installing handles and railings (stairways, hallways, bathroom showers and tubes, etc.)
- Installing emergency alerting systems

Resident and Family Programs
- Provide lectures on falls risk and prevention that emphasize
  - Role of vision
  - Threat of osteoporosis and other physical problems
  - Dangers of environmental hazards
  - Role of medications in dizziness
  - Importance of exercise
- Target at-risk residents and their families for falls risk prevention programs
- Offer exercise classes (e.g., Tai Chi, Zumba, Sit ‘n Be Fit)
- Inspect residents’ living quarters for hazards
- Provide reminders to:
  - Ask for help, if needed
  - Use:
    ▪ Ambulatory assistive devices
    ▪ Handles, rails, and grab bars
    ▪ Lights at night
  - Avoid unnecessary risks
  - Report:
    ▪ Hazards in room or common areas
    ▪ Peers at risk for falling
  - Avoid getting up or standing too quickly
  - Report sensations of dizziness
  - Make sure shoes fit properly

Program Stakeholders and Partners
- Residents
- Families
- Staff
- Health-care providers
  - Primary care physicians
  - Audiologists
  - Physical therapists

Appendix C
HANDOUT FOR STARTING A FALLS PREVENTION PROGRAM
We can and do more to Educate Our Patients about Falls Risk

soles are sturdy and that they make firm and level contact with surfaces; removal of throw rugs, loose carpeting, and clutter in the home; assuring adequate lighting; checking that pets and toddlers are not underfoot; taking special care on wet, icy, or slippery surfaces; making sure that eyeglasses and hearing aids are on and functioning properly; and having portable telephones and television remote controls located within arm’s reach of the favorite viewing chairs. One of the take-home messages that I received from the recent AudiologyNOW! was how important it is for audiologists to counsel patients about loops and the use of t-coils in their hearing aids. In this case, looping the living areas of elderly persons might keep them from having to get up and move around quickly, particularly after sitting for long periods, to adjust televisions or answer phones, which is exactly how my dad fell. Many of these suggestions are simple, common sense things that everyone already knows to do, but attending to any one of them might prevent a catastrophic fall. Adding these items to audiologists’ counseling of elderly (or even younger when appropriate) patients and their families and warning about the importance of warding off osteoporosis and neuropathy, keeping active, and investigating how medications (especially if taken along with alcohol) may contribute to falls does not require much additional time during an office visit but can show them that you care about all aspects of the patients’ well-being. It also offers an opportunity for audiologists to make the inner ear connections between the hearing and balance mechanisms clear to patients and why it is sometimes necessary to evaluate both vestibular and auditory systems and to consider how vision and proprioceptive sensory integration may contribute to both. These aspects are clearly within the audiology scope of practice and should not be left to our primary care physician colleagues alone.

If audiologists will take the time to include a discussion of falls risk for their patients when appropriate, then perhaps they may be able to help families avoid the consequences of untimely accidents like the one we have all had to deal with in our own families. We audiologists are all in a unique position to offer more than hearing tests and hearing aids to our patients—we can and need to do more. We can also extend our influence into the community by speaking on the need for decreasing falls risk when addressing civic organizations or providing in-services to staff at long-term residential care facilities who may wish to establish falls prevention programs. Appendix C is an example of an outline for a

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We can do more to educate our patients about falls risk

talk to encourage administrators and staff to set up a falls prevention program.

Audiologists, physicians, care givers, and families need to give elderly persons their due respect and acknowledge their desires to maintain their independence. We need to remember that just because people reach a certain age and become more frail, it does not necessarily mean that they all are incompetent, demented, or incapable of making proper decisions. Dennis, I am reminded of how you told me that your dad had looked a bit demented with blueberry jelly on his face when the paramedics arrived at his house after one of his earlier falls but that his appearance was due to his Parkinson’s disease interfering with his grooming habits rather than incompetence as he was quite capable of interacting and reasoning with and assuring them that he was okay. Similarly, Carole Johnson relayed how her dad could not sleep recently and allowed a piece of toast to burn and set off alarms while he was in the shower at 5:00 am, which prompted a visit from the assisted-living facility staff. He told Carole how strange it must have looked to see an old man standing naked with the kitchen on fire as the firemen broke down his door. Unfortunately, he lost his toaster oven and was put on close watch after the incident, but that he was able to discuss and joke about the event with Carole showed that he was neither senile nor incompetent. These stories remind us that age, how someone looks, and the situation should cause us to respect and not prejudge and jump to conclusions about a person’s cognitive status. Nevertheless, these events can be a precursor of things to come. Your dad fell and passed away only a few days after his incident with the paramedics, and Carole just informed me that her dad hit a bicyclist while driving his car today. Although it was a relatively minor accident, not his fault, and no one was hurt, Carole’s dad freely admitted that his driving days were over. I saw my dad dent his car and knock off his rearview mirrors on people’s mailboxes on multiple occasions yet deny that he had problems driving and refused to give up the keys. Take a look at your elderly patients’ cars and observe them pulling in and out of the parking lot, and you will quickly notice which ones are likely to be at risk for falls and other issues.

In reality, in spite of our efforts it will often be difficult to get all patients to follow our recommendations. We all know of examples like the couple who was in their 80s, lived alone, had no help in the house, and were clueless about what to do, even about how to get a housecleaner. During an extensive counseling session in which it was stressed how important it was for them to plan for help and for emergencies, it was determined that their nearest family member was a daughter about 90 minutes away, who was busy and rarely visited. Although the schedule was jammed as a result of a lengthy counseling session, they were given a simple “to do” list for them to take home, which hopefully had a small impact on a huge and growing problem for them. Several important questions arise as busy clinicians begin addressing issues of falls risk with their patients. How much time can we exert on this type of counseling? Where do we draw the line on helping these people with whom we have had long-standing relationships and who are not being fully served by their family and physicians? How effective can we be in counseling patients when they do not or cannot see how serious the topic is? I recall you telling me how your father insisted on keeping his old wobbly swivel rocker that threatened to toss him through the window every
time he sat in it and how he steadfastly refused the power lift chair you bought for him. We audiologists need to include anything that helps us counsel this stubborn, independent, and proud population. Things will likely get worse as Medicare is gutted and patients have to start paying more and more for treatment. We must remember that even if we are effective with our counseling, patients may still look at the cost and refuse to follow the plan.

Again, Dennis, I am very sorry to hear about your loss. Unfortunately, we will probably hear about similar accidents from a lot more of our friends, both inside and outside of the audiology community over the coming years, especially as we baby boomers embrace the challenges of joining that “chronologically gifted” group known as the elderly. Hopefully, this article can serve as a heartfelt wake-up call for clinicians that will encourage them to help look after the global needs of their patients. At the risk of information overload, the attached counseling checklists include critical safety and convenience factors that should be valuable to assure that patients are doing all that can be done to ensure their safety, including having a support network. If audiologists use these checklists as handouts for their patients, then they can at least highlight the critical points in the office and patients can go over the rest (hopefully with families) at home at their own convenience. If we are lucky and take our own advice, then maybe the best we can hope for is that we and our immediate loved ones are not the next to fall.

Sincerely,

Jeff

Jeffrey L. Danhauer, PhD, is chair and professor of audiology in the Department of Speech and Hearing Sciences at the University of California Santa Barbara and can be reached at danhauer@speech.ucsb.edu; Carole E. Johnson, PhD, AuD, is a professor of audiology in the Department of Communication Disorders at Auburn University; Craig W. Newman, PhD, is the audiology section head at the Cleveland Clinic; Victoria A. Williams, AuD, is a doctoral student in the PhD program at the University of South Florida; and Dennis Van Vliet, AuD, is the director of professional relations at Starkey Laboratories.

References


AAAF Foundation Research Spotlight:

BY DAVID FABRY, RICHARD DANIELSON, AND KATHLEEN DEVLIN CULVER
As part of the Foundation’s efforts to advance audiology research, Audiology Today will periodically feature an interview with a past recipient of Foundation research funding. This segment features Tiffany Johnson, PhD, a 2007 recipient of a New Investigator Award.

Fabry: When the Foundation was reorganized in 2002, I was privileged to serve as chair of the inaugural board, which recommitted its role as the philanthropic arm of the Academy, with the new mission “to support programs of excellence in research, education, and public awareness.”

To that end, one of the new board’s first initiatives was to establish a primary goal to support the Academy’s Research Awards program, providing support in the form of New Investigator, Student Investigator, and Summer Fellowship awards that ranged from $2,500-$10,000. Assuming financial stewardship for this program was a first step in fulfilling its renewed philanthropic responsibilities.

Danielson: Since that time, the Foundation’s support of audiology research has been one of its most successful programs. Foundation research funding has been expanded and now includes funding for the Student Research Forum and the James Jerger Awards for Excellence in Student Research, in addition to partnerships with allied organizations such as the National Hearing Conservation Association (NHCA), the Association for Research in Otolaryngology (ARO), and the American Balance Institute Education Foundation. The Foundation has also received support for topic-focused research in the areas of pediatrics, noise-induced hearing loss, and vestibular issues.

Culver: The Foundation’s Research Grants in Hearing and Balance program continues to attract high quality applications from hearing scientists across the United States. Proposals are reviewed each fall by the Academy’s Research Committee, and several innovative projects are funded each year. Since 2003, the Foundation has provided approximately $350,000 in research funding, supported largely by Academy members’ gifts to the Annual Fund.

Fabry: It is our pleasure to visit today with Dr. Tiffany Johnson, who received a 2007 New Investigator Award in the amount of $10,000 for her work, “Characterizing the Effect of Stimulation Parameters on DPOAEs Recorded in Normal and Impaired Ears.” Thank you so much, Dr. Johnson, for taking the time out of your schedule to speak with us. Can you discuss a little bit about the factors that went into your choice of research topic?

Johnson: It was an extension of a line of research that I became involved with during my postdoctoral training at Boys Town National Research Hospital. During my time at Boys Town, we completed several studies that involved manipulations to the stimuli that are used to record distortion product otoacoustic emissions (DPOAEs). DPOAEs have been used for a variety of purposes with normal hearing persons and those with hearing loss. As I’m sure you’re aware, DPOAEs are evoked with pairs of primary tones of different frequencies, \( f_1 \) and \( f_2 \) (\( f_2 > f_1 \)), and with levels, \( L_1 \) and \( L_2 \), that may be equal or different. At Boys Town, we were using a technique that my colleague, Steve Neely, had developed that allowed us to very rapidly present many different stimulus-level combinations in an efficient manner. We used that technique to explore...
a number of questions, including which stimulus-level combinations produce the biggest response in normal hearing subjects.

**Fabry**: So the technique provided larger DPOAE magnitudes?

**Johnson**: Over the course of a couple different studies, we developed new stimulus parameters that we believed would produce larger responses in normal-hearing subjects than other stimulus approaches that are in use. We were excited by this and thought that a logical next step would be to see if these new parameters resulted in more accurate identification of hearing loss. We completed a study asking that question and found that these new stimuli did not improve the accuracy with which DPOAEs identify hearing loss compared to other protocols that are used clinically. We were surprised by this result, but in discussing that outcome with colleagues at conferences, we began to think that maybe we were thinking about the stimulus issue the wrong way. Perhaps it would be useful to look at what happened in the impaired ear as we manipulate stimulus parameters. This idea was the basis of the project that I submitted to the Foundation for funding.

**Fabry**: Understood. So what did you find?

**Johnson**: Well, as most research studies do, this one led us to more questions than answers. The project had two aims: the first aim was to identify the stimulus parameters that produce more robust responses in ears with mild-to-moderate hearing loss. The second aim was to identify stimuli that would more effectively separate responses for subjects with normal hearing from subjects with mild-to-moderate hearing loss.

**Fabry**: So the first aim is really the opposite of the goal with newborn hearing screening, where the objective is to develop stimuli that effectively segment normal and mildly impaired ears with high sensitivity and specificity.

**Johnson**: Right. But our thought with this aim was to explore the parametric space to see if we could identify stimuli that would allow us to record a response in an ear with preexisting hearing loss that might not produce otoacoustic emissions using our standard stimuli. This could potentially be useful for monitoring applications (e.g., otoxicity monitoring). There’s also been some work in Germany (Muller and Janssen, 2004) using DPOAE input/output functions to set hearing aid parameters, and so there might be hearing aid fitting applications where you want to record a DPOAE in an ear with hearing loss.

**Fabry**: Potentially providing an “objective” tool for use with hearing aid evaluation and fitting.

**Johnson**: Possibly, yes. The second aim was more of the traditional application of emissions, which is to separate normal ears from those with hearing loss. We know from a number of studies (Norton et al, 2000; Gorga et al, 2005) that if you look at screening performance, we miss about half of ears with mild hearing loss (defined as audiometric thresholds of 25–40 dB HL). We were interested specifically in improving the accuracy with which DPOAEs identify milder amounts of hearing loss.

**Fabry**: Which has obvious implications for hearing screening purposes if “false negative” responses can be reduced.

**Johnson**: Yes. So, with those two aims in mind, we recruited a group of 28 adults: 14 with normal hearing and 14 with mild-to-moderate hearing loss, and we recorded responses using Dr. Neely’s technique for rapid recording of responses for a range of stimulus combinations.

**Fabry**: That’s a lot of data.
Johnson: Yes, we ended up with an enormous data set. We recorded results at four primary frequencies ($f_2$) and eight frequency-ratio ($f_2/f_1$) combinations for a huge range of stimulus-level ($L_1, L_2$) combinations. In looking at the results, we feel like we’ve come up with a set of stimulus parameters that would result in robust responses in ears with mild-to-moderate hearing loss. We’ve reported these findings at a couple of meetings, the ASHA Convention and the American Auditory Society Annual Meeting, and we’re currently preparing a manuscript. We’re excited about the stimuli we’ve developed, and we think they will allow us to record responses in ears with mild-to-moderate hearing loss, but they need to be validated before we explore the clinical utility of these new parameters.

Fabry: Such as, if you measure a response, have you still maintained the sensitivity of the emission to show changes after pathology?

Johnson: Yes, that is definitely a study that would need to be done. Regarding the second aim, we felt like the Foundation grant provided us with some really good pilot data but that we needed a much larger sample-size to really answer our question. The pilot data suggested that we had better separation of responses from normal ears and ears with mild-to-moderate hearing loss if we set $L_2$ at a lower level than is commonly used, in combination with an $L_1$ set at a higher level than is typical. We need to explore these trends in a larger sample, with some slight modifications to our test conditions. The data that we collected for the second aim became pilot data for an NIH grant that I submitted and was recently awarded.

Fabry: Congratulations!

Johnson: Thanks. So we are going to continue to explore that question as part of the NIH grant.

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Fabry: Excellent. Did the frequency ratio data (f2/f1) interact with the level data you refer to?

Johnson: We explored frequency ratios (f2/f1) from 1.05 to 1.4 for this study. We found that ears with hearing loss did not produce emissions, regardless of how we manipulated the level combinations, for extreme ratios (1.05 and 1.4). Ratios in the middle (approximately 1.22), that are commonly used to record DPOAEs, provided the best results for both normal and impaired ears. We want to explore the frequency-ratio effect a little more, but we need to narrow the f2/f1 range that we are working in.

Fabry: You mentioned that the maximum losses you included in your study were 60 dB HL. Are you planning to explore the limits of the theoretical maximum for presence of outer hair cells (OHCs)?

Johnson: Although we were most interested in the mild and normal distinction, we did include ears that had thresholds up to 60 dB HL. Our rationale was that ears with 60 dB of hearing loss should have lost all outer hair cell function, and so, for hearing losses greater than 60 dB HL, you would not expect the ear to produce an emission. In a bigger study, though, you would want to include a broader range of hearing loss just to make sure you know what’s going to happen in a clinical population.

Fabry: Sure, and the “brass ring”, at least from my perspective, is to extend the utility of emissions to move beyond screening applications to work, in combination with other electrophysiological measures, to reduce our dependence on the behavioral audiogram for first fits in children (and adults). I realize that is a ways off, but we will look for more research from you in this area, and it is impressive that you extended the project funded by the Foundation into NIH-funded research. That is really what the Foundation’s effort was established to support.

Johnson: Yes, we felt it worked out very well from our perspective. As I mentioned, we need to do some additional validation in an independent sample, but we’re encouraged.

Danielson: How did receiving the award affect you in your education and your career? I mean what has receiving the award meant to you?

Johnson: I think the award was quite important. When I applied for the award, I was in my first year in a tenure track position. It was the perfect type of award to apply for when you’re in the early stages of your research and academic career. I appreciated the feedback that was like the summary statement that you get from an NIH review panel. It’s always useful to find what the reviewers liked, and what could have been strengthened. I think that this is very helpful at any stage in a research career, but particularly when you’re new and doing all this for the first time it’s good to have that sort of feedback. So, I think the Foundation award was the perfect way to start my research career, to help kick-start what was going on in the lab.

Danielson: Actually it’s encouraging to hear that your experience provides a template of what we wish to have this New Investigator grant provide, so we know that we have a committee that has done its job well. They are very dedicated and take it very seriously, and we are delighted to receive some very, very strong proposals followed by quality outcomes like yours to be accredited by the Academy Foundation’s financial support.

Johnson: Well, thank you. I appreciated it.

Fabry: So you’ve recently received the R03 Award from NIH, ensuring that you will continue with your DPOAE research. Can you fill us in on other developments regarding your role at the University of Kansas?
Johnson: Beginning in August 2011, I will be switching to the Medical Center at the University of Kansas, which is an exciting opportunity for me. I’ll have more graduate teaching than I’ve had on the Lawrence campus. So I’ll have even more interaction with our AuD and PhD students. I’ll be continuing to teach a hearing disorders course and will be moving into teaching a diagnostic audiology course and a pediatric audiology course.

Danielson: Earlier you mentioned Dr. Neely, is there anyone in particular who has been to this point particularly influential to you as a mentor?

Johnson: Yes, I feel like I’ve been very fortunate to have had really good mentors at various stages in my career. It started when I was at the University of Iowa. I worked with Carolyn Brown and Paul Abbas, who were (and continue to be) great mentors. In addition to Steve Neely, I have to acknowledge Michael Gorga at Boys Town National Research Hospital. Michael and Steve provided invaluable guidance and support as I transitioned from a PhD student to a postdoctoral researcher and into my faculty position. All of my mentors have been fabulous and so important to me and my career.

Fabry: You can’t overstate the importance of a good mentor, and I always remind people that it doesn’t cost anything to let them know what they meant—and mean—to you. Now that your role has transitioned from “student” to “mentor,” what advice do you want to provide for those considering a research career in audiology?

Johnson: Well, one thing I tell my current students is that there are tons of opportunities out there, and I actually think it’s a good time to be an audiologist who’s embarking on a research career. Although the funding landscape is difficult, the NIH and the NIDCD are quite interested in supporting translational studies where we’re moving basic science into the patient arena – from bench to bedside, as it were.

Fabry: Well, thank you again for sharing your story on how the Foundation’s New Investigator Grant made an impact on your research career in Audiology. We encourage other young researchers to consider applying for one of the several types of grants available to carry out the Foundation’s mission to support Audiology research, education, and public awareness.

References


They Said What About Audiology

By Patricia Gaffney

After audiology is mentioned in a television show or in the news, a flurry of discussion generally ensues in offices, on the Academy’s SoundOff listserv, and on social media sites such as Facebook. Whether the information is positive or negative there is always a discussion. But, as a community, are we using this free publicity as an opportunity to increase audiology awareness? October is National Audiology Awareness Month. One of the main goals of this initiative is to equate audiologist as the hearing and balance health-care professional. Harnessing the power of free publicity is one approach to meeting that goal.

Take Advantage of Free Publicity

Using online news stories or other similar pieces from the press are great tools, as it is quick and easy to provide a link from that Web site to your Web site. One component of guerrilla marketing is to use these free opportunities to your advantage (Levinson et al, 2008). Many news sites have sharing mechanisms such as a blog, LinkedIn, Twitter, or Facebook widget. Cross-posting increases the viewing audience, as well as, potentially linking your Web site to other search results. Not only can these widgets be used to post the article on your own business site, but you can also post directly under the article in the comments section. You can post information about audiology and, if it is local, you can post information about your business. One tool that is helpful for finding these free publicity gems is Google Alerts. Google Alerts allows you to search for key terms, such as audiology or hearing loss, in news articles, blogs, and videos as they are published and Google will deliver any new findings to your e-mail account. Social media is another great source for information. The Academy often posts relevant articles on the Academy’s official Facebook and Twitter pages.

Create Your Own Publicity

When there is no mention of audiology in the news, then why not make your own news. Press releases are one resource readily available from the Academy. Contact your local news organization (Levinson et al, 2008) with a pre-written press release on various content areas that can be modified as needed. Several Academy members have done this and found that not only is the press release published, but their business information was published with it. It is important to remember small newspapers as well as the large well known newspapers; smaller newspapers particularly those that appeal to your target audience may have more space to publish this information (Levinson et al, 2008).
Ouch, Negative Press

“Audiology is one of the least stressful jobs” (Brienza, 2011). That statement spread like wildfire amongst the audiology community around the world. Many viewed this online article as a negative statement against our profession. Positive publicity is easy to embrace, negative publicity is often more difficult to manage. Negative publicity can lead to a reduction in community trust (Ferrell and Hartline, 2008). The difference between the reaction of positive and negative publicity is primarily based around emotions. There is often more of an emotional response when there is negative publicity (InBusiness, Inc, 2010). It is important to check emotions at the proverbial door and take an assertive and proactive approach.

Can negative press be good? Yes. There is data to support that even negative press will bring new “customers” in the door (Shoemaker, 2008). People are naturally curious, so even if the information is negative, the curiosity of the reader may push them to investigate further. This is particularly true if the reader does not know much about the subject (Berger et al, 2010). For example, when a celebrity goes to jail or rehab, certainly a negative situation, search result ratings for that celebrity will skyrocket. The negative situation becomes a positive by increased awareness of the product (Berger et al, 2010)—essentially just by getting the name out there.

Curiosity will pique the interest of some, but to gain the interest of more use the tools available to you. Most importantly, do not let emotions fuel negative press with more negativity. If there is a comment area, post truthful, positive comments for others to read. Based on the content of the article, refer readers to more information such as your business Web site, a local AuD program, the Academy, or the Academy’s consumer Web site (www.howsyourhearing.org). Another way to handle negative publicity is to e-mail the author. When e-mailing the author, it is important to focus on asking the author to consider writing a follow-up article on a different aspect of the situation from the viewpoint of the audiologist rather than asking to have the article removed. More often than not, your request to have an article removed will be rejected. You may find success by offering the author another viewpoint with a focus on the interests of the public and information about your organization while keeping the interests of the media in mind (Smith, 2005). Taking a moment to think about what the most proactive approach is will yield results in our awareness campaign.

Conclusion

Audiology awareness is a part of the American Academy of Audiology’s mission statement. Using every opportunity, from both positive and negative publicity, to promote audiology moves the field one step closer to our awareness goals. Take a moment to visit the Academy’s Web site to view all of the marketing materials already created for your use in our awareness campaign.

Patricia Gaffney, AuD, is chair of the Academy’s Public Relations Committee.

References


ALSO OF INTEREST

Review and download some of these marketing materials, including press releases and fact sheets. Visit www.audiology.org and search keywords “audiology awareness month” or use QR code to view the materials on your mobile device.
**CSI: Audiology—You Be the Detective!**

By Paul Pessis

Welcome back to an ongoing article series that challenges the audiologist to identify a differential diagnosis for a case study based on a listing and explanation of the non-audiology 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 not only rewarding for the audiologist, but it enhances patient hearing and balance healthcare.

**Case History**

A 16-year-old Asian male presents with the complaint of a constant headache for two months. Pain radiated from the right temple to the back of the head. His throat was slightly sore, but he denies the presence of a cough. Hearing is reported as “okay” without tinnitus or vertigo. He has had a persistent unilateral history of middle ear effusion (right ear). Some drainage was noted from the right ear.

**Medication History**

He has currently been taking Levaquin tablets (antibiotic), Floxin Otic Solution (eardrop), and Darvocet and Fiorinal (pain medications) to treat his headache. Additionally, he was self-medicating with Motrin, Tylenol, and Advil.

**Past History**

Six weeks earlier, the patient was seen by an ENT, and was diagnosed with acute otitis media (AOM) in the right ear and treated with an antibiotic. Three weeks later, the fluid remained, so the ENT inserted a T-tube (T-Tubes are typically the choice when there is a history of chronic fluid being that the T-tube is less likely to be spontaneously extruded). The ENT physician instructed the patient to avoid water in the right ear and was advised to use steam every other day to address the pressure he felt in his head.

**Physical Exam**

His mom was very disturbed by her son’s degree of discomfort and his need to take so many medications, especially ones for pain. She contacted our office because she wanted a joint consultation by both ENT and audiology as a second opinion. He was first seen by ENT, who observed that he was in obvious pain from the headache. The pain radiated from the right temple to the back of his head. The T-tube has already mostly extruded from the tympanic membrane.

The ENT suctioned some middle ear fluid through the posterior perforation. There were no apparent signs of being allergic. The ENT attempted to examine the nasopharynx, but due to a strong gag reflex, this couldn’t be completed.

**Diagnostic Recommendations**

- Audiogram and middle ear evaluation
- CT scan of the head with and without contrast
- CT scan of nose and sinuses
- MRI of brain with gadolinium
- Flexible Fiberoptic Laryngoscopy (FFL) with topical anesthesia, if able (Endoscopy)
- Consult pediatric neurologist (regarding the refractory headaches) pending results of the radiographic studies
- Advil for pain; discontinue narcotics

**Audiometric Findings**

Audiogram and immittance testing:

- **Audiometry:** Normal puretone and speech audiometry findings for the left ear. A minimal air-bone gap noted in the right ear, most likely the result of the prior T-Tube resulting in a posterior perforation.
- **Tympanometry**
  - Left ear—normal
- Right ear—flat with increased volume consistent with a perforation

**Ipsi Reflexes**
- Left ear—present
- Right ear—CNT

**Radiographic Findings**
- **CT sinuses**: Nasopharyngeal mass was present, eccentric to the right, with erosive changes in the sphenoid bone/clivus.

- **MRI brain with and without contrast**: Abnormal mass was present with the epicenter in the right nasopharynx. The mass extended up to the skull base abutting the right internal carotid artery at the foramen lacerum and crossing to the left of midline. The lesion was associated with eustachian tube obstruction and right middle ear/mastoid opacification. Probably unrelated to the nasopharyngeal mass, was a five to six millimeter cyst of the pituitary gland. Marginal thickening of the right maxillary sinus mucosa was noted.

A differential diagnosis is predicated upon considering all the findings. The key facts include: this is a 16-year-old male patient of Asian descent, he has a history of right-sided unilateral middle ear effusion, he has a persistent severe headache for two months, and has no relief from pain medications and other medical and non-medical treatments. Radiographic studies support the presence of a nasopharyngeal mass.

Possibilities for the diagnosis include:
- Chronic Otitis Media
- Lymphoma
- Nasopharyngeal Carcinoma
- Scarring Secondary to Syphilis

- Juvenile Nasopharyngeal Angiofibroma (JNA)

So, what do you think? If you selected nasopharyngeal carcinoma, you are correct!

**Discussion**
Nasopharyngeal carcinoma accounts for 85–95 percent of malignancies of the nasopharynx. Cancer begins when one or more genetic mutations cause normal cells to grow out of control and can metastasize to other parts of the body. Exactly what causes the gene mutations that lead to nasopharyngeal carcinoma isn’t known. Interestingly, 80–90 percent of patients with nasopharyngeal carcinoma (NPC) have increased antibody titers to the Epstein-Barr Virus (the virus most commonly associated with mononucleosis). Researchers report that NPC is more common in men, that it more commonly affects people in Asia and Northern Africa, and, in the United States, Asian immigrants have a higher risk of this type of cancer than do American-born Asians. NPC can occur at any age, but it is most commonly diagnosed in adults between the ages of 30 and 50. Having a family member with NPC increases the risk of the disease, although there is controversy as to whether this is due to genetic or environmental factors, or a combination of both factors. Smoking and drinking alcohol increases the risk of developing NPC.

**Symptoms**
In the early stages of NPC, most patients are asymptomatic. Eventually, a lump in the neck may occur which is caused by a swollen lymph node and is most likely metastatic disease. There can be blood in the saliva and/or in the nose. It is very common to have hearing loss, frequent ear infections, and headaches.

A CAsE stUdY

**FIGURE 1.** The majority of nasopharyngeal carcinomas originate in the lateral wall of the nasopharynx. NPCs possess an inherent propensity for invasiveness. Cancer cells can travel to bone, bone marrow, lungs, and liver. Distant metastases occur more commonly in NPC than any other type of head/neck cancer.
Prevalence
- North American and European Whites—1:100,000
- African, Eskimo, Polynesians—4:100,000
- Southern Chinese (Guangdong Province, Hong Kong, and Taiwan)—30:100,000
- First generation descendants of above—15:100,000

NPC is typically an undifferentiated type of squamous cell carcinoma. It is believed that chemicals contained in salt-cured foods, such as fish and preserved vegetables, may increase the risk of NPC. Being exposed to these chemicals at an early age may increase the risk of acquiring NPC. NPC is common in southern regions of China, particularly in Guangdong accounting for 18 percent of all cancers in China. It is also common in Taiwan due to the South East Asian diet which typically includes consumption of large amounts of salt-cured vegetables, fish, and meat.

Anatomic Considerations
The nasopharynx is located directly behind the nose at the top of the pharynx (throat). This is where the nasal passages and the Eustachian tubes join the remainder of the upper respiratory tract. It is not uncommon to have regional metastases. Cancer cells from the initial tumor migrate to nearby areas, such as lymph nodes in the neck, often before the primary lesion is discovered. 40 percent spread to lymph nodes on both sides of the neck and 25 percent invade the base of the skull.

Prognosis and Treatment
The one year survival rate is approximately 85–90 percent. In contrast, the five-year survival rate is 30 percent, even with early detection. Better prognosis is associated with lower clinical stage of the tumor, younger patient age, and female gender. The prognosis is worse with high-stage tumors, older patients, and male gender.

Primary treatment is radiation therapy from the base of the skull to the clavicle. Chemotherapy may help with metastases, but not the primary tumor. Cisplatin is the drug of choice; however, because it is essentially ineffective in controlling the primary tumor, it doesn't increase the survival rate. Surgery adds very little benefit.

The patient described in this case is in remission. He is healthy and well four and a half years post-diagnosis and treatment. There has been no recurrence of the tumor. The tympanic membrane perforation persists; however, there is no otorrhea. He continues to be followed at four month intervals. Tumor surveillance will continue his entire life.

“Case” closed until the next AT issue!

Paul Pessis, AuD, is president of North Shore Audio-Vestibular Lab in Highland Park, IL.

FIGURE 2. This cross-sectional image of the MRI scan shows the NPC (marked by the arrows) in the right nasopharynx, posterior to the nasal cavity. There is thickening of the mucosa of the right maxillary sinus and fluid within the right mastoid air cells.

FIGURE 3. This vertically-oriented image shows the NPC at the base of the skull (in the superior-most area of the nasopharynx). [The black region is air in the nasopharynx; the white structures are bone.]
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» Bethany Wenger, AuD Student at Vanderbilt University

Visit www.StudentAcademyofAudiology.org for more information on the conference and the attendee selection process.
Speech recognition is sometimes difficult because of suboptimal speech, rather than an inability to hear. A talker may hypo-articulate, i.e., mumble, or speak too quickly and quietly, resulting in words lost in a sentence that leaves no clue to what was said. When language fails us in this way, we become aware of our sensory and cognitive limits. There is growing evidence that speech is optimized to maintain an even rate of information transmission, which reduces speech recognition difficulty under normal communication demands (Jaeger, 2010). One clinical implication of this premise is that speech optimized for listeners with normal hearing may be suboptimal for listeners with hearing loss—too fast, too quiet, or under-articulated.

Computational theories of language explain that speech regulates information flow to keep communication efficient (Aylett and Turk, 2004). Talkers may adjust the duration of their speech by hyper- and hypo-articulation (Baker and Bradlow, 2009), vowel length changes, contractions, and syntactic reductions that omit unnecessary words (Jaeger, 2010). Piantadosi et al (2011) conducted a new analysis of large-scale linguistic databases from 11 languages, including English, German, and Dutch, and found that word length increased for words that are less predictable from sentence context. This suggested that word length functions to slow speech whenever guessing would be too costly. Piantadosi et al (2011) was particularly notable because it added a significant, new discovery to a line of research more than a century old, investigating language principles using word counts.

Speech recognition is less challenging for longer words, in part because word length gives the listener extra processing time. The uniqueness point of a word is the letter or sound that disambiguates the identity of a word from similar-sounding alternatives (Marslen-Wilson, 1987). For example, “dolloh-“ is uniquely the beginning of “dollhouse,” whereas “doli-“ could be the beginning of many similar sounding words, including “dolly,” “doll,” “dollar,” and so forth. Many short words can only be identified with certainty after the talker finishes saying them. For example, “hear” could be the beginning of other words, including “hero” or “hearing” (Bard et al, 1988). Listeners often recognize longer words before the talker finishes saying them, which was demonstrated by eye tracking (Strauss and Magnuson, 2008) and time-gating experiments (Grosjean, 1980) where listeners guessed words from interrupted recordings. Although the uniqueness point tends to occur later in time for longer words than shorter words, the later offset of longer words may allow more time for recognition and memory encoding. This is an added advantage for speech recognition thresholds (SRTs) measured using spondees or disyllabic words, e.g., baseball, drawbridge, hot dog, whose forms are likely to give listeners extra time to recognize items.

Listeners are less likely to mistake a long word for other words, in part because long words rarely sound like other words. Speech recognition is more challenging for words with many phonological competitors, or similar sounding words. For example, “cat” can be mistaken for many other similar sounding words, while “wooden” has few competitors. Speech recognition models, including the Cohort Model (Marslen-Wilson, 1987) and the Neighborhood Activation Model (Luce and Pisoni, 1998), propose that phonological competitors in the lexicon, i.e., long-term memory for words, are activated based on their similarity to the spoken word, and then compete until the listener perceives a single word. Shorter words with many competitors require more time to resolve large competitions, resulting in increased reaction times and decreased task performance compared to longer words with fewer competitors.

Long words also contain more redundant sound information compared to short words, which
provides extra clues that make words more recognizable. For example, the word “spaghetti” can be identified in English without its middle or final syllable, so the two last syllables contain redundant information (Shannon, 1948). Although extra information may seem inefficient, redundant information can be critical to word recognition when hearing loss, noise, or suboptimal pronunciation obscure the speech signal (Warren et al, 1995). Following from Piantadosi et al (2011), redundant clues improve the recognition of high information words, which benefit less from sentence context.

Although long words are easier to recognize, the message of Piantadosi et al (2011) is not to start restructuring your vocabulary to include longer words. Rather, their observation added evidence that information flow is optimized according to communication demands. The clinical significance is that normal speech conveys information at a stable but suboptimal rate for reduced communication channels, e.g., with noise or hearing loss, which makes recognition of speech in noisy environments a particular challenge for individuals with hearing loss. In line with the view that language is optimized, talkers can automatically adjust speech quality in response to changing communication demands, e.g., clear speech, (Helfer, 1997; Krause and Braida, 2002). Listeners with hearing loss may elicit a more optimal speech rate by indicating their communication needs to the talker, to elicit changes that optimize communication. Talkers adjust their speech rate nearly automatically, which contrasts with the extra effort required to recognize degraded speech signals.

Kenneth I. Vaden, PhD, is a postdoctoral fellow and Judy R. Dubno, PhD, is a professor in the Department of Otolaryngology-Head and Neck Surgery at the Medical University of South Carolina, Charleston.

References


It’s More Than Just an Oath: Special Olympics World Summer Games, Athens 2011

By Kari Morgenstein

The Special Olympics athlete oath reads as follows: “Let me win. But if I cannot win, let me be brave in the attempt.” This unique oath was implemented at the first-ever international Special Olympics (SO) games on July 20, 1968, in Chicago, IL. Since then, this oath has been repeated in various languages by thousands of athletes from hundreds of countries.

Last year, the Student Academy of Audiology (SAA) developed a unique relationship with the Special Olympics Healthy Hearing (SOHH) program. This newly formed alliance aims to encourage audiology graduate students to volunteer their audiological services (under supervision) to the athletes during Special Olympics events at the local, regional, and state levels. Thanks to Samantha Gustafson, 2010–2011 SAA Humanitarian Committee chair, and her committee members, the SAA is well on its way to making this a reality! There are currently 21 local SAA chapters, registered with the national SAA board of directors that provide services to local Special Olympic events. The ultimate goal of the SAA is to involve audiology students in these philanthropic events to educate them about this underserved population and to brand audiology on a global level with hearing health care through our involvement with Special Olympics.

Recently, I was given a once-in-a-lifetime opportunity to attend the Special Olympics World Summer Games in Athens, Greece, as the delegate from the SAA Board of Directors, thanks to the generosity of the American Academy of Audiology Foundation and the University of Florida. During the games, I had the opportunity to volunteer my audiological services, interact with athletes, and help further develop the SAA/Special Olympics Healthy Hearing relationship. I, along with a group of dedicated, hard-working volunteers, screened over 1,200 athletes, and this was only in the first six days of competition! We also fit 19 athletes with hearing aids and provided a few more athletes with vouchers to receive free Phonak hearing aids in their specific countries.

I learned a great deal from my attendance at this international event, but there were two lessons that really struck me. First, I realized there are many selfless, determined individuals in this world. I saw this first hand. The Special Olympics Healthy Hearing venue at the World Games was run entirely by volunteers who donated their time and services to a cause bigger than themselves. Second, I learned that individuals with intellectual disabilities are an extremely underserved population in terms of hearing health care, no matter the country and resources available. We were able to help this population a little at the World Games, but there is still an enormous amount of work to be done. If you feel inspired to volunteer for Special Olympics or learn more about the SAA/Special Olympics Healthy Hearing relationship, check out www.specialolympics.org or e-mail Nicole Corbin, 2011-2012 SAA Humanitarian Committee chair, at n.corbin4@gmail.com.

At the end of the games, a handful of athletes walked away with medals, but more importantly, athletes with previously undiagnosed hearing loss were identified by the healthy hearing program and provided with follow-up care through the SOHH program. When the athletes took their oath at the Opening Ceremonies of the Special Olympics World Summer Games 2011, they promised to try their hardest and be brave during their various competitions. Now it’s our turn. The SAA will do our best to “be brave in the attempt” to help this underserved population and work to continue the development of the SAA/SOHH relationship.

Kari Morgenstein is the 2011-2012 president of the Student Academy of Audiology and a third-year AuD student at University of Florida, in Gainesville, FL.
South Korea will be the next host of the Special Olympics World Winter Games in 2013.

There were 22 sports offered at the Special Olympics World Summer Games, Athens 2011. The sports offered ranged from volleyball, judo, and swimming to cycling, badminton, and football.

Eunice Kennedy Shriver (1921–2009) was the founder of Special Olympics. In June 1962, Mrs. Shriver started a small summer camp at her home for individuals with intellectual disabilities that led to an international organization with 3.7 million athletes from 185 countries.

A total of 2,658 athletes were screened at the Special Olympics World Summer Games, and 23 percent of these athletes failed the pure tone hearing screening.
Advanced Beneficiary Notice Update

The Advanced Beneficiary Notice (ABN) form, CMS-R-131, has been revised with a new release date of March 2011, indicated in the lower left hand corner, and is available for immediate use at https://www.cms.gov/bni/02_abn.asp. Mandatory use of the new version begins on November 1, 2011; the previous form with the release date of March 2008 will be considered invalid on or after November 1, 2011.

HIPAA 5010—Are You Ready for January 1, 2012?

To avoid claims processing interruptions, you will want to check with your billing and claims vendors, and clearinghouses to confirm that they are HIPAA 5010 compliant. The compliance date is January 1, 2012. HIPAA 5010 is a required step for payers in the transition to the ICD-10 code set, effective October 1, 2013, as the current platform structure, HIPAA 4010, is compatible with only the ICD-9 coding system and not the ICD-10 code set.

Medicare Enrollment—Providers Must Revalidate by March 23, 2013

The Centers for Medicare and Medicaid Services (CMS) is requiring that all provider enrollment information be revalidated in the Provider Enrollment Chain and Ownership System (PECOS) by March 23, 2013, due to the new screening requirements mandated in the Affordable Care Act. In addition, it is suggested that you monitor your enrollment information monthly. To complete enrollment, revalidation, and monitoring, visit https://pecos.cms.hhs.gov/pecos/login.do. Providers who have recently enrolled will still be required to revalidate by the March 2013 date. Applications are not considered complete until the Medicare contractor is in receipt of your documentation and signed certificate, to be sent via the United States Postal Service.

Electronic Health-Care Records—Eligible Providers Qualify, Audiologists Don’t

You may have heard of the financial incentives offered by the Centers for Medicare and Medicaid Services (CMS) for Eligible Providers (EP) instituting Electronic Health Records (EHR). Audiologists are not currently on the CMS list of EPs for EHR. It is anticipated that all health care providers will eventually be required to be in compliance with EHR in their offices and the Academy will keep members apprised of any changes in those requirements.

New Superbill/Encounter Form Template on Academy Web Site

A new encounter/form superbill template with the codes pertinent to most audiology practices can be located at www.audiology.org/practice/coding/documents/201105_academynsuperbillform.pdf.
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The Journey to Certifying the First Audiologists with Pediatric Audiology Specialty Certification

By John A. Coverstone, AuD

As the profession of audiology grows and matures, there is an increasing need for specialists in audiology to become highly trained in working with specific populations, as well as a continuing need for general practitioners. The American Board of Audiology (ABA) is an organization that develops certifications for all audiologists desiring to accomplish a higher level of training than that required by licensure, whether in general practice or specialty practice. Following AudiologyNOW!® 2011 in April, a group of audiologists sat for the inaugural examination in pediatric audiology. In doing so, the ABA and audiology celebrated years of work by the Pediatric Audiology Specialty Certification (PASC) Task Force, the ABA Board of Governors, and subject matter experts in the profession.

The reasons for taking this examination were as varied as the audiologists who elected to sit for it. Some wanted to recognize or promote their pediatric specialty. Some wanted to set an example for their colleagues, who they are encouraging to become certified. Some felt it was an important step forward for the profession and wanted to be a part of it. No matter the reason, the ABA applauds and thanks all those who took the examination,
and commends the audiologists who passed the exam and have now received the Pediatric Audiology Specialty Certification.

This exam and certification, as with the Cochlear Implant Specialty Certification, was created with tremendous effort and dedication on the part of hundreds of pediatric audiologists who volunteered their time, resources, and expertise to this endeavor. The examination was first framed by the creation of subject areas, which are available on the ABA Web site at www.americanboardofaudiology.org. These areas were further delineated into sub-speciality areas and then weighted according to importance of knowledge for a pediatric audiologist.

Once the subject areas were finalized, additional subject matter experts (SMEs) were recruited to write, edit, and revise (and edit, and revise!) exam questions. A few hundred exam questions were drafted so that future examinations could draw from a large pool and vary from any other exam that had been provided. The first group of candidates took the inaugural examination, after it had been Beta tested, with 150 questions so that each could be rated for performance and a cut score (percentage of typical pediatric audiologists who would correctly answer each question) be calculated.

Finally, additional SMEs were recruited—along with existing experts—and the exam was reviewed. Every SME rated each question according to how he or she believed it should perform and weighted that against how it did perform, with the benefit of discussion among the SMEs. A final rating was given with a cumulative cut score calculated by the psychometrician assigned to this project.

As you can see, the process was very involved, with each of the steps requiring months of work and many meetings and workshops. The result is a comprehensive and rigorous examination that truly tests the knowledge of a pediatric audiologist. It has become apparent that Pediatric Audiology Specialty Certification is meaningful and useful for identifying audiologists who have chosen to make pediatrics their specialty area and have achieved additional training in this area.

Although only a handful of audiologists currently hold pediatric certification, it is already become the standard in this specialty area. Employers have begun to look at pediatric certification for an upcoming standard for their audiologists. Primary care audiologists have already expressed interest in using pediatric certification as their standard for making referrals to pediatric specialists. Physicians and other health-care providers are sure to follow. With the ABA’s commitment to maintaining the rigor of this examination and the high standards for maintaining pediatric certification, there is no doubt that this will become the standard for pediatric specialists in audiology.

If you are interested in becoming a candidate for certification in pediatric audiology or cochlear implants, or would like to join the growing ranks of board certified audiologists, visit www.americanboardofaudiology.org or contact the ABA office at 800-881-5410 or aba@audiology.org. Join the ranks of audiologists who hold themselves to a higher standard. Become certified today!

Join us in extending our congratulations to the inaugural class of Pediatric Audiology Specialty Certification certificants!

Arlene Balestra-Marko, AuD
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New York
Patricia M. Mauceri, AuD
Massachusetts
Jessica R. Stich-Hennen, AuD
Idaho

John Coverstone, AuD, is a member of the ABA Board of Governors.
Take the Pledge for Passage

By Melissa Sinden

One of the most important things you can do for the profession of audiology takes only 30 seconds—contacting your representative in Congress. Perhaps you have grown tired of hearing that you need make this effort to advance audiology issues, but have you actually done it? If not, what's stopping you?

Here are the facts: members of Congress decide what initiatives to support or oppose based on feedback from their constituents (that's you!)

So what message do they hear if they receive 100 e-mails from physicians in their district who oppose an audiology bill and hear nothing from the audiologists they represent? The "message" is that more of the people they represent oppose the bill than favor it, so they should vote in opposition. Do we want physician groups influencing the future of audiology? If the answer is no, I highly encourage you to take 30 seconds or less and send a message to your representative through the Academy's Legislative Action Center. Here's how:

1. Type http://capwiz.com/audiology/home/ in your Internet address bar (You can also go to the homepage of the Academy Web site (www.audiology.org) and choose "Legislative Action Center" under the Advocacy header).

2. There you will find letters for various issues facing audiology. Click on "Ask your representative to Support Direct Access in the 112th Congress!" or any of the other letters.

3. Enter your contact information in the fields at the bottom of the screen. The Legislative Action Center will locate your representative for you. You can also edit the form letters if you wish.

4. Click on "Send Message" and you're done. You have taken the pledge for passage.

During the month of July, both the Student Academy Board and the Academy's Board of Directors made their way to Capitol Hill to visit with representatives and staff from their respective districts. That the student board members altered their plans to arrive a day early in order to visit the Hill, and that Academy board members devoted half of one day out of two work days for their meeting to participate, speaks to the importance of these actions. Your elected board members are leading by example. They took the pledge.

Academy fellows cannot assume that "someone else will do it." If every member takes the "pledge for passage" and commits to sending an email through the Academy's Legislative Action Center, we could achieve direct access and obtain our first step toward greater professional autonomy. The success of that initiative would pave the road for countless future legislative achievements. It all starts with you.

Melissa Sinden is the senior director of government relations for the American Academy of Audiology.
Development of Public Policy Resolutions

NEW Resolutions: Fair Reimbursement for Audiology Services and Eliminating the FDA Requirement for Audiolists to Obtain a Medical Waiver Prior to Dispensing Hearing Instruments to Adult Patients.

The Academy’s Board of Directors recently approved these resolutions developed by the Academy’s Government Relations Committee. Resolutions describe the Academy’s policy on key issues and serve as a resource for Academy members, state audiology associations, members of Congress, Federal agencies, and consumers.

To review these new documents, visit www.audiology.org, and search keywords “public policy resolutions.”

Audiology Today Wins APEX 2011 Award

The Academy is proud to announce that Audiology Today (AT), Nov/Dec 2010 issue, has won an APEX 2011 Excellence in Publications Award for best issue. APEX awards are based on excellence in graphic design, editorial content, and the ability to achieve overall communications excellence. With more than 3,300 entries this year, competition was intense, and we are very proud to be one of the winners. Review the content of the latest issue of AT...
Phonak Gift Underwrites New Annual AudiologyNOW!® Lectureship

Richard Danielson, chair of the American Academy of Audiology Foundation Board of Trustees, recently announced that Phonak Hearing Systems has made a generous gift that will support a new lectureship series at AudiologyNOW! The grant of $67,500 will fund an annual educational program on workplace management and business practices that result in improved audiological care for patients of all ages.

In making this announcement, Danielson explained that the idea had germinated following the Audiology and Industry Forum in 2010. “During the meeting, many participants were vocal about the growing need for profession-wide education in business skills as a complement to audiologists’ clinical, technical, and scientific skills,” he stated. “Since the Foundation funds offerings at convention as part of its educational mission, the next step was to explore funding and implementation of a new multiyear lectureship program. Last fall, Mike Orscheln, Phonak’s president and CEO, and Dianne Meyer, then-chair of the Foundation board, began discussion about a possible industry partnership…and the rest, as they say, is history! On behalf of the Foundation board, I extend great appreciation to both of them for their leadership on this project. And of course, the Foundation thanks Phonak for the generous gift that will allow us to move forward with the lectureship at AudiologyNOW! next spring in Boston.”

This annual presentation will focus on practical skills for audiologists in a variety of practice settings who strive to improve audiology treatment delivery. Some topics under consideration include the development and implementation of interpersonal and business practices that engage patients resulting in interaction that improve diagnosis and care, and ways that principles of patient psychology can be incorporated into different health-care delivery models. These topics may be discussed within the context of finance, human resources, time management, quality control, marketing and other management concepts. In brief, the ultimate goal is to provide audiologists with additional skills that ensure that those with hearing impairment receive the highest level of hearing health care and that audiologists are better equipped to provide that care.

Commenting on the announcement, Orscheln said, “Phonak is very excited to be engaged with the AAA Foundation to launch this dynamic lectureship. I am proud of the collaborative approach we took with Dianne Meyer and Kathleen Devlin Culver of the Foundation to bring this to fruition.”

Look for more information on this exciting new lectureship series in the coming months. And again, the Foundation extends thanks and appreciation to the Phonak team for their support of this important educational opportunity.
2011 Research Grants in Hearing and Balance Recipients

The AAA Foundation presented each of the following researchers with a Research Grant in Hearing and Balance at AudiologyNOW!® 2011. Congratulations!

New Investigator Grants

Kristi A. Buckley, PhD
State University of New York at Buffalo
Sensory Integration and Sensory Interference in Individuals with Hearing Impairment and Individuals with Normal Hearing

Yu-Hsiang Wu, MD, PhD
University of Iowa
Establishing a Conceptual Model of the Acceptable Noise-Level Test

Student Investigator Grants

Karolina Charaziak, MS
Northwestern University
Relating Physiological and Perceptual Measures of Frequency Selectivity

Michelle Hsieh, AuD
University of Texas at Austin
Physiological and Psychoacoustical Sensitivity to Amplitude and Frequency Modulation in Normally Hearing and Hearing-Impaired Listeners

Student Summer Research Fellowship

Kensi M. Cobb, BA
East Carolina University
Effect of Altered Auditory Feedback on Stuttering Duration and Type in Adults Who Stutter During Conversation

Vestibular Research Grant For Student Investigator*

Gary C. Gaines, II, AuD/PhD Candidate
East Carolina University
Neural Generators of Mammalian Vestibular Responses to Linear Head Motion

* This grant is funded in partnership with this American Institute of Balance Education Foundation.

State Academies! Apply Now for Science Fair Award Funding

Looking for a way to recruit the audiologists of tomorrow? Attend your local or state science fair! Science fairs are a great way to introduce students to the audiology profession while recognizing research excellence in the hearing sciences. To facilitate nationwide involvement, the Foundation is allocating funds to state academies to provide awards for high school science fairs. Don’t miss this exciting chance to share your rewarding profession with a future hearing scientist! For more information, visit www.audiology.org/resources/recruitment or www.audiologyfoundation.org.
What made you first decide to donate to the American Academy of Audiology Foundation?
Early in my career, I worked with a physician whose philosophy was that “giving back” was mandatory. He actually encouraged and insisted that all of us in the office pick charities to receive donations and included many with which I was familiar. It was only a hop, skip, and jump away to realize that we also had to “give back” to our profession. Donating to the Foundation allows me to have a hand in helping those in need, helping doctoral candidates, and helping students. The goal of giving back to our profession is such a worthy one that it surprises me that everyone is not donating. Similar to other nonprofits, every dollar counts, so I would encourage all members of the Academy to “give back” with a gift to the AAAF. Every single dollar counts.

Is there an aspect to the Foundation’s mission that you especially like or programs that you like to support?
Earmarking contributions is one way to make sure that some of the dollars you donate go to an effort in which you believe. As a former member of the ABA board of governors, I have restricted past gifts to support pediatric audiology, which supported the development of the ABA pediatric audiology specialty certification. Foundation support helped get the initiative off to a good start. And by the way, the second go round of this exam for specialty certification is scheduled for this fall, and I am thrilled my donation has contributed to this ongoing success.

What do you think will change about the Foundation over the next five to ten years?
The Foundation has moved ahead and this year at AudiologyNOW! rocked its roots! We had an opportunity to bid on guitars signed by luminary rock stars, food baskets, and audiology tools. And the end result is that some doctoral student may receive some funding, some student may find he/she can attend AudiologyNOW!, and more support for other worthwhile causes funded by the Foundation. What a thrill to be a part of this! So perhaps next year, the Foundation will fund a seat at some university studying the effects of noise at some of the parties thrown at AudiologyNOW! Since they are preceded by increasing noise levels and are based on some fun, likely we will find out that the damage risk is minimal and a good time will be had by all.

What would you tell someone who is thinking about donating to the Foundation?
Join us next year at the Happy Hour with a View and find out how many of your fellow audiologists support the AAAF.

Now for something fun! We know audiologists rock, so if you had a band, what would you name it?
Name a rock band? So not my thing!
The Ear Aches? 😄
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Contact Christy Hanson at chanson@audiology.org or 703-226-1062 for more information or to place an ad.

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Contact Sarah Sebastian at ssebastian@audiology.org for more information.

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A Full Line Of Tinnitus Masker Products

One of the most advanced hearing instruments on the planet just got a lot better. We have incorporated advanced digital signal processing technology into our EVoK and Olé series to help tinnitus sufferers. By implementing input referred masking levels and by giving users the ability to choose when and where to use it, we have created the perfect device for Tinnitus patients with or without accompanying hearing loss.

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<tbody>
<tr>
<td>• Tri-Mode Layered Noise Reduction</td>
<td>• Compression, threshold and output adjustments in 8 channels</td>
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<tr>
<td>• Data-Logging</td>
<td>• Gain adjustments in 12 channels</td>
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<tr>
<td>• Feedback Shield</td>
<td>• Up to 4 masker programs for varying levels</td>
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<tr>
<td>• Telesolutions</td>
<td>• Volume control for setting desired masking level</td>
</tr>
<tr>
<td>• Focus-Mic System</td>
<td>• Independent Masker or combination hearing device</td>
</tr>
<tr>
<td>• Dynamic Speech Enhancement</td>
<td>• Available in ITE, ITC, RIC, BTE, and OTE models</td>
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<tr>
<td>• SpeechPro Auto Fit</td>
<td></td>
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