Agil takes speech understanding in difficult situations to a new level with Speech Guard signal processing technology.

Clinical tests have shown that Oticon Agil delivers improved speech understanding, providing:

1.4 dB more clarity

16-18% more words understood

This gives your patients more energy to follow, participate and engage in the conversation!

Speech Guard automatically adjusts gain level in changing environments without the speech distortions of traditional compression systems.
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1.4 dB more clarity
16-18% more words understood

This gives your patients more energy to follow, participate and engage in the conversation!

Speech Guard automatically adjusts gain level in changing environments without the speech distortions of traditional compression systems.

For more information about Agil, visit us at www.oticonusa.com or call us at 1.800.526.3921.

Conventional WDRC

The more energy used to understand speech, the less there is to remember, reflect and respond.

Oticon Agil

By demanding less energy to understand speech, Oticon Agil frees up more energy to remember, reflect and respond.

10-12% less listening effort required

Patients who have tried Oticon Agil notice an almost immediate difference between their current instruments and Agil. It's a whole new way of preserving the natural dynamics of sound.

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The custom hearing instrument that is changing the industry

Significantly smaller than conventional custom products and able to fit a wide range of patients, the ReSound Alera Remote Microphone is a revolutionary new design. It uses the ear’s natural contours and a single microphone to deliver superior sound quality, outstanding speech recognition and virtually eliminates wind noise.

- Technology platform for superior sound
- Simple to fit, easy to use
- Robust out-of-the-box features
- Wireless Fitting and Wireless Accessories
- Flexible, reliable, durable

A dramatically different custom hearing instrument.

www.gnresound.com/remotemic
The Contribution of Genetics to Hearing Impairment  What has become clear since the chromosomal location of the first gene for deafness was found in 1988, and in the two decades of research done since, is that the variety of genes and the proteins they encode is astounding.

By Karen B. Avraham

Stay on Target? Audibility and Real-Ear Measurements  The focus on gain and targets has obscured the most important part of the real-ear measurement—audibility. The topic of audibility is familiar; after all, a primary goal of fitting hearing aids is restoring the audibility of average speech. Yet audibility is not a commonly observed metric in many clinics today.

By Jason A. Galster

Public Health in Audiology  Expand your awareness of public health and learn examples of public health domains in audiology that may suggest how we as a profession can improve our “public health footprint.”

By Christopher Spankovich

AudiologyNOW!® 2011 Keynote Address—Hello to Humor and Goodbye to Burnout  Jody Urquhart, the keynote presenter at this year’s AudiologyNOW! general assembly in Chicago, has extensive experience speaking to and consulting with health-care groups. Audiologists, like many other health-care professionals, face stress on a daily basis and are often faced with professional “burnout.”

By David Fabry

Risks Faced by Recreational Firearm Users  The level of impulse noise generated by almost all firearms exceeds the 140 dB peak SPL limit recommended by OSHA and NIOSH. Studies of the shooting habits of recreational firearm users indicate that many of these shooters are at risk to acquire NIHL. The present study provides information about the shooting habits of recreational firearm users that will help audiologists provide better hearing conservation services to this population.

By Michael Stewart, Lauren Foley, Mark Lehman, and Andrea Gerlach
The American Academy of Audiology publishes Audiology Today (AT) as a means of communicating information among its members about all aspects of audiology and related topics. AT provides comprehensive reporting on topics relevant to audiology, including clinical activities and hearing research, current events, news items, professional issues, individual-institutional-organizational announcements, and other areas within the scope of practice of audiology.

Send article ideas, submissions, questions, and concerns to amiedema@audiology.org.

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Happy Birthday, PAC-Man!

Hard to believe but it’s true:

I just came across an article about Pac-Man™ celebrating his 30th birthday this past year. To me, it seems just like yesterday that my kids and their buddies would get together after school and play Pac-Man until I said, “Enough! Time for homework!” Although I must confess that I miss hearing the electronic synthesized arcade music that accompanied Pac-Man, I don’t miss the “nagging mom” role I used to play until all of the Kricos kids left the nest. However, this reminiscence inspires me to nag regarding another important PAC, namely, the Academy’s Political Action Committee.

Like all PACs, ours relies on voluntary member contributions and are not tax-deductible. What they are, though, is absolutely essential for the profession of audiology. Our congressional representatives make decisions every year that affect the value and stability of our profession, our ability to provide quality services to our patients, our qualifications to carry out our scope of practice, and our financial success. Your PAC contributions support and protect the profession. They enable the Academy to interact with and influence congressional decision makers.

Our PAC dollars help supportive congressmen and women get the word out to their colleagues about the importance of our profession and its political issues, and, yes, in many cases, these financial contributions will help them to get reelected, which in turn, benefits us by their continued advocacy support. With your support of the PAC, the Academy can work more efficiently on behalf of its members to promote and protect our legislative causes.

This year, there are many new faces in Congress, so now is a perfect time to inform newly elected legislators about the profession of audiology and its value to U.S. citizens. Please donate today! Contributions by individuals to federal PACs are limited to $5,000 per year. If $5,000 is too steep for your budget, think about this: even a yearly $50 donation (equal these days to the cost of dinner and a movie for two) can help significantly to ensure that our initiatives are heard on Capitol Hill. But remember, the greater the amount you can afford to contribute, the more likely we will be able to push our positions in Washington, DC. So contribute as much as you comfortably can. Help us achieve our PAC goal for 2011.

Speaking of PUSH, that was our PAC’s slogan this past year (see our PUSH the PAC! Web page), and we came close to meeting our goal. How about this year if we shoot for the sky and go OVER our goal? Stay tuned for our spring 2011 PAC campaign as we prepare for the start of the 112th Congress. And before I close, kudos to Gyl Kasewurm, chair of our Academy PAC Advisory Board, and to members of the advisory board, as well to Academy staff members Steve Taylor, Kate Thomas, and Melissa Sinden for their tenacious efforts to push the PAC!

Patti Kricos, PhD
President
American Academy of Audiology

Patti Kricos, PhD
President
American Academy of Audiology
What’s hard on the outside, soft in the middle, and a sweet solution to fitting a RIC?

The answer to this riddle—and to the riddle of how to fit more patients with receiver-in-canal instruments—is found in our revolutionary new RIC custom-fit earpieces.

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- Allows virtually any style of Westone earpiece to be used for a RIC fitting, including canal-locks, skeletons and shell-style earpieces
- Provides better retention and a more secure fit for most patients
- Westone RIC earpieces are designed for each specific model of RIC hearing instrument

Now, the challenges of fitting a RIC have a sweet solution! Contact us to learn more.
Small or Tall?

Throughout life, we use points of reference for comparison purposes both personally and professionally. My son, Justin (age 14), has wanted to compare his height to mine in recent years, eagerly anticipating the moment he could say he was taller than me. Using a quantitative measure to benchmark performance can also be instrumental for improvement. For example, a student’s GPA can provide an incentive to spend more focused time studying if it is lagging.

The same is true for associations. Comparing the Academy and the profession of audiology with other organizations/professions in a variety of areas helps to benchmark our current “size” as well as potential for growth. In some areas, we might see that we are lagging behind others. The data might serve as motivation for Academy members to achieve higher outcomes in a given area.

As part of a recent decision-making process, Academy leadership reviewed data (collected from Web sites and public IRS documents) comparing the Academy with several professional societies. They noted:

- Of the six, the Academy has one of the smallest budgets.
- Audiology is the smallest of the six professions considered; in fact, the total population of audiologists is still only half of the next largest profession.

|----------------------------------------------|-----------------------|---------------------------------------------|--------------------------------|----------------------------------|
| American Speech-Language-Hearing Association1 | $45,692,143           | 135,972 (11,824 AUDs; 115,415 SLPs and others) | 110,000/121,0004               | $57,710-Median  
46,360-$72,410-Middle 50%4    |
| American Physical Therapy Association1      | $32,001,962           | 74,000                                       | 173,000/220,000                | $66,200-Median  
55,030-$78,080-Middle 50%     |
| American Optometric Association1            | $18,874,723           | 36,000                                       | 33,000/36,000                  | $91,040-Median  
66,530-$118,490-Middle 50%    |
| American Occupational Therapy Association2  | $13,241,906           | 41,434                                       | 99,000/122,000                 | $60,470-Median  
50,450-$73,710-Middle 50%     |
| American Academy of Audiology2             | $7,059,549            | 10,600                                       | 12,000/13,000                  | $57,120-Median  
47,220-$70,940-Middle 50%     |
| American Chiropractic Association3          | $5,369,871            | 15,000                                       | 53,000/60,000                  | $65,220-Median  
45,710-$96,500-Middle 50%     |

1 Budget year ending 12-31-08; 2 Budget year ending 6-30-09; 3 Budget year ending 9-30-08; 4 SLPs only; 5 Source: Occupational Outlook Handbook 2008–2009
For some organizations, membership is only half of the total population whereas the Academy’s membership is approximately 73 percent of the total number of audiologists.

Most professions have one representing organization; audiology has two.

The Academy’s PAC is the equivalent of each member contributing $11; however, only 10 percent of members contribute to the PAC, averaging $100.

The Academy has the smallest number of professional staff of the six organizations.

What can we learn from these benchmarks?

While the initiatives of the larger professions/organizations are appealing, the Academy needs to acknowledge its smaller size and operate within its resources.

A small profession means a small budget for the professional society and fewer staff to implement the Academy’s strategies.

Due to our relatively small size, it is critical to have sufficient reserves to protect the Academy from unexpected financial downturns. Building financial reserves is an Academy board priority.

The size of our PAC resources indicates a much needed area for improvement. Read President Kricos’ column on page 8 for more details.

These data can motivate each of us to consider how to grow the profession of audiology, if we want to accomplish more as the professional society. Although small, the Academy can also be mighty with lofty but attainable goals predicated on 100 percent membership participation.

And, for the record, my son Justin surpassed me in height at age 13.

Cheryl Kreider Carey, CAE
Executive Director
American Academy of Audiology

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<td>$225-Certified members, $135-Grad students, $84-Members w/out certification, $199-Certified nonmembers, $64-Life members, $130-International affiliates</td>
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<td>$295-PTs, $190-PTAs, $80-Students/PTs or PTAs, $150-Postprofessional students</td>
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<td>$768 plus state dues, which vary from $500 to close to $1,550</td>
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<td>$225 OTs (1st year $119, 2nd year $175), $131-OTAs (1st year $100, 2nd year $120), $75-Students, $231-Associates, $387-Individuals</td>
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<td>$265-Fellow members and affiliates ($165-1st year after grad, $200-2nd year after grad, $265-3rd year after grad), $165 + mail fee-International, $159-Life members, $55-Students</td>
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<td>$639-Individuals in practice more than 5 years after grad (Free-1st year after grad, $122-2nd year after grad, $244-3rd year after grad, $366-4th year after grad, $488-5th year after grad), $160-International, $319.50-Life members, $60-Students</td>
<td>$355,610</td>
<td>37</td>
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Are you considering making a change to electronic medical records (EMRs)? Have you considered the benefits that an EMR system could bring to your practice?

Medical professions are moving toward a completely electronic record keeping system. The adoption rate of EMR systems by medical professionals will continue to see marked growth in the next four years due to the incentives that physicians have access to through the American Recovery and Reinvestment Act of 2009 (American Medical Association, 2009). Early adopters of electronic medical records can be eligible for Medicare incentive payments of up to $18,000, for eligible providers (EPs). In addition, physicians who choose not to adopt an EMR system will be penalized by a reduction in Medicare reimbursement by the year 2015.

Although audiologists do not qualify for these incentives, as they are not considered eligible providers at this time, practices may need to consider implementing an electronic medical records system to maintain an image similar to that of other medical professions. Consider the advantages an EMR system can bring to your office:

1. **Accessibility:** Electronic medical records can be safely stored, are HIPAA compliant, and are accessed through secure connections. Access can also be given to your patients through password-protected secure connections. For offices with multiple locations, the records can be accessed easily without the need to transport charts and fax records needed for appointments.

2. **Storage:** Office space can be at a premium, and by reducing the amount of space needed for storage of records, you can free up additional space to expand your practice.

3. **Internal Marketing:** Electronic medical records can improve your ability to access your existing patients. Tracking patients based on key indicators can be built into the software. EMRs can reduce the need to maintain a separate database. Patient information can be accessed to generate birthday cards, reminder notices, mailers, referral letters, and events.

4. **Efficiency:** Improve efficiency of office staff and free time within your schedule by using the tools within the EMR system for internal marketing, data entry, scheduling,
and billing. Simply reducing the need to pull, file, and maintain a paper record can make your office staff significantly more efficient, freeing time to focus on other revenue producing endeavors.

5. Environmental Friendliness:
Reduction of paper products not only benefits the environment but also can improve your bottom line.

Now that you have considered the advantages of using an electronic medical records system, do you feel an EMR system is right for your practice? Before you are able to answer this question you will need to evaluate the different EMR systems available. Research the systems that are used by professionals in your area to determine if it may be possible to link into their systems, further streamlining the referral process and communication of results.

Once you have gathered all of your facts, do a cost analysis of this option to determine if you are ready to make the switch. Understand that converting from a paper system to an electronic system will take time. Making the commitment and leaving the paper behind can be intimidating.

The benefits that an electronic medical records system can bring to your business can not only benefit you in the present but can catapult your business into the future by creating a positive image, maintaining a strong relationships with referral sources, and decreasing the inefficiencies in your office.

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

Illustration by Johanna van der Sterre.

Reference
Get in the Hearing Loop

Douglas Beck, AuD, and David Fabry, PhD, offer a terrific vision of improved connectivity with “a universal standard for communication that is low cost, easy to use, acceptable, seamless, and effective” (Audiology Today, January/February 2011). As a consumer advocate for hearing aid compatible assistive listening, that’s my vision as well. Moreover, it’s one we’ve already achieved in West Michigan.

Looped facilities here, which include my worship place, airport, campus auditoriums, home TV room, and office phone, seamlessly deliver crystal clear sound via telecoil-equipped hearing aids. Because the magnetic signal communicates universally to most new hearing aids and cochlear implants sold here, virtually anyone can benefit.

With my hearing instruments serving an important second function—as customized, wireless loudspeakers—I now love the hearing technology I once barely tolerated. Moreover, with my M+T setting, I can hear room conversation or the doorbell ringing, even while my TV broadcasts via my in-the-ear loudspeakers.

Thanks to initiatives in various states and cities, hearing loops are now spreading to other parts of the country. New hearing loop vendors are manufacturing and marketing product. With new installations ranging from the very big (the 12,200 fixed seats in Michigan State University’s basketball arena) to the very small (New York City’s subway information booths), more and more people are experiencing hearing aid compatible assistive listening. New hearing loop articles are appearing in newspapers and magazines, from the AARP Bulletin to the leading audio contractors’ trade magazine.

It’s true that the United States lags behind the Scandinavian countries and Britain, where hearing loops are becoming omnipresent (they’re now in all London taxis, in most churches and cathedrals, and at tens of thousands of post office windows, pharmacy counters, and the like). But with the support of this year’s joint Academy/HLAA “Get in the Hearing Loop” campaign, to be climaxed by a 2nd International Hearing Loops meeting next June, now is the time to seize Beck and Fabry’s vision.

“The best system is simply ‘the one that is used,’” add Beck and Fabry. Amen! And that is the number-one argument for hearing loops that communicate via telecoils. No need for conspicuous headsets. No need to locate and check out special receivers. No need to master special equipment. Folks need only activate their telecoils—the same simple, seamless technology that serves them for telephone listening as well.

Will some alternative future technology similarly offer us clear sound via simple, miniaturized, universal, low-cost, no-power receivers that can work in both small and large areas and with most phones? If so, bring it on! In the meantime, today’s Brits, Scandinavians, and more and more Americans have realized the Beck and Fabry vision, and they’re loving it.

David G. Myers
Hope College
Whatever your OAE needs, the choice is easy

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### MARCH

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<td>16</td>
<td><strong>Online Hotel Registrations/Changes Deadline</strong> Audiologynow® 2011&lt;br&gt;www.audiologynow.org</td>
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<tr>
<td>16</td>
<td><strong>eAudiology Web Seminar—Global Humanitarian Audiology: The Next Step</strong> (.1 CEUs)&lt;br&gt;1:00–2:00 pm ET&lt;br&gt;www.eaudiology.org</td>
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<td>18</td>
<td><strong>Badge Mailing Deadline</strong> Audiologynow® 2011&lt;br&gt;www.audiologynow.org</td>
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<td>18–19</td>
<td><strong>Speech-Language-Hearing Association of Virginia Annual Conference</strong>&lt;br&gt;Richmond, VA&lt;br&gt;www.shav.org</td>
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<td>31</td>
<td><strong>Advance Registration Deadline/Last Day to Cancel Registration for Refund</strong> Audiologynow® 2011&lt;br&gt;www.audiologynow.org</td>
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### APRIL

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<td>6</td>
<td><strong>Academy Research Conference 2011: Current Trends in the Evaluation of Tinnitus</strong>&lt;br&gt;Chicago, IL&lt;br&gt;www.academyresearchconference.org</td>
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<td>6–9</td>
<td><strong>Audiologynow®</strong>&lt;br&gt;Chicago, IL&lt;br&gt;www.audiologynow.org</td>
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<td>11</td>
<td><strong>Rhode Island Hearing Assessment Program 17th Annual Seminar</strong>&lt;br&gt;Warwick, RI&lt;br&gt;<a href="https://secure1.carenewengland.org/events/?id=006">https://secure1.carenewengland.org/events/?id=006</a></td>
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<td>28</td>
<td><strong>eAudiology Web Seminar—How Well Can Bilateral CI Users Combine Inputs from the Two Ears?</strong> (.1 CEUs)&lt;br&gt;7:30–8:30 pm ET&lt;br&gt;www.eaudiology.org</td>
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Why miss a decibel of life?

Introducing Siemens iMini™. There’s CIC, and then there’s the invisible iMini.

Advanced hearing technology in its tiniest and most colorful form.
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The American Academy of Audiology’s bylaws, code of ethics, strategic plan, position statements, guidelines, reports, and scope of practice are key strategic documents essential to the Academy and the audiology profession. These resources and more, organized by topic, can be found on the Academy’s Web site.

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What has become clear since the chromosomal location for the first gene for deafness was found in 1988, and in the two decades of research done since, is that the variety of genes and the proteins they encode is astounding.
Genetics is a mystery on many fronts, but remains at the core of our very being. How we look, act, and, ultimately, the cause of many of our disorders and diseases, are due to the genes and their mutations we carry in our bodies. Hearing impairment, or deafness in its most severe form, is no exception. Approximately 60 percent of hearing loss (HL) is estimated to be due to mutations in genes. This is further broken down into syndromic HL, estimated at about 30 percent of genetic HL, and nonsyndromic HL (NSHL), comprising about 70 percent of hereditary HL.

At least 400 syndromes have been described with HL, with the more prevalent ones being Usher syndrome and Waardenburg syndrome. NSHL encompasses different ages of onset and variation in hearing levels and may be accompanied by balance disorders. NSHL is further broken down into different modes of inheritance—recessive, dominant, X-linked, Y-linked, and mitochondrial. In recessive inheritance, both parents carry a mutation, although they themselves do not express the disorder. Each child has a 25 percent chance of inheriting both mutations, all of whom will suffer from HL. The most common form of recessive HL is due to mutations in the connexin 26 gene (Kelsell et al, 1997), which encodes a protein that forms gap junctions between cells of the inner ear. These gap junctions allow crucial molecules, such as ions, to move from cell to cell. In dominantly inherited HL, the HL passes from generation to generation, as it is enough for the parent with a mutation (and hence the disorder) to pass on the mutation to the next generation. Each child has a 50 percent chance of inheriting this mutation. There is no one prevalent form of dominant HL in the world. X- and Y-linked HL are quite...
The Contribution of Genetics to Hearing Impairment

Mitochondrial mutations are carried though the mother. One particular mutation makes people carrying them susceptible to hearing damage if exposed to aminoglycosidases (Estivill et al, 1998).

What has become clear since the chromosomal location of the first gene for deafness was found in 1988, and in the two decades of research done since, is that the variety of genes and the proteins they encode is astounding. Others may find that this is not surprising at all, since the inner ear is a complex organ, requiring many different levels of regulation, and tissue types and cells. Genes with mutations leading to HL encode for proteins that are found in the stria vascularis, the hair cells, the supporting cells, and the tectorial membrane. A defective protein in any one of these areas will impair the function of this cell type. For example, mutations in TECTA, associated with dominant HL and expressed in the tectorial membrane, leads to abnormalities in the striated sheet matrix of this region of the inner ear, subsequently causing HL (Verhoeven et al, 1998).

Why study the genetics of HL? There are both immediate and more long-term reasons to do so. First, the discovery of a specific mutation may allow predictions regarding progression of the HL. Will the hearing impairment remain an isolated problem, or will blindness follow? For example, identification of a specific PCDH15 mutation in children predicts that it is extremely likely that the child, thus far diagnosed only with a profound HL, will begin to lose his or her sight at about the age of 10 due to retinitis pigmentosa (RP) (Ben-Yosef et al, 2003). The discovery of a connexin 26 mutation in a child suggests that the HL will not change dramatically over time. Alternatively, a MYO6 mutation suggests that the HL will indeed be progressive.

The identification of a mutation allows genetic counselors to make predictions regarding the HL in future children. It provides the family with a known cause for the HL. And for the scientist, discovery of the genes associated with HL enables them to learn how the inner ear functions. For example, the identification of CDH23 and
The Contribution of Genetics to Hearing Impairment

FIGURE 1. The chromosomal location of genes with mutations causing hearing impairment. The genes labeled in red contain mutations inherited recessively; the genes labeled in blue are inherited in a dominant fashion. X-linked genes are shown in black and syndromic HL genes are shown in green. Interestingly enough, there are genes with mutations leading to both syndromic and nonsyndromic HL, shown in light blue.

The Contribution of Genetics to Hearing Impairment

PCDH15 mutations in human patients led to the discovery that the tip link, the connector between the stereocilia, is made up of the proteins these genes encode. Finally, knowing how and why the cascade of proper hearing fails is leading to the development of therapeutics based on genetics. For example, the insertion of a viral vector containing a transcription factor, Atoh1, was able to rescue hair cells in the inner ears of deafened guinea pigs (Izumikawa et al, 2005).

To date, 54 genes are known to contain mutations that lead to various forms of HL. They are distributed throughout the human genome, as can be seen on the chromosomes shown in Figure 1. Each gene encodes a protein with a specific function. Most compelling, this research has taught us an incredible amount about different regions of the inner ear.

One recent discovery centers around a large Israeli family (Walsh et al, 2010). Pure tone audiometry demonstrated HL with onset in the 30s. The HL was progressive, initially at high frequencies and eventually reaching severe to profound HL at all frequencies. There was no association with vestibular defects. Chromosomal mapping revealed that the gene for the HL in the family was on chromosome 9. Sequencing of the genes in the region, which reads the nucleotide pattern of DNA of the gene, did not reveal any mutations in DNA derived from hearing impaired family members when compared to DNA from hearing individuals. A new technique, named arrayCGH, was subsequently used to discover a duplication of a gene named TJP2. This gene encodes a protein that is present at the junctions of cells and is crucial for the separation between endolymphatic and perilymphatic fluids of the inner ear. Experiments on blood cells derived from hearing impaired family members revealed that these cells have increased levels of proteins that lead to apoptosis, or death, of cells. Though there is no access to the inner ears of these patients, we predict there is similar damage to the hair cells. This example is one of the first where the pathway leading to hair cell death has been determined. Where does this all lead? Today, we can only predict which family members will lose their hearing prior to the loss. In the future, however, therapeutics may be developed that target the mechanism for hair cell loss and thus delay or prevent the onset of the HL.

Many more genes responsible for HL remain to be found. New techniques, including the revolutionary “deep sequencing,” where we can sequence the entire genome of an individual in one go, is paving the path for more discoveries. The mystery of the genetics of HL may soon be solved, heralding the path for a deeper understanding of the causes of hearing impairment.

Karen B. Avraham, PhD, is a full professor in the Department of Human Molecular Genetics and Biochemistry at Tel Aviv University, vice dean of the Sackler Faculty of Medicine, and president of the Association for Research in Otolaryngology (ARO).

References


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The focus on gain and targets has obscured the most important part of the real-ear measurement—audibility. The topic of audibility is familiar; after all, a primary goal of fitting hearing aids is restoring the audibility of average speech. Yet audibility is not a commonly observed metric in many clinics today.

Recently, the results of multiple surveys have suggested that the use of real-ear probe-microphone measures in the United States may be growing, if only slightly (Kirkwood, 2010; Mueller and Picou, 2010). However, when talking with audiologists, there continues to be some confusion related to the need for routine-real-ear measurement. Take Australia, for instance. For an audiologist to be reimbursed by the government for the sale of hearing aids, that audiologist must document the fitting with a real-ear measurement. This means that it is routine practice for Australian audiologists to do real-ear measures. Yet on a recent trip to Australia, I spoke with audiologists who are not doing real-ear measures with private-pay patients. These audiologists choose only to do real-ear measures when the government requires the documentation. So I began to ask questions, and my anecdotal experience from these and other discussions suggests that if you ask some audiologists why they do a real-ear measurement, they will respond in one of two ways:

1. Real-ear measures are done as a means of matching prescribed targets.

2. Real-ear measures help to verify that hearing aid gain is appropriate for the patient.

While both statements are correct, they are highly reflective of the methods we have used to teach real-ear measurement for years. The focus on gain and targets has obscured the most important goal of the real-ear measurement—ensuring audibility.
Starting with the topic of prescriptive targets, audiologists have been provided with a number of independently derived prescriptive formulae, such as the desired senation level (DSL i/o) and a non-linear formula from Australia’s National Acoustics Laboratory (NAL-NL1). Their successors, DSL 5.0 and NAL-NL2, are being made publicly available. Both are steps forward in the evolutionary process of understanding the needs of the impaired auditory system and will bring with them supporting evidence for clinical application (Polonenko et al, 2010). The targets generated by these formulae are a statistical generation—a method of quantifying the relationship between an appropriate amount of amplified sound and the patient’s audiometric data. By matching prescribed targets at the start of a fitting, the amplified sound will be audible and comfortable, keeping a wide range of inputs within the patient’s residual dynamic range. However, not all patients will tolerate the sound quality or loudness of a prescriptively appropriate fitting—and that’s not a problem. Adjusting a hearing aid to optimize subjective sound quality after meeting prescribed targets is not heresy. Part of an audiologist’s role is to ensure that patients wear their hearing aids. However, when adjusting a hearing aid’s response, maintenance of audibility must be a concern.

A common question from clinical practitioners is “Where is the evidence that real-ear is beneficial?” The process of doing real-ear measures is not a magical formula that yields success. The question that should be asked regarding real-ear measurement is “Are patients successful when audibility is ensured?” This is a much different question—one supported by years of robust research—and the answer is an overwhelming yes. Audibility is a crucial component of success. In fact, the Speech Intelligibility Index can be used to predict speech recognition ability based on measures of audibility (ANSI S3.5-1997; ANSI, 1997). If a hearing aid fitting isn’t providing an audible response, patients will not have access to the many acoustic cues that improve speech understanding (Moore et al, 2008), improve awareness of environmental sounds, and improve spatial awareness of sounds (Ahlstrom et al, 2009; Best et al, 2010). All of these are factors that combine to yield success and are contingent upon audibility.

The topic of audibility is familiar; after all, a primary goal of fitting hearing aids is restoring the audibility of...
conversational speech. Yet audibility is not a commonly quantified metric in many clinics today. In fact, any measure of gain (e.g., real-ear insertion gain [REIG] or real-ear aided gain [REAG]) will not be displayed with a reference to audibility. In other words, the on-screen display will show the prescribed targets, but there is no reference to the patient’s thresholds. This means that if the hearing aid is turned down, or the frequency response rolls off in the high frequencies, there is no method for quantifying when that hearing aid response drops below the threshold of audibility for that patient.

In today’s real-ear measurement equipment and manufacturers’ programming software, the default view and the data collected must reference an SPL value in order to illustrate the audibility of a hearing aid fitting. Looking at real-ear measures taken from an Audioscan Verifit helps to illustrate this point. FIGURE 1 shows a screen capture from a measurement of the REIG. The red arrow points to the REIG of a typical hearing aid fitting. The magenta response curve is the REIG with an excellent match to the NAL-NL1 targets generated for a 65 dB input. The green response curve below the magenta curve is the same hearing aid best fit to the manufacturer’s default NAL-NL1 settings. In this example, the default NAL-NL1 settings underfit the Audioscan targets: with simple adjustments, the same hearing aid easily matched these prescribed targets.

However, a patient may make comments related to sound quality or comfort. This patient may even prefer the default fitting (green) over the adjusted fitting (magenta). If the patient were to wear the “preferred” green response, would they have appropriate access to audible, conversational speech? The answer to that question is not available when the measured response is reported in gain.

FIGURE 2 shows a recording of the real-ear aided response (REAR) from the same hearing aid using the same Audioscan Verifit. Looking at FIGURE 2, differences are immediately apparent. First, the scale is in dB SPL, and second, the patient’s audiogram, converted to dB SPL, is shown in blue. Again, with manual adjustment, the hearing aid response matches the NAL-NL1 prescribed targets. Now with the audiogram as a reference point, it can be seen that the default NAL-NL1 response falls below the threshold of audibility at approximately 3,000 Hz. If a patient’s requests for reduced amplification resulted in a fitting that compromised audibility above 3,000 Hz, would you counsel differently? My personal answer is yes. My counseling strategies now include showing the patient his or her aided response recordings. As I make adjustments, I counsel that patient on the relationship of the hearing aid output to the audiogram, attempting to maintain broadband audibility whenever possible.

It should be noted that the response curve of the hearing aid shown in FIGURE 2 is the average response for a 65 dB speech stimulus. If this average response falls below the audiogram at a given frequency, it does not mean that all speech at that frequency is inaudible; it simply means that average speech in that frequency range, for that talker, has fallen below the audiometric thresholds. If a 30 dB dynamic range is assumed for speech (+15/−15 around the average), it is likely that some components of speech will be audible (ANSI S3.5-1997; ANSI, 1997). This is a consideration that will vary greatly across talkers and environments in the real world.

In many ways, referencing a hearing aid’s response in dB gain has become a point of comfort and habit for many audiologists. Unfortunately, it has also numbed many of us to the consideration of quantifying audibility in our hearing aid fittings. For future applications, it is entirely...
Stay on Target?

possible to derive a measure of minimum audible gain and superimpose these values onto the REIG and REAG response measurements, but this is not an approach that is currently available. Even if this were done, the REAR is the most basic measure of how a hearing aid performs in the patient's ear, and the patient’s audiogram is the fundamental reference for the prescription of a hearing aid. These two data sets can be used within a simple protocol:

1. Fit the hearing aid of your choice to the patient’s ear, ensuring that the earmold or earbud fits comfortably and is oriented appropriately inside the ear canal.

2. Select a fitting configuration (open vs. closed) in the manufacturer’s software and select your preferred prescriptive formula. This formula will need to be available in your real-ear equipment as well.

3. Set your real-ear equipment to record the real-ear aided response and select the same prescriptive formula that is being used in the manufacturer’s software.

4. Record the real-ear aided response, adjusting the hearing aid to match prescribed targets.

5. Present this information to the patient, pointing out the relationship of the hearing aid response to his or her audiogram. Inquire about sound quality and listening comfort.

6. If the patient requests adjustments to the prescribed response, adjust the response to address these comments while illustrating how these adjustments relate to the patient’s audiometric information. Most patients will understand that hearing aid output must be audible in order to provide appropriate benefit. If the patient has visual confirmation that he or she is requesting the hearing aid be turned down below the audiogram, this will help establish realistic expectations for that patient and may present an opportunity to develop a treatment plan that includes increasing audibility over time.

This discussion is a reminder that the fundamental goal during a hearing aid fitting is restoration of audibility of conversational speech. Prescriptive targets ensure that we meet the needs of our patients with regard to speech audibility, but these targets are only a part of the process. To ensure that a patient is successful with hearing aids, we must also optimize sound quality for the patient based on her specific needs and preferences. This individualized balance between ensuring audibility and optimizing sound quality is something that can only be achieved by measuring the hearing aid response in the patient’s ear.

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Public Health in Audiology

BY CHRISTOPHER SPANKOVICH

Expand your awareness of public health and learn examples of public health domains in audiology that may suggest how we as a profession can improve our “public health footprint.”

What do you think of when you hear the term public health? Maybe you think of HIV/AIDS, vaccines, Medicare, the CDC, or even the movie Outbreak! What if I asked you about public health in audiology? Perhaps you think of newborn hearing screenings, occupational noise standards, and direct access.

Public health surrounds us; it does not fall neatly into any category but does have principles that can serve to better audiology, and for audiology to better serve the hearing and balance needs of the public. The purpose of this article is to expand your awareness of public health, to offer examples of public health domains in audiology, and to suggest how we as a profession can improve our “public health footprint.”

The Institute of Medicine (IOM) in its 1988 report The Future of Public Health defined public health as “the fulfillment of society’s interest in assuring the conditions in which people can be healthy.” This definition was intentionally broad, as to capture the expanding substance and emphasis from early focus on sanitary measures to contemporary multidimensional health promotion. The drawback of such a broad definition is loss of distinctive meaning. The IOM goes on to discuss a more restricted definition of public health as “a coalition of professions united by a shared mission; with focus on disease prevention and health promotion; using a prospective approach in contrast to a reactive focus of medicine (and audiology); and founded in the common science—epidemiology (IOM, 1988).” The interested reader is encouraged to
review the entire report “The Future of Public Health” for a more in-depth exploration of this topic.

The edifice of public health is exemplified by the common infrastructure shared among schools of public health. I reviewed the curriculum of three top schools of public health in the United States, according to U.S. News & World Report: Johns Hopkins University, Harvard University, and UNC-Chapel Hill. Schools of Public Health are typically divided into departments with tracks of specific emphasis. These generally include some variation of behavioral science and health education, biostatistics, epidemiology, environmental and occupational health, health policy and management, and international/global health.

Behavioral Science and Health Education

Behavioral science and health education (BSHE) is a track of public health founded on the principles of psychology and health behavior theory. This area of study has broad implications for public health, including development of theory-based health interventions. Health theories are abundant and may apply to interpersonal (i.e., how one’s knowledge, attitudes, beliefs, and other traits affect behavior), intrapersonal (i.e., how our interactions with others, social identity, and normative expectations affect our behaviors), community-based (i.e., how regulations and policies can affect health behavior), and/or a combination of these relationships (as reviewed by Sobel and Meikle, 2008).

Principles from BSHE can provide us with the foundations to develop appropriate targeted interventions with measurable outcomes. An example of a successful application of BSHE in audiology is the Dangerous Decibels® campaign. This is an intervention targeted at children and adolescents to increase hearing conservation practices. This program was founded in a health behavior theory (in this case Theory of Reasoned Action), developed an intervention based on identified needs, and has ongoing evaluation of outcomes based on that theory (for more information see Griest et al, 2007). Other campaigns directed at children and teens exist related to noise and hearing conservation (Turn It to the Left®, Listen to Your Buds®, and Noisy Planet® to name a few), but how about other populations?

So much more needs to be done to improve hearing “public health” behaviors! For example, where are theory-based interventions for hearing conservation practices among young adults? How about older adults and prevention of falls? How can public health principles be applied in the diffusion of innovations such as hearing aids and tinnitus treatment? The literature suggests that we tend to stop at the point of looking at knowledge, attitudes, behaviors, and other traits without actually taking the next step of developing programs founded upon recognized theories with measurable outcomes. Hearing loss and dizziness are two of the top health conditions facing older adults, yet where are our public service announcement (PSA) campaigns, such as “Only You Can Prevent Hearing Loss,” “Hearing Is a Terrible Thing to Waste,” “This Is Your Cochlea…This is Your Cochlea on Noise…Any Questions,” “You Could Learn a Lot from a KEMAR,” “Give a Hoot…Wear Hearing Protection” (okay maybe the last two are stretch).
Biostatistics
Biostatistics is the science of obtaining, analyzing, and interpreting data. If you are in academia you likely have an appointed biostatistician (formally or self-educated) you run to for questions on data analysis. Can I use the standard error of the mean instead of the standard deviation? Biostatistics is not unique to public health but is a critical component in analyzing and interpreting public health outcomes. The other areas of interest discussed here are highly dependent on our friendly neighborhood biostatisticians.

Epidemiology
Epidemiology is the discipline focused on methods to understand patterns and causes of health and disease; it is considered the “mother science” of public health (IOM, 1988). Almost every day you can find an article online concerning an epidemiological study showing some relationship such as “dark chocolate reduces risk of heart disease” or “second-hand smoke increases risk of hearing loss.” Biostatistics and epidemiology have long been a part of hearing and balance research. However, in many instances of our literature, epidemiological studies are cross-sectional in a representative population and may only consider reported hearing loss or may be limited to a pure tone average (250–4000 Hz). Don’t we hear above 4000 Hz?

Larger multi-institutional longitudinal studies are needed to further understand diseases, genetics, dietary factors, and other variables involved in susceptibility to hearing loss and balance disorders. Audiologists need to be more involved in and contribute more to these areas. Knowledge of factors that influence population susceptibility to hearing and balance function enable the field to strategically plan for future research needs.

Health Policy and Management
Health policy and management is the track of public health that generates policy, standards, and regulations based on the outcomes of our research (well, hopefully). Audiology is already involved in a number of these issues including universal newborn hearing screening, noise standards and regulations, direct access to audiology, hearing aid tax, and others. Changes at this level can be more difficult to implement and are dependent on outcomes founded in theory and good science. The better the evidence, the stronger the support for updating regulations and policy. However, this step goes beyond the creation of policy and ultimately comes down to the health behavior of interest. For example, there are a number of occupational health standards and guidelines set forth by separate organizations (OSHA, NIOSH, etc.) for occupational noise exposure. But how well are they enforced? How often have you seen your luggage loading onto an airplane with a ground crew worker wearing brightly colored ear protection around their neck and not in their ears? Do we just blame the workers for insubordination? Or, do we try to develop a solution, perhaps with principles from BSHE?

Environmental and Occupational Health
Environmental and occupational health is fairly self-descriptive. Many environmental and work-related factors can affect our health. As audiologists, we are well aware of this. Noise, chemicals, drugs, and a host of other factors in our everyday environment and workplaces can increase risk for hearing loss and/or balance disorders. This influence of the environment and workplace on our hearing and balance incorporates principles and components from all areas of public health, as exemplified in the ground crew worker case above.

International/Global Health
International/global health expands public health beyond domestic concerns and takes into consideration global implications. Hearing loss is not only a leading public health concern in the United States but in both developed and undeveloped countries around the world. For example, let’s talk about multiple-drug resistant tuberculosis (MDR-TB). In the United States, the prevalence of MDR-TB is low, approximately 0.6 percent of all U.S.-born patients with TB (LoBue et al, 2010). In Eastern Europe, Asia, and Africa these numbers are much higher, in some areas over 30 percent of all TB cases being drug-resistant (Migliori et al, 2010). What does this have to do with audiology? One of the common treatments for MDR-TB is aminoglycoside drugs (Carminero et al, 2010). Aminoglycosides have well known ototoxic properties. Risk to hearing is exacerbated in countries with high rates of MDR-TB, minimal controls on dosing, and lack of audiological monitoring.

You and Public Health
Each of these disciplines represents a piece of public health. The final public health piece is you, the healthcare professionals on the front line or the researcher in the lab. I hope by reading this you are now thinking about how we audiologists, as a profession, can deepen our public health footprint. Our efforts may include improving interventions by using relevant health theories, enhancing epidemiological studies with
stronger methods, progressing policy and regulations
with evidence-based outcomes, and considering global
implications of hearing and balance health. These
public health principles are applicable to audiology as
a profession acting not only globally, but also locally
at the level of the individual audiologist. How can you
improve the hearing health of your individual patients
as well as your community?

This is your cochlea...This is your cochlea on noise...
Any questions? 

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Emerging epidemic of drug-resistant tuberculosis in Europe,
Russia, China, South America, and Asia: current status and

JODY URQUHART, the keynote presenter at this year’s AudiologyNOW!® general assembly in Chicago, has extensive experience speaking to and consulting with health-care groups. Audiologists, like many other health-care professionals, face stress on a daily basis and are often faced with professional “burnout.”

Hello to Humor and Goodbye to Burnout

BY DAVID FABRY
Laughter is a distinctly human trait; although many pet owners may beg to differ, there is no documented support that animals are capable of laughter. With that said, laughter is closely regulated by society in adult life, especially in the workplace. Children laugh an average of 300 times a day and that number drops to only 15 times a day by the time people reach age 35 (Laugh for No Reason, Kataria, 2005). Evidently, preschoolers must know something we don’t—laughter releases endorphins (a chemical 10 times more powerful than the pain-relieving drug morphine) into the body, with the same exhilarating effect as doing strenuous exercise. Additionally, laughing increases oxygen intake, thereby replenishing and invigorating cells. It also increases the pain threshold, boosts immunity, and relieves stress.

Don’t expect “knock-knock” jokes or endless jokes with “what?” punch lines at her presentation, as Ms. Urquhart is not a stand-up comedian. She has been presenting her keynote addresses for more than 10 years to over 40 different professional organizations and is a top motivational congress speaker. She authored the book All Work & No SAY and writes a syndicated column called “The Joy of Work,” which is published in over 40 magazines and trade journals. Her mission is to help motivate professionals derive more meaning and satisfaction from their work.

Ms. Urquart’s keynote session will focus on the following:

- To laugh at the tough stuff—what is really funny is when things go wrong. It is conflict with colleagues, patients, family members, and more that, in hindsight, the humor in our work comes from.
- Humor is the best way to immediately decrease stress. Learn four quick ways you decrease stress every time you laugh.
- Be compelled to use humor, laughter, and play to breathe new passion into work. Play along the way and enjoy work. The power of play is that it puts you in the present moment, where time flies. Work is fun when we view it with a playful perspective. The idea is to take yourself lightly and take your work seriously.
- Use their Amuse System to boost their Immune System. Laughing boosts the immune system.
- Use humor to create rapport and win patient trust and loyalty. We will see some examples of how humor builds rapport and decreases tension.
- Know that a sense of humor is invaluable in promoting flexibility, resilience, and coping skills.
- Use humor to stay in control—of your environment and the way you feel.

As has become tradition, Ms. Urquhart will also present a “break out” session during AudiologyNOW!, focusing on leadership challenges presented by generational differences in the workplace. The first of the “baby boomer” generation (born between 1946 and 1964) reached (theoretical) retirement age in 2011, and audiologists often work in clinical, academic, or business environments that comprise four unique generational perspectives.

With its rich tradition of comedy, music, and hard-working people, Chicago serves as the ideal stage for Jody Urquhart and for AudiologyNOW! 2011. We look forward to seeing you there to diagnose whether laughter truly IS the best medicine!

David Fabry, PhD, is the content editor for Audiology Today. He is also the managing director of AudioSync Hearing Technologies.
The level of impulse noise generated by almost all firearms exceeds the 140 dB peak SPL limit recommended by OSHA and NIOSH. Studies of the shooting habits of recreational firearm users indicate that many of these shooters are at risk to acquire NIHL. The present study provides information about the shooting habits of recreational firearm users that will help audiologists provide better hearing conservation services to this population.
Risks Faced by Recreational Firearm Users

Although recreational firearm activities can provide individuals and families with leisure-time opportunities, participation in those activities can also be hazardous to hearing. The level of impulse noise generated by almost all firearms exceeds the 140 dB peak SPL limit recommended by the Occupational Health and Safety Administration (OSHA) and the National Institute of Safety and Health (NIOSH) (Coles et al, 1967; Odess, 1972; Ylikoski, 1989; Ylikoski and Ylikoski, 1994; Kardous et al, 2003; Murphy and Tubbs, 2007; Flamme et al, 2009). Exposure to impulse noise levels in excess of 140 dB SPL can lead to noise-induced hearing loss (NIHL) (Patterson and Hamernick, 1992; Chan et al, 2001). Increasing the duration of firearm noise by shooting in an enclosed, reverberant environment increases auditory risk (CHABA, 1968; Weissler and Kobal, 1974; Smoorenburg, 2003).

Because of the widespread use of firearms for recreational pursuits and the dangerously high peak SPLs generated by most firearms, it is not surprising that recreational firearm noise exposure is one of the leading causes of NIHL in America today (Clark, 1991). Several studies have found recreational firearm use can result in high frequency NIHL (Prosser et al, 1988; Dancer et al, 1991; Kryter, 1991; Cox and Ford, 1995; Stewart et al, 2001; Stewart et al, 2002). Nondahl et al (2000) estimated an increase of seven percent incidence of high frequency hearing loss for every five years of hunting activity. Audiometric configurations of NIHL caused by firearm noise exposure are often characterized by normal or near normal hearing in the lower frequencies, with a precipitous drop-off in the higher frequencies for both ears. Individuals with this type of hearing loss often minimize the communication difficulties and may not always receive adequate benefit from hearing aids.

An important factor in the incidence rate of NIHL secondary to firearm noise exposure may be the shooting habits of many recreational firearm users. Wagner et al (2006) surveyed 297 recreational firearm users and found more than 80 percent of the subjects reported never using hearing protective devices (HPDs) while engaging in hunting activities. Only 39 percent of the subjects reported consistently using HPDs during target practice. The majority of subjects in the Wagner et al study were males. However, Nakayama et al (2008) found a similar trend of sporadic HPD use in a survey of 153 female shooters. A study by Stewart et al (2009) found waterfowl hunters reported inconsistent use of HPDs during both hunting (only five percent reported 100 percent use) and

FIGURE 1. Demographic data of subjects: age (A), occupation (B), and occupational loud noise exposure (C).
target practice (only 40 percent reported 100 percent use) while many hunters reported being exposed to over 100 unprotected shots in a single hunting season. Approximately 90 percent of the waterfowl hunters reported using the 12 gauge shotgun (which is one of the loudest shotguns available), and over half of subjects in this study reported routinely shooting in a reverberant environment (hunting blind) when hunting waterfowl. Collectively, these studies of the shooting habits of recreational firearm users indicate many of these shooters are at risk to acquire NIHL.

The purpose of the present study was to collect more information about the shooting habits of recreational firearm users including their use of conventional HPDs, their use and knowledge of commercially available HPDs designed specifically for the shooting sports, the types of commonly used firearms, use of enclosed hunting blinds, the estimated number of unprotected exposures, and their self-assessed auditory status. This information is necessary to increase understanding about how and under what conditions firearms are being used in recreational shooting activities so that better hearing conservation services can be provided to this population.

Methods

Subjects
The subjects in this study were 573 recreational firearm users and were solicited while they shopped at a central Michigan sporting goods store during the first week of deer season (November 2009).

Materials
A 25-item survey was used to collect information from participants regarding demographic information and their recreational firearm use (see Appendix A). Five items requested demographic information, including age, sex, county of residence, occupation, and exposure to occupational noise; five items requested information regarding use of HPDs during target practice and while hunting; ten questions focused on shooting habits during target practice and while hunting; and five items inquired about self-perceived hearing ability, hearing aid use, and tinnitus.

Procedures
A proposal of this project was submitted and approved by the institutional review board of Central Michigan University. It was concluded no risk would exist to participants of this project.
A display was set up in the lobby of the central Michigan sporting goods store, and customers were invited to complete the survey to assist in data collection for the project. The survey took approximately 10 minutes to complete, and subjects were given a pair of hearing protection devices for participating. Data analysis was completed using Microsoft Excel, and descriptive statistics were derived from the raw data.

Results

Demographics

Of the 573 participants—90 percent were male and 10 percent female. Participants ranged in age from 18 to 82 years with a mean age of 42.6 years. See FIGURE 1 for additional data regarding age, occupation, and loud noise exposure.

Shooting Habits

Shooting habits of participants were assessed through multiple questions on the survey, including years of firearm use, types of firearms used (size of bore and type of action), hunting environments, and estimated shots taken both during target practice and hunting.

The majority of recreational firearm users in this study (62 percent) reported shooting firearms for more than 21 years. Approximately 17 percent reported shooting 10 years or less, while 21 percent reported shooting for 11 to 20 years. The average age of subjects in this study, in addition to the average number of years of reported recreational firearm use, would likely increase the risk of acquiring an NIHL for many of these subjects.

The firearms most commonly used for large and small game hunting by these subjects are shown in FIGURE 2. A majority (70 percent) of small game hunters reported that their guns were equipped with either semiautomatic (36 percent) or pump (34 percent) actions, which allow several shots to be fired in a short period of time. The most commonly used actions reported by the large game hunters were either a bolt (54 percent) or semiautomatic (17 percent). Both of these actions allow the hunter to fire several shots in a short period of time. Thus, both large and small game hunters reported using large-bore guns that are loud and can be fired in a rapid manner. Both the .30.06 rifle and 12 gauge shotgun are capable of generating peak impulses over 160 dB SPL (Flamme et al, 2009). Noise levels of this intensity may physically damage the inner ear resulting in temporary or permanent hearing loss (Ylikoski et al, 1987; Patterson and Hamernick, 1992; Chan et al, 2001).

Another important variable in the analysis of risk for NIHL is acoustic environment in which shots are fired.
Solutions for better hearing

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Peak SPL and duration values can be significantly higher if the shots are fired in a small enclosure like a hunting blind. Higher peaks and longer durations of firearm noise impulses increase auditory risk (CHABA, 1968; Weisssler and Kobal, 1974; Smoorenburg, 2003). Figure 3 shows the majority (70 percent) of respondents reportedly hunt large game from an enclosed blind at least part of the time. The use of an enclosed blind, especially in cold weather climates during later hunting seasons, is a common hunting practice that serves to protect the hunter.

**FIGURE 3.** Shows the majority (70 percent) of respondents reportedly hunt large game from an enclosed blind at least part of the time. The use of an enclosed blind, especially in cold weather climates during later hunting seasons, is a common hunting practice that serves to protect the hunter.

**FIGURE 4.** Number of shots fired during target practice and during hunting (N = 572).

**FIGURE 5.** Types of HPDs used during target practice and hunting (N = 425).
from the elements while concealing him or her from approaching game.

Probably the most important aspect of shooting habits, as they relate to NIHL, is the total number of shots taken during various shooting activities in a year’s time. Increasing the number of exposures, especially if unprotected, logically serves to increase the risk of hearing loss. The comparison of the number of shots reportedly taken during target practice and during small and large game hunting in the past year can be seen in FIGURE 4.

**Hearing Protection Devices**

A major goal of this study was to assess the use of HPDs by recreational firearm users during firearm use. Several questions on the survey focused on this issue, including the percentage of time HPDs were worn and which types were worn during target practice versus hunting. Over 70 percent of the subjects reported never wearing HPDs during hunting activities, and only 54 percent reported consistent use of HPDs during target practice. These results are consistent with those of prior studies (Wagner et al, 2006; Stewart et al, 2009) and suggest many recreational firearm users are putting themselves at risk for NIHL, especially while hunting with large-bore (loud) firearms. FIGURE 5 shows that the most common types of HPDs used by subjects for both target practice and hunting were nonelectronic plugs or muffs. Approximately 15 percent of the subjects reported using electronic hearing protective devices (EHPDs) when hunting. This is a significant increase in EHPD use, compared to a previous study by Wagner et al in 2006, and indicates hunters are becoming more aware of this type of protective device. Although over 50 percent of the subjects reported that they were aware of the nonlinear (military) type of HPDs, few reported utilizing these devices during target practice or hunting.

Large numbers of shots and lack of HPD use increase auditory risk. FIGURE 6 shows the reported number of shots taken by subjects in the past year without HPDs as a function of firearm type. The types of firearms were categorized as small, medium, and large rifles, small and large pistols, and shotguns. Rifles categorized as small included the .17 and .22 caliber rimfire guns. Rifles categorized as medium included .22–250, .223, .243, .25–06, and .257 caliber. Rifles categorized as large included .30 caliber and larger. Any pistol larger than a .22 caliber was classified as large. Shotguns were placed in the same category regardless of gauge. Most subjects reported being exposed to either 1–10 or 11–50 unprotected shots in the past year across firearm types. However, many
individuals reported much higher numbers of unprotected shots for various firearm types. For example, over 15, 18, and 10 percent reported being exposed to over 200 unprotected shots in the past year from large pistols, medium rifles, and shotguns, respectively. Individuals exposed to a high number of unprotected shots in a year’s time from firearms capable of generating high impulse noise levels may be at considerable risk for NIHL.

**Subjective Hearing Status**

Self-perceived hearing ability was assessed for both right and left ears. Subjects were asked to categorize their right and left ear hearing ability as being excellent, very good, good, fair, or poor. Although over 75 percent of the subjects assessed right and left hearing ability to be good to excellent, approximately 20 percent reported right and left hearing to be either fair or poor. In the personal clinical experience of the authors, it has been observed that most patients presenting with a hearing loss underestimate the severity of their hearing loss when asked to make a self-assessment.

In addition to self-assessment of their hearing ability, subjects were asked if they experience temporary or constant tinnitus, or if they noticed an increase in tinnitus, a major symptom of sensorineural hearing loss (Axelsson and Barrenas, 1992; Eggermont and Roberts, 2004; Moller, 2007; Bauer and Brozoski, 2008; Dawes and Welch, 2010; Mazurek et al, 2010), following firearm use. Twenty-two percent of the subjects reported constant tinnitus (81 percent bilateral, 11 percent left ear only, eight percent right ear only) while approximately 44 percent reported temporary tinnitus or an increase in constant tinnitus after shooting a firearm in the past year. The reported incidence of constant tinnitus by firearm users in this study is significantly higher than the national average of 10–15 percent (Henry et al, 2005; American Speech-Language-Hearing Association [ASHA]) and suggests many of these individuals may have NIHL secondary to firearm noise exposure. Individuals reporting temporary tinnitus after shooting a firearm may have been exposed to SPLs high enough to cause NIHL.

**Discussion**

Results of this study reveal that the shooting habits and inconsistent use of HPDs reported by many recreational firearm users may put them at risk of acquiring an NIHL. The majority of subjects reported using firearms for over 20 years. The most frequently used firearms reported by

![FIGURE 6. Number of shots fired without HPDs as a function of firearm type (N = 436).]
shooting in this study for hunting small and large game were the 12 gauge shotgun and 30.06 rifle, respectively. Most shooters reported using either the semiautomatic or pump actions for small game hunting, while the most common action for large game was a bolt. The most commonly used firearms for both small and large game are not only loud (over 160 dB peak SPL) but are equipped with actions that allow up to five shots to be fired in a few seconds. Also, small game hunters often hunt in groups, which could serve to increase the number of exposures to high-level firearm noise during a single hunting excursion. The majority of large game hunters in this study reported frequently, if not always, hunting from an enclosure (hunting blind), which can increase peak SPL and duration of the impulse noise generated by their firearms via reverberation and lead to an increase in auditory risk.

Many subjects reported inconsistent use of HPDs, especially during hunting activities. Over 70 percent of the hunters reported never using HPDs while hunting, while only slightly more than one-half reported consistent use of HPDs during target practice. Ironically, using HPDs during target practice would not only protect hearing but also has the potential side benefit of increasing accuracy by reducing physical flinching by the shooter caused by anticipation of hearing the loud shot. Over half of the shooters reported they were aware of non-electronic, level-dependent (i.e., military style) HPDs specifically designed for the shooting sports, yet fewer than five percent reported using them during hunting activities. Approximately 12 percent of the shooters did report using electronic HPDs when hunting. Overall, the finding that approximately 17 percent of the hunters in this study used either active or level-dependent HPDs for hunting purposes is encouraging and indicates a significant increase in both awareness and use of these devices compared to previous studies (Wagner et al, 2006; Stewart et al, 2009). Both of these devices are especially applicable for hunting game since they allow hearing of softer environmental and animal sounds while protecting hearing from loud firearm noise.

Although an overwhelming majority (88 percent) of recreational firearm users in this study acknowledged that firearm noise can cause hearing loss, many reported a large number of unprotected firearm noise exposures within the past year. This finding suggests that recreational firearm users in this study may be recklessly putting themselves at risk for NIHL. Audiologists and other hearing health professionals should be aware of this behavior and effectively counsel recreational firearm users to use appropriate hearing protection devices (HPDs).
users about the importance of protecting their hearing during target practice and especially while hunting.

The reported incidence of subjective hearing problems and tinnitus by recreational firearm users in this study should be of concern to audiologists and hearing conservationists, as approximately 20 percent of the subjects rated their hearing to be only fair or poor, 22 percent reported constant tinnitus, and 44 percent reported tinnitus or an increase in their constant tinnitus after firing a gun in the past year. Many of these subjects may be hearing aid candidates (although only four percent reported wearing hearing aids), and the incidence of constant tinnitus is being severely annoying (nine percent) is similar to findings by Axelsson and Barrenas (1992). These subjects may be considered candidates for a tinnitus therapy program.

Results of this study support the need for hearing conservation educational programs for recreational firearm users. A major focus of the educational training should stress the hazardous effects of firearm noise on hearing so shooters fully understand the auditory consequences of excessive exposure. Appropriate selection and proper use of HPDs should be a major component of any educational program. Students enrolled in these programs should be advised on the effectiveness of various types of HPDs and when double protection (muff and plug) may be needed to attenuate firearm noise to nonhazardous levels.

They also need to be knowledgeable about and able to select appropriate active (electronic) and level-dependent HPDs that are specially designed for the shooting sports. Demonstrations of simulated hearing loss (NIOSH, 2004) and simulated tinnitus (Martin, 2009) should also be used to allow the students to actually hear the consequences of excessive firearm noise exposure. Students should also receive a basic hearing test by a qualified hearing health professional to identify possible hearing loss and establish a baseline audiogram. The educational programs could be offered through hunter safety courses, hunting clubs, or during shooting instructions. A special firearm noise section in industrial hearing conservation program educational programs could be included for workers who use firearms. Finally, clinical audiologists should educate their patients who use firearms with regard to the hazards and types of hearing protection to prevent NIHL.

Michael Stewart, PhD, is a professor of audiology, Lauren Foley, BS, is an AuD student, and Mark Lehman, PhD, is a professor of speech-language pathology in the Department of Communication Disorders at Central Michigan University. Andrea Gerlach, AuD, is the territory manager at Phonak Hearing Systems, Dallas, TX.

References


Also of Interest

**Facts About Noise-Induced Hearing Loss**

Log in to www.audiology.org and search key words “fact sheets NIHL.”


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**Appendix A**

**Shooter Survey**

Department of Communication Disorders
Central Michigan University

Age: _______ County of Residence: ___________ Sex: M ☐ F ☐
Occupation: ___________________ Do you work in loud noise? Yes ☐ No ☐

1. Do you feel that noise from shooting a gun may cause hearing loss?
   - Yes ☐ No ☐

2. Do you shoot:
   - Right-handed ☐ Left-handed ☐

3. How many years have you been shooting guns?
   - _____ years

4. Which type of gun do you use the most for small game hunting?
   - Caliber/gauge _______
     - Auto ☐ Single/double barrel ☐ Bolt ☐ Pump ☐ Lever
5. Which type of gun do you use the most for large game hunting?
   Caliber/gauge ______
   □ Auto  □ Single/double barrel  □ Bolt  □ Pump
   □ Lever

6. How many shots do you typically fire per year during target practice?
   □ 1–10  □ 11–50  □ 51–100  □ 101–150  □ 151–200  □ 201+

7. What percentage of time do you use ear protection during target practice?
   □ 100%  □ 75%  □ 50%  □ 25%  □ 0%

8. Are you aware of the non-electronic type of hearing protection device used by the military to reduce loud sounds while allowing softer sounds to be heard?
   □ Yes  □ No

9. If you use ear protection during target practice, which type do you use?
   □ Plugs  □ Muffs  □ Plug/muff combo
   □ Electronic device  □ Military device

10. How many shots do you typically fire per year while hunting small game?
    □ 1–10  □ 11–50  □ 51–100  □ 101–150  □ 151–200  □ 201+

11. How many shots do you typically fire per year while hunting large game?
    □ 1–10  □ 11–50  □ 51–100  □ 101–150  □ 151–200  □ 201+

12. What percentage of time do you use ear protection while hunting?
    □ 100%  □ 75%  □ 50%  □ 25%  □ 0%

13. If you used ear protection while hunting, which type did you use?
    □ Plugs  □ Muffs  □ Plug/muff combo
    □ Electronic device  □ Military device

14. When hunting large game, what percentage of time do you shoot from an enclosed blind?
    □ 100%  □ 75%  □ 50%  □ 25%  □ 0%

15. How would you rate your hearing ability?
    Right Ear  Left Ear
    □ Excellent  □ Excellent
    □ Very good  □ Very good
    □ Good  □ Good
    □ Fair  □ Fair
    □ Poor  □ Poor

16. Do you wear hearing aids?
    □ Yes  □ No
    If yes, which ear?
    □ Right  □ Left  □ Both

17. Do you notice constant or almost constant ringing in your ears?
    □ Yes  □ No
    If yes, which ear?
    □ Right  □ Left  □ Both

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www.earinc.com or call 800-525-2690.
18. If you experience ringing in your ears, at which level of annoyance do you find it:
☐ Severely ☐ Moderately ☐ Mildly

19. Do you ever notice ringing or an increase of ringing in your ears after shooting?
☐ Yes ☐ No

If yes, how many times in the past year?
____ times

20. List all guns you've shot in the past year without wearing hearing protection. List the bore size and whether the gun is a rifle, shotgun, carbine, or pistol. Check the number of shots that you take per year with each gun.

Gun #1: ________________
Number of shots per year without protection:
☐ 1–10 ☐ 11–50 ☐ 51–100 ☐ 101–150 ☐ 151–200 ☐ 201+

Gun #2: ________________
Number of shots per year without protection:
☐ 1–10 ☐ 11–50 ☐ 51–100 ☐ 101–150 ☐ 151–200 ☐ 201+

Gun #3: ________________
Number of shots per year without protection:
☐ 1–10 ☐ 11–50 ☐ 51–100 ☐ 101–150 ☐ 151–200 ☐ 201+

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Involvement—It Goes to the Heart

Tina Stern

One of my esteemed professors at Nova Southeastern University (NSU), Teri Hamill, PhD, once noted that involvement in your profession and in your community goes to the heart of what it means to be a professional. As a person who comes to audiology after working in an unrelated field for over 10 years, I wholeheartedly agree with this statement and have lived by it throughout my career. Many of my past endeavors involved participation in various professional committees or community outreach efforts—all of which proved to be fulfilling experiences. It was no surprise, then, that when I came to the profession of audiology, this commitment to serving my profession and community continued.

Because my prior career involved politics and law, I was naturally drawn to the challenges audiology faces on the legislative front. Shortly after expressing my desire to become more involved with this facet of audiology, my department chair at NSU, Erica Friedland, PhD, advised me of two American Academy of Audiology committees that may be of interest to me—the Government Relations Committee (GRC) and the Political Action Committee (PAC) Advisory Board. Before long, I became a student volunteer on both of these groups and have enjoyed being an active part in shaping the future direction of the profession.

Another of my past endeavors involved organizing community outreach events for a large university. Once I learned that NSU’s SAA chapter vice president was responsible for planning community outreach opportunities, I knew that this position would be a great fit for me. In fact, I ran for this position and have just completed my one-year term! My goal as vice president was to involve as many students as possible by providing a variety of opportunities. Whether it involved collecting pet supplies for a local pet rescue, working with the athletes at the Special Olympics, or presenting to local high school students about the profession of audiology, there was something to entice almost every NSU audiology student to participate.

Additionally, through my involvement in the Academy’s GRC and PAC Advisory Board, I was introduced to other students who had similar interests. As a result, we have banded together to become part of the national SAA’s Advocacy Committee and are planning the very first SAA Advocacy Summit at AudiologyNOW! 2011 in Chicago. This summit will strive to educate students on the legislative process and how it relates to audiology, as well as to inspire students to become active members of the profession at this early stage in their careers.

Being actively involved in the profession can be challenging for students, especially given the strenuous workload that comes along with being an audiology doctoral student. However, I have learned through experience that when you choose to be involved with aspects of the profession in which you truly have an interest, the desire and drive to be an active participant comes with ease—and the rewards, personal and professional, are both empowering and lasting.
Physician Quality Reporting Initiative (PQRI) Changes for 2011

Several changes to the Physician Quality Reporting Initiative (PQRI) will occur in 2011, the first of which is a new name—the Physician Quality Reporting System (PQRS). The second change is the transition of the two percent reporting bonus in 2010 to one percent for successfully reported measures in 2011. In 2012, the bonus will transition to .5 percent and by 2015, it is anticipated that Medicare will decrease payment to those providers who are not reporting on eligible measures. The Academy strongly encourages Medicare Part B participating audiologists to begin reporting for either the January 1, 2011, to June 30, 2011, reporting period, or for the January 1, 2011, to December 31, 2011, reporting period in order to be familiar with the process, before the disincentive is applied. It is only a matter of appending unique PQRI/PQRS specific modifiers to your Medicare claims.

The measures that are eligible for audiologists to report on for 2011 are:

- **Measure # 94**: Otitis Media with Effusion (OME)—Diagnostic Evaluation-Assessment of Tympanic Membrane Mobility. This measure applies only to those Medicare beneficiaries who are two months to two years of age.
- **Measure # 188**: Referral for Otologic Evaluation for Patient with Congenital or Traumatic Deformity of the Ear.
- **Measure #189**: Referral for Otologic Evaluation for Patient with History of Active Drainage from the Ear within the Previous 90 Days.
- **Measure #190**: Referral for Otologic Evaluation for Patient with a History of Sudden or Rapidly Progressive Hearing Loss within the Previous 90 Days.

The Academy is proud to announce that, as of October, audiologists successfully reported at the highest rate on eligible measures of all 2010 PQRI reporting non-physician professionals, as acknowledged by the Centers for Medicare and Medicaid Services (CMS). For further information on PQRI/PQRS, the dedicated page on the Academy Web site (www.audiology.org/practice/PQRI/) will walk you through the reporting process.

Medicare and Medicaid Recovery Audit Contractors (RACs) and False Claims

Medicare’s Recovery Audit Contractors (RACs) have been seeking Medicare overpayments and underpayments nationally since 2009, recovering over $1 billion in overpayments. As a result of the Affordable Care Act of 2010 (ACA), otherwise known as the health-care reform bill, each state was required to contract with a minimum of one RAC by December 31, 2010, and to fully implement the Medicaid RAC programs by April 1, 2011.

As with its Medicare counterpart, this will include auditing providers and suppliers who file claims to Medicaid, as well as Medicare Advantage Plans. If a practice has identified an overpayment, it must be returned within 60 days. If it is not returned within that deadline, it may be considered an automatic violation of the False Claims Act and can be prosecuted. This civil statute violation may result in the exclusion in participation in federal health-care plans such as Medicare, as well as the incurrence of financial penalties that can range from $5,500 to $11,000 per claim, plus damages.

Audits

As mentioned in previous Academy publications, the Centers for Medicare and Medicaid Services (CMS), as well as the Office of the Inspector General (OIG), have instituted various programs to detect fraud and abuse in federal health-care programs such as Medicare, some of which are a result of the Affordable Care Act of 2010 (ACA). Audits are a rigorous procedure to detect fraud as well as verify that payments were filed appropriately and are typically instituted by a random or automated selection, a complaint, or by data that indicates suspicious billing practices.

Currently, the federal government considers fraud to include, but is not limited to: billing for unnecessary services, the inability to produce documentation, and billing on behalf of providers who are ineligible to provide services and patients who are ineligible to receive them.

The Academy recommends that audiologists examine their billing practices to avoid an audit. Ensuring compliance within the payment policies of all payers, (Medicare, Medicaid, and commercial), as well as providing appropriate documentation based on the proper code selection for procedures performed (CPT and HCPCS codes), as well as the applicable diagnosis (ICD-9) codes, will be helpful if an audit is initiated.
ICD-9 to ICD-10 Transition—Get Ready!
The first step in the ICD-9 to ICD-10 diagnosis code transition is to ensure that your claims clearinghouses and vendors are HIPAA Version 5010 compliant. This must be done prior to January 1, 2012. The current HIPAA version—4010—is not compatible with ICD-10 codes, so compliance with the 5010 version will need to be verified in order to file claims once the transition is complete. Medicare contractors have already begun testing the 5010 version, so you will want to contact vendors who process your insurance claims to ensure successful claims filing. Practices are also encouraged to create new encounter forms using the ICD-10 codes. The entire transition from ICD-9 to ICD-10 is scheduled for completion by October 1, 2013. The Centers for Medicare and Medicaid Services (CMS) has indicated that there will be no grace periods or delays. The Academy has a dedicated page on our Web site at www.audiology.org/practice/coding/ICD-10-CM/ with information on the ICD-10 coding system, which includes the diseases of the ear and mastoid process codes—H60-H99—and specifically, the hearing loss codes of H90-H95.

One-Year Claim Filing Timeframe for Medicare
Due to the Affordable Care Act of 2010 (ACA), the Centers for Medicare and Medicaid Services (CMS) has changed the claims filing period to one year from the date of service, effective January 1, 2010. You will no longer have up to 26 months to file a claim to Medicare after the date from which the service was provided, but will be required to file the claim within one calendar year of the date of service, or risk denial. Services provided to Medicare Part B beneficiaries on or after January 3, 2011, will have to be submitted to your Medicare contractor by January 3, 2012.
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Preceptor training and education have been identified as strong needs in audiology education. The American Academy of Audiology’s Gold Standards Summit 2009: Transforming Clinical Education in Audiology emphasized the importance of preceptor training in audiology education, among other critical factors. The Academy’s Gold Standard Summit Action Items Task Force, formed to help address the summit’s outcomes, has also recognized this importance by charging a subtask force to specifically address key issues related to precepting. Further, the need for formal training and education in precepting and supervision has been specifically identified by the state of California, which now requires continuing education in precepting and supervision in order to be qualified to precept an AuD extern.

Preceptor training and education are clearly essential but where do audiologists learn the skills required to be an effective preceptor? It takes time, patience, and good communication skills to develop and maintain a positive learning environment throughout a clinical rotation or the externship period, but student preception is not second nature to most people. It takes training to provide quality feedback, identify the need for remediation, and to know when to implement a remediation plan. Unfortunately, precepting and supervision classes were not within the curriculum of the audiology master’s degree programs, and are not prevalent within the AuD programs.

To help address this need for a more formal educational approach to preceptor training, the San Diego State University/University of California San Diego (SDSU/UCSD) AuD Joint Doctoral Program has developed a two-part class that involves third-year students in their first semester (Y1) precepting first-year students in their third semester (Y3). The class is structured to include a didactic component that exposes the students to some of the basic skills needed for effective precepting and also allows for a practical component for the students to apply what they are learning.

**Classroom Experience**

Much of the literature related to precepting can be found within the fields of medicine, nursing, social work, and education. The didactic component of this experience involves readings related to the topics of teaching and learning styles, conflict and conflict resolution, provision of feedback, remediation, and grading. These all relate to the experiences that the Y3 students encounter both in the practical portion of the precepting class with their Y1 student, and in his or her own clinical rotations off campus. Each week, the literature is discussed both in class and on the online discussion board. The discussion of experiences allows the students a safe forum to debrief and troubleshoot with each other, as well as learn from each other’s experiences. The didactic portion also
involves assignments such as correcting and providing feedback on a sample student diagnostic report, and completing the SDSU clinic grading form for their Y1 student. At the end of the course, the final exam for the didactic portion involves the Y3 student preceptor holding a mock final conference with the faculty preceptors who play the role of a Y1 student. During the conference, the Y3 student reviews the completed grading form with the “student.” While this mock conference might seem contrived, the students, to this point, have presented their review, feedback, and grades in a very authentic manner. They presented intuitive and thoughtful feedback, and were fairly accurate in their assessment of their student’s skills (as judged by the faculty preceptors).

**Practical Experience**

The practical portion of the course involves the Y3 student being paired with a Y1 student in the last half of the Y1 student’s summer rotation. In the SDSU clinic, the audiology booths and treatment rooms are all equipped with video cameras to allow for the faculty preceptor to watch the live feed from a nearby room. This permits a much more authentic experience for the Y3 student preceptor to work with the Y1 student clinician and the patient.

The complexity of the cases and appointment types are carefully chosen to allow the students to have maximum input and interaction, and to minimize the need to consult the faculty preceptor. In the event the students need direction, the faculty preceptor calls the treatment room to provide the student preceptor with real time feedback and guidance. Following the appointments, the Y3 student preceptor provides the Y1 student clinician feedback by reviewing the appointment. This feedback session is also observed by the faculty preceptor, via the video feed. When the students are done with their session, there is a short meeting with the faculty preceptor, involving both students, to discuss any final teaching moments before the Y3 student preceptor is given their own feedback about the clinic and feedback session.

**Student Perspective on This Experience**

“**How Do You Think That Appointment Went?**”

I recall this question being asked by my clinical preceptor during my first year, and I asked it again of first-year students in my role as third-year student preceptor. Needless to say, the question certainly feels different when one is on the receiving end. In that first instance, during the beginning of my clinical training, reviewing the appointment’s high and low points was as daunting as it was educational. In asking that question as a Y3 student preceptor, developing a constructive critique of a fellow student’s work felt foreign, as if I somehow did not have that right, given our relationship as peers. At that moment, I had my first glimpse at the complex nature of the clinical preceptor’s task.

During my training experiences in the SDSU/UCSD AuD Joint Doctoral Program, the precepting course marked a definitive change in my worldview as a student. Having the opportunity to precept first-year students in a safe, monitored environment helped me to gain a better grasp on this unique educational role. This experience also allowed me the opportunity to reinforce my clinical skills. After all, as the old adage suggests, the best way to really learn a concept is to teach that concept.

Exploring the theoretical bases to precepting and implementing them in clinic helped me understand that we are all stakeholders in the learning process—from the first-year student, to the third-year student, to the faculty preceptor, to the patient. That understanding helped me take responsibility in my own clinical rotations for not only consuming feedback provided to me by the clinical faculty preceptors, but also for the questions I asked of them in an effort to enhance my learning. While I first viewed the act of delivering a critique of a fellow student to be somewhat overstepping the peer boundary, I learned that clinical preceptors often experience a similar discomfort. Engaging that uneasiness, confronting, and resolving it to deliver the best possible patient-centered care became crucial to getting the most from this class.

Another benefit of this learning experience is that by introducing current students to the roles of preceptors, we can promote a future of consistency in training. One of the benefits of learning from different clinicians is the exposure to different styles and approaches in audiology; however, sometimes the variety of teaching and precepting styles may lead to inconsistencies in training and confusion on the part of the student. It is my hope that other programs will consider adopting a similar curriculum that will help current students develop a core set of competencies that can be used in a future role as clinical preceptor.

“**So, How Do You Think That Class Went?**”

In reflecting on this question posed at the conclusion of our precepting course, there are many answers. Among them, we learned that this model is one that requires active engagement from both student and preceptor. Challenging existing complacency in the precepting model should be encouraged. The student is not merely...
the consumer of feedback, but is an active participant in his or her own learning. Conversely, the preceptor is not merely a dispenser of feedback but is also working in concert with that student to care for the patient. Taking this ownership of one’s education serves to empower the student, making him or her better able to serve the patient and better prepared to lead our profession into the future.

**Realized Advantages**

Advantages of this experience have been identified for both the Y3 and the Y1 students.

**Advantages for Y3 students:**

- Builds confidence for the student
- Builds professionalism
- Allows students to see how far they have advanced in their knowledge and clinical skills during the second year of the program
- Gives insight to the student regarding what preceptors are looking for in assessing clinical skills
- Helps with interactions in their off-campus rotations
- Allows students to realize the time, responsibility, and importance of precepting students
- Develops camaraderie between student cohorts within the program

**Advantages for Y1 students:**

- Creates excitement for advancing to year two in the program
- Helps students learn to work collegially with other cohorts
- Fosters an early responsibility for the student’s role in the feedback process and helps students feel more comfortable sharing feedback with their student preceptor

**Final Thoughts**

As the profession of audiology and the state of California have identified, there is a need to educate audiologists to serve as preceptors, rather than assume that the skills for effective precepting are inherent. With this in mind, the initiation and implementation of the clinical precepting class and lab into the SDSU/UCSD AuD curriculum has proven to be a positive experience for the students and worthy of further development, both in our program specifically and in the curriculum of AuD programs nationally.

Abby Fox, MA, is a forth-year AuD extern at UCLA Medical Center and member at large of the SAA Board of Directors; Jacquelyn Georgeson, AuD, is the audiology clinic director at San Diego State University, San Diego, CA; and Lesli A. Guthrie, AuD, is a clinical faculty preceptor at San Diego State University, San Diego, CA.
For nearly 12 years, the American Board of Audiology (ABA) has provided certification for audiologists who wish to demonstrate a commitment to lifelong learning and adherence to a higher standard than state licensure. At the close of 2010, approximately 1,600 audiologists chose to voluntarily achieve a greater level and amount of continuing education and maintain the highest level credential possible for the profession.

In 2005, the ABA responded to the requests of industry and practicing audiologists to create a special certification for those working with cochlear implants. Following the requests of many audiologists and outside entities, the ABA has created its second specialty certification—for pediatric audiology. The first audiologists will sit for the certification examination in April 2011, immediately following AudiologyNOW® in Chicago, IL.

Update on Pediatric Audiology Specialty Certification
By John Coverstone

ABA Board Profile

Angela S. Pond, AuD
LtCol, USAF, Ret.

Hails from: Raised in Tulsa, OK. I’ve now retired from the U.S. Air Force and I’m building a house in Vancouver, WA.

In My Free Time: I enjoy travel, photography, reading, hiking, and pseudo-gourmet cooking!

Year Certified: 2002

Degree: AuD, Central Michigan University; MA, The University of Texas at Austin; BS, Oklahoma State University

What I Do for the ABA: I’m the incoming chair of the Certification Committee, and I look forward to becoming more involved with other projects as they arise.

Quote to Live by: “Always do your best”—Your best is going to change from moment to moment; it will be different when you are healthy as opposed to sick. Under any circumstance, simply do your best and you will avoid self-judgment, self-abuse, and regret. Anon.
Pediatric audiology specialty certification denotes an important step forward for the profession of audiology. It formally recognizes pediatric audiology as the specialty area that audiologists know it to be. Universal newborn hearing screening and follow-up diagnostic and intervention services have increased demand for pediatric audiologists. Specialty certification provides a credential to recognize those who have acquired the skills and knowledge to fully specialize in this area and maintain their specialty through the ongoing pursuit of education in this subject area.

Any qualifying audiologist who holds state licensure or international board certification from the ABA may apply for this certification and sit for the examination. Applicants must have completed one year of full-time (2,000 hours) post-degree, paid professional experience as an audiologist with 550 direct contact hours in pediatrics, and 50 hours of case management of pediatric cases, each over two consecutive years out of the previous five years. For more information, visit the ABA Web site at www.americanboardofaudiology.org, and click on “Specialty Certifications.” The area for pediatric certification contains application materials, resources for exam preparation, and more information about this important specialty certification.

The exam was developed by a group of carefully selected subject matter experts. Over the past two years, these individuals have studied the area of pediatrics in order to define it, develop areas of expertise within this specialty area, and, finally, develop questions to use for the examination. The first exam will be a field test and consist of 150 questions, 100 of which are pre-selected for scoring. Future exams will be operational and consist of 100 questions across defined subject areas to include:

- Screening and assessment procedures
- General knowledge about hearing and hearing loss
- Communication enhancement technology
- Habilitation/rehabilitation strategies and educational supports
- Laws and regulations
- Counseling
- Child development

As audiology continues to grow and expand as a profession, it will become increasingly important to provide credentials that allow individual practitioners to demonstrate knowledge, training, and commitment within specialty areas. Specialty certification provides clearer pathways for referring colleagues, physicians, and other providers. It also identifies those practitioners whom the public should seek out for specialty services. In addition, it may actually improve the quality of services provided when demand is high and individual audiologists feel a need to obtain and keep specialty certification. These offer tremendous benefits to the audiologist, to the practice facility, and to the profession of audiology.

John Coverstone, AuD, is a member of the ABA Board of Governors and is the chair of the ABA Marketing Committee.
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JOIN US as we honor these individuals at the Academy Honors and Awards Banquet on Thursday, April 7, 6:30–8:30 pm (at the Palmer House Hilton) during AudiologyNOW!® 2011 in Chicago, IL. This event will recognize the best and brightest of the profession. Tickets for the banquet are $25 per person ($15 for students) and are available through the AudiologyNOW! online registration system. For more information, contact ssebastian@audiology.org.

Distinguished Achievement Award
This award is presented to those individuals who are or have been exceptional educators in the classroom or clinic, have been innovative in program development, pioneering in areas of clinical service delivery, teaching, or research, or any combination of these areas. The contributions made by the recipients of the Distinguished Achievement Award must have an impact on the profession of audiology as a whole and not just at a state or local level. Recipients must be members of the Academy.

Theresa Chisolm, PhD
Theresa (Terry) Hnath Chisolm’s career exemplifies the intent of this award. During the course of her master’s work at Montclair State College and doctoral work at the graduate school of the City University of New York, she was already distinguishing herself amongst her teachers and peers. As one faculty recommendation noted, “...she exemplifies the ideal student: one who surpasses the master.” Since completion of graduate school, Dr. Chisolm has held noteworthy positions at every level: staff audiologist, lecturer, assistant/associate/full professor, departmental chair, and, most recently, special assistant to the dean in the College of Behavioral and Community Sciences at the University of South Florida. In every role, she has “distinguished” herself as exemplary and influential. From her early roots as an adjunct lecturer at City University Hunter College, where she developed her passion for rehabilitative audiology, to her current (and multiple) roles in academia, Dr. Chisolm has shown the ability to combine creativity, relevance, collaboration, and innovation. In all, Dr. Chisolm’s dedication and enthusiasm for her profession, as exemplified by her many accomplishments, makes her the ideal recipient for the Academy’s Distinguished Achievement Award.

International Award in Hearing
The American Academy of Audiology has established an annual international award to honor and recognize achievements of international significance in audiology by an audiologist, hearing scientist, or audiological physician. Nominees should be nonresidents of the United States who have provided outstanding service to the profession of audiology in a clinical, academic, research, or professional capacity, and be in good standing in their country.

John Bamford, PhD
John Bamford, PhD, has worked tirelessly in the United Kingdom to upgrade professional audiological services through education and training. As the chair and Ellis Llwyd professor of audiology and deaf education, he helped elevate the University of Manchester audiology program to one of the best known and prestigious in the world. Dr. Bamford worked closely with the UK Medical Research Council to carry out a series of multi-center studies leading to the development and implementation of a comprehensive, evidenced based national infant program. He was editor-in-chief of the British Journal of Audiology, when it merged into the International Journal of Audiology. He has life membership in the British Society of Audiology (BSA) and the British
2011 Academy Honors

Academy of Audiology (BAA), and has received the TS Littler Prize, the BSA’s most prestigious award, and there is even a “Bamford Lecture” at the BAA conference.

Dr. Bamford is chair of the National Audiology Review Committee of Ireland. His advice on audiological matters is often sought in New Zealand, Australia, and Canada. His curriculum vitae includes over 60 studies focused on epidemiology, screening, identification, and intervention for hearing impaired children. Dr. Bamford has a lifetime of contribution to audiology and a world-wide reputation, making him truly deserving of the Academy’s International Award.

**William J. Keith, PhD**

William J. Keith, PhD, quickly worked his way up to the title of principal audiologist, subsequently becoming director of the National Audiology Centre in New Zealand. Dr. Keith used his expertise and influence to grow the profession of audiology in New Zealand and, in short, the name “Bill Keith” is synonymous with audiological excellence in New Zealand.

Dr. Keith has also been an entrepreneur and businessman; advancing audiology via those roles as well. He served as managing director for Phonak New Zealand, providing creative and visionary leadership there for 16 years. Although a successful businessman, he took just as much pride in other accomplishments during this time, including the creation of many scholarships for audiology students, advocacy for audiologists, involvement in workers’ compensation programs, and the promotion of ethical professional business practices in hearing healthcare.

A tireless advocate for the identification and treatment of hearing loss in children, Dr. Keith helped establish audiology services in public hospitals and schools for the deaf throughout New Zealand. He helped to start the first cochlear implant program while at the National Audiology Centre. Finally, while at Phonak New Zealand, Dr. Keith established an overseas audiology aid project in western Fiji, a program that is still in operation, with regular visits by audiologists and hearing-aid technicians, as well as free hearing aids for those in need.

It is clear, even from this brief synopsis, that Dr. William J. Keith is most deserving of International Award from the Academy.

**Jerger Career Award for Research in Audiology**

This award is given to a senior level audiologist with a distinguished career in audiology. Candidates must be members of the Academy, have at least 25 years of research productivity in audiology (not in related field), as well as have made significant contributions to the practice and/or teaching of audiology.

**Judy R. Dubno, PhD**

Judy R. Dubno, PhD, is unquestionably one of the most outstanding audiology researchers in the United States today. She is professor and director of research in the Department of Otolaryngology-Head and Neck Surgery at the Medical University of South Carolina. Dr. Dubno is a creative researcher with a continuously funded research program that enjoys national and international acclaim. Her multifaceted research program on human auditory system function has made long-lasting contributions regarding the encoding of auditory information in simple sounds and speech, as well as how these abilities change in adverse listening conditions, with age, and with hearing loss. In each of these areas Dr. Dubno has had a significant impact on our fundamental knowledge of auditory perceptual abilities, and on clinical audiological methods of assessment and rehabilitation.

Dr. Dubno has an extensive publication record with seminal papers that have influenced the field of audiology, as well as set the highest standards for precision and clarity in auditory research. Her research program is valued greatly by her peers and has had a substantial influence on research conducted by other investigators. Additionally, she has contributed to the research and professional communities in audiology through leadership positions and continuing service on highly esteemed editorial boards and grant review panels.

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Become an Advocate for Audiology at AudiologyNOW!®

By Melissa Sinden

The Government Relations Committee, in conjunction with the Academy’s Advocacy team, hope you will take advantage of some of the many exciting and informative events at AudiologyNOW!® 2011 in Chicago. These sessions are designed to educate Academy members (with some student-specific opportunities!) on how to become active advocates, and to provide valuable tips on influencing elected officials and working to advance public policy. Here are just a few ways to get involved.

Third Annual Advocacy Summit
The past two Advocacy Summits were a great success and we hope this year will be no different. The third annual summit will take place on Wednesday, April 6, from 3:00–5:00 pm, and is open to all Academy members interested in becoming the “go-to” person in his or her state or congressional district for advocacy-related issues. These key contacts represent the voice of audiology on legislative issues in their hometowns. For more information on the Key Contacts initiative, visit: www.audiology.org/advocacy/keycontacts/

If you are interested in attending the event, please contact Kate Thomas at kthomas@audiology.org.

First Annual Student Academy of Audiology (SAA) Advocacy Summit
This inaugural SAA Advocacy Summit aims to educate students on the current issues facing audiology (without the governmental jargon), provide information about how to become an advocate, and afford students an opportunity to brainstorm how to best educate their peers on the importance of advocacy. Professionals from the Academy’s Government Relations Committee and the Academy’s office in Washington, DC, will also be in attendance to inform participants about current legislative issues. (This event is by invitation only.)

Advocacy-Centered Learning Module
Want to influence public policy at the state or federal level, but don’t know the issues and/or don’t know where to start? If so, you could benefit from attending our learning module titled, “Become an Advocate for the Profession: The Ins and Outs of the Legislative Process.” This interactive module, hosted by Dr. Erin Miller, chair of the Academy’s Government Relations Committee; John Williams,
the Academy’s federal lobbyist; and Melissa Sinden, the Academy’s senior director of government relations, will prepare you in your role as an advocate for the profession. Attendees will be given background information on the legislative process and will leave with a good understanding of what to expect when meeting with representatives. This learning module will teach you how to become a lobbyist for the profession and ensure the voice of audiology is heard. The module takes place on Friday, April 8, from 2:00–3:00 pm.

The Advocacy Booth: Your Home for All Things Advocacy
Be sure to visit us at the Advocacy Booth in Academy Central for all the latest advocacy and PAC information. Learn more about the Academy’s legislative issues, check out our exciting giveaways, and find out how YOU can PUSH the PAC! PAC contributions may be made via the Academy Web site, by mail, or directly at the Advocacy Booth by cash, check, or credit card. This year’s Chicago-Style Pizza and Beer PAC event (members only) will take place at Gino’s East of Chicago, at 162 E. Superior Street, on Thursday, April 7, from 6:30–8:30 pm. You may purchase tickets through registration or at the booth, where there will also be a limited number of prepaid “L” train tickets for attendees who wish to take public transportation. For more information about the PAC, or to make a donation, visit: www.audiology.org/advocacy/pac/. To inquire about purchasing advance tickets to the PAC event, please contact Steve Taylor at 202-544-9337 or staylor@audiology.org.

We look forward to seeing you at one of our many advocacy events in Chicago!  

Melissa Sinden is the senior director of government relations for the Academy.
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Don’t forget to pick up your copy of the Daily News to get valuable coupons to use at the Academy Store at AudiologyNOW!
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## New Members of the American Academy of Audiology

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<thead>
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<th>New Member</th>
<th>Degree or Role</th>
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<tbody>
<tr>
<td>Gretchen Allen, AuD</td>
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<td>Lisa Angelina, MA</td>
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<td>Sara Billari, AuD</td>
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<td>Kristen Burns, AuD</td>
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## New Members of the Student Academy of Audiology

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Dora Murphy-Courter
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Chelsea Nava
Courtney Neil
Jacklynn Neutz
Benjamin Ng
Holly Nguyen
Megan Novak
Cristiane Nunes
Stephanie O’Bryan
Stacee Ommundsen
Martha Orcutt
Kristian Ormsen
Anna Palterman
Shivani Patel
Carla Petersen
Alexandra Peterson
Kathryn Pitts
Taren Plackman
Kelly Powell
Charles Pudrith
Erin Richardson
Brittany Rinehart
Caitlin Rinehart
Cheryl Robinson
Rebecca Robinson
Annie Rodriguez
Tamarra Roths
Lauren Rouse
Diana Russell
Mario Salazar
Stephanie Sanders
Amanda Savasta
Jaime Schaden
Samantha Schopp
Tiffany Sexton
Stacey Snow
Eugene Spindler
Meghan Spriggs
Richard Squires
Jill Stephens
Samantha Stepan
Sara Tackett
Leslie Townsend
Sarah Tracy
Ashley Vandlik
Vanessa Vani
Margaret Verespie
Rebecca Walker
Brenda Ward
Sarah Watson
Emily Weil
Kaitlyn Werho
Jennifer Weyler
Alexandra Wheeler
Julie Wheeler
Carolyln Whitcomb
Kathryn White
Renee Williams
LaTonya Willis
Louise Yeager
Sara Young
Michael Yu

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Visit www.audiology.org, search key words “PUSH the PAC.”
Calling All Members Attending AudiologyNOW!® 2011

The 2011 Academy Business Meeting will be held on April 9 at 1:00 pm for 50 minutes at the McCormick Place—Chicago Convention Center, Chicago, IL. Stop by to get a recap of 2010, and the opportunity to help shape the future of the Academy during the round-table discussion with Academy leaders and staff. Learn more at www.audiologynow.org.

Academy Supports Hearing Loop Conference 2011

You are invited to attend the 2nd International Hearing Loop Conference, June 18–20, 2011, hosted by the Hearing Loss Association of America and the American Academy of Audiology as part of the “Get in the Hearing Loop” campaign. The conference is a rare opportunity to learn cutting-edge information from experts about audio induction loop installations, aka hearing loops. Hearing loops are an especially user-friendly assistive listening system for people with telecoils in their hearing aids or cochlear implant processors. Research by audiologist Bill Diles has shown that the use of hearing loops greatly increased user satisfaction with hearing aids.

Presentations at this international conference will provide updated information about effective communication access in public facilities, new telecoil developments, how to recognize and address electromagnetic interference, how to optimize audio for people with hearing loss, how to set up a basic loop system, and creative and complex loop systems. Audiologists will address recommendations for how to bring consumers “into the hearing loop.”

The Hearing Loop Conference will be held in conjunction with HLAA’s Convention 2011, June 16–19, 2011. Both events will be held at the Hyatt Regency Crystal City, located just a mile from Reagan National Airport. Registration at the conference will include the cost of all meals, including the banquet for the Convention and a separate dinner cruise.

For more information about these exciting events, including registration information, please visit www.hearingloss.org.

Recent ACAE Accreditation Decisions—2010

ACAE meets at least twice a year in the spring and fall. Doctoral programs in audiology—i.e., the AuD—are reviewed at the first meeting following an on-site visit. At its meeting in December 2010, The ACAE Board of Directors voted to award the status of accreditation to two academic programs in audiology following an intensive and rigorous review of the Self-Study and Preliminary Site Visit Reports.

- Accreditation—The Program in Audiology, Division of Speech and Hearing Sciences, Department of Allied Health Sciences, School of Medicine, University of North Carolina at Chapel Hill, NC
- Accreditation—The Department of Audiology, College of Allied Health and Nursing, Health Professions Division, Nova Southeastern University, Fort Lauderdale, FL

Learn more about ACAE by visiting www.acaeaccred.org.

Acronym Jim—Erratum in Audiology Today

In the article titled "Jim Jerger: By the Letters" (Jan/Feb 2011 issue of Audiology Today, page 22), we published the lyrics to the song "Acronym Jim" by Charles Berlin. We inadvertently left off the ending of the song. We have updated the PDF online with the ending and apologize for this oversight. Review the corrected article by visiting www.audiology.org and search key words "Audiology Today."

In Memoriam—Iêda Chaves Pacheco Russo

Iêda Chaves Pacheco Russo, PhD, one of the leading audiology figures in Brazil, passed away on January 5, 2011, after a battle against pulmonary hypertension.

She was a full professor at the Catholic University of São Paulo (PUC-SP), associate professor on the faculty of Medical Sciences of Santa Casa de São Paulo, as well as
professor and director of the Center for Studies of Hearing Disorders.

Teaching was a duty, which she performed brilliantly since the start of her career as a professor in 1974. She lectured not only at the undergraduate level but also in graduate school, supervising numerous master and doctoral dissertations, monographs, and scientific initiations. She developed research that focused primarily on psychosocial implications of hearing loss, and hearing preservation in the workplace and leisure. In addition, she also took up the study of aging; teaching classes in several courses geared to seniors.

She was a founding member and active collaborator of the Brazilian Society of Speech-Language Pathology and Audiology. In addition, she was a founding member and tireless contributor to the Brazilian Academy of Audiology and an international fellow of the American Academy of Audiology, and past president of the International Society of Audiology.

She was recognized by her peers for her ethical conduct and scientific excellence in 2007 when she received the Brazilian Society of Speech-Language Pathology and Audiology Merit Award. In 2010, she was honored with another accolade—the Department of Hearing and Balance Award for her clinical work, dedication, and contribution to audiology.

Russo was further honored with the creation of a humanitarian fellowship (Solar Ear) in her name.

Her contributions to audiology were numerous—editorial board member and editor of scientific journals; participation in small meetings, seminars, student workshops, large national and international conferences; examiner of monographs, dissertations, theses, and contests around Brazil; explanations in small classrooms and conversations of major events in corridors; in interdisciplinary committees of scientific societies and representing or chairing of international scientific societies—devoting her professional life to sharing her knowledge and generosity.

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Mark Your Calendars for the COCHLEAR IMPLANT SPECIALTY CERTIFICATION EXAMINATION

The examination will be on Saturday, July 16, 2011, in Chicago, IL.

Applications are due on May 16, 2011.

Visit www.americanboardofaudiology.org to download the application and to learn about application criteria.
Did you know that as an Academy member, you can...

**Save money on**
- Auto insurance
- Business owners insurance
- Professional liability insurance
- Health/life/long-term care insurance—individuals and employees
- Calling card
- Academy credit cards
- Credit card payment processing—special rates on transaction fees charged for your business’ credit payments
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**Promote yourself with**
- *Compensation and Benefits Survey*—make sure you are competitively compensated
- *Fellow logo*—use on your Web site and stationery
- *Direct Connect*—link from our Web site to yours
- *Framing*—for personal recognition
- *Messages On Hold*—promote yourself, audiology, and hearing health care to patients on hold
- *HEARCareers*—post resumes and search job listings for free
- *Resume Review Service*

Learn more about these benefits at www.audiology.org, search key word “benefits.”
Foundation Partners with The Children’s Hospital—Colorado
eAudiology Web Seminar to Feature Renowned Auditory Neurophysiologist, Ruth Litovsky, PhD

Each spring, Bill Daniels Center for Children’s Hearing at The Children’s Hospital—Colorado (TCH) offers the Advances in Children’s Hearing lecture. This lecture provides current updates on children’s hearing health to audiologists, hearing scientists, parents, and others interested in hearing health in the Denver area. This April, thanks to a new partnership with the American Academy of Audiology Foundation, this educational presentation will be offered live and on-demand through eAudiology, allowing international access to the 2011 Advances lecture.

“Two Ears, One Brain: How Well Can Bilateral Cochlear Implant Users Combine Inputs from the Two Ears?” (1 CEUs), will be presented by Ruth Litovsky, PhD, professor at the University of Wisconsin—Madison, on Thursday, April 28 at 7:30–8:30 pm (U.S. Eastern Time). Dr. Litovsky will discuss growing evidence that bilateral implant users perform better at sound localization and speech recognition in noise when using two implants compared with a single implant, and the effect of limitations due to the fact that clinical processors are fitted independently in the two ears. Additionally she will present her recent findings from traditional “free field” testing approaches, and her research on processors that enable the synchronization of inputs to the two ears. Dr. Litovsky’s research results will be discussed in the context of auditory development and plasticity.

Dr. Litovsky received her PhD in developmental psychology from the University of Massachusetts in Amherst, with additional post-doctoral training in auditory neurophysiology. She worked for seven years as a research associate at Boston University’s Hearing Research Center and the Massachusetts Eye and Ear Infirmary, and later joined the University of Wisconsin—Madison faculty where she now directs the Binaural Hearing and Speech Lab at the Waisman Center. She has served on numerous grant review panels, and serves on the editorial boards of the Journal of the Acoustical Society of America and the American Journal of Audiology. She was elected fellow of the Acoustical Society of America and member of the Executive Council of the Association for Research in Otolaryngology. She has published over 75 journal articles, book chapters, and reviews.

AAAf’s Happy Hour with a View

Chicago | April 6, 2011

Start off AudiologyNOW! with fine wine, food, and friends at the AAAf’s Happy Hour with a Chicago View at The Club at Symphony Center. Tickets ($75 for members/$25 for students) can be purchased with your AudiologyNOW! registration at www.audiologynow.org or by phone at 866-229-2386. Don’t risk missing out on this annual convention highlight; reserve your ticket today!

Happy Hour proceeds support audiology education and scholarship.

The 2011 Happy Hour is underwritten by HearUSA Hearing Care Network.
chapters, and reports, and has given over 40 invited talks and keynote addresses.

A philanthropic grant to the AAA Foundation from Bill Daniels Center for Children’s Hearing will underwrite Dr. Litvosky’s presentation on the eAudiology platform. The 2011 Advances in Children’s Hearing Lecture, scheduled for Thursday, April 28 at 7:30–8:30 pm (ET) will be offered at no charge to the first 100 registrants for the live Web seminar. Dr. Litovsky’s presentation will also be available on-demand at no cost through December 2011.

This joint venture was facilitated by Deborah Hayes, PhD, chair of audiology at TCH and former member of the Foundation Board of Trustees. When this new endeavor was announced in January, Hayes stated, Bill Daniels Center for Children’s Hearing at The Children’s Hospital—Colorado is excited to offer this outstanding educational program in partnership with the Foundation. We are especially pleased that through this collaboration our colleagues in audiology and hearing science throughout the world can “attend” this event, “speak” with Dr. Litovsky during real-time Q&A, and learn from her expertise and fascinating discoveries.

To register for the Web seminar or for more information, visit www.eAudiology.org or call the Foundation office at 703-226-1048.

Click-and-Bid to Rock-and-Roll in Chicago!

The American Academy of Audiology Foundation is gearing up for its annual Auction 4 Audiology being held March 28–April 9 at www.biddingforgood.com/auction4audiology. Of course, you won’t want to miss our annual collection of getaways, electronics, handcrafted

This Squier electric guitar, signed by both REO Speedwagon and Styx, is a must-have for the classic rock fan.

The priceless nature of this C.F. Martin & Co. guitar featuring artwork by Dave Matthews is sure to attract bidders from across the United States.
Unlimited CEUs for only $99
Our unlimited on-demand Web seminar package offers access to more than 50+ Web seminars in the eAudiology library.

New to the Web seminar library

| Medical Errors to Avoid: Guidelines for Audiologists | .2 |
| Presentated by James W. Hall III, PhD |

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| The Road to Blissful Hearing Aid Satisfaction | .3 |
| Presented by Patricia B. Kricos, PhD |
| **ABA Tier 1** |

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| Could You Use an Assistant? | .1 |
| Presented by Teri Hamill, PhD and Gyl Kasewurm, AuD |
| **ABA Tier 1** |

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| Understanding Vestibular Function & Dysfunction: A Case Study Approach | .3 |
| Presented by Christopher Zalewski, MA |
| **ABA Tier 1** |

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| 2010 Marion Downs Lecture on Pediatric Audiology | CEUs |
| Optimizing Early Word Learning in Infants with Hearing Loss | .1 |
| Presented by Mary Pat Moeller, PhD |
| Available FREE on-demand through March 31, 2011 |

For a complete list of Web Seminars, visit www.eAudiology.org.
Philanthropy in Action at AudiologyNOW!
The AAAF supports research, education, and public awareness at
convention. Plan to participate in one of our fundraisers or AAAF-
sponsored educational programs while in Chicago!

APRIL 6
Happy Hour with a Chicago View HearUSA Hearing Care Network

APRIL 7
Honors & Awards Banquet Oticon’s Empowering People Rock Gala Benefit for the AAAF Scholarship Program

APRIL 8
PhD Networking Breakfast Marion Downs Lecture in Pediatric Audiology The Oticon Foundation Student Research Forum Plural Publishing

APRIL 7 AND 8
James Jerger Award for Excellence in Student Research Poster Awards Anonymous Donor Marsha Engle, author of 100 Sounds to See, book signing at Foundation Booth

APRIL 9
Audiology Unplugged Trivia Bowl Siemens Hearing Instruments DiscovEARty Zone

IN THE FOUNDATION BOOTH AND ONLINE
Auction 4 Audiology: Closing April 9 at Noon CT

OTHER FOUNDATION AUDIOLOGYNOW! PARTNERSHIPS
AudiologyNOW! Member Assistance Program Auban, Inc. and Oaktree Products, Inc.

For more information on events or corporate underwriting opportunities, visit www.audiologyfoundation.org or call the AAAF office at 703-226-1049.
Classified Ads

American Academy of Audiology

Attending AudiologyNOW®?
Searching for a Job?
Need to Hire an Audiologist?

The HEARCareers Employment Center at AudiologyNOW! 2011 provides employers and job seekers a place to connect.

Visit www.HEARCareers.org for more information.

Be Part of the Academy's Future

The 2011 Academy Business meeting will review 2010, followed by round table discussions with members of the Academy staff and leaders. It is the responsibility of all members to help shape the “future” of the Academy.

April 8, 2011 | 1:00pm | AudiologyNOW! | Chicago
Visit www.audiologynow.org for more information.

Call for Papers
California Academy of Audiology Annual Conference
www.caaud.org
September 22–24, 2011
Anaheim, CA
Contact: Marcia Raggio, PhD, Conference Coordinator
mraggio@ohns.ucsf.edu
PLEASE SUBMIT BY APRIL 15

Maine
Experienced Dispensing Audiologist wanted for 30+ year established multi-location practice. Main office located in quaint college community of Farmington, Maine. Please see our Web site www.sparkeshearingaids.com. If you are seeking a career opportunity with complete benefit package and growth potential, please fax or e-mail resume with salary history to Barry (fax 508-276-0457, e-mail bn@massaudiology.com). Replies will be held strictly confidential.

Visit www.audiologynow.org for more information.
Classified and Employment Line Listing Rates for Audiology Today

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<td>Up to 50 words</td>
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Agency discount not valid for line listings.

Classified and Employment Display Advertising for Audiology Today

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Agency discount of 10% is valid to recognized agencies only, not valid on line listings.

Contact Christy Hanson at chanson@audiology.org or 703-226-1062 for more information or to place an ad.

Web Employment Postings

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<td>3 Job Postings for 1 Month</td>
<td>$625</td>
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Resume search included with job posting.

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

Advertiser Index

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Save up to $40 on registration rates if you complete your online registration by April 1, 2011, before rates increase.

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- AirTouch™ Multi Memory
- Easy Placement
- 30dB Gain (REAG)
- No Echo; Low Group Delay
- Secure For Active Patients
- Better Comfort / No Tickle
- Retains Natural Directionality
- Less Perspiration Damage
- Minimize Maintenance
- Wax Barrier

Open fittings turned the industry upside down by moving hearing aids behind the ear in order to minimize occlusion and feedback. Now, we’re turning the industry right side up again by giving patients the open fit feel without the use of tubes and tips and bringing the hearing device back in the ear - where it belongs!