A beautiful description of the ear was penned many years ago by audiologist, David Lipscomb. He wrote, “The mystery of the majesty of creation is abundantly evident in the structure and function of the ear.” Although most lay persons may not know the anatomical names of the structures of hearing, many can cite the common name for the eardrum and the smallest bone in the body, the stirrup. According to Lipscomb, “The tympanic membrane is the collector of acoustic pressures directed against the ear by vibratory energy in the air,” and “the mass of the stapes is one tenth that of the other two middle ear ossicles, because it is constructed with strong, yet light, formation.”
Although Gandhi wasn’t referring to the American Academy of Audiology and our AudiologyNOW! meeting, we can use his beautifully simple concept to better our Academy and our profession through a number of avenues. Let’s think about two: our AudiologyNOW! experiences and volunteerism.

**AUDIOLOGYNOW! EXPERIENCES:**

As of this writing, I am just leaving the Program Committee meeting for the 20th Anniversary AudiologyNOW! 2008 in Charlotte, North Carolina. Program Chair Therese Walden and her committee, along with Cheryl Kreider Carey and Academy Staff, and members of the Exhibitor Advisory Panel (EAP) representatives, spent 3 days discussing important issues, some of which related to Audiology Solutions (the Exhibit Hall) including “giveaways.” Yes, those gizmos and “stuff” that are sometimes termed a “necessary evil” in our Audiology Solutions. But are they a necessary evil? Are they necessary at all?

In preparation for this meeting, I was provided with a copy of the results of the post-convention survey that 267 Academy members filled out following the Denver meeting. It was fascinating reading (OK, true, I had a 5-hour flight from Los Angeles to North Carolina, but nonetheless, I enjoyed every word I read). You told us many things that are important to consider in planning subsequent meetings:

In answer to the question: “What Did You Enjoy Most?” (about AudiologyNOW!) your answers included

- Exhibit hall and seeing the new products
- The expo was very helpful
- The exhibits were WOW!

And…What Did you Enjoy Least?

- Crowded Exhibit Hall
- Expo Hall is too LOUD!
- The greed it (exhibits) brings out in me and my colleagues

**QUITE THE DIVERSITY OF OPINION!**

At the Program Committee meeting, we had long discussions about the role, the scope, and the appropriateness and effectiveness (or not) of the Exhibit Hall manufacturer giveaways. In Denver, giveaways ranged from pens and water bottles to an iPOD Shuffle and a Coach “wristlet”. What would happen if exhibitors didn’t give anything away? How would it affect members and exhibitors? Would it have any effect at all?

The responses on Survey Monkey to the question: “How do you feel about the relevance of the giveaways in Audiology Solutions?” ranged from “Totally inappropriate—we have to stop the giveaways; I find this kind of escalated consumerism distasteful; I felt they were out of hand; Out of control; Perhaps the ethics committee should be involved…One cannot preach for audiologists to be ethical and then allow for such unethical practices to occur within its own convention”; to “Giveaways are great and do not compromise a professional’s integrity; I enjoyed them!; Fine and appropriate; nice; I like giveaways; awesome; relevant; appreciated; motivating; they have no influence on my decision-making in the office.”

The range of responses, while not necessarily a random sample, is worth noting. Overall, about one-third of responses were pro-giveaways, one-third neutral, and one-third anti-giveaways. That one-third of the respondents expressed concern signifies to me that this is not a trivial issue, and as such, I believe that these concerns should be addressed.

It is increasingly recognized that the acceptance of a gift, no matter what the size or value, sets up a feeling of obligation towards the giver on the part of the receiver (Brennan, 2006). For this reason, many academic medical centers, such as the one in which I work, have conflict of interest policies regarding the acceptance of gifts from manufacturers, drug companies, and the like. Use of a pen with a manufacturer brand, or displaying brochures advertising specific hearing aids, is not permitted. Manufacturers’ representatives may not bring in lunches or bagels when educating staff on new products or software. Business development plans, paid trips (even for educational purposes) and holiday gifts are no longer permitted. Manufacturers’ representatives may not bring in lunches or bagels when educating staff on new products or software. Business development plans, paid trips (even for educational purposes) and holiday gifts are no longer permitted. And, of course, gifts or travel provided on a quid pro quo basis (i.e., based on the number of hearing aids sold) are prohibited.
In our own Academy Expo, the nature and cost of exhibitor giveaways deserves scrutiny. Currently, there is a limit on the value of giveaways of $100. In the near future, you will see this limit decrease significantly. Our staff expo expert (Sabina Timlin) reported that the typical nonprofit health-care professional meeting limits gifts to a value of $25 or less; some prohibit gifts of any amount. This (zero-gift) policy may come to be viewed as an industry standard. These are not new ideas; when I was on the Ethical Practices Board years ago, this was a topic for discussion.

There has been some confusion between the issue of exhibitor “giveaways” and “sponsorships.” The distinction between the two is not trivial. A giveaway is simply that—a token gift or a gift of not-so-nominal value that is given to create the opportunity to educate attendees about the giver’s product or service. And perhaps, subliminally, to foster a relationship between the giver and the receiver. A sponsorship, on the other hand, is a solicited donation to the Academy to help underwrite the costs of the Convention, in exchange for the opportunity to publicize the donation to the membership. As an example, exhibitors underwrite a portion of the costs of badge lanyards, shuttle busses, and boxed lunches, all of which are identified with the sponsor’s name. It bears mention that the sponsorship of such items does not typically cover the complete cost of the sponsored item, and the balance of the cost is borne by you, the Academy, through annual dues and meeting registration costs.

If sponsorships were eliminated, Academy members would have two options available: first, the cost of the item or service would be added to the convention registration fees, or alternatively, the goods or services would not be provided to the attendee.

Eliminating giveaways, on the other hand, would have no obvious impact. The Audiology Solutions Expo would continue to exist; the manufacturers would have the opportunity to educate audiologists about their products and services, and audiologists would continue to experience the casual, informative give-and-take with exhibitors. The only obvious impact is that audiologists would leave the Expo Hall with comparatively empty hands.

What is the best course of action? Each member of the Academy might have her/his own take on this. Sponsorships by manufacturers would be sorely missed by the attendees if they were eliminated. Giveaways, perhaps not so much. The distinction is important, and the implications of both sponsorships and giveaways must be carefully considered.

There is one additional concern regarding giveaways: the number of items given away only to be left behind in hotel rooms, or carried home and then given away or discarded.

We are all increasingly aware of the need to conserve resources in all aspects of our daily lives. This past Convention, visitors to Audiology Solutions were able to place unwanted giveaways into donation bins. The Academy was able to make a substantial gift of unwanted items to Children’s Hospital in Denver. This is an excellent alternative to leaving unwanted items in hotel rooms.

The 3 Rs, reduce, reuse, recycle, suggests that we could go one step further by reducing the number of items given away in the first place, as well as reusing items such as badge holders, lanyards and convention book bags. How many of us might be willing to purchase a leather (or faux-leather) briefcase with an Academy logo to carry during AudiologyNOW! and bring back the same bag in ensuing years for re-use? Would we be inconvenienced if we received our registration materials in a simple bag (that could double as a shopping bag when we return home) made of a recycled fabric? Could we get speaker hand-outs on a flash drive or read them on a Web site rather than taking home reams of paper?

There is a concern about the “carbon footprint” that such materials create, through their manufacture, the transporting required to bring them to the convention, and the disposal of them when they are no longer desired. We should all think of ways to positively impact this footprint, through the 3Rs.

Another option is to encourage giveaways that have a socially-redeeming value. Rather than more trinkets, how about donations to favorite charities or low-cost hearing aids that could be provided to needy individuals? In the years to come, we will see a change in some of the policies regarding giveaways at our meetings. This change, I hope, will be embraced as a positive step towards reducing costs related to the manufacture and transportation and disposal of items.

Equally important, this change will exemplify the professionalism of Audiology in our relationships with our partners on the manufacturing side. Exhibitors are an integral part of our Convention and our profession, and we could not do our jobs and help our patients without this collegial partnering. Our relationships with these strategic partners can be built on a positive basis of mutual interdependence, support and information exchange, and the giving of giveaways can fade into our past.

Volunteerism

A second way that we can be the change is to… volunteer! Since being elected President of our Academy, I have had some wonderful e-mails from members volunteering to serve on committees or task forces on subjects that interest them. Daily, our members volunteer in countless ways. Reviewing reports emanating from AudiologyNOW! 2007, I saw that no fewer than 25 task forces and new committees were suggested by members. These task forces and committees require volunteers to do the work that they are charged to complete. Sadly, however, in the call for committee volunteers published in the March-April issue of Audiology Today, and in an email alert to members, fewer than 25 responses came in!

A volunteer, according to Wikipedia, is someone who serves in a community primarily because they choose to do so. The volunteering audiologists whom I know choose to serve are passionate about their profession and work to move the
profession forward, bettering the lives of our patients.

Take a look at the Academy’s Strategic Plan and committee structure on our Web site to see the wide range of volunteer opportunities.

Volunteers DO work! On this past Memorial Day weekend, as the Program Committee and the 20th Anniversary Task Force volunteers were meeting in North Carolina, there was at least one late-afternoon conference call on Memorial Day to discuss audiometric symbols. I received an e-mail from a board member looking for summaries of the round-table discussions at the business meeting. Even on a holiday, the Academy’s volunteer work goes on.

A member-driven organization means that the heavy lifting comes from members! Those of you who filled out Survey Monkey with suggestions about changes, improvements and new initiatives for next year’s convention can be part of this solution through volunteering. That’s the beauty of a member-driven organization—it can be whatever we want it to be.

Thank you to the newly-elected Board members—talk about a volunteer job! Enjoy meeting them in the Direct Access/My Life bios in Audiology Today. I am continually impressed and gratified to hear of the countless ways in which members volunteer. Thanks to all of you who volunteer your time and energy!

(My thanks to Teri Hamill, Therese Walden, Cheryl Kreider Carey and others for the suggestions and discussions that led to many of the thoughts expressed in this column!).

NEW & IMPROVED

JAAA Online CEU Program!

• Instantaneous grading  
• Correct answer feedback  
• Automatic reporting of your CEUs to the Academy

The Ethics “Green Book” CEU Program is available online too!

To register visit www.eAudiology.org

For more information about eAudiology – Your CEU Source!  
Contact Cornelia Gallow, Education Manager, at cgallow@audiology.org or 703.226.1068
My name... Gary Jacobson

childhood ambition... Even... profession for which I am unqualified.

first job... Team tour driver at Lake Forest housing development (Irving, CA). Don't ask.

inspiration... Patients, young and old, who, despite disease and discomfort persevere and find beauty and humor in life.

tondest memory... My wedding.

favorite movie or book... "Duck Soup" and "To Kill a Mockingbird" (It's ok to get "misty" at the end right?)

indulgence... Tennis... and ice cream (yin yang)

proudest moment... Birth of my daughter, and every accomplishment she has had since then.

perfect day... Watching the French Open at Roland Garros (French Open) and having a great dinner after.

My life... a great and wonderful surprise.

My profession... Audiology (same as above).

Gary Jacobson, PhD
Vanderbilt Univ. Medical Center, Audiology, Suite 9302
1215 21st Avenue, South, Nashville, TN 37232-8025
gary.jacobson@vanderbilt.edu
Direct Access

My name: Pat Kricos

childhood ambition: To be a teacher. Surprise, surprise!

first job: Age 16, selling beer and pizza at a deli in Germany where my dad was stationed

inspiration: Books...my grandmother read to me...about Helen Keller

fondest memory: The birth of each of my three precious kids

favorite movie/book: Any book by Frank McCourt...or...Amy Tan

indulgence: Dark chocolate, red wine, and a lovely bed & breakfast in Key West

proudest moment: Finally learning how to parallel park within 36 inches of the curb

perfect day: Walking in the woods with Gerty, my Scottish Terrier; biking with family; lunch with friends; no deadlines; and news that H.A. Nos has passed

My life: Is just about right, and keeps getting better...

My profession: Is hot, hot, hot! It's my passion, my job, and my challenge.

Pat

Patricia Kricos, PhD
University of Florida, Department of Communication Sciences & Disorders
PO Box 117420, Gainesville FL 32611-7420
pkricos@csd.ufl.edu

AMERICAN ACADEMY OF AUDIOLOGY
Can you hear the beat as you read these words? Have you made your $20 donation to the AAAF to receive your copy of the Academy’s CD? Have you heard the craze about the Academy’s new rap single, Turn it to the Left, which debuted during AudiologyNOW! 2007 and a week later was picked up by National Public Radio (NPR)?

With special recognition to Academy member Sharon Kujawa, the above is an excerpt from Turn it to the Left that was written by the son of one of her patients who experienced noise-induced hearing loss. Thanks to Sharon’s connection and loyalty to the Academy, the Academy now owns the rights to this educational tune. The exposure through NPR has individuals, as well as educators, contacting the Academy’s Foundation to obtain copies of the rap given the fact that the Academy has created this opportunity for interdependence with our Foundation.

The Academy’s Vision is to be essential in the professional lives of audiologists by advancing the science and practice of audiology and achieving public recognition of audiologists as experts in hearing and balance. After meeting with a professional at developing PR campaigns for healthcare clients regarding our newly acquired rap, the Academy is launching a public awareness campaign centered on Turn it to the Left.

Excited about the unique educational tool the rap presents, the PR firm has presented a plethora of opportunities through which the Academy can expose our message to the public regarding the protection of our hearing. One of the first things we’ve done is to upload the video of Ben Jackson performing Turn it to the Left on YouTube.com.

The Academy will look to our Foundation to seek corporate and individual donors who are willing to provide financial support for these awareness efforts. Each corporate exhibitor who attended our AudiologyNOW! 2008 site visit in Charlotte, NC in June was given a “Don’t be LEFT out” gift notifying them of the fact that some exciting opportunities will be forthcoming. And, as members of the Academy you can support this public awareness campaign by making a $20 donation to the Turn it to the Left fund… and you’ll receive a complimentary copy of the CD as a thank you gift for your contribution. (Donations to the Turn it to the Left Campaign are tax-deductible and can be made on the Foundation’s Web site: www.audiologyfoundation.org).

Additionally, the Academy has reached out to others who have been involved in hearing loss prevention initiatives and are grateful for the input from Dangerous Decibels, Educational Audiology Association and the National Hearing Conservation Association. Learn more about our joint efforts at turnittotheleft.com

If you answered “yes” to any of my questions above, feel privileged to be part of the living legacy that the AudiologyNOW! 2007 theme “hearing loss prevention” has created. The fact that it has given the Academy a mechanism for moving towards our vision of exposing the public to our profession through such a cool, attention-grabbing mechanism, is an opportunity that we will leverage to the benefit of the Academy, as well as our Foundation… ultimately benefiting you, the audiologist, through those whom we serve.

If none of this is sounding familiar…listen up close and follow my advice… go to turnittotheleft.com to a) hear a snippet of the rap, b) link to YouTube.com to see Ben Jackson’s performance during AudiologyNOW! 2007 and c) read the latest about the public awareness campaign. Through this WEB site you can also receive a copy of the CD (lyrics included) by making a $20 donation/s to the Academy’s Foundation and make additional donation to receive copies to give as gifts. Your donation helps support research in noise-induced hearing loss.

Protect your ears when you’re near loud sounds,
When you’re listening to music, 
turn the volume down,
Use good headphones, don’t listen too long,
Get your hearing tested, and memorize this song.
CALL FOR PAPERS:
Proposals are now being accepted for platform, workshop, and poster presentations for the 33rd Annual Hearing Conservation Conference in Portland, Oregon. Topics related to "the prevention of hearing loss due to noise and other environmental factors in all sectors of society" will be considered. Presentations may be applied research, scientific investigations, or practical applications of hearing loss prevention issues.

Proposals should include the title, type of presentation (platform, workshop or poster), presenter(s) name, affiliation and contact information, and a short description (150 words for platform and workshop presentations; 75 words for poster presentations). Final acceptance of proposals is determined by the Program Task Force.

DEADLINES:
Platform and workshop presentations: July 15, 2007
Poster presentations: October 1, 2007

Send proposals by email with subject line "NHCA 2008 Presentation Proposal" to nhca@gwami.com, or mail to the NHCA office at 7995 E. Prentice Ave., Ste. 100, Greenwood Village, CO 80111.

The program task force welcomes ideas for presenters, topics, and conference activities. Please email suggestions to the NHCA office at nhca@gwami.com.
INTRODUCTION

Universal newborn hearing screening (UNHS) has improved the lives of deaf children throughout the world and must surely rank as one of the major achievements of medicine during the past 50 years. The completion of the sequencing of the human genome is a second monumental achievement that has dramatically increased our knowledge about the extremely large number of independent genes and specific environmental factors that can cause hearing loss (HL). Further improvement in the early detection, effective treatment and even the prevention of pre-linguistic HL will require the integration of existing screening programs with the new knowledge we have gained about the many genetic and environmental causes of HL. Because of their daily exposure to deafness in infancy, audiologists are uniquely qualified to play an expanded role in this process and it is gratifying to note that many of the new doctoral programs in audiology that are being established now include genetics in their curricula.

CAUSES OF DEAFNESS

Incidence: The incidence of deafness can show remarkable variation depending on the presence of environmental causes that are epidemic in nature, or the prevalence of specific genetic causes, which in turn can be influenced by the mating structure of the population. However, one of the major causes for apparent differences in the incidence of deafness are the criteria that are used to define this trait. For example, in the United States, a sensorineural loss of 35 dB or more in either ear is generally considered to be the threshold at which infants should be referred for confirmatory testing; but in the UK, permanent childhood hearing loss is defined as a bilateral sensorineural loss of 40 dB or more, and these differences greatly complicate direct comparisons between countries. Despite these difficulties it is possible to obtain rough estimates of the incidence and prevalence of clinically significant hearing loss in this country throughout life, as shown in Table 1.

Environmental Causes: Recognized environmental causes of deafness include pre- and post-natal infections such as congenital rubella and CMV infections, AIDS, meningitis and chronic otitis media; perinatal complications including prematurity, low birth weight, hyperbilirubinemia and pharmacologic ototoxicity, and other factors like environmental noise exposure, head injury, and sub-arachnoid hemorrhage (Table 2). In this country, congenital CMV infection has replaced congenital rubella as the major environmental cause of hearing loss, but in others such as India, where immunization programs have not yet been established, congenital rubella remains the commonest cause of deafness. In the United States, the overall incidence of CMV infection during pregnancy is about 1%. The hearing loss can involve one or both ears; it can be congenital or greatly delayed in its onset, and can be an isolated finding or associated with many other clinical abnormalities that allow the diagnosis to be made at birth. (1)

Genetic Causes: The Human Genome Project enormously accelerated the discovery of many new genes for deafness. Genetic causes explain more than half of profound congenital deafness and in most areas of the world data from UNHS shows that for every child with profound HL, 1 to 2 are born with a lesser but clinically significant bilateral or unilateral loss. The causes for the HL in this group is less well understood, and clarifying the etiology should be an important research priority to which audiologists could make a major contribution. Hereditary deafness can be classified in

<table>
<thead>
<tr>
<th>TABLE 1: Incidence of Deafness with Age in the United States (per 1000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• At birth</td>
</tr>
<tr>
<td>Severe to profound.................................................0.8</td>
</tr>
<tr>
<td>Moderate, unilateral................................................1.1</td>
</tr>
<tr>
<td>Total........................................................................1.9</td>
</tr>
<tr>
<td>• Prevalence at age 10..................................................3.5-4.0</td>
</tr>
<tr>
<td>• Prevalence at age 65...................................................200-400</td>
</tr>
<tr>
<td>• Pre-linguistic hearing loss=2.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE 2: Environmental Causes of Deafness</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Infections: Rubella, CMV, Meningitis, AIDS, Chronic otitis media</td>
</tr>
<tr>
<td>• Perinatal: Prematurity, Anoxia, Low birth weight, Hyperbilirubinemia, Ototoxic drugs</td>
</tr>
<tr>
<td>• Other: Environmental noise pollution, head injury, subarachnoid bleeding leading to superficial siderosis</td>
</tr>
</tbody>
</table>

Table 3: Classification of Genetic Deafness

By Phenotype
• Syndromic Forms..................................................15-25%
• Non-Syndromic Forms...........................................75-85%

By Mode of Transmission
• Autosomal Recessive.............................................77-88%
• Autosomal Dominant...............................................15-20%
• X-linked......................................................................1-2%
• Y-linked.......................................................................< 1%
• Mitochondrial............................................................1-20%
• Digenic........................................................................1%

By Chromosome Locus, Gene or Mutation
Lecture
Be Improved?

WALTER E. NANCE MD, PhD
Professor of Human Genetics
Virginia Commonwealth University

and

KELLEY DODSON, MD
Assistant Professor of Otolaryngology
Virginia Commonwealth University

FIGURE 1: Chromosomal Location of Genes Causing Deafness

Green = Dominant Red = Recessive

Table 4: Important Causes of Late Onset Pre-linguistic HL (PLHL)

- **Connexin Deafness**: Most common genetic cause of HL; not always expressed at birth
- **CMV**: Most common environmental cause of HL & most common cause of PLHL
- **SLC26A4**: Most common genetic cause of PLHL because of EVA risk in carriers
- **Mt 12S rRNA A1555G**: Most common preventable cause of genetic deafness

**IMPORTANT CAUSES OF PRE-LINGUISTIC DEAFNESS**

The establishment of newborn hearing screening programs has led to the recognition that all forms of pre-linguistic deafness may not be expressed at birth. Infants at risk for at least four important causes of delayed onset pre-linguistic deafness could readily be detected by molecular testing at birth, providing the opportunity for the anticipatory follow-up of at risk infants (Table 4).

**Connexin Deafness**: Because of the large number of genes for deafness, the discovery that mutations involving a single locus, DFNB1, are the major cause of genetic...
deafness in many populations came as a great surprise (Table 5). Two genes within this region (Figure 2), GJB2 and GJB6, are widely expressed in the supporting cells of the cochlea where they code for the protein subunits of cellular structures known as “gap-junctions” that assemble in the cell wall to form homologous or heterologous channels between adjacent cells through which ions and small molecules can pass (Figure 3). These channels are thought to play a critical role in maintaining the endocochlear potential by facilitating the recycling of potassium ions away from the hair cells to the stria vascularis where they are actively pumped back into the cochlear endolymph.

Mutations involving the CX26 protein are the commonest cause of connexin deafness and more than 150 are known. Many are “private” mutations, observed only once or in a few pedigrees, but others are common in specific populations such as the 35delG mutation in Caucasians, 167delT in Ashkenazi Jews, 235delC in Asian populations and the R143W mutation in Ghana. Most mutations are recessive, but at least 6 show dominance, and typically exhibit associated cutaneous findings such as keratitis or ichtheosis. In addition, HL occurs with dermatologic abnormalities in some CX30 and CX31 mutations and with neurologic findings in X-linked Charcot-Marie-Tooth disease caused by CX32 mutations. Many deaf probands are found to be apparent heterozygotes for a single recessive CX26 allele. Since the frequency of heterozygotes exceeds 3% in some populations, heterozygosity could represent an unrelated finding in some deaf CX26 heterozygotes. However, in such cases, digenic transmission of a co-existing GJB6 mutation must be excluded as the cause for the deafness. In this country, a specific 342 kb deletion spanning the GJB6 locus (Figure 2) accounts for the hearing loss in 17.7% of deaf subjects who are apparent CX26 heterozygotes.

Initially, pathologic connexin mutations were thought to be the cause of severe to profound hearing loss that was invariably present at birth. As more families and mutations have been identified however, it has become apparent that connexin deafness is consistent with a moderate degree of variation in severity such that patients who carry certain base substitution mutations, as opposed to the common deletions that severely truncate the resulting protein, can have somewhat milder effects. Anecdotal reports also began to emerge of infants homozygous for two pathologic alleles who passed their newborn hearing screening tests, only to develop profound deafness later in infancy. Although the frequency of such “non-penetrance” at birth has not been rigorously established, the analysis of a series of nine such cases suggests that deafness may not be apparent at birth in as many as 2.4% of affected connexin homozygotes.(2) The universal screening of all newborn infants for connexin deafness would identify these non-penetrant cases whose hearing could then be monitored closely throughout infancy. In deaf newborns, the immediate diagnosis of this commonest genetic cause of deafness would greatly promote the acceptance and appropriate response to the diagnosis by parents and their pediatricians. Because of the complexities in the interpretation of some genetic test results, universal molecular screening for deafness should clearly be viewed as an adjunct to and not a replacement for audiologic screening.

**Congenital CMV Infection:** In this country, congenital CMV infection varies in frequency with maternal age, race, parity and socioeconomic status from 0.1-2%, averaging about 1% of all births as noted previously. It is the leading non-genetic cause of congenital HL, the leading cause of unilateral HL, and the leading cause of pre-linguistic HL that is not expressed at birth. The HL can be unilateral, fluctuating or progressive, and can begin months or even years after birth. Only 14% of CMV infections are diagnosed clinically at birth, and if not recognized, the diagnosis may be difficult to establish retrospectively because of the possibility that positive antibody titers later in infancy may represent a postnatal rather than a congenital infection. HL is common both in cases that are clinically apparent at birth and in infants who are otherwise asymptomatic, affecting 36% of the former by age 6 and 11% of the later. HL is present at birth in 3.9% of viremic infants, with nearly equal numbers in those with clinically diagnosed and unrecognized infections. In a retrospective study, viral DNA was found on newborn blood spots from 10% of infants with congenital HL and 35% of those with moderate to severe late onset HL (Table 6). Universal
newborn screening for CMV could be performed on the same blood spots that are collected for newborn metabolic screening. Such a program would provide a definitive diagnosis in a large proportion of infants with HL of unknown cause and would identify a cohort of infants with normal hearing at birth who are at risk for developing HL later in infancy.

**Pendred syndrome**: Pendred syndrome (PDS) is a relatively common form of recessive deafness with an onset in infancy or early childhood that results from mutations involving the SLC26A4 gene on chromosome 17q31. The associated defect of iodine transport and the resulting goiter that define the syndrome may not appear until adolescence or adult life, thus complicating attempts to anticipate the hearing loss from the syndromic features. Cochlear abnormalities ranging from Mondini malformations to enlarged vestibular aqueduct (EVA) are often seen, and the latter can occur with deafness in the complete absence of thyroid disease in patients with so-called “non-syndromic EVA”. Such patients are often found to carry only a single PDS mutation. In a study of non-syndromic EVA, 61% of affected probands carried a single PDS mutation (3), a risk ratio in excess of 30 for the 1.7% of the population who are PDS heterozygotes. Non-syndromic EVA can also result from mutations either within a non-coding regulatory region of the SLC26A4 gene, or from the unlinked activator gene FOXP1 on chromosome 5q34 whose gene product binds to this region. EVA in double heterozygotes for mutations involving these two genes represent yet another example of the digenic transmission of deafness.(4) In a large study, non-syndromic EVA was found in 20.8% of 810 children with sensorineural HL most of whom became symptomatic after birth at an average age of 5.8 years.(5) These data suggest that at least 7% of the affected children had pre-linguistic deafness resulting from non-syndromic EVA and indicate that apparent carriers of PDS must represent the leading genetic cause of late onset pre-linguistic deafness. As in the case of CMV and connexin deafness, infants at risk for PDS associated non-syndromic EVA could readily be detected by molecular tests at birth.

**The mt 12S rRNA A1555G mutation**: The mitochondria are DNA containing structures in the cytoplasm that play an essential role in cellular energy metabolism. Mitochondrial DNA is circular in structure and was presumably derived from symbiotic bacteria at some time in the early evolution of animals. Only 37 genes are still retained by mitochondria, but several are associated with deafness mutations, including the A1555G mutation in the mt 12S rRNA gene that causes sensitivity to the ototoxic effects of aminoglycoside antibiotics. This is a preventable form of deafness that accounts for 10% of deafness attributed to pharmacologic ototoxicity in this country. (6) Some gene carriers develop hearing loss later in life even without aminoglycoside exposure, an effect that may also reflect interaction with a modifier gene (Table 7). Universal screening would identify this commonest preventable cause of deafness. Because mitochondrial traits are transmitted exclusively by mothers who carry the trait to all of their offspring, all of these children are at risk of becoming deaf if they are exposed to aminoglycoside antibiotics.

**AGE RELATED CHANGES IN THE CAUSES OF PRE-LINGUISTIC DEAFNESS**

Although excellent studies of specific causes of deafness are available, no longitudinal studies have been performed that have included testing for multiple causes of pre-linguistic HL in the same sample of newborn infants. However, educated “guesstimates” of age related changes can be obtained by combining very diverse studies, (7) to obtain an overall estimate that the incidence of clinically significant HL in the U.S at birth is about 186 per 100,000, rising to a prevalence of 270 per 100,000 at four years (Figure 6). Using data from older children and adolescents, the proportion of genetic cases can be estimated by sentinel phenotype analysis from the relative frequency of connexin deafness in probands from simplex and multiplex sibships. The frequencies of connexin deafness at birth can be extrapolated from the prevalence at four years and the frequencies PDS and non-syndromic EVA from incidence figures and the risk ratio for PDS carriers. Finally, published data provide estimates for the contribution of CMV in relation to other environmental causes. In aggregate, our estimates suggest that if newborn audiological screening were
supplemented by universal molecular testing for the four causes of deafness we have discussed, the follow-up of at risk infants would allow the pre-symptomatic detection of nearly 60% of all infants who develop late onset pre-linguistic HL. This program would provide an immediate etiologic diagnosis of the commonest genetic and environmental causes of HL in the U.S. at birth, the commonest genetic and environmental causes of late onset pre-linguistic HL and the commonest cause of preventable HL.

HOW CAN NEWBORN HEARING SCREENING BE IMPROVED?

Finally, let me return to the major focus of my talk. I want to make it clear that I believe Newborn Hearing Screening has been a highly successful program that has benefited thousands of infants throughout the world. But we should not let this success blind us to effective ways in which this marvelous program could be improved. These would surely include, (7)
1) An effort to adopt an etiologic focus.
2) The introduction of universal molecular testing for selected forms of deafness
3) The immediate confirmation of audiologic screening abnormalities and
4) Standardization of screening protocols

Adopt an etiologic focus: Most existing hearing screening programs lack an etiologic focus, and the goal has been simply to identify infants with hearing loss at birth to permit early intervention. However, there are circumstances when knowledge of the cause of the deafness is absolutely essential for proper management.

- In order to prevent hearing loss from biotinidase deficiency, the diagnosis must be made before hearing loss appears so the infant can be started on biotin therapy.
- The hospital charts of patients who carry the mt A1555G mutation need to be flagged so that aminoglycosides are not used on the patient or in any other children of the mother.
- Patients found to carry two pathologic Connexin mutations will almost certainly become deaf during the first year of life no matter what the results of the newborn hearing test were, and promptly establishing the diagnosis of this commonest form of genetic deafness should force parents and their physicians to take the diagnosis of hearing loss more seriously.
- As we have seen, children who have even a single gene for Pendred Syndrome are at risk for hearing loss in infancy and early childhood if they are also found to have enlargement of the vestibular aqueduct and should be followed closely until this finding can be excluded.
- Finally, congenital CMV infection is the commonest non-genetic cause of deafness in this country. It can lead HL that is present at birth, or begins in infancy or childhood. The HL can be accompanied by other abnormalities including seizures and microcephaly, but is frequently seen in the absence of any other clinical abnormalities. CMV infection is also the leading cause of unilateral pre-linguistic HL, and it remains to be established whether the reported poor school performance of infants and children with unilateral losses results from their hearing loss per se, or whether it merely reflects the high frequency of CMV as a cause for unilateral hearing loss with associated neurologic deficits contributing to their poor academic performance. Clearly, it will never be possible to answer this question without an etiologic diagnosis.

Universal molecular testing for selected causes of deafness: By screening all newborn infants for just four important causes of deafness (DFNB1, CMV, PDS, and the mt 12S rRNA A1555G mutation) it would be possible to detect more than half of all infants with normal hearing at birth who are at high risk for delayed onset hearing loss in infancy in addition to detecting infants at birth infants who have the commonest genetic, the commonest environmental and the commonest preventable causes of deafness. Based on years of experience with newborn metabolic screening, it is clear that parents and their physicians are much more likely to comply with recommended therapy when it is possible to make a specific etiologic diagnosis. It is important to recognize that such programs would clearly represent an adjunct to audiologic screening, and could never replace universal audiologic testing because of ambiguities in the interpretation of molecular screening in the absence of audiologic testing.

Immediate confirmation of audiologic screening tests: It would be unimaginable to discharge newborn infants with signs of a serious abnormality affecting the heart, lungs, brain or other organs without initiating appropriate diagnostic testing. What not-so-subliminal message does it convey to the parents about the importance that we attach to the early diagnosis of hearing loss when we merely “REFER” them for audiologic confirmation, often without fully disclosing the fact that their infants have actually FAILED the screening test? Because confirmatory audiologic tests in newborn infants seldom require sedation they can actually be easier and possibly more accurate than the testing of 1-3 month old infants. Furthermore, as evidence accumulates that early cochlear implantation leads to improved results the age at which a definitive diagnosis is required will doubtless be reduced. Confirmation of the hearing loss at birth would permit the initiation of genetic evaluation and counseling as well as the provision of specialized care by audiologists, otolaryngologists and experts in infectious disease, all under the coordination of the pediatrician. If necessary, third party payers should be required to provide for an additional day of hospitalization for the small number of infants who currently fail the audiologic screening test.
Standardization of testing protocols: Finally, there is a growing recognition of what an important contribution auditory neuropathy makes to pre-linguistic HL. In view of this, testing equipment and protocols should be reviewed to be sure they do not preclude the detection of infants with these disorders. Typically, this will require performing an ABR based screening procedure alone or in combination with testing for OAEs. The development of automated equipment to collect threshold data at multiple frequencies that could be transmitted to and reviewed by an audiologist, would allow even the smallest hospitals to obtain prompt confirmation in most infants who fail the initial screening test.

CONCLUSION

UNHS is a major advance in the treatment of deafness but there are clearly ways in which existing programs could be improved. Follow-up and compliance rates for infants with abnormalities detected in newborn metabolic screening programs approach 100% and there is no good reason why hearing screening should not achieve similar results. Initially, pediatric audiologists often have more extended contact with deaf infants and their parents than any other health professional and are in a unique position to attempt to provide an immediate confirmation of abnormal screening tests prior to discharge and the follow-up of infants found to be at high risk for late onset pre-linguistic hearing loss. The addition of molecular tests for four important causes for late onset pre-linguistic hearing loss to the battery of much less common diseases for which newborn blood spots are currently screened would detect more than half of all infants with normal hearing at birth who develop clinically significant hearing loss by the age of four. Because the professional lives of pediatric audiologists are exclusively focused on deaf infants and children they should actually be far better qualified to suspect the true cause of deafness than primary care physicians (PCP) who may, at most, treat 10 or 20 infants with profound deafness during their entire career. The PCP is, of course, responsible for orchestrating the entire health care of his or her patients, and in the case of deaf children, PCPs needs all the help they can get from audiologists, otolaryngologists, geneticists, experts in infectious disease and other relevant medical specialists. Audiologists should never be satisfied until the cause of the hearing loss in a deaf infant has been determined. Often the family history or specific clinical features can provide important clues, but in the future molecular tests will be of increasing importance in establishing the specific cause, and only when the cause is known can an accurate prognosis be given. I am confident that audiologists will find that when a specific etiology can be identified, the parents and their physicians will be much more motivated to accept and act upon the diagnosis of deafness in a newborn infant.

REFERENCES

New Doctoral Program Launched at UNCG

The University of North Carolina-Greensboro (UNCG) has developed a new doctoral program in the School of Health and Human Performance that will prepare students for teaching and research careers in communication sciences and disorders.

The new program, which will enroll both full and part time students, was approved in January and will begin Fall 2007.

According to Celia Hooper, head of UNCG’s Department of Communication Sciences and Disorders, the program is the first of its kind in the Southeast, and one of only a few in the nation, to offer a research doctoral program for both full and part-time students. The program will encourage students to study “intersecting disciplines,” exposing them to a wider range of thought and expertise. A student interested in child hearing disorders, for example, might specialize in that area through CSD courses, and also study of genetic disorders by taking courses in other departments. Students can also work with faculty members at other institutions, including Duke, North Carolina A&T, NC State, UNC-Chapel Hill, and Wake Forest Universities.

Applications are being accepted from students with masters in audiology, speech-language pathology, hearing science, speech science, linguistics, and other related fields. Students with AuD degrees interested careers in teaching and research are also welcome to apply. For more information, contact Dr. Denise Tucker, Associate Professor, at datucker@uncg.edu.
New Heights in Attendance!

Thanks to all in attendance for making AudiologyNOW! 2007 such a success! We hit new heights for attendance, innovative ideas, creative programming, and spreading the word about Hearing Loss Prevention. See y’all in Charlotte!

~Sharon Sandridge, 2007 Program Chair

Denver Wrap-Up

Highest number of attendees ever! 4311 attendees and 2852 exhibitors, which means a total of 7,163 people, experienced AudiologyNOW! 2007. This was the second highest total registration on record. Just 153 short of the record made in San Diego 2001.

INTERNATIONAL – Attendees hailed from 51 Countries!

<table>
<thead>
<tr>
<th>Country</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>45</td>
</tr>
<tr>
<td>Belgium</td>
<td>5</td>
</tr>
<tr>
<td>Brazil</td>
<td>46</td>
</tr>
<tr>
<td>Canada</td>
<td>197</td>
</tr>
<tr>
<td>China</td>
<td>23</td>
</tr>
<tr>
<td>Columbia</td>
<td>2</td>
</tr>
<tr>
<td>Denmark</td>
<td>77</td>
</tr>
<tr>
<td>France</td>
<td>16</td>
</tr>
<tr>
<td>Germany</td>
<td>80</td>
</tr>
<tr>
<td>Italy</td>
<td>11</td>
</tr>
<tr>
<td>Japan</td>
<td>68</td>
</tr>
<tr>
<td>Korea</td>
<td>15</td>
</tr>
<tr>
<td>Mexico</td>
<td>27</td>
</tr>
<tr>
<td>Netherlands</td>
<td>16</td>
</tr>
<tr>
<td>New Zealand</td>
<td>20</td>
</tr>
<tr>
<td>Norway</td>
<td>28</td>
</tr>
<tr>
<td>Singapore</td>
<td>8</td>
</tr>
<tr>
<td>South Africa</td>
<td>5</td>
</tr>
<tr>
<td>Spain</td>
<td>7</td>
</tr>
<tr>
<td>Sweden</td>
<td>12</td>
</tr>
<tr>
<td>Switzerland</td>
<td>41</td>
</tr>
<tr>
<td>Taiwan</td>
<td>7</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>3</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>123</td>
</tr>
</tbody>
</table>

PRIMARY WORK SETTING

<table>
<thead>
<tr>
<th>Setting</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinic</td>
<td>14%</td>
</tr>
<tr>
<td>College or University</td>
<td>15%</td>
</tr>
<tr>
<td>ENT/Physicians Office</td>
<td>13%</td>
</tr>
<tr>
<td>Hospital</td>
<td>11%</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>6%</td>
</tr>
<tr>
<td>Military/VA</td>
<td>3%</td>
</tr>
<tr>
<td>Other</td>
<td>9%</td>
</tr>
<tr>
<td>Pri/Secondary School</td>
<td>2%</td>
</tr>
<tr>
<td>Private Practice</td>
<td>27%</td>
</tr>
<tr>
<td>Retired</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

SPECIALTY AREA

(Attendees were able to select more than one Specialty Area)

<table>
<thead>
<tr>
<th>Specialty Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostics</td>
<td>35%</td>
</tr>
<tr>
<td>Disorders</td>
<td>14%</td>
</tr>
<tr>
<td>Hearing Conservation</td>
<td>9%</td>
</tr>
<tr>
<td>Hearing and Balance Sciences</td>
<td>7%</td>
</tr>
<tr>
<td>Professional Issues and</td>
<td>7%</td>
</tr>
<tr>
<td>Practice Management</td>
<td>7%</td>
</tr>
<tr>
<td>Treatment</td>
<td>28%</td>
</tr>
</tbody>
</table>

DEGREE

<table>
<thead>
<tr>
<th>Degree</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>AuD</td>
<td>34%</td>
</tr>
<tr>
<td>EdD</td>
<td>1%</td>
</tr>
<tr>
<td>MA</td>
<td>17%</td>
</tr>
<tr>
<td>MD</td>
<td>1%</td>
</tr>
<tr>
<td>MS</td>
<td>19%</td>
</tr>
<tr>
<td>PhD</td>
<td>13%</td>
</tr>
<tr>
<td>Other</td>
<td>12%</td>
</tr>
<tr>
<td>MBA</td>
<td>1%</td>
</tr>
<tr>
<td>Internationally Trained</td>
<td>3%</td>
</tr>
</tbody>
</table>

YEARS IN PRACTICE

<table>
<thead>
<tr>
<th>Years</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5</td>
<td>17%</td>
</tr>
<tr>
<td>6-10</td>
<td>15%</td>
</tr>
<tr>
<td>11-15</td>
<td>13%</td>
</tr>
<tr>
<td>16-20</td>
<td>11%</td>
</tr>
<tr>
<td>21-25</td>
<td>15%</td>
</tr>
<tr>
<td>25+</td>
<td>21%</td>
</tr>
<tr>
<td>Student</td>
<td>9%</td>
</tr>
</tbody>
</table>
2008 Program Committee

Contact the appropriate subcommittee members for suggestions or questions.

Got program ideas or speaker suggestions for AudiologyNOW! 2008
Contact the appropriate subcommittee chair listed below with your suggestions or comments.

2008 Program Chair
Therese Walden
therese.walden@na.amedd.army.mil

Community Support
Tracy Swanson
tswanson@ceenta.com

Discussion/Focus Groups
Sharon A. Sandridge
SANDRIDGES@ccf.org

Employment Services
Melanie Herzfeld
mherzfeld@earminder.com

Exhibitor Courses
Gus Mueller
gus@gusmueller.net

Featured Sessions
Teri Hamill
hamillt@nova.edu

Learning Labs
Harvey Abrams
harvey.abrams@med.va.gov

Learning Modules
Kim Barry
kimbar@knology.net

Research Podium/Posters
Rachel McArdle
rachel.mcardle@va.gov

Student Research
Linda Hood
linda.j.hood@vanderbilt.edu

Student Volunteers
Mike Metz
mmetz@aol.com

Student Representative
TBD

The 2008 AudiologyNOW! Program Committee is composed of (back row from left) Gus Mueller, Harvey Abrams, Mike Metz, Therese Walden (Chair), Rachel McArdle, Linda Hood, Kim Barry; (front row kneeling from left) Teri Hamill, Sharon Sandridge, Tracy Swanson, Alison Grimes (Academy President).

The members of the AudiologyNOW! 2008 Program Committee met in beautiful downtown Charlotte, NC during the last week of May to begin the planning process for the 20th Anniversary convention of the American Academy of Audiology. The committee, led by 2008 Program Chair, Therese Walden, held brain-storming discussions to field new ideas and special considerations to insure that the 20th Anniversary meeting will be the best ever! The Program Committee had the opportunity to tour the Charlotte Convention Center and be actively involved in laying out meeting rooms and special interactive areas as well as view the mammoth exhibit hall space. The committee was delighted to see, again, a fine light-rail system that runs conveniently through the Convention Center that will transport attendees from outlying hotels. Academy members are encouraged to contact sub-committee chairs with suggestions, comments or ideas for the 20th Anniversary AudiologyNOW! 2008.

The Academy National Office convention staff includes (from left) Shannon Kelley (Convention Manager), Cheryl Kreider Carey (Interim Executive Director), Christine Parker (Convention Coordinator) and Lisa Yonkers (Director of Convention).
As you may know, the very first American Academy of Audiology convention was held in Kiawah Island, SC, in 1988. In 2008 we’re going ‘Back to the Carolinas’ to celebrate our 20th Anniversary AudiologyNOW! in Charlotte, NC! A proven leader in educational programs, AudiologyNOW! 2008 promises a multitude of exciting events to highlight this special milestone. Look for more details in upcoming issues of Audiology Today.

Call for Innovative Proposals – Opens August 1, 2007

Members in November promotion
Registration and Housing opens for Academy members only on November 1 and for all others on December 3, 2007.

20th Anniversary Celebration at AudiologyNOW! 2008
Charlotte, North Carolina

Be sure to include these activities in your 2008 Convention Planning Schedule:

‘Bike Through the Carolinas’ - a 3- to 4-day bicycle ride!
Arrive early for the ‘Celebratory Golf Tournament’
Don’t miss the ‘Party of the Century’ celebration!
Gather your team for the special ‘20th Anniversary Trivia Bowl’
Watch for displays, videos, and mural exhibits featuring the ‘BEST of the Academy, 1988-2008’
THE POWER OF RECOGNITION
IS IN YOUR HANDS…

The Academy Honors Committee encourages all Academy Fellows to identify those colleagues they believe have made significant contributions to the audiology profession. If you know someone who should be recognized for his or her efforts, please take the time to submit a nomination packet to the committee for review. **All nominations must be received by October 22, 2007.**

**NOMINATION PROCESS**
To nominate an individual, a nomination packet that includes a letter of nomination addressed to the Committee Chair and an up-to-date resume of the nominated individual should be submitted by the deadline. Self-nominations will not be accepted. The nomination packet should include sufficient documentation as to how the nominee meets the specified criteria for the selected category. Additional letters in support of the nomination and any other documentation that will assist the Honors Committee in their decision are strongly suggested. All materials should be mailed to the Academy headquarters.

**SELECTION OF HONOREES**
The Committee will consider all nominations, and awards will be made to qualified candidates who receive a majority vote of the voting members of the Committee pending final approval of the Academy Board of Directors. Not all awards may be given each year. Selected recipients will be presented at AudiologyNOW! in Charlotte, NC, April 2-5, 2008.

**GUIDELINES**
Nominations should be made in a letter format with the resume of the candidate enclosed. **The nomination and all supporting materials must be received at Academy Headquarters by October 22, 2007.**

Address the nomination package to:
Sheila Dalzell, Chair, Honors Committee
c/o American Academy of Audiology
11730 Plaza America Drive, Suite 300
Reston, VA 20190-4798
AWARD CATEGORIES

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 20 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.

SAMUEL F. LYBARGER AWARD FOR ACHIEVEMENTS IN INDUSTRY
This award is given for significant pioneering activity (research, engineering, or teaching) within the field of hearing. This award is restricted to individuals whose achievements occurred while employed by a company or corporation in the hearing healthcare fields but whose contributions extended beyond their contributions to their company’s services or product and served to have a significant impact on the understanding of normal or disordered auditory systems.

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 US 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. Recipients must be members of the Academy.

HUMANITARIAN AWARD
This award is given to an individual who has made a direct humanitarian contribution to society in the realm of hearing. This award could fit a broad category of significant service oriented activities. Candidates should have demonstrated direct and outstanding service to humanity in some way related to hearing, hearing disability, or deafness. Candidates should have demonstrated significant and consistent humanitarian contributions, preferably in matters related to hearing.

DISTINGUISHED ACHIEVEMENT AWARD
Recipients of this new award may include audiologists 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. More than one Distinguished Achievement Award may be awarded per year. Recipients must be members of the Academy.

2006 & 2007 Academy Honors Recipients

2006
DISTINGUISHED ACHIEVEMENT AWARD
Barry Freeman
Joseph Hall
H. Gustav Mueller
Martin Robinette

JAMES JERGER CAREER AWARD FOR RESEARCH IN AUDIOLOGY
Harry Levitt

INTERNATIONAL AWARD IN HEARING
David Baguley
Stuart Gatehouse

SAMUEL F. LYBARGER AWARD
Sadanand Singh

HUMANITARIAN AWARD
Jackie Clark

2007
DISTINGUISHED ACHIEVEMENT AWARD
Kathryn Beauchaine
Theodore Glattke
David Goldstein
Gyl Kasewurm
Sharon Lesner

INTERNATIONAL AWARD IN HEARING
Peter Blamey
Richard Seewald

JAMES JERGER CAREER AWARD FOR RESEARCH IN AUDIOLOGY
Robert Margolis
Frank Musiek
The American Academy of Audiology (AAA) traditionally conducts local community outreach activities in each city hosting AudiologyNOW!. With the focus on hearing loss prevention for the recent 2007 Denver, CO conference, new outreach venues were successful in communicating hearing loss prevention strategies throughout Colorado. Where else might you see children, teachers and audiologists playing with pipe-cleaners, tuning forks and ping-pong balls? The Colorado outreach activities centered on our belief that hearing loss prevention should not just be “talked about” or limited to a “public awareness campaign,” hearing loss prevention must be practiced using strategies based on health communication theory and scientific evidence. Hence, the Academy Community Support Subcommittee (chaired by Robert Traynor) developed a 4-tiered approach to raising awareness of hearing loss prevention targeting parents, students, teachers and professionals.

Public Educational Outreach:

The AudiologyNOW! DiscovEARy Zone was developed with the intention of engaging children and their families in hearing loss prevention activities. The exhibit area located at the entrance to the Colorado Convention Center held computer kiosks featuring Dangerous Decibels® interactive computer games adapted from the virtual exhibit at www.dangerousdecibels.org and an ear anatomy video from Blue Tree Publishing. Giant anatomical murals invited the curious viewer to learn more about the ear and hearing loss prevention. A large video screen provided entertaining graphics and music to supplement educational messages relative to safe MP3 player listening habits courtesy of Sensimetrics’ interactive DVD entitled “What You Lose When You Lose Your Hearing”. Academy student volunteers were assigned to support these activities.

Certainly most rewarding for the graduate students involved was the interactive Dangerous Decibels® learning tables which were designed to provide hands-on interactive learning experiences for children visiting the DiscovEARy Zone. Fifteen AuD/PhD students at the University of Northern Colorado and the University of Colorado-Boulder attended pre-conference training sessions to learn the educational messages and demonstration techniques related to the Dangerous Decibels® interactive teaching strategies. Many of these students also volunteered additional time to the DiscovEARy Zone above those hours required as part of their routine student volunteer assignments. The student participation was certainly critical to the success of this component. In fact, some students stated that they were having so much fun with the kids that it was hard to give up the station to the next volunteer!

Home-schooled children from the Denver area “front-range” communities were invited to attend the DiscovEARy Zone via email invitations. Cheryl DeConde Johnson and Shelley Miller established a hearing screening component to the DiscovEARy Zone, since many of these children do not routinely access hearing screening services offered by local school districts. Student volunteers screened 229 children and referred 24 children for audiological follow-up (10.5%). They were also entertained by Ben Jackson performing “Turn It to the Left.”
SCHOOL CHILDREN: COLORADO DANGEROUS DECIBELS® TEACH-IN

The second tier of outreach was designed to encourage audiologists to visit the classroom and apply educational intervention strategies targeting the prevention of noise-induced hearing loss and tinnitus which are based on proven outcome measures. Planning for this effort was facilitated by Lisa Cannon at the Colorado Department of Education. Local educational audiologists attended training classes which included an orientation to the Dangerous Decibels® Educator Kit® resources. The Academy and the American Academy of Audiology Foundation (AAAF) supported the Teach-IN by providing educator kits to educational audiologists. This generosity enabled 34 audiologists to educate approximately 1500 children throughout Colorado!

TEACHERS: SOUND, HEARING AND DANGEROUS DECIBELS® WORKSHOP

The third tier of our outreach program involved 22 teachers for a full-day workshop focused on training about hearing loss prevention. This eclectic group of teachers included those that taught all grade levels, and specialty courses such as music, physics and science. Substitute teacher salary and Dangerous Decibels® Educator Kits were provided for each teacher through a University of Colorado-Boulder community outreach grant submitted by Kathy Arehart. In addition to Arehart, workshop faculty included Billy Martin from Oregon Health & Science University (OHSU) and Deanna Meinke from the University of Northern Colorado. Also in attendance at the workshop was Catrice Jefferson, from the Washington, DC office of the Environmental Protection Agency (EPA), who was interested in learning more about hearing loss prevention training targeting children and teachers.

Post-workshop evaluations indicated that the teachers were embracing the subject matter and several implemented lessons in their classroom the next day after the workshop. One teacher commented, “This is just another “healthy choice” we should be teaching all students. We talk about global warming, pollution, eating correctly...hearing protection should be added to that. I think that every teacher should have the opportunity to participate in this program. It applies not only to students, but everyone.” Each of the classroom teachers indicated that they desire collaboration with local audiologists.
Audiologists: AudiologyNOW! Dangerous Decibels® Symposia
(Billy Martin, Deanna Meinke and Ted Madison)

Over 350 audiologists attended a workshop session at AudiologyNOW! to learn more about the risk of noise-induced hearing loss in children, the Dangerous Decibels® intervention program and hearing protector considerations for children.

Hearing loss prevention is integral and essential to the practice of audiology in all settings. It is hoped that the recent Colorado experience will continue in the future and extend to other communities and schools throughout the country. Imagine a time when parents, teachers and children routinely turn it down, walk away and protect their ears.

*Dangerous Decibels® Educator Kits were developed as a non-profit collaborative project between the National Hearing Conservation Association, the Dangerous Decibels® Program and the Marlon Downs Hearing Foundation. Kits include such items as teaching resources, training DVD’s, sound level meter, tuning fork, ping-pong ball, pipe cleaners, earplugs and a plastic funnel. Order forms are available online at www.dangerousdecibels.org/teachers_guide/ddb_edukit_order.pdf

COLORADO STUDENT VOLUNTEERS:

Christine Tobin  Rachel Flint  Elizabeth Walstrom  Brittany Vogel  Annelise Wakkinen  Kirsten Adkinson  Emily Wakefield  Cassie Tuell  Naomi Haebegger  Melissa DeBoer  Julia Campbell  Cory Portnuff  Pang Thongyai Kanthong  Wendy Nolting  Becky Nelson  Kristen Cowart

COLORADO DANGEROUS DECIBELS® TEACH-IN PARTICIPANTS:

In December of 2006, a team of 14 volunteers traveled in Panama, working to bring audiological services to those in need. For the team made up of audiologists, Panamanian volunteers, and AuD students from the Universities of Louisville, Gallaudet, Central Michigan, and the University of Texas at Dallas, the trip was a challenging clinical opportunity that resulted in a highly memorable and rewarding experience. Despite challenges such as language barriers (only a portion of the team was fluent in Spanish), noisy test conditions (i.e., ceiling and air conditioning fans and rain), and at times limited testing space and resources, the trip was successful in bringing much needed hearing healthcare to hundreds of children and adults.

The team provided hearing services to more than 300 adults and children and fit more than 100 hearing aids donated by Phonak, the Hearing OutReach to Neighboring Societies and several clinics. The volunteers traveled to the cities of Chitré, Santiago, Aguadulce, Guarare, and Pese to provide services in several health clinics, the Chitré hospital, and a house for the elderly. Patients needing hearing services often traveled quite a distance, and in some cases, waited in line for nearly 12 hours to be seen.

Brisy Northrup, a native Panamanian and audiologist at the Callier Center for Communication Disorders, UT Dallas, organized the trip. Northrup has been working on bringing humanitarian audiological aid to Panama since 1992 and is responsible for initiating a Panamanian foundation which raises money to assist in the country’s audiological services. The money raised has been used to fund cochlear implant recipients, provide education and training to local audiologists, as well as aid in the expense of hearing aids. Leyda Díaz de Rodríguez, an audiologist based in Chitré, Panamá, was instrumental in coordinating the care of the patients seen during the trip. Patients will have the opportunity to receive the necessary follow-up care at Rodríguez’s clinic, the Clínica de Audición, Lenguaje y Aprendizaje. In addition, approximately 40 hearing aids were left with the clinic as donations to be fit throughout the year.

Following six days of intensive diagnostic and audiological testing, the trip concluded with a visit to the Ministerio de Salud (Department of Health) in Panama City where the group members met with the Prime Minister of Health, Dr. Camilo Alleyne and the Vice Minister, Dr. Dora del C. Jara, to share their experiences and raise awareness about audiology issues. The Prime Minister extended his welcome for additional future audiology visitors. As one volunteer put it, “I learned about myself here. This experience opened my eyes. The people were so gracious…it was very moving.” For further information contact Briseida Northrup at northrup@utdallas.edu.

Erica Hansen, AuD, The Hearing Professionals of Northern Arizona, Flagstaff, AZ. At the time of this project, Erica was a 4th year AuD student at Central Michigan University.
Professions that recommend or dispense (sell) products to consumers are susceptible to conflict of interest (COI) because they may benefit from recommending or selling a product that may not be in the best interest of the consumer. In the general marketplace, this situation is accepted as the natural result of a free-market society, and buyers are expected to look out for themselves. *Caveat emptor* (let the buyer beware) is widely regarded as the responsibility of the consumer and a primary force that encourages ethical behavior in business. But there are a different set of expectations in health care. In that arena, professionals are expected to put the interests of patients before the profit motive, and there are a variety of professional and legal sanctions that enforce that expectation.

The most widespread area of potential conflict in health care lies in the relationships between the medical profession and pharmaceutical companies. These relationships have been subject to increasing scrutiny recently by regulatory bodies, professional societies, and the media. Abuses in these relationships may increase scrutiny and enforcement in related professions like audiology, but more importantly, they provide opportunities to learn from the experiences of others. Indeed, relations between physicians and drug companies may be useful models that we might adopt and can provide major warning signals that could help us avoid serious consequences.

**Conflict of Interest Defined**

A conflict of interest exists when a clinician benefits from the provision of a product or service that is not in the best interest the patient. In these situations, the interests of the clinician and the interests of his or her patients are in conflict because benefit to one may result in a detriment to the other.

There are three levels of COI. A *potential* conflict exists when a clinician has a relationship with a company whose products are sold by the clinician. Such relationships create the potential for situations in which the clinician may benefit from selling a product that is not in the best interest of the patient. An *apparent* conflict exists when there is a situation in which a reasonable person would expect that the clinician’s benefit from the company may encourage behavior that is not in the best interest of the patient. A *real* conflict exists when a clinician accepts gifts or payment for recommending or selling a product, whether or not the product is in the patient’s best interest. Examples of each level of conflict are provided below.

**Potential Conflict of Interest:** A clinician provides consulting services to a manufacturer related to the development of a new product. The clinician dispenses existing products manufactured by the company and does not receive payment or gifts for selling those products.

**Apparent Conflict of Interest:** A clinician receives gifts from a manufacturer of products that he or she recommends or sells. There is no *quid pro quo*. That is, the gifts are not contingent on sales of the manufacturer’s products.

**Real Conflict of Interest:** A clinician receives gifts that are contingent on a certain number of sales of the manufacturer’s products (*quid pro quo*).

As we will see, there is growing evidence that the size of the gift is not related to the potential harm produced by a conflict of interest and that a *quid pro quo* may exist without the clinician being aware of it.

**Enforcement of Conflict of Interest Policies**

Conflict of Interest is both an ethical and a legal issue. Ethical issues are enforced by professional societies and employers. When sanctions for unethical behavior are written into law, it becomes a legal issue. Ethical COI policies are enforced by professional societies like the American Academy of Audiology (AAA) and employers like universities. The lobbying organization of the pharmaceutical industry (Pharmaceutical Research and Manufacturers of America, PhRMA) produced its own guidelines for physicians, which stops short of discouraging all gifts but encourages the priority of patient interests.

Many professional societies adopt codes of ethics that prohibit situations that produce real or apparent COI. The AAA Code specifies that “Individuals shall not participate in activities that constitute a conflict of professional interest” (Rule 4c). Currently, the code does not distinguish between real and apparent COI. An interpretation of that rule was published as “Ethical Practice Guidelines on Financial Incentives from Hearing Instrument Manufacturers,” jointly adopted by AAA and the Academy of Dispensing Audiolgists. That document recommends that gifts from industry should not be accepted if their value exceeds $100. The policy is under review by the Academy. The AMA has a similar policy.

Professional codes of ethics apply to the members of the organization that promulgated the code. Generally, those organizations sanction members who violate the
code by written reprimand or termination of membership. Employers, like universities, may sanction employees who are found to violate their COI policy by restriction of privileges or termination of employment.

There are legal restrictions of COI in state and federal law. At the state level, licensure laws and statutes regulating commerce usually have some COI provisions. At the federal level, the statute that most directly addresses COI is the Federal Anti-kickback Statute. That law prohibits any person from receiving any remuneration for purchasing any item or service reimbursable under a federal health-care program. Because hearing aids are reimbursable under some federal programs (e.g., Medicaid), the law applies to hearing aids, even if the clinician does not serve patients covered by a federal program.

Violation of the anti-kickback statute is a serious offense, a felony punishable by
- up to five years in prison
- criminal fines up to $25,000
- administrative civil money penalties up to $50,000
- exclusion from participation in federal health-care programs.

Violation of state laws with provisions related to ethical practice can result in a legal action or sanctions such as fines and revocation of license.

The Purpose of Gifts

In an article by a physician entitled, “Why I No Longer Accept Pens (or Other “Gifts”) from Industry (and Why You Shouldn’t Either),” the author writes, “No big company gives away its shareholder’s money in an act of disinterested generosity” (Panush, 2004). There is only one reason for gifts from industry.

In their self-evaluation of potentially conflicting situations, the medical profession has turned to social science research that explores the effects of giving and receiving gifts. That body of research contains compelling evidence that gifts from industry produce significant harm to consumers and that industry knowingly uses gifts to influence clinician behavior to favor product sales at the expense of patient health. Furthermore, although it is widely believed that clinicians are unaffected by small gifts, social science evidence indicates that gifts of nominal value have a surprisingly powerful effect, and the recipient may not be aware of the influence (Dana and Lowenstein, 2003).

Their thorough review of social science evidence and the potential harm of gifts led a group of leaders from prominent academic health centers to conclude that
- Social science research demonstrates that the impulse to reciprocate for even small gifts is a powerful influence on people’s behavior.
- People who give or accept gifts with “no strings attached” expect reciprocation.
- The expectation of reciprocity may be the primary motive for gift giving. [Brennan et al, 2006]

Three prominent medical ethicists writing in the American Journal of Bioethics concluded that
- A large body of evidence shows that behavior can be influenced by gifts of negligible value.
- The more gifts a physician receives, the more likely he or she is to believe that they do not influence behavior.
- The sense of obligation to reciprocate, whether or not the recipient is conscious of it, influences behavior.
- Favors and promotional items of small value influence behavior in ways the recipient may not realize.
- Feelings of obligation are not related to the size of the gift.
- The main objective of gift giving is to create relationships that conflict with the obligation to act in the best interest of patients.
- Guidelines establishing thresholds, such as $100, are based on the belief that there is a “dose response”—that the risk of bias increases as the value of the gifted item increases.
- Feelings of obligation are not related to the size of the gift. [Katz et al, 2003]

The purpose of gifts from industry is evident from the fact that the cost of gifts is budgeted as marketing expenses, not charitable donations (Katz et al, 2003). Furthermore, it is revealing (and maybe a bit infuriating) that the likelihood of receiving gifts from pharmaceutical companies is inversely related to the number of Medicaid and uninsured patients in the physicians’ practice (Campbell et al, 2007). Shouldn’t clinicians who take care of the most disadvantaged and at-risk patients be rewarded the most? That the pharmaceutical industry is aware of the influence of gifts is evident in the policy of some drug companies that prohibit their own employees from accepting even small gifts (Dana and Lowenstein, 2003). One author writing in the American Journal of Bioethics pointed out that gifts from drug companies can
be fairly described as “money or favor given or promised in order to influence the judgment or conduct of a person in a position of trust” (Mansfield, 2003). That, the author points out, is the Merriam-Webster’s Collegiate Dictionary definition of a bribe.

**Recent Responses by the Medical Profession**

As a result of increased attention to the COI issue and growing evidence of harm done by gifts from industry, there have been some bold responses. One of the most interesting is the policy of the American Medical Student Association which “OPPOSES the use of promotional gimmicks and inappropriate gifts serving no educational or informational purpose to influence medical students or physicians” and asks its members to take an oath that includes the following: “I, therefore, pledge to accept no money, gifts, or hospitality from the pharmaceutical industry.”

Medical schools are reevaluating their policies. The Stanford University Medical School policy was recently amended to include, “Personal gifts from industry may not be accepted anywhere at the Stanford School of Medicine.” Yale University medical faculty “may not accept any form of personal gift from industry or its representatives.”

There is clearly a shift underway toward a no-gift policy. The trend is driven by:

- The recognition that gifts of any size are potentially harmful to patients;
- The increased awareness of the harm of apparent as well as real COI;
- The recognition that gift giving behavior favors larger companies that have more marketing resources and is therefore unfair to smaller companies; and
- The difficulty of enforcing a policy that establishes a threshold value above which a gift should not be accepted.

With respect to a “threshold value” rule, it becomes clear that such rules are unenforceable when the following questions are considered.

- How is the value determined?
- Does the threshold value apply to each individual gift or to the total number of gifts?
- If the intent is to control the total number of gifts, does that mean the total number in a day? A month? A year? From one company? Or from all sources?

The logical conclusion from the foregoing discussion is that in order to protect the interests of patients, minimize apparent as well as real COI, and establish an enforceable policy, health-care providers should be prohibited from receiving gifts of any value from companies who make products recommended or sold by the clinician. This is the conclusion of a number of recent influential opinions from the medical profession (Kassirer, 2000; Katz et al, 2003; Mansfield, 2003; Brennan et al, 2006).

**What If We Don’t?**

As a profession we should be concerned that our current gift behavior could be regarded as being in violation of existing laws and policies. The Department of Health and Human Services (DHHS) Office of the Inspector General published guidelines in the Federal Register for enforcement of the Federal Anti-kickback Statute. These guidelines may be used by enforcement agencies and by clinician to examine their own behavior. Affirmative answers to any of the following questions indicate a potential violation:

- Does the arrangement have a potential to interfere with or skew clinical decision making?
- Does the arrangement have a potential to increase costs?
- Does the arrangement have a potential to increase the risk of overutilization?
- Does the arrangement raise patient safety or quality of care concerns?
- Do gifts from industry diminish, or appear to diminish, the objectivity of professional judgment?

**Does the Shoe Fit?**

In one important article, the following opinion was rendered regarding physician relationships with drug companies: “In light of the evidence that all gifts influence behavior, physicians and pharmaceutical firms could be sanctioned now for small gift exchange under current antikickback laws” (Katz et al, 2003).

When examined in the light of the DHHS guidelines, the behavior of audiologists could be questioned. As a profession, we should be concerned that our own current behavior could trigger an investigation or even an indictment.

Do we need gifts from industry? Consider this opinion by three medical ethicists at the University of Pennsylvania. “Industry gift-giving should ... be viewed as a negative exchange because the practice is inherently profit-motivated, and the profit potential significantly exceeds the value of the gift” (Katz et al, 2003).

Our patients deserve better.

**References**


The Ethical Practices Committee (EPC) has received several inquiries regarding the ethics of accepting hearing aid commissions. The reason audiologists may question this type of arrangement may well be a direct result of the growing understanding of the ethics of *quid pro quo* relationships, i.e., receiving or accepting remuneration in exchange for a purchase, referral or recommendation, as might be indicated by receiving a direct commission for the sale of a hearing aid. Most of the available literature on the ethical practice of the profession of audiology discusses *quid pro quo* relationships with the manufacturing companies with whom audiologists interact but there has been little published regarding similar relationships with employers or contractors of audiologic services.

Hearing aid commissions are used by some employers as a means of compensation, presumably intended to reward hard working employees or to motivate employees to be more productive. The subject of incentive compensation is complex and can be applied in various situations and by a variety of arrangements thereby precluding a simple ‘yes or no’ to address the issue. Underlying all healthcare practices is the bond of trust between providers and patients, which must be preserved, and the best interests of patients must have priority over the personal business interests of the provider. Incentive compensation, as a component of what an employee or contractor receives as a reward or to motivate one to increase productivity, is acceptable and encouraged in some situations. Incentive compensation packages can reward hard working employees and appropriately structured incentive plans can reward healthcare providers who, through efficient and effective use of time, help reduce the overall cost of health care. Potential problems arise and confusion may exist over business practices which involve incentive plans that provide for hearing aid commissions alone or reward unethical behavior.

Employee productivity is and should be measured in a variety of ways. Components of productivity (with which to determine employee compensation) may include the number of patients served, outcome measures which indicate that the patient’s needs were met, amount billed or collected for evaluations and follow-up, number of hearing aids prescribed (which can be linked to outcome measures), meeting employer goals such as team work or attitude, as well as others. It is recommended that incentive pay include multiple components of productivity and not be limited solely to the number of hearing aids fit, number of “high end” hearing aids fit, or the amount of revenue generated to the practice or the facility.

It is recommended that, when an employee is offered compensation which includes only hearing aid commissions, the employee audiologist renegotiate a compensation package to one which is more encompassing and which includes quality indicators and other measurable goals as described in the previous paragraph. Broadly structured compensation packages will help to relieve the employee of the potential influence of the *quid pro quo* relationship. Additionally, when developing a compensation package, the employer and employee should review the federal and state statutes, which regulate the legality of commissions in the healthcare arena. In some instances, the employee audiologist may wish to consult with legal counsel before signing contracts which stipulate hearing aid commissions as part of an overall compensation package.
Strategies to promote compliance in adult audiologic rehabilitation follow the tenets of a “collaborative problem-solving approach to working with the hearing-impaired elderly” (Kricos, 1997). A brief review of obstacles along with the 10 strategies outlined here compels us to call upon our allies—primary health care personnel, hearing health care professionals, and families who can actively contribute to increasing compliance of adult and older adult patients in audiology rehabilitation programs.

### PRIMARY HEALTH CARE PROFESSIONALS

**Obstacles:** Physicians, health service managers, and allied health care personnel have been charged with documenting the outcomes of services they deliver to patients. Physicians have a dual responsibility; they are ethically bound to offer the best medical and health care available and are equally bound by their role as ‘gatekeeper’ where health care resources may be unavailable for all patients collectively. Primary and allied health care professionals are aware of hearing loss, yet it seems that most health care professionals are not fully knowledgeable on the degrees (i.e., mild, moderate, severe, etc.) of hearing impairment or its handicapping effects. The handicapping effects of untreated hearing loss places adults at higher risk for depression, detachment, loneliness, and increased social isolation, and data are readily available to indicate impaired hearing negatively impacts quality of life (Bess et al., 1989; Christian, Dluhy, and O’Neill, 1989; Almeida et al., 1995; Scherer and Frisina, 1998; Strawbridge et al., 2000; Pugh, 2004). These deleterious effects resulting from hearing impairment and lack of rehabilitative action lie in staunch opposition to the goals of medical and health care practice, where intervention should be to assist patient’s in achieving and/or maintaining an optimal level of functioning.

**Solutions:** Successful re/habilitation of hearing-impairment starts with identifying the presence of the condition and initial compliance efforts can be directed towards increasing awareness.

- **Strategy #1** – Marketing campaigns such as ‘Better Hearing and Speech Month’ serve as a viable activity and can be easily adopted by health service managers in large and small clinics to establish hearing screening programs for adults. During the month of May there is a major push to get individuals screened for hearing loss. Health organizations can inform the public about the importance of hearing, offer free or reduced priced hearing tests, and offer assistance in obtaining hearing aids when needed.

- **Strategy #2** – Primary health care managers can use mass mailings to patients that address the importance of good hearing health with the same zeal often given to other chronic health conditions (e.g., arthritis, high blood pressure, heart disease, cataracts, diabetes mellitus) frequently experienced by adults. The intent would be to encourage adults to monitor their hearing status by getting their hearing tested or encourage patients to include hearing evaluations as part of their health maintenance regimen. The practice implications of solutions such as marketing campaigns and mass mailings to improve the identification process are both politically and ethically sustainable at extremely minimal costs.

- **Strategy #3** – Primary care physicians can improve the detection process by utilizing a questionnaire approach and an audioscope as part of their screening regimen (Bogardus et al., 2003), and patients with suspected hearing impairment from the physical examination and screening procedures should be referred to an otolaryngologist and an audiologist for a more comprehensive evaluation. The overall intent is to create more opportunities for adults to present concerns about their hearing (Scudder et al., 2003). If the hearing screening requires referral and the magnitude of hearing impairment is confirmed, then the primary care physician, otolaryngologist, and audiologist should collectively insist upon an intervention program geared towards improving communication. Should patients opt for hearing aids, assistive technology, and/or participate in audiologic rehabilitation, then monitoring should be noted in the patient’s medical record. Such proactive approaches to identifying hearing impairment and monitoring utilization patterns of care can serve as a strong foundation for a revolution of activities that will help us move towards the goal of improving rehabilitative intervention.

### HEARING HEALTH CARE PROFESSIONALS

**Obstacles:** Audiologic rehabilitation programs work to reduce hearing handicap and improve physical and mental health functioning by conducting multiple activities such as lip-reading drills, auditory training exercises, individual and family counseling, and furnishing educational materials on hearing loss. The educational (print) materials typically address anatomy of the auditory system, different types of hearing loss, care and maintenance guidelines of hearing aids, sources for obtaining vocational assistance, and assertive listening strategies to
improve communication. Difficulties exist in effective utilization of print materials because audiologists and hearing instrument specialists alike make a common general assumption: adult patients—and older adults in particular—possess adequate literacy and comprehension skills and can read materials that are frequently printed in the English language. Unfortunately, literacy statistics for medical and health care purposes (i.e., reading, understanding, and actions based on printed health care information) reveal a common trend; individuals from the general population in the United States have sixth to eighth grade reading equivalency skills (French and Larabee, 1999; Health Literacy, 1999; Monsivais and Reynolds, 2003). This condition has been found even when the total number of years of completed education exceeds the individuals’ actual reading skill (Wilson et al., 2003). Patients with limited reading skills may not understand the written document(s) which increases the risk of improper use and care of their hearing aids, and adults who lack sufficient literacy levels or have limited comprehension skills due to concomitant vision or cognitive deficits serve as obstacles routinely encountered by hearing health care specialists that further complicate successful adjustment to amplification.

The type of intervention program serves as another obstacle to audiological rehabilitation. Rehabilitation programs vary from individualized hearing aid and assistive technology instruction sessions to well-organized group environments that focus not only on the person with the hearing loss, but give attention to spouses and other family members as well. Comprehensive multi-session programs are frequent among universities and large hospital programs, whereas smaller facilities and private practices may not be able to offer similar rehabilitation due to limited time, resources, personnel, and sparse or non-existent third-party reimbursement.

Solutions: Professionals involved in the rehabilitation process are mindful of the numerous print materials that are available on hearing loss, but professionals should also have some insight on the readability levels of these documents to ensure that individuals can read and comprehend the subject matter. Availability of educational materials in multiple languages is also a matter of concern.

Strategy #4 – Make improvements to facilitate reading and overall comprehension by using documents (or obtaining documents in multiple languages) with simple language structure, 15-Point font size or greater, color illustrations and descriptors that coincide with the print material, or offer a video with subtitles with the same content contained in the printed documents. The most direct method to ensure adequate reading and comprehension skill when furnishing written materials is to, with respectful yet casual candor, ask the patient directly about their reading ability or have the patient read the materials with you while in your office and subsequently ask the patient if they understood what they read. These activities allow for estimating reading ability as well as determine the need for providing videos or educational materials in other languages. A combination of print and video materials along with simple word choice and support—described in a later section under Family compliance—can also greatly improve the compliance process.

Strategy #5 – Professionals in smaller practices and facilities can adapt models from successful larger programs of audioligic rehabilitation. A well-recognized rehabilitative program on a large scale has been offered by HearUSA (formerly known as HEARx). The HearUSA/HEARx organization established a Hearing Education and Listening Program (HELP) consisting of three one-hour audiologic rehabilitation courses to maximize communication skill and assist in learning to use hearing aids (Northern and Beyer, 1999). Data from slightly more than 7,000 patients were reviewed to determine the impact of the HELP. A lower percentage of patients who attended the HELP returned their hearing aids (3080 patients; 3% hearing aid return rate) versus those patients who did not attend the HELP (4,107 patients; 9% hearing aid return rate). These remarkable statistics not only infer the financial windfall of reducing hearing aid return rates but also underscores the financial value of audioligic rehabilitation services that can be successfully adopted by smaller practices.

Strategy #6 – Enhance participation and compliance in fast-paced practices by utilizing rehabilitation activities such as establishing client libraries (Tye-Murray et al., 1994), utilization of the W.A.T.C.H. paradigm (Montgomery, 1994), or auditory training via a home-based, adaptive computer program (Sweetow and Sabes, 2006). Each rehabilitation activity can prove useful for accelerating adjustments to new communication situations.

FAMILIES

Obstacles: The contemporary family dynamic serves as the greatest force as well as the greatest hindrance to achieving compliance. It is fairly common where routine conversations take place amongst families where background noise makes it challenging for the older adult with hearing impairment (Luterman, 2001). Disruptions in conversational flow may occur, leading to frequent communication breakdowns. When communication breakdown becomes a regular event, family members become frustrated, stigmatize/ostracize the older adult (Hetu, 1996), and often demand their respective elder get their hearing tested and/or obtain hearing aids. These unyielding demands not only hinder and lead to frustration for the older adult with hearing impairment, but may also anchor the older adult into a position of non-compliance. In other words, the older adult becomes anchored by the history of stigmatizing judgments about their hearing to the point where they are less inclined to consider alternatives necessary for moving from conflict to compromise. Cultural (i.e., individualist versus collectivist) behaviors of families also play a role in the compliance-gaining process. Cultural individualism is characterized in which family ties between individuals are unrestricted and each person is expected to look after him/herself and his/her immediate family while cultural collectivism is characterized in which people from birth are integrated into a strong cohesive group, where the collective influence and owing respect to elders of the group protects each person in exchange for unquestioning loyalty. Cultural aspects are crucial, as some consider United States culture and English-speaking countries in general to be high on individualism, whereas individuals from European and much of Africa, Asia, and Latin American cultures are high on collectivism (Chen et al., 2006). These cultural birds are equally likely to influence the amount of individual or family participation in the audioligic rehabilitation process.
Solutions: The ability to hear, at its basic level, provides a sense of awareness in a person’s surroundings, allows for acquisition of language for direct communication among friends and family members, and ultimately promotes a level of security and independence. When these attributes are diminished due to impaired hearing, it leads to increased anxiety and reliance upon other family members to make due.

Strategy #7 – Encourage families to assist in identifying “the motivator.” Motivation is one of the most important factors that determine rehabilitative success (Kemp, 1990). Quality rehabilitation addresses not only the hearing needs but also incorporates emotional, psychosocial, and possibly spiritual needs into the process as well. The ability to hear television programs, church sermons, or play an active role in social conversions (i.e., motivators) on behalf of the individual with hearing impairment should be identified and serves as the “buy-in” to the client’s desire to participate in rehabilitation. Just as with hearing instruments, the benefits of assistive listening devices and assistive technology can be viable alternatives to increased independence among older adults with hearing impairment and can further improve communicative functioning.

Strategy #8 – Develop a support network where each family member readily accepts increased responsibilities for effective communication. Successful rehabilitation can occur by developing functional communication tasks as it relates to activities of daily living and simplifying tasks when necessary by leaning more towards closed-ended statements. When establishing a system of communication that requires everyone to play an active role, it defines the parameters of how each person operates and increases the likelihood of participation. Family members should be proactive in modeling the desired communication actions and not place the entire burden solely on the person with the hearing difficulty.

Strategy #9 – Encourage families to keep a written log where mutual concerns regarding hearing loss and communication can be gathered and addressed with appropriate primary care and allied hearing health care professionals. Documentation allows all family members to assist in the rehabilitation of their loved one, rather than fuel the patient’s frustrations with their own.

Strategy #10 – Harness the power of diversity, bilingual capabilities of family members, and community resources. If English is the patient’s second language, one can increase compliance in attendance patterns by scheduling appointments with a family member or caregiver as an interpreter who will also attend the appointment and serve as the person responsible for follow-up. Additionally, encourage families to inquire about whether or not bilingual health care professionals are available. Having professionals that speak languages other than English is likely to increase patient satisfaction and build strong patient-provider relationships. In the event that a bilingual employee or family interpreter is unavailable, seek community services for assistance. One such entity is the Bilingual Access Program, a service that offers qualified interpreters and translators in 20 different languages that can be used for a variety of medical and legal services (Helping Hands Hawai’i, 2007).

SUMMARY

The service system for individuals with disabilities such as hearing loss has changed from an institutional-based medical model to more of a collaborative re/habilitation model, and increased attention should be given to everyone involved in the process. In doing so, participation and compliance in audiologic rehabilitation occurs when there is a good fit between specific needs of each client and abilities of their compliance partners (i.e., Primary Care Professionals, Hearing Health Care Professionals, and Families). The strategies outlined here encompass many different options such as increasing awareness, making improvements to facilitate reading and overall comprehension of print materials, recognizing the financial value of rehabilitation via reducing hearing aid returns, identifying the motivator(s), and harnessing the power of diversity. Failure to provide adequate services can jeopardize safety and health, and developing good working relationships with everyone involved is a vital component in the process.

REFERENCES

In essence, all audiologists who work with infant and toddler children are behaviorists. That is, they use particular techniques to elicit desired responses. The techniques based on behaviorism are highly effective tools to get people to behave in a particular way.

Even though audiologists doing pediatric hearing assessment must, by necessity, deal with behavior, our field is not well versed in behavioral principles. Yet, our main approaches to behavioral hearing assessment—visual reinforcement audiometry and conditioned play audiometry—contain words right out of behaviorism. Using behavioral language is not an academic nicety. It sets a framework of what we do, provides a way to analyze what is effective or not effective at a given moment, and promotes more appropriate terminology rather than phraseology which at times is nearly that of a lay person. A behavioral model not only leads to more sophisticated assessment but also has applicability in all clinical activities with children.

Behavioral management techniques are not based on whether a particular activity is deemed “fun” or if the clinician is cheery, but rather on their effectiveness in influencing behavior, that is, increasing desired responses and decreasing undesired responses. Of course, in dealing with children—or people of any age for that matter—a pleasant environment with a cheerful person is probably going to raise the chances of reaching the target behaviors.

The goal in this paper is to present a number of the behavioral terms, and thereby, concepts of behavioral principles, to enhance our assessment and management of young children. Where appropriate, a term is accompanied by an example from psychology to clarify, and then by an example from audiology to illustrate its applicability. Also, the reinforcer referred to in visual reinforcement audiometry (VRA) means some sort of toy behind a darkened glass that can either be illuminated or both illuminated and animated.

Before proceeding, an important distinction must be made between a stimulus and a signal. A stimulus is a perceptible event capable of eliciting a response. A signal is an event that can communicate or indicate; however, it is not a stimulus, if it cannot be perceived, or, in the case of hearing testing, is inaudible. So, if unbeknownst to the audiologist, a child has a 70-dB hearing loss, a tone of 60 dB is a signal but not a stimulus.

**DEFINITIONS**

**Aversive stimulus.** A noxious stimulus or event that an organism will avoid thereby decreasing the chance of a response that might cause that stimulus.

**Psychology:** A shock delivered when an animal touches a certain button will decrease the likelihood of or eliminate that behavior.

**Audiology:** Aversive stimuli are hardly used in audiology. However, the clinical situation may be perceived by the child as having several aversive stimuli: strangers, unfamiliar environment, white lab coats, and other accoutrements reminiscent of a doctor’s office (where shots are often received). Audiologists try to contrive the situation to minimize how aversive the situation seems by having the child remain close to the parent, moving slowly, using reassuring voice and words, letting the child handle clinical objects, and so forth. (See systematic desensitization.)

**Behaviorism.** The concept that behaviors are highly influenced by stimulus and response. Behaviors bring consequences that shape and influence further action. The environment supplies the consequences, thus, the environment shapes and influences a person’s behavior. Behavior that elicits positive consequences will tend to be repeated. Behavior that elicits negative consequences, e.g., an aversive stimulus or decrease in reinforcement, will tend to be avoided.

**Behavior modification.** The use of the principles and techniques of behavior theory to change behavior, such as, conditioning or use of an aversive stimulus, to improve adaptation or alleviate symptoms.
**Conditioning.** A process of learning in which behavior is highly influenced by environmental stimuli and consequences. (There are classical and operant conditioning, whose distinctions are not essential for present purposes.)

**Psychology:** A guinea pig learns to push a button by receiving a food pellet when that button is pushed.

**Audiology:** During conditioned play audiometry (CPA), a child learns to put a peg in a pegboard in response to a sound stimulus. The response is seen by the child as a game, and therefore the response itself is reinforcing.

**Conditioned stimulus and conditioned response.** A conditioned stimulus (CS) is one that is initially neutral and comes to elicit a particular response as a consequence of having been paired with an unconditioned stimulus (US). A conditioned response (CR) is a learned response that follows a conditioned stimulus.

**Psychology:** In classical conditioning, a dog salivates at the sound of a bell. First, the sound of a bell (conditioned stimulus) is presented simultaneously with the smell of meat (unconditioned stimulus). The dog salivates, which is an unconditioned response or reflex due to the smell of meat. Eventually, just the bell (now the conditioned stimulus) elicits salivation (conditioned response). This is diagrammed as:

\[
\text{US} > \text{UR} \\
\text{US} + \text{CS} > \text{UR} \\
\text{CS} > \text{CR}
\]

**Audiology:** The paramount example is VRA, pairing a sound (CS) with a light (US), the light eliciting a head turn (CR). The head turn is reinforced. Eventually, the sound alone (CS) elicits the head turn (CR). This is in contrast to behavioral observation audiometry, in which a sound is presented, and reflexive changes in behavior are watched for, such as a startle or an orienting head turn toward the sound. This is US ? UR.

**Contingency.** The dependence of one event on the occurrence of another; the conditions in which a reinforcer depends, or is contingent, on the response or behavior that occurs. This is “if-then” thinking.

**Psychology:** The reinforcer, food, is dispensed only if (is contingent upon) the pigeon tapping the correct button.

**Audiology:** The VRA reinforcer is turned on only if the patient makes a head turn toward the sound source following a sound signal (after the conditioning phase).

**Desensitization.** Gradual steps from a state of low anxiety to having an aversive stimulus become less aversive. (See systematic desensitization.)

**Extinction.** Decrease of a response, potentially to ultimate disappearance, that occurs when the stimulus controlling that response is repeatedly presented but the response is not reinforced. Extinction can take a very long time to modify behavior and to decrease or extinguish an undesired response.

**Psychology:** A pigeon that has become conditioned to peck a button following a light signal to obtain food will decrease the rate of response and eventually cease the behavior, when the food reinforcement is withheld.

**Audiology:** Although extinction is primarily a term from operant conditioning, a similar concept can be seen during VRA, (which is more like classical conditioning). The reinforcer is withheld as long as the child persists in looking at the light box or makes excessive false positive responses. Because extinction takes a relatively long time to modify behavior (as compared to reinforcement), it is crucial not to activate the reinforcer unless certain that the child can hear the signal. If in doubt as to whether a head turn was a genuine response, do not activate the reinforcer as that will accidentally lead to reinforcing an undesired behavior.

**Punishment.** Used in the sense of an aversive stimulus that follows a specific behavior for the purpose of reducing or eliminating that behavior. Punishment is erroneously thought of as negative reinforcement, which is nearly the reverse of punishment. Strictly speaking, negative reinforcement is not a term in pure behavioral learning theory.

**Reinforcement.** A process by which a response is strengthened because of a favorable consequence. There are positive reinforcement and negative reinforcement.

**Positive reinforcement.** Increasing the response as a consequence of its being followed by the appearance of a favorable consequence. As long as the desired behavior is produced, reinforcement occurs (hence the positive).

**Psychology:** A pigeon receives food, if it pecks a certain button.

**Audiology:** Activating the VRA reinforcer, when the child makes the desired response of a head turn in the correct direction in the presence of the sound signal.

**Negative reinforcement.** Increasing the response as a consequence of its being followed by the cessation or avoidance of an aversive stimulus. As long as the desired behavior is produced, the aversive stimulus does not occur (hence the negative). Thus, negative reinforcement is not a matter of applying punishment or an aversive consequence but rather one of avoiding an aversive consequence.

**Psychology:** A pigeon receives a shock if it steps into a marked section of its enclosure but does not receive a shock if it remains in a different section; as long as the pigeon stays in the correct sector, the pigeon avoids the shock.
**Audiology:** Hardly applicable in audiology. The term is included to explain the correct meaning of “negative” as applied to reinforcement in behavioral terminology.

**Reinforcer.** A consequence that increases the probability that a behavior will recur.

**Audiology:** The light-up toy in Visual Reinforcement Audiology (VRA). Note that if the child’s behavior is unaffected by the light-up toy, it is not a reinforcer. Not only that, if a child is frightened by the toy, it is the opposite of a reinforcer; it is an aversive stimulus. As such, it not only decreases the likelihood of the desired behavior, it increases undesired behaviors (hiding eyes, crying, wanting to leave, and so forth). Therefore, it is often wise, the first time the light-up toy is activated, to make presentations brief and without animation, especially, in the 18-30-month-age range.

**Reward.** A consequence likely to have reinforcing properties and thereby to increase the probability that a behavior will recur. Reward is inherent in positive reinforcement. Strictly speaking, not a term in pure behavioral learning theory.

**Satiation.** The decrease is a response to the point of no longer responding despite the continued availability of a reinforcer.

**Psychology:** After having obtained much food, a pigeon slows down and stops pecking the button, which provided the food. Being sated, the previous reinforcer, food, is no longer reinforcing.

**Audiology:** During VRA, a child becomes inconsistent or stops responding to a stimulus that previously elicited a response despite the availability of reinforcement. In non-behavioral terms, clinicians might refer to this as “getting bored, losing interest,” and so forth. In effect, the “reinforcer” has lost its reinforcing properties. (The burden is on the audiologist to try to devise another reinforcer or alter the original “reinforcer.”)

**Shaping.** Modifying behavior by reinforcing a behavior that at first is generally of the kind desired and then reinforcing only subsequent behaviors that increasingly resemble the desired response until only the specific response is reinforced. This occurs through a method of successive approximations.

**Stimulus control.** When presentation of just the conditioned stimulus has a high probability of eliciting the desired response.

**Audiology:** During CPA, the child puts a peg in a peg board every time an audible sound signal is presented and only when it is presented (no false positive responses). The child’s response behavior is controlled by the stimulus. Conversely, if the child keeps putting a peg in a peg board in the absence of a sound stimulus (false positive responses), the child’s behavior is not under stimulus control.

**Successive approximations.** A technique of behavior shaping that reinforces only behaviors that more closely approximate the ultimately desired behavior.

**Psychology:** Increasing the speed or rate of a pigeon’s pecking a button in response to a light signal by reinforcing only those responses that occur in shorter time intervals until the desired response time is reached.

**Audiology:** During VRA, the reinforcer is activated for even the slightest appropriate response, such as raising the head slightly or moving the eyes slightly to the correct side, then only reinforcing greater eye or head movement toward the correct side, and eventually reinforcing only a brisk, direct head turn to the reinforcer.

**Superstitious behavior.** Generally, an irrational belief in magic or chance regardless of evidence to the contrary. An example from popular culture is believing that breaking a mirror will result in seven years of “bad luck.” In a behavioral learning model, a superstitious behavior is one based on erroneously attributing an outcome to that behavior. It can be considered “accidental” conditioning in that a behavior merely happened to occur immediately prior to or coincidentally with a reinforcer that was really not contingent on the behavior.

**Psychology:** On one occasion, a person did not turn the car radio on before starting the engine, as was his routine, and happened to have the unusual experience of encountering nearly all green traffic lights driving to work. Thereafter, the driver made certain not to turn the radio on until after the car was started.

**Audiology:** A child is given a bone conduction vibrator to hold so that the clinician can present a vibrotactile stimulus along with the VRA reinforcer (after no response to very strong sounds). The child squeezes the oscillator, erroneously believing that squeezing it will make the light go on. A main way to reduce this sort of behavior is through extinction; which can be time consuming.

It is preferable to avoid the false CR in the first place by watching the child closely and waiting until a moment, when the child is merely holding and not squeezing the oscillator, before activating the reinforcer. If in doubt, do not activate the reinforcer, as that will lead to reinforcing an undesired behavior.

**Systematic desensitization.** Making an aversive stimulus less aversive. A technique for reducing or eliminating anxiety or avoidance behavior in response to a particular stimulus. It involves a hierarchy of stimuli that provoke the undesired response, ranked from most to least provocative. Then, while the subject is relaxed, the clinician progresses from the least anxiety producing situation to more anxiety producing
situations, only as the patient remains relaxed, so as to reduce the power of a thought or event to disturb.

**Psychology:** Treating a phobia of snakes by going from imagining a snake, to a picture of one, to a snake in cage in the same room but at a distance, to moving the cage closer, and so on, as the patient can tolerate and remain relaxed, until the stimulus (snake) no longer produces negative response (fear, panic, anxiety).

**Audiology:** If a child shows signs of fear as the clinician prepares to make an ear impression, following a sequence of letting the child see the materials at a distance, bringing the items closer, inviting the child to touch, hold, and then handle them (especially the syringe), as long as the child maintains a low state of anxiety and avoidance, thereby eventually overcoming the child’s resistance to having the syringe put to the ear canal and the material inserted. A similar pattern of steps is applicable to gradually getting a child to accept having an immittance probe tip inserted in the ear canal.

**Conclusion**

Behavioral audiometry with very young children is not simply a matter of the setup, toys, or how elaborate a reinforcer is. Those are just tools. VRA and CPA are not fixed mechanistic procedures, such that, if the audiologist does this, the child will do that. They are just activities. Success in testing the hearing of children ultimately depends on the clinician’s skills in using those tools, making astute observations of behavior, having a sense of timing, being patient, reading a child’s body language, and being creative and flexible, even unconventional. This framework of definitions is presented to help all clinicians have a stronger scientific underpinning and thereby organize and refine their ways of managing child behavior.

**References**


Antioxidants: Can They Scavenge Hearing?

There is currently a great deal of scientific interest in the effects of free radicals on cell function, viability, and lifespan. These studies may result in new therapies for some of our most debilitating diseases. One exciting new prospect is the potential to develop new therapies to inhibit free radical-induced damage in the inner ear. This research holds promise for inhibiting hearing loss caused by traumatic noise exposure and ototoxic drugs, and even offering insight into the processes underlying age-related hearing loss.

Free radicals play important signaling roles in normal cellular functions including growth, metabolism, proliferation, and viability. Production of free radicals is part of normal cellular metabolism. Oxygen is required in cells for mitochondrial production of ATP, which is the cell's primary source of energy. Free radicals in the form of reactive oxygen species (ROS) are normal byproducts of ATP production. Whether a cell has a healthy level of free radicals or is at risk for free radical-induced damage depends on the balance between production and elimination of free radicals. Disequilibrium favoring production leads to free radical accumulation and oxidative stress. Due to their potential to damage almost all cellular molecules, accumulation of free radicals can result in decreased cell function and even cell death (Kregel and Zhang, 2006).

Cells have a host of intrinsic antioxidant safeguards to neutralize free radicals via antioxidant enzymes and small molecules. Antioxidants are also present in food. For example, Vitamin C, Vitamin E and coenzyme Q are all active in the direct binding and inactivation of ROS (Sanz et al., 2006). Cells also contain specialized enzymes that eliminate free radicals. The primary cellular antioxidant enzyme is superoxide dismutase (SOD). Loss of SOD function has been implicated in various disease pathologies from obesity and diabetes to cancer (Johnson and Giulivi, 2005). Importantly, reduced SOD function is also associated with age-related hearing loss (Coling et al., 2003).

Free radical accumulation is detrimental to the tissues of the inner ear. Oxidative damage to the cochlea plays a role in noise-induced hearing loss, ototoxic drug-induced hearing loss, and as a component of age-related hearing loss. Significant increases in free radical levels have been observed in the cochlea after noise exposure (Henderson et al., 2006). These increases in free radicals have been directly linked to both cell death and hearing loss caused by exposure to noise (Henderson et al., 2006). The mechanism(s) underlying noise-induced free radical formation are poorly understood, but it may be due to a noise-induced increase in cellular demand for ATP, resulting in increased mitochondrial energy production. In addition, noise trauma is characterized by decreased blood flow to the cochlea, resulting in reduced oxygen levels available to the cell. Increased mitochondrial activity in the absence of available oxygen results in inefficient ATP synthesis and increased free radical formation (Henderson et al., 2006).

Both of the major classes of ototoxic drugs (cisplatin and the aminoglycoside antibiotics) are associated with increased free radical production in the inner ear, and several antioxidant compounds have shown potential therapeutic efficacy in animal models of ototoxicity. Cochleas treated with cisplatin show increased levels of free radicals and reduced levels of antioxidant enzymes (Rybak et al., 2007). Antioxidants have been shown to reduce free radical levels and prevent cisplatin-induced hearing loss in laboratory animals (Minami et al. 2004; Wang et al., 2003). Free radicals also play an important role in the ototoxicity of aminoglycoside antibiotics, and antioxidants significantly inhibit gentamicin-induced ototoxicity in the inner ears of guinea pigs. (Priuska and Schacht 1995; Hirose et al., 1999; Sha and Schacht, 2000).

Free radicals are also important in the aging inner ear. Cochleas of old mice show increased free radical-induced damage in support cells and hair cells as well as a decrease in antioxidant enzymes (Jiang et al., 2006). Loss of SOD expression results in age-dependent cochlear hair cell death, and numerous experiments have shown that SOD is necessary to prevent free radical-induced cell death in the inner ear (McFadden et al., 1999). However, overexpression of SOD offers no protection against the induction of age-related hearing loss in mice, suggesting that while SOD is necessary for a healthy aging cochlea, it is not sufficient to prevent age-related hearing loss (Kiehley et al., 2005; Coling et al., 2003).

Free radical-induced cell damage is a major cause of tissue degeneration in a number of disease models. Though the body is equipped with antioxidant defenses, these defenses can be overwhelmed by cellular stress, resulting cell damage or even cell death. Research has identified methods for enhancing antioxidant activity, resulting in significant protection of cells. Understanding the mechanisms that regulate free radical production, accumulation and toxicity in the cells of the inner ear may lead to effective treatments to prevent noise-induced, ototoxic drug-induced and age-related hearing loss.

REFERENCES
Representing the Best Interests of Audiology from Austin to Boston

As the Academy moves forward in implementing our strategic advocacy plan, the goal to strengthen the Academy’s influence and visibility with state legislators and regulatory agencies will take center stage this month with our participation in the National Conference of State Legislatures’ Strong States Strong Nation 2007 State Legislative Summit. This meeting is billed as the “largest, most prestigious and balanced meeting state lawmakers and staff can attend anywhere in the nation.” More than 1,400 legislators and staff from 47 states, as well as leaders from some of the nation’s top corporations, have registered to attend. The Academy will have an exhibit and provide information to showcase the Academy and the state academies as the principal organizations representing the audiology profession and the patients we serve. While this section of Audiology Today is entitled “Washington Watch,” I would like to focus these next few lines on the importance of what occurs outside of the Beltway in the states to demonstrate the advocacy activities of audiologists for audiology.

Over the past months there have been a few critical state victories that demonstrate how the Academy and, more importantly, individual state academies are serving as the true representatives of audiology. In Michigan, it was the Michigan Academy of Audiology that succeeded in having the Michigan Department of Community Health rescind and reissue a bulletin order that would have erroneously required audiologists to obtain an additional ASHA CCC-A certification as a prerequisite (in addition to licensure) to be eligible to provide audiology services to Medicaid beneficiaries in Michigan’s state Medicaid program. Upon the Michigan Academy of Audiology’s prompting, the department stated, “After further consultation with the Bureau of Health Professions, Licensing Division, it has been determined that the federal requirements for qualified Audiologists are being met by the state licensing requirements and that licensure will be the standard applied to Audiologists. An additional American Speech, Language and Hearing Association (ASHA) certification is not necessary.”

The Academy was alerted to this issue and assisted the Michigan Academy of Audiology in clarifying this issue with the department by providing a copy of the federal Medicaid regulations that explain how each state determines the scope of its Medicaid program.

In May, Maryland Governor Martin O’Malley signed legislation revising the Maryland Audiologists, Hearing Aid Dispensers, and Speech-Language Pathologists Act, making Maryland the first state to officially recognize the Accreditation Commission for Audiology Education (ACAE) in a state licensure statute. The legislation passed unanimously by the Maryland State legislature before arriving on the governor’s desk. This occurred due to the extraordinary efforts by members of the Maryland Academy of Audiology and other Academy members in Maryland who supported this provision, despite the formidable lobbying efforts by other state and national speech and hearing associations against this provision, who touted their “strong opposition to the inclusion of the ACAE.” Based on the Academy’s interest in ensuring that the ACAE accreditation program is recognized in state licensure laws and regulations, the Academy has targeted states requesting that the ACAE accreditation program be appropriately recognized. Taking action is critical in those states that may have statutory or regulatory provisions that currently do not provide the opportunity for ACAE to be recognized as an audiology program accreditation body. Currently, there is one accrediting agency, the Council on Academic Accreditation in Audiology and Speech-Language Pathology (CAA), recognized in some states, that accredits both audiology and speech pathology programs. The Academy believes that while the CAA accreditation program may be deemed appropriate under state statute/regulations, it should not be exclusively recognized to accredit audiology programs. We have solicited individual state academies to send letters in support on this effort.

In an effort to ensure that we have the most up-to-date information on the various components of state licensure laws
and regulations on the Academy’s Web site, the Academy issued a state licensure survey, asking state academies to respond. The survey questions focused on state licensure requirements, including the structure of the state licensure board, continuing education requirements, how licensure addresses fourth-year students, whether requirements for physician referral to perform certain audiology services are imposed, how certification programs are addressed, and if/how the state recognizes university program accreditation programs. Respondents were also asked to provide information on Web site links to their licensure statute, regulations and licensure board. The results of the survey are available on the Academy’s “State Laws Governing Audiology” Web page www.audiology.org/govtrelations/state/statelaws.

These activities are bringing us closer to our goal to “strengthen the Academy’s influence and visibility with State legislators and regulatory agencies” and demonstrate how the American Academy of Audiology and individual state academies are the premier advocates for audiology in the states and the only organizations without competing interests to truly represent the best interests of the profession of audiology.

---

**eAUDIOLOGY ON-DEMAND WEB SEMINARS:**

- Is Your Patient Drugged? Common Medications Used in ENT July 25, 2007 (.2 CEUs)

- Marketing -- The Key to Growing your Practice or Organization Recorded June 6 & 13, 2007 (.3 CEUs)

- Central Auditory Development and Re-Organization in Children with Cochlear Implants Recorded May 16, 2007 (.1 CEU)

- Optimizing Hearing Aid Outcomes Through Evidence Based Practice Web Seminar Recorded March 21 & 28, 2007 (.4 CEUs & Tier 1 CEUs available)

- A Framework for Resolving Ethical Dilemmas: The Academy’s Code of Ethics Recorded February 7 & 14, 2007 (.4 CEUs & Tier 1 CEUs available)

- Precepting: The Opportunities - The Challenges Recorded January 18, 2007 (.2 CEUs)

- The Audiological Implications of Open Fittings Recorded November 29, 2006 (.1 CEU)

- When Generations Collide: Hearing Aids and Baby Boomers Recorded October 26, 2006 (.1 CEU)

- Learning CPR: Coding, Protocols and Reimbursement Recorded September 27, 2006 (.2 CEUs)

Visit www.eAudiology.org for complete descriptions and to register.
AAA Foundation Welcomes New Trustees to Board

Brad Stach, Chair of the American Academy of Audiology Foundation Board, is pleased to announce that A.U. Bankaitis, Sharon Fujikawa Brooks, Dianne Meyer, Paul Pessis (Academy Board Liaison) and Thomas Powers will join the AAAF Board of Trustees as of July 1, 2007. In addition, Blythe Holmes will serve as the NAFDA representative to the Board for the next 12 months.

“It will be a privilege to work with such highly regarded individuals, and I thank them in advance for their willingness to serve the profession of audiology,” stated Stach. “They each bring many years of expertise and experience to the table, which will enable the Foundation to even more fully achieve its goals to support of research, education and public awareness in the hearing sciences.”

AU Bankaitis, is Vice President and General Manager of Oaktree Products, Inc., in St. Louis, Missouri. She is also the founder and president of Auban, Inc., a company dedicated to publishing practical-application textbooks for the fields of audiology and speech-language pathology. She received her doctorate in audiology from the University of Cincinnati and is a leading expert on infection control in audiology.

Sharon Fujikawa Brooks, is Director of Audiology at the University of California Irvine Medical Center and Clinical Professor in the Departments of Neurology and Pediatrics. She received her doctorate from the University of Washington and has published research in the areas of pediatrics, auditory neuropathy and ototoxic monitoring. Dr. Brooks has served as President of the Academy’s Board of Directors, Paul Pessis, is the owner and founder of North Shore Audio-Vestibular Lab (NSAVL) in Highland Park, Illinois. He has lectured extensively on reimbursement and practice management issues and has served as the Chairman of the Academy’s Reimbursement Committee. Dr. Pessis also teaches AuD students at Northwestern and Rush Universities.

Thomas Powers, is currently Vice-President, Audiology & Professional Relations for Siemens Hearing Instruments, Inc. Dr. Powers received his PhD in audiology from Ohio University. He was a partner in an audiology private practice and has over 25 years of experience in the hearing health-care industry. His primary areas of interest include hearing instrument technology, outcome measures and directional microphone technology.

Currently serving as Past-President of the Academy’s Board of Directors, Paul Pessis, is the owner and founder of North Shore Audio-Vestibular Lab (NSAVL) in Highland Park, Illinois. He has lectured extensively on reimbursement and practice management issues and has served as the Chairman of the Academy’s Reimbursement Committee. Dr. Pessis also teaches AuD students at Northwestern and Rush Universities.

Creig Dunckel, Carol Flexer, Lina Kubli, Yvonne Sininger, Robert Traynor and Gail Whitelaw are retiring from the AAAF Board as of June 30, 2007. “I have really enjoyed getting to know these dedicated audiologists over the last several years,” said Kathleen Devlin Culver, AAAF Director of Development. “They each have a real commitment to the Foundation’s mission…the Foundation is a stronger organization thanks to their many positive contributions. I thank them each for their time, talents and leadership.”

For more information on the AAA Foundation, its programs, supporters and special fundraising events, visit www.audiologyfoundation.org.
Cathy Jones, President of Phonak Hearing Systems, Inc., announced that Phonak will make a gift in the amount of $50,000 to the American Academy of Audiology Foundation to support the American Board of Audiology’s Pediatric Audiology Specialty Certification (PASC) initiative.

“We are pleased to partner with the Foundation and the ABA to ensure that all children receive adequate care for the assessment and treatment of their hearing loss from knowledgeable practitioners,” said Cathy Jones as she presented the check to Cheryl Kreider Carey and Paul Pessis, Past President of the Board of Directors.

This specialty certification is critically important to the audiology profession’s success in developing effective newborn hearing screening and intervention programs. Now that most newborns are screened for hearing, the families of referred infants need to be able to quickly identify pediatric audiologists with the requisite knowledge to fully and appropriately take part in successful hearing habilitation efforts.

“The AAA Foundation is delighted to partner with the Foundation and the ABA to ensure that all children receive adequate care for the assessment and treatment of their hearing loss from knowledgeable practitioners…”

—Cathy Jones
With increasing numbers of consumers engaged in online commerce, audiology practices need to have an Internet presence and a Web site that will captivate and cultivate business. Not all audiologists or patients are computer savvy, but as the Internet grows in popularity as an avenue for business, having a Web site related to audiology practice is increasingly become a measure of credibility and information for the consuming public, not to mention a powerful marketing tool and source of referrals to expand your patient base.

When you have your own Web site, you have control over the content. This means you can do everything possible to maximize your site for organic search engine optimization. Creativity is helpful in designing a Web site that will hold visitors attention and cause them to return for future visits. You may decide to share some personal details of your life, such as your background and how your unique qualities contribute to the business. Including photos or interesting facets of the business may also be of interest to current and prospective patients. What you choose to include in your Web site will, in part, depend on the message you are trying to convey. Most importantly, you will want the Web site to be creative and original enough to set you apart from your competition.

The first step to building a Web site is to do some basic research on Web site creation by professionals specializing in this marketing arena. Doing it yourself may be possible for some - there are plenty of articles and Web sites available for the daring and creative. However, for those who need additional expertise in design and implementation, Web site development services can prove invaluable in creating a Web site that will captivate visitors. When consulting with these companies about creating your unique site, keep the following in mind:

- Be sure you have a clear understanding about initial design costs and monthly fees to maintain the Web site. Software is available that can make it easy to perform your own monthly maintenance and updates to the Web site.
- Get references of other Web sites the company has created and take time to look them up to get an idea of their previous work.
- Determine how many pages are included in the original package and what’s involved in terms of cost and man-hours for updating your site.
- Have photographs of your office and staff ready to provide to the designer. Limit the number of photographs as they will increase the time to load the site.

- Include information that highlights the personal nature, not the size, of your audiology practice. Show how the products or services that you provide have benefited your patients. You may even want to include a page for patient testimonials.
- Remember the basics – your company’s name, logo, address, and telephone number should be easy to find and they should appear on each page of the Web site.
- Check to be certain that preferred key words such as “audiology” and “hearing aids” appear on your home page. This will help insure that your site is easy for patients to find.
- Make sure the Web site will be identified by all of the major search engines.
- Be sure the text offers concise, easy to understand information about what your practice offers. Use visuals to draw visitors, but don’t confuse them with too many words or flashy pictures.
- Personalize your site with links to local and state programs of interest to your patients and links to organizations that may provide more information on hearing loss.
- Ask for a mechanism to track hits on your site. Like all marketing efforts, tracking your Web site’s activity will help you determine its usefulness and help justify the cost.

Once the creative portion of the Web site has been completed, you will want to make certain that the finished product is attractive, offers information that is appealing to visitors and is easy to navigate. However, the job isn’t finished because a good Web site requires continual maintenance. Businesses and organizations, whether large or small, need to regularly monitor Web site performance to ensure that the opportunities that become available are utilized. Improvements in technology occur constantly. Although Web site development has certainly been simplified, the marketing challenge has become greater as more organizations have recognized the importance of Web marketing and competition has exploded.

Having an effective Web site can be a cost-effective and easy way to advertise an audiology practice. It is not a coincidence that more and more patients are doing business on the Web. Maybe now is the time to reach out to a Web developer and get more information on how the Web can work for you and your audiology practice.
As you can see by looking closely at my picture, I am so proud to be Board Certified in Audiology that I have the designation embroidered above my coat pocket. The designation is right up there with “AuD” and “Doctor of Audiology,” and I consider it just as important.

I believe many of our prospective patients have seen “Board Certified in …” after the names and titles of physicians for years. The term is reassuring to the public, and it gives them confidence in their choice of provider. Ultimately, patients can take comfort in the fact that the provider has excellent credentials, that he or she is on top of the mountain of information the profession commands, and that the provider’s knowledge base has been reviewed and “stamped” as qualified by professional peers.

We all know that consumers are becoming better and better informed about the choices available to them for health care. Who among us has not been bombarded by medically focused articles in daily newspapers, introductory consumer newsletters from major medical institutions, and radio and television advertising regarding hospital credentialing? The media overflow of information is making consumers very savvy and much more selective.

Certainly, in our profession, where audiologists are trying to get “brand identification” in the eyes of the consumer, Board Certification is an extra stratum providing patients a layer of comfort and satisfaction. The consumer seeking hearing health care is in a quandary whether to seek hearing services at the mega chain store, at a hearing aid specialist down the street, at a corporate network-owned hearing aid office, at an otolaryngologist’s office, at a private practice in audiology, or at a hospital’s hearing clinic. I doubt whether any other profession has such a variety of sales settings and willing hands extended to provide services.

We all need to get on the same page here. There is no doubt that the requirements to be Board Certified are stringent. Enrolling in Tier One designated seminar-like classes that require confirmation that knowledge has been learned and retained, taking a minimum amount of hours in professional ethics per certification period, and constantly supplementing current knowledge by taking mandatory continuing education, is reassuring to the public. Actually, it’s reassuring to me. I want my colleagues to uphold high standards even after graduating. After all, we are doctors … 😊

Linda S. Remensnyder, AuD
ESPONSIBILITIES OF THE BOARD AS A WHOLE ARE TO:

• determine the mission and vision of the Academy and see that the Academy fulfills its stated aims and purpose
• develop a strategic plan which includes goals, strategies, and action plans that define how and what the Academy must accomplish in order to achieve its vision
• understand and comply with the Academy’s Articles of Incorporation and Bylaws,
• comply with laws relating to not-for-profit structures
• develop, execute, and evaluate the Academy’s policies, plans, and budgets, approve the annual budget, review quarterly financial reports and appoint the auditor
• grant membership to those applicants whose qualifications, in the Board’s judgment, meet the requirements specified in Article II of the Bylaws
• establish Boards, Committees and Task Forces, as necessary, to guide and assist the Academy in its mission
• decide when and where the Annual Academy Meeting shall take place and elect a Program Chair for the meeting
• elect the Nominations Committee
• abide by the Code of Conduct and Conflict of Interest Statements contained in the Academy Policies & Procedures Manual, and
• maintain a working knowledge of the affairs, policies and assets of the Academy.

RESPONSIBILITIES OF INDIVIDUAL BOARD MEMBERS ARE TO:

• advocate for the mission and vision of the Academy,
• attend and actively participate in all Board meetings (locations to be announced), and conference calls as necessary, in their entirety,
• maintain confidentiality of all Board discussions,
• express one’s opinion during discussion and debates, speaking with one voice regarding the final decisions of the Board,
• commit to a strategy of financial health that includes a long-term investment fund, supported through annual allocated contributions and additional income as available,
• accept and fulfill Committee liaison assignments (typically one or more standing committees),
• transact all such other business in the interest of the membership that may from time-to-time come before the Board, and
• serve as a role model for the Academy membership by annually renewing one’s membership, contributing to the PAC and Foundation on an annual basis at a level commensurate with one’s capacity to give, and attending AudiologyNOW!

Four face-to-face Board meetings are typically scheduled in January, March/April, July, and October. Board members are expected to participate in periodic meetings held via conference call, scheduled at the discretion of the President. Members of the Academy Board of Directors will be reimbursed for lodging expenses incurred in attending all regular Board of Directors meetings as well as duly announced special meetings of the Board. Board of Directors travel expenses will only be reimbursed for travel that is not previously approved by the budget at the request and with the prior approval of the Academy President and Executive Director. The Academy does not reimburse travel expenses for attending the meeting held in conjunction with AudiologyNOW! However, Board members will receive complimentary housing at the headquarters hotel during AudiologyNOW!
AMA Refers Resolution on In Ear Headphones for More Study at the Urging of the Academy, Others

As a result of testimony provided by the American Academy of Audiology (Academy) along with the National Hearing Conservation Association (NHCA), the American Medical Association referred consideration of a policy resolution calling for the establishment of regulations that would limit the output of portable musical devices, citing further study to better clarify medical and regulatory issues and concerns related to the use of in-ear headphones in portable musical devices.

Brian Fligor, Sc.D., Director of Diagnostic Audiology, Children’s Hospital Boston, Instructor in Otolaryngology, Harvard Medical School submitted testimony to the AMA House of Delegates Reference Committee calling for further study of hearing loss associated with exposure to excessive noise levels from in-ear headphones. Dr. Fligor, agreed with AMA’s decision, recommended modifications to the original resolution calling for advocacy efforts to be focused on the prevention of hearing loss from misuse of portable music players. He stated, “The American Academy of Audiology with the support of and the National Hearing Conservation Association, recommends advocacy for the prevention of hearing loss from misuse of portable music players by:

- Encouraging technological interventions that address risk for noise-induced hearing loss by monitoring (or minimizing) the integration of sound levels over time.
- Targeting education to young people to be able to recognize the risks of hazardous sound exposures, understand how hearing may be damaged by hazardous sound levels, and learn the effective strategies for the prevention of noise-induced hearing loss.
- Advocate for national public health campaigns addressing the broader issue of prevention of noise-induced hearing loss.

The Academy looks forward to working with the AMA and others to further study this issue in order to better clarify medical and regulatory issues and concerns related to the use of in-ear headphones in portable musical devices.
Don’t Suffer the Consequences: The Importance of Malpractice Insurance

The American Academy of Audiology is well aware of the challenges you face in providing quality hearing care today. Many changes in the health-care industry have increased your personal exposure to an allegation of negligence. And, whether or not the allegation is valid, you need to be able to protect yourself, your license and your family from the financial consequences of a lawsuit.

To address this issue, the Academy has endorsed the professional liability insurance program offered through Healthcare Providers Service Organization (HPSO). The Academy reviewed many programs before endorsing this plan. We selected this program because of the plan’s many benefits, affordable rates, and their commitment to superior service.

This professional liability insurance program through Healthcare Providers Service Organization (HPSO) is designed to protect your assets and cover your expenses in the event of a suit being brought against you for malpractice. This plan is underwritten by CNA and is designed to meet the unique needs of today’s audiologists.

CNA has been a leader in providing professional liability insurance coverage for over 30 years and is rated A (Excellent) by A.M. Best, Inc., one of the nation’s leading independent insurance analysts.

For more information on the professional liability insurance plan offered through HPSO, contact them at 1-800-982-9491, and let them know you are a member of the American Academy of Audiology.

Will Perform Hearing Screenings for Food: When Unemployment Strikes!

One of the most stressful times in my life was the 6 months I became unexpectedly unemployed. I had a medical emergency that made it impossible for me to work, and I blew through my savings while recuperating. After I was better (healthwise at least), I had little money left, the bills were quickly piling up and my future employment prospects weren’t looking good.

Being unemployed is something that can sneak up on you. Maybe a health crisis or a family emergency surprises you. Perhaps a drastic change in policy or leadership in the workplace makes you reevaluate your situation. No matter what the cause, the circumstances leading to unemployment are often unpredictable. That is why you need to attack the job market with everything you’ve got.

First, you need to make sure you have a resume that is ready to show. Even if you have a job, you should always update your resume. One way to do this is to keep a copy of your resume listed on your personalized HearCareers account.

HearCareers is the Academy’s job and resume posting Web site. Go to the “Quick Links” section of audiology.org (along the right-hand side of the home page), and click on “HearCareers” to get to our “Employer” and “Job Seeker” log-in pages. Create an account and save a copy of your resume in case you ever need it. HearCareers gives job seekers the option of keeping their resume confidential if they wish.

Second, use every avenue at your disposal. Who knows where your dream job lies. It could be on any job site. It could very well be on HearCareers. Considering that HearCareers only posts jobs related to the field of audiology, it will certainly make it easier to find what you are looking for. No scrolling through different search fields: there is only one category … audiology. Make sure to put HearCareers on your favorites list when you are searching for a job. If you really needed to find something, would you only look in one place?

Remember to keep checking the job postings. People post new items all the time. If you want to simplify this process, you can set up a Job Search Agent from your HearCareers account. A Job Search Agent allows you to receive weekly updates of all the new job postings that match your search criteria. To use the Job Search Agent, log in to your personalized HearCareers account and click “Create/Manage Job Agent” (in the “Links” section under the “My Account” tab). Next, enter your e-mail address, a description of the search and the date you would like to start receiving Job Search Agent e-mails. Lastly, select your search criteria, and then click “Create Search Agent.” Now when the perfect job is posted, you don’t have to find it. It will find you.

So you have a resume. You’re putting it out for the world to see, and you are making sure that whenever a new job comes out, you are poised and ready to pounce. No one likes the uncertainty that comes with being unemployed. Make sure that if you ever find yourself in that situation, you are prepared enough to not be unemployed for long.

One of the most stressful times in my life was the 6 months I became unexpectedly unemployed. I had a medical emergency that made it impossible for me to work, and I blew through my savings while recuperating. After I was better (healthwise at least), I had little money left, the bills were quickly piling up and my future employment prospects weren’t looking good.

Being unemployed is something that can sneak up on you. Maybe a health crisis or a family emergency surprises you. Perhaps a drastic change in policy or leadership in the workplace makes you reevaluate your situation. No matter what the cause, the circumstances leading to unemployment are often unpredictable. That is why you need to attack the job market with everything you’ve got.

First, you need to make sure you have a resume that is ready to show. Even if you have a job, you should always update your resume. One way to do this is to keep a copy of your resume listed on your personalized HearCareers account.

HearCareers is the Academy’s job and resume posting Web site. Go to the “Quick Links” section of audiology.org (along the right-hand side of the home page), and click on “HearCareers” to get to our “Employer” and “Job Seeker” log-in pages. Create an account and save a copy of your resume in case you ever need it. HearCareers gives job seekers the option of keeping their resume confidential if they wish.

Second, use every avenue at your disposal. Who knows where your dream job lies. It could be on any job site. It could very well be on HearCareers. Considering that HearCareers only posts jobs related to the field of audiology, it will certainly make it easier to find what you are looking for. No scrolling through different search fields: there is only one category … audiology. Make sure to put HearCareers on your favorites list when you are searching for a job. If you really needed to find something, would you only look in one place?

Remember to keep checking the job postings. People post new items all the time. If you want to simplify this process, you can set up a Job Search Agent from your HearCareers account. A Job Search Agent allows you to receive weekly updates of all the new job postings that match your search criteria. To use the Job Search Agent, log in to your personalized HearCareers account and click “Create/Manage Job Agent” (in the “Links” section under the “My Account” tab). Next, enter your e-mail address, a description of the search and the date you would like to start receiving Job Search Agent e-mails. Lastly, select your search criteria, and then click “Create Search Agent.” Now when the perfect job is posted, you don’t have to find it. It will find you.

So you have a resume. You’re putting it out for the world to see, and you are making sure that whenever a new job comes out, you are poised and ready to pounce. No one likes the uncertainty that comes with being unemployed. Make sure that if you ever find yourself in that situation, you are prepared enough to not be unemployed for long.
Massachusetts, Rhode Island & New Hampshire

HealthDrive, a leading provider of on-site healthcare services at nursing home facilities, has an opening for a MA/RI licensed Audiologist. We currently have a F/T (4-5 days) position available.

We offer an established patient base, flexible schedule & excellent compensation. CCC-A required. Call Maria at (toll free) 877-724-4410 or fax (toll free) 866-657-5400 or email: caring@healthdrive.com

Montana

Audiologist needed for private practice in Kalispell, MT. Minimum of 4 years dispensing and good communication skills for dispensing and counseling of most hearing aid technologies to the adult population. Compensation includes salary, commission, educational benefits, health, dental, retirement and annual bonus. Email resume and letter of interest to: smoores@digisys.net

Virginia

Seeking FT experienced Clinical Audiologist for a busy ENT practice serving 3 offices in the Tidewater Region of Virginia. There are 6 board certified physicians and 4 audiologists providing complete diagnostic audio & hearing aid dispensing services. Competitive salary and benefit pkg available. Please email your resume to rrussell@entltd.com or fax to R. Russell at (757) 623-0609.
News & Announcements

PASSAGES

George S. Osborne, PhD, DDS, died unexpectedly June 14, 2007 at the age of 66. George was an optimist, a visionary, an experienced professional, and a dedicated educator. His contributions to the profession of audiology were historic and many. He was one of the nation’s first private practitioners of audiology, and remained involved in both clinical service and training throughout his career.

In 2000, Dr. Osborne founded the School of Audiology at the Pennsylvania College of Optometry (PCO), creating a curriculum that combined high academic standards and a strong biomedical component. As dean, Osborne created AuDonline, a robust and comprehensive program designed specifically as a bridge for licensed, practicing audiologists. Graduating 960 students to date, the program will have awarded more than 2,000 Doctor of Audiology (AuD) degrees when its last class graduates in 2010.

Dr. Osborne was founder and past president of the Pennsylvania Academy of Audiology; co-founder and past chair of the Audiology Foundation of America; co-founder and director of the American Academy of Audiology; and co-founder and director of the Accreditation Commission for Audiology Education. He worked steadfastly to promote the profession and to ensure that audiologists would achieve recognition and parity with other healthcare professionals, such as dentists, optometrists, and podiatrists.

George was a playful man with a taste for adventure. A veteran boat driver and inventor of countless water-ski tricks, he also went sky-diving for the first time on his 65th birthday. An avid and accomplished pilot, he built an experimental seaplane, the Seawind, a project that took three years. His plane, embossed with the logo of a loon (the fastest amphibious bird and a frequent sight on Lake Elora), won the prestigious Lindy Award in Oshkosh in 2004. In 2006, he and his wife won a cross-country race commemorating the 100th anniversary of the Wright Brothers.

Antonia Maxon Brancia, PhD, retired faculty audiologist from the University of Connecticut, suffered a fatal accident during May in a car crash while en route to her son’s college graduation. ‘Toni’ Maxon was a noted pediatric audiologist who was instrumental in establishing universal infant hearing screening as a viable clinical procedure and mandatory in the states of Rhode Island and Connecticut. With a strong interest in early intervention and cochlear implants, she was a co-founder of the New England Center for Hearing Rehabilitation. A pediatric audiology scholarship is being established.

Kathryn P. (Kay) Gillispie, MA, passed away in May of 2007. Gillispie earned her MA degree in Audiology from Temple University in 1965. In 1975, she became the Director of Audiology at Mercy Hospital in Springfield where she established the first comprehensive hospital-based hearing aid dispensing program in Massachusetts. In 1980, Kay founded Hampden Hearing Center, Inc. in West Springfield, Massachusetts, one of the first private audiology practices in the Commonwealth, where she practiced until her retirement in 2002.
Dr. George S. Osborne  
1940-2007

“Aviation is proof that, given the will, we have the capacity to achieve the impossible.”

Eddie Rickenbacker

We honor the memory of our friend and colleague, George S. Osborne, Ph.D., D.D.S., founding Dean of the PCO School of Audiology. We salute George’s will and his capacity to achieve what many thought impossible. Our first class of residential Doctors of Audiology graduated on May 18, 2007.

PCO School of Audiology  
8360 Old York Road, Elkins Park, PA 19027

800.824.6262
admissions@pco.edu

The George S. Osborne Scholarship Fund was established in 2001 by the first graduates of our AuDonline program. For more information: www.pco.edu/_osborne/osborne_giving.htm
SPECIAL ISSUE: COGNITION

EDITORIAL
Rehabilitative Audiology: Using the Brain to Reconnect Listeners with Impaired Ears to Their Acoustic Ecologies
M. Kathleen Pichora-Fuller, Guest Editor

ARTICLES
Interactions between Cognition, Compression, and Listening Conditions: Effects on Speech-in-Noise Performance in a Two-Channel Hearing Aid
Thomas Lunner and Elisabet Sundewall-Thorén

Recognition of Speech in Noise with New Hearing Instrument Compression Release Settings Requires Explicit Cognitive Storage and Processing Capacity
Catharina Foo, Mary Rudner, Jerker Rönningberg, and Thomas Lunner

Cognitive Supports and Cognitive Constraints on Comprehension of Spoken Language
Arthur Wingfield and Patricia A. Tun

How Competing Speech Interferes with Speech Comprehension in Everyday Listening Situations
Bruce A. Schneider, Liang Li, and Meredity Daneman

The Role of Event-Related Brain Potentials in Assessing Central Auditory Processing
Claude Alain and Kelly Tremblay

The Contributions of Audibility and Cognitive Factors to the Benefit Provided by Amplified Speech to Older Adults
Larry E. Humes
A panel convened during May in the nation’s capital to address alarming new data that implicate continued gaps in follow-up and early intervention programs for children with hearing loss. The public event, which was held at the National Press Club and co-sponsored by the Alexander Graham Bell Association for the Deaf and Hard of Hearing (AG Bell) and the National Center for Hearing Assessment and Management (NCHAM), featured a diverse panel of pediatric and education experts, including former Surgeon General Dr. C. Everett Koop. Other speakers included Karl White, director of the NCHAM, Frank Aiello from the American Academy of Pediatrics, and John Hager, Assistant Secretary for the Office of Special Education and Rehabilitative Services at the U.S. Department of Education.

The national Early Hearing Detection and Intervention (EHDI) data, released by AG Bell and the NCHAM, indicate that, although hearing loss is the most common birth-defect, one-third of babies who fail their newborn hearing screening do not receive a confirmed diagnosis, and many do not receive the necessary follow-up care so critical for speech and language development. EHDI data are collected periodically to assess America’s progress in providing screening and early intervention services for children with hearing loss. Ten years ago, only seven states had laws mandating newborn hearing screenings. Today, 40 states and the District of Columbia have EHDI laws, and more than 95 percent of babies are now screened for hearing loss at birth.

According to the panelists, and despite tremendous progress in the early identification of hearing loss, significant gaps in follow-up care after identification remain. Current legislation under consideration by both the House and the Senate is aimed at addressing these issues. In addition to reauthorizing the EHDI grant program, the legislation seeks to expand states’ abilities to enroll identified babies in early intervention programs, and offer coordinated support to families of young children with hearing loss.

Families feel lost and don’t know where to turn,” said panel member Stacy Allen, regarding the discovery that a child has hearing loss. Stacy and her husband Anthony are well aware of the emotions associated with this. They are the parents of four children, three of whom have profound congenital hearing loss. These children all use cochlear implants and are in mainstream classrooms at their local public school. Mrs. Allen attributes much of her children’s success to early detection of the hearing loss and the comprehensive, interdisciplinary follow-up they received. Although progress in EHDI has been great, this new data reveal there is much that is left to accomplish. This will require increased education and awareness, along with new legislation endorsing government support. “We have come a long way, we are not there yet, but diligent effort will bear great fruit in the future,” said Koop.

—Submitted by Kelly King, University of Maryland

The Academy has been advocating for the Early Hearing Detection and Intervention Act of 2007 (H.R. 1198/S. 1069), introduced by Rep. Lois Capps (D-CA) and Rep. Jim Walsh (R-NY) in the House and Sen. Olympia Snowe (R-ME) and Sen. Tom Harkin (D-IA) in the Senate, that calls for the reauthorization of the Early Hearing Detection and Intervention (EHDI) programs over the next five years. To ensure the continued success of EHDI programs, the reauthorization of this bill addresses necessary improvements to the original legislation, which includes: connecting screening programs to pediatric audiology services, appropriate early intervention programs, family support, and tracking and data management activities, and provides the U.S. Department for Health and Human Services the authority to address the shortage of trained health professionals and other personnel necessary to make certain that every child who is screened and has a hearing problem gets access to appropriate diagnosis and intervention programs needed to succeed.
New clinical and research data presented at the 11th International Conference on Cochlear Implants in Children (CI 2007), held in Charlotte, NC, identified new groups of patients that can benefit from advances in hearing technology. But, equally as important, some of the more than 350 presentations given at the international conference also identified a small group of patients that do not benefit from cochlear implants. The CI 2007 conference was divided into three clinical areas: cochlear implantation in very young children; patients with auditory neuropathy; and bilateral cochlear implantation. Among the many conclusions presented at the conference were the following: adults with significant residual hearing benefit from cochlear implants thereby broadening the criteria for cochlear implantation and allowing greater access to this technology for individuals with hearing loss.

John K. Niparko, MD, of Johns Hopkins University, presented information from the NIH-sponsored Childhood Development after Cochlear Implantation Study. This study is closely following 188 children that have received cochlear implants as well as a group of normal hearing children. It appears that cochlear implants greatly improved the socialization and advancement of children who received these devices when compared to deaf and hearing-impaired children without cochlear implants. Researchers from the University of Oslo presented findings on the effect of bilateral cochlear implantation on spoken language skills in children from five months to 18 months old.

Jennifer Weinstock, audiologist at the University of North Carolina at Chapel Hill School of Medicine, demonstrated that the use of a common cochlear implant test, ECAP (electrically evoked compound action potential) can help identify those children with auditory neuropathy that will benefit the most from cochlear implants. As most children with auditory neuropathy do well with cochlear implants, this test allows for the identification of a small subgroup of children that may not gain as much benefit. One group of patients that clearly do not benefit from cochlear implants are those who do not have a cochlear nerve. Although cochlear nerve deficiency was thought to be an extremely rare condition, the condition is much more common than previously believed. Currently there are 44 children with this condition who are being followed at UNC Hospitals.

On Saturday April 14th, 1st through 3rd year students enrolled in the Vanderbilt University AuD program “sat” for the first annual AuD Inservice Examination. The examination was patterned after the Inservice Examinations that are completed each year by physicians who are in residency training programs. Questions constituting the Inservice Examination were authored by the faculty who teach in the Vanderbilt AuD training program. It is the purpose of the Inservice Examination to assess knowledge (not skills) that should be present in each student prior to the start of their 4th year externship. The Inservice Examination will be administered during the spring each year for the 3 years of formal AuD training. Since the exam is a summative assessment it is predicted that first year students will perform poorest and the third year students will perform best. However, it is unknown to what extent, practicum experiences augment didactic training.

The potential benefits of an Inservice Examination are many. Since the level of complexity of questions constituting the Inservice Examination is summative, taking the examination should be very good practice for students planning to take the Praxis examination. Additionally, students may use the information and feedback they receive from the Inservice Examination to evaluate progress they have made from year-to-year. Professors/program directors may use the information to evaluate the extent to which students retain critical information and they may use this information to re-evaluate methods they use to train students. Results of the assessment may provide a method for identifying curriculum deficiencies and topical areas that need reinforcement. It is hoped that after a number of administrations of the Inservice Examination, and with the benefit of years of data, the Inservice Examination will provide a method for identifying weaknesses in individual students so that these areas can be strengthened before students enter their 4th year clinical externship. If the concept of the Inservice Examination is to have broad appeal across many training programs, it would be possible to administer the examinations each year in multiple academic programs, making it possible to determine which programs are graduating the strongest students. Information concerning the Inservice Examination may be obtained by contacting Gary Jacobson at gary.jacobson@vanderbilt.edu.
“I think I’d like to be an audiologist.”

The National Institute on Deafness and Other Communication Disorders (NIDCD) celebrated “Take Your Child to Work Day” and the Audiology Clinic hosted an open house to teach youngsters about hearing, hearing loss and what an audiologist does in their daily work. In the photo at right, NIDCD audiologist Carmen Brewer shows the 7-year-old daughter of NIDCD’s communication director, Patricia Blessing, how to work the dials of an audiometer during a hearing test.

Alabama Academy of Audiology Annual Convention

The Alabama Academy of Audiology (ALAA) Annual Convention will be held September 6-8, 2007 at the beautiful Callaway Gardens Resort in Pine Mountain, Georgia. The event will offer CEU sessions from featured speakers Charles Berlin (University of South Florida), Jay Hall (University of Florida), and David Zapala (Mayo Clinic, Florida). 2007-2008 membership in ALAA is included with each registration. Come enjoy the spa, lake, beach, pool, grounds, butterfly house, hiking, biking, and so much more at the Gardens. Contact Sandra Cook at auburnaudiology@charter.net for more information about the ALAA convention.
American Academy of Audiology
11730 Plaza America Drive, Suite 300
Reston, VA 20190
800 • AAA • 2336

1988-2008 Celebrate in Charlotte
The Academy is going "Back to the Carolinas" to celebrate our 20th Anniversary.
Be a part of the future of audiology by presenting at AudiologyNOW! 2008:
Call for Innovative Proposals—coming August 2007.

KIAWAH ISLAND • New Orleans • Denver • Nashville • Phoenix • Richmond • Dallas • Salt Lake City • Fort Lauderdale • Los Angeles
Miami • Chicago • San Diego • Philadelphia • San Antonio • Salt Lake City • Washington, DC • Minneapolis • Denver • CHARLOTTE

Hearing is a gift...

and every gift matters.
Together with contributions from others, your gift to the American Academy of Audiology Foundation can make a difference.
Support research, education and public awareness in audiology...and give the gift of hearing.

MAKE A GIFT ONLINE
at www.audiologyfoundation.org
or SEND a check to the American Academy of Audiology Foundation
11730 Plaza America Drive
Suite 300
Reston, VA 20190
703.790.8466 • 800.222.2336

Your gift to the AAA Foundation is tax-deductible as allowed by law.