



UPDATE

Sound Identification



Training: Auditory Armament for the Battlefield

By Dr. Doug Ohlin

Soldiers go to war with the hearing they have—not the hearing we wish they had or even the hearing they had when they came into the Army! Over a typical soldier’s career, most hearing loss is incurred in training and to a lesser extent in combat. You don’t agree? Think about it. Soldiers train as they fight. Over a military career, how much time is spent in combat firefights as opposed to training in garrison? Still don’t agree? Then read no further. You are probably one of those who also believe our soldiers are losing all their hearing from listening to rock and rap music. Cultural biases aside, that’s like comparing the lethality of a BB gun to a howitzer. There is no comparison. A soldier can lose more hearing from one unprotected firing exercise than from years of listening to loud music.



Garrison-Based Hearing Conservation Programs

Noise is generally defined as *unwanted* sound. Hearing conservation programs are designed to protect and preserve the ability to hear *wanted* sounds vital to maintaining situational awareness and effective communication. Hearing conservation professionals in garrison (Army post) employ a variety of motivational strategies to elicit command emphasis and program compliance:

- For the benefit of our senior leadership, reduced noise-induced hearing loss has been associated with cost savings/cost avoidance (Ohlin, 1998). Training costs for individuals profiled out of a job specialty and for their replacements can add up quickly, as can hearing loss compensation and disability costs.

- For noise-exposed individuals, a focus on the hearing mechanism itself is sometimes effective and is required by regulation and law (Department of the Army, 1998). The wonders of the ear, its vulnerabilities and the permanency of damage to nerve hair cells in the inner ear are emphasized. Since the layperson’s knowledge of the ear usually doesn’t extend beyond the eardrum, the hope is that mere mention of permanent nerve damage will have them scrambling for earplugs.
- Medical professionals, notably audiologists, often advocate preservation of good hearing as a quality of life issue, i.e., how hearing is our most precious learning and social sense. However, preservation of an ability to hear grandchildren is usually not on the radar scopes of nineteen-year olds living in the moment. Such considerations are not foremost in anyone’s mind bound for combat either.

Hearing Conservation Forward

The importance of an effective garrison-based hearing conservation program may be no less significant than the training conducted there. However, to match the transformation efforts of the Army, the time has come to extend our thinking and our hearing conservation efforts even more forward — forward to the battlefield. Although it may appear contradictory, a focus on the battlefield can provide increased relevance for garrison-based hearing conservation programs.

For years, this author has advocated an association of hearing conservation measures with mission accomplishment. For example, if hearing protection is worn properly, there is less of a tendency to flinch at the impact of small arms being fired and the soldier will shoot more accurately – something members of rifle and pistol teams seem to have always known. Preservation of hearing, though, can be associated with something more important than a high marksmanship score. The ability to make accurate sound identification can

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UPDATE

Published by the Council for Accreditation in Occupational Hearing Conservation, a not-for-profit organization dedicated to the establishment and maintenance of training standards for those who safeguard hearing in the workplace.

Articles should be submitted with a black and white photograph of the author. The UPDATE is available to individuals not certified by CAOHC at an annual subscription rate of \$20.

Payment must accompany request:

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Chair's Message

By Richard W. Danielson, PhD

Recognition. It's an advantage for brand name products, entertainers, and family members. When shopping, choosing a movie, or figuring out which kid out on the playing field is mine, I rely on recognition and associations that are burned in my memory. Similarly, recognition brings instinctive responses. When I recognize that I'm passing a police car, I reflexively look at my speedometer to see if I'm speeding. When I recognize my old fitness trainer in a public place, I try to camouflage my weight. When I see my dental hygienist, I wonder when I last flossed my teeth. Mind you, these actions all happen whether they recognize ME or not!

So then, how does recognition contribute to what we do in hearing conservation? In our roles as OHCs and Course Directors, we have our own unique recognition status... giving us identity (e.g., the person to turn to when seeking hearing protection advice), authority (as schedulers of hearing tests or retests), and wisdom (as we keep up with late-breaking news, like that found in this issue of UPDATE). Such recognition is a reward AND a responsibility. Many of us are "Obsessive Hearing Conservationists" (described in a previous Update article, found at <http://www.caohc.org/updatearticles/summer02.pdf>), whose neighbors recognize as a source for spare earplugs (and a coach for hearing conservation practices). Our jobs, and our recognized roles as hearing conservationists, let us influence others in how they approach noise exposures and prevention of hearing loss. This happens whether at work or elsewhere, and even when we don't know whom we're affecting. I encourage you to not shirk that role, but to be an eager and enthusiastic guardian of hearing conservation. As you're recognized as an enthusiast for the cause of hearing conservation, the cause itself is seen as being a worthy endeavor.

Similarly, recognition of CAOHC contributes to our individual roles. CAOHC has been acknowledged as the national leader in providing standards and certification for OHCs and CDs since its inception in 1973. Some of us have "been around" for these three decades and have seen industrial and military organizations become increasingly more aware of CAOHC's capabilities and products. I recently assumed the chairmanship of CAOHC and am delighted about how the Council is working to increase the value of certification and quality programs. I hope that you share this enthusiasm.

CAOHC is currently developing several initiatives that promise to benefit many. One program is aimed at providing a solid background for those working as the Professional Supervisor (PS) of an audiometric monitoring component of hearing conservation programs. CAOHC just conducted another pair of successful PS courses this spring, held in conjunction with the 2005 American Academy of Audiology convention, as well as at the 2005 American Occupational Health Conference. Based on these successes, CAOHC will hold its first independent PS course this fall – on Saturday, November 5, 2005, in Rosemont IL. Perhaps your professional supervisor might want to attend (see the CAOHC website for more details). The Council is also refining CAOHC's curricula for CD certification and recertification. This effort will improve the quality of OHC training and increase awareness of new teaching techniques that could be used in hearing conservation instruction. Finally, the Council has charged an *ad hoc* committee to find methods for marketing CAOHC to groups who don't fully appreciate the advantage of OHC certification.

Of course, your personal investment in hearing conservation efforts should be recognized for what it is – conscientious and invaluable to the American workforce. Thank you for your contributions and your persistence, for it is **YOUR** presence that is meaningful to the noise-exposed worker. That worker recognizes **YOU** (just like the patrolman, fitness trainer, and dental hygienist) to have an indispensable (and unwavering) sense of what's **RIGHT** and what's **NECESSARY**... As we know, prevention of noise-induced hearing loss benefits us all!

Custom-Molded Hearing Protectors

By Theresa Y. Schulz, PhD
CAOHC Immediate Past Chair



Custom-molded hearing protection devices (HPDs) have been around for nearly 30 years (Berger, 2003) and continue to evolve and improve. Currently there are several types of custom HPDs:

- 1- Instant mixtures that cure in a period of minutes once they have been injected into the earcanal (instant HPD)
- 2- Custom impression, fabricated with various materials (conventional custom HPD)
- 3- Instantly custom-fitted bladder in multiple sizes (i.e. balloon) that is filled with soft silicone



Figure 1 - Instant HPD



Figure 2 - Instant Custom Bladder

The process of making any of these custom hearing protectors (or impressions) takes from 10 to 15 minutes. Pictured here are samples of these custom hearing protection devices. (Photos courtesy of Sonomax Hearing Healthcare, Inc.)

New developments

The instant custom HPD (Figure 1) is a viscous liquid (consistency of thick syrup) that is injected into the earcanal and firms as it cures. The conventional custom-molded HPD is made by taking an impression of the individual earcanal and then sending that impression to a manufacturing lab for production of the actual hearing protector. The custom-fitted bladder is also filled with a viscous liquid, and also contains a core through its center that allows for special acoustic features (Figure 2).

The instant and sized inflatable bladder types can be made on-the-spot without having to send an impression for fabrication. The conventional and inflatable bladder types can be compatible with communication devices and can also be vented with filters inserted to allow the attenuation to be modified to an appropriate level.

Most workers (at least 90%) are exposed to time-weighted averages (TWAs) less than 95 dBA (Royster and Royster, 1994), so they only need about 10-15 dB of attenuation. Providing the RIGHT amount of attenuation protects the worker from noise-induced hearing loss but also from possible safety hazards due to over-protection. A worker with the appropriate amount of attenuation will be less likely to remove the HPD to hear signals, conversation, etc. (Voix, J. and F. Laville, 2004). Since we often don't know the true attenuation that a worker is getting from a

given hearing protector, it is difficult to achieve the target protection outcome with any accuracy. However, the values in Table 1 are a worthy goal to achieve.

Table 1 - Target protection inside the hearing protector.

Sound level inside the hearing protector (dBA/8hrs)	Protection Outcome
85 or Greater	Inadequate protection
80 - 85	Good
75 - 80	Best
70 - 75	Good
Less than 70	Over-protection

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OHC Spotlight

Meet Matthew Smith, a newbie to occupational hearing conservation. Matt was certified in March 2005 after attending an OHC course in Houston. A native of the Houston area, Matt grew up in Pasadena, Texas and graduated from South Houston High School in 1998. Last fall, he graduated from Stephen F. Austin State University in Nacogdoches, Texas with a B.S. in geography and history. After graduation, Matt discovered that his skills fit well with a company doing occupational health testing. He is now the Director of Operations for Mobile Units for a Houston based occupational health firm.



Matt's firm gives physicals for all of one corporation's employees working in Iraq—over 90,000 to date. On Fridays, Matt learns how many people (anywhere from 300 to 900) will be tested the following Tuesday. As Director of Operations, he is charged with:

- Checking the mobile units to be sure they are properly equipped for all of the testing that will be performed: hearing tests, general physical, pulmonary function tests, chest X-rays, drug screening, and blood tests.
- Ensuring that all testing personnel have the appropriate certifications and that they are current with the certifying body.
- Scheduling the health testing personnel, including OHCs to perform the tests
- Maintaining the calibration records for all of the equipment.

Matt became certified as an OHC completing a CAOHC course, taught by Course Director Johnny Sanders, MA CCC-A, so that he could better understand the testing process that is performed on the mobile vans. Like almost all OHCs, Matt has come to realize that "most people do not think about their hearing or its loss—until it happens." He is proud to be a part of the hearing conservation movement.

LETTER TO THE AUTHOR

Dear Ms. Wells: I was just reading your article *Audiometric Baseline Revision: Separate or Single?* in the *UPDATE* newsletter (Issue 17(1), Winter/Spring 2005, Page 4). I have a few concerns.

- You report that there is a standard threshold shift (STS) when the 2002 baseline is used in Table 3 (see below). It is my understanding that in addition to the average 10-dB shift there must also be an average of 25 dB loss in the average of 2, 3, and 4 kHz to be considered an STS. Thus, there would NOT be an STS.

Table 3: Separate-ear baseline revision (highlighted tests are revised baselines)

kHz	LEFT EAR							STS avg	RIGHT EAR							STS avg
	.5	1	2	3	4	6	8		.5	1	2	3	4	6	8	
2002	10	10	05	00	05	10	05		15	10	10	05	05	00	05	
2003	10	10	05	10	15	10	05	6.7	35	35	30	30	20	25	25	20
2004	10	10	15	15	25	05	00	15	40	35	35	25	20	25	20	0

Dear Reader: Please note the difference between an STS and a recordable STS. In the example, there is an STS present, therefore the employer must follow all of the requirements for intervention as specified in the Hearing Conservation Amendment 1910.95 (inform employee in writing within 21 days, refit and retrain on hearing protection devices (HPD), etc.). You are correct that this STS is not of recordable degree, because the average of the absolute thresholds at 2, 3, and 4 kHz is less than 25 dB. When I review, I differentiate for my clients the “recordable degree STS” and the “non-recordable degree STS” so they will provide all required intervention for STSs, and recognize which STSs are eligible for recording on the OSHA log (if they in fact are work related). Note that the recordkeeping rule (29CFR part 1904.10) only changed the rule for when an STS has to be recorded on the OSHA 300 log, but did not change the definition of an STS and the intervention requirements (according to 1910.95).

- As a physician, I am often puzzled by what baseline to use after an STS is identified. I know that it states that once an STS is identified that becomes the new baseline. However, it is unclear to me if the companies are sending people back to repeat and verify the STS and whether they are referring those with a persistent STS. As a physician I make the recommendations, but whether they are acted upon I am not always sure. I would be curious as to what other physicians are doing.

You have raised some good questions. I’m not a physician, but have been providing professional audiology review of audiometric databases for nearly 15 years, and will share my experience with you. One reference I recommend is the National Hearing Conservation Association (NHCA) *Guidelines for Audiometric Baseline Revision*. This document was created in 1996 and is posted on the NHCA website (www.hearingconservation.org) under “position statements.” It is widely used by professional reviewers and some software programs to revise baselines for both persistent improvements and decreases in hearing (NHCA is in the process of updating this document due to the recent recordkeeping rule change; however the rules for applying baseline revision are not in question). After an STS is persistent (persistent on the next annual test, or a test done at least 6 months after the STS), the baseline should be revised in that ear. Future comparisons for STS determination are made between the annual test and the revised baseline. Baseline revisions for STS, which is the trigger for

employer intervention, is the same for both OSHA and MSHA. However, the definition of when hearing loss is reportable to MSHA or recordable on the OSHA 300 log is different.

In addition, to accurately identify STS for employers, I also make a determination regarding the hearing health of the employee. In other words, should the employee be referred for additional medical and/or audiology consultation? This involves looking at all of the hearing test data and not just making a simple mathematical calculation for STS. For this purpose, a “medical baseline” is identified, which may be different than the baseline used for calculating STS. The medical baseline is the test that triggers a medical referral, and can be revised if the medical condition changes.

In my practice, I separate a “personal medical/audiological referral” from an “occupational medical/audiological referral.” Additional medical/audiological consultation that is needed because it may be work related, or it is the responsibility of the employer (to obtain a valid test for example) would be an “occupational” referral and the employer should pay for it. On the other hand, an employee with a shift in hearing or a reported symptom that is not considered work related, is given a “personal” referral, and the employer is NOT responsible for payment.

My experience is the same as yours regarding receiving information back from these referrals. I may never know if the employee actually went to see a doctor or audiologist, as I’ve recommended. I usually DO know if an occupational referral was completed, because I request that information from the employer and include it in the database. If I don’t have the information, I assume it hasn’t been done and repeat the referral if it is still pertinent.

If I understood your question correctly, I think this discussion addresses your concern about which baseline to refer to: not only do I look for STS for OSHA/MSHA compliance (original vs. revised baseline), but I look for overall hearing health and hearing loss management (medical baseline).

Thank you for your feedback from the article. It is nice to know that it has generated some thought and discussion. I just returned from the NHCA annual conference which was held in February, and we conducted a forum on exactly this topic. It appears there are many questions and opinions! I hope my input is helpful to you in your practice.

Response by the author, Laurie Wells, MS FAA, Associates in Acoustics, Inc., Evergreen, CO



Hearing Conservation in the US - A Road Less Traveled

Final of a two-part series

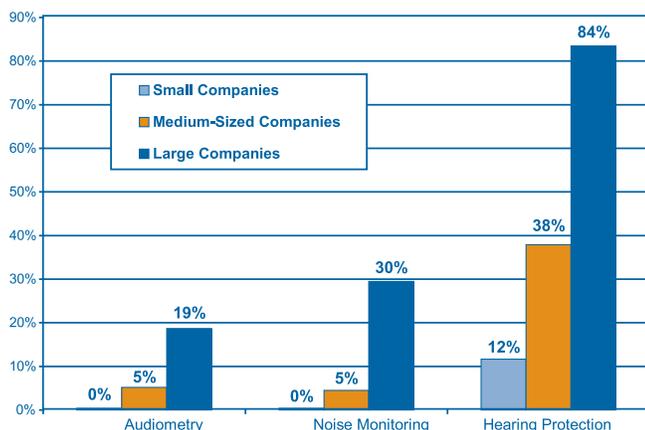
By Tom Thunder, AuD, FAAA, INCE Bd. Cert.

So What is the Present Regulatory Situation?

As mentioned in the first part of this article (UPDATE, Winter/Spring 2005, Volume 17, Issue 1), OSHA's 1983 amendment requires a hearing conservation program (HCP) when noise exposures reach 85 dB TWA - known as the "action level." It is no secret that industry has always preferred HCPs, presumably because of their lower cost relative to engineering or administrative controls. But the amendment was explicit in requiring five components in order for the HCP to be considered "effective," namely: 1) timely noise monitoring, 2) adequate hearing protection, 3) annual audiometric monitoring, 4) yearly employee training, and 5) careful recordkeeping. But has industry included all five components in their programs?

To answer this, National Institute for Occupational Safety and Health (NIOSH) included this question as part of its National Occupational Exposure Survey of 4,500 companies (Franks and Burks 1998). As seen in Figure 2, the survey found that large companies were the best at providing hearing protection. But noise monitoring occurred in substantially fewer plants and audiometry in even fewer plants. The trend was the same for medium and small plants, only worse.

Figure 2 – Percentage of plants reporting presence of various components of a hearing conservation program (Franks & Burks 1998).



It's easy to understand why hearing protection is the most common component of an HCP. After all, the earplug is the icon of hearing conservation. Unfortunately, based on the NIOSH survey, not much consideration is given to other equally important components.

Noise assessment, for example, is necessary to: 1) identify those who must be included in a HCP, 2) inform employees of the level of the hazard to which they are exposed, 3) evaluate the need for engineering/administrative controls, 4) prescribe

adequate hearing protection, and 5) assess the work-relatedness of hearing loss. Yet the NIOSH survey revealed that companies have not consistently included noise assessment in their programs.

The next time you conduct an audiogram, ask the employee if they know the level of noise to which they are exposed. Don't be surprised if they have no clue. Most don't think the testing was ever done – at least not in a long time. In the audiological examinations I perform for worker compensation, only half the companies have done noise monitoring. The other half have not done it since the OSHA amendment was introduced in 1983 or they cannot locate a copy of the testing. Furthermore, although the Occupational Safety and Health Administration (OSHA) requires that a noise assessment be repeated if there is a change in equipment or process that might change exposures, my experience is that such repeat testing is seldom done, at least in small and medium sized plants.

Audiometry is necessary to flag employees for follow-up action and to assess the overall effectiveness of a program. Yet, the NIOSH survey revealed that monitoring hearing was disappointingly low in the large companies, scant in the medium companies, and almost nonexistent in small companies.

Although employee **training**, another HCP component required by OSHA, was apparently not an item of interest in the NIOSH study, my experience is that this component is just as neglected as the others.

The NIOSH survey was conducted in the late 1980s. So it is reasonable to ask, "Is the trend the same today?" We can glean an indication from a unique study conducted in Michigan in the late 1990s that provides equally as disconcerting results (Rosenman, et al. 1998). In this survey involving 1800 reported cases of hearing loss, the most significant number of people seeing an audiologist because of possible noise-induced hearing loss was in the 40-45 year old range. But how could this be if they should have been "protected" by the OSHA regulations during their working careers? While some of these cases of noise-induced hearing loss could involve non-occupational sources, notably gun shooting, the study revealed that 46% of the companies where these people worked **did not** have a hearing conservation program; one might therefore reasonably presume these cases are substantially occupationally related. So if states are experiencing an increase in worker compensation claims, it's not that noise-induced hearing loss (NIHL) is some sort of epidemic; rather it may be a reflection of a long-term, insidious problem that is just now being revealed because employees working the last 35 years are beginning to retire, can meet their state's waiting period, and are filing claims.

Which Companies Need our Help the Most?

The NIOSH survey revealed that small and medium sized manufacturing plants aren't doing a very good job at hearing conservation. "So what?" you say. "They can't constitute a very big element of American industry." On the contrary, as seen in Figure 3 (based on data taken from the final regulatory analysis to the OSHA 1981 amendment), small plants – those defined as less than 100 people – comprise the vast majority

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Hearing Protectors – continued from page 3

Communications hardware can be coupled or inserted into custom HPDs expanding their applications to meet communication needs.

There are many interesting applications for custom HPDs. They can, of course, be used in traditional industrial settings as well as recreational activities. Soft materials can be used to block noise while sleeping. Children (and adults) with “tubes” in their ears or eardrum pathologies need to protect their ears from getting water in them. These plugs are referred to as swim plugs but are used for showers or any time to keep the ear canal dry. Musician’s earplugs are available in custom designs with a filter that attenuates all frequencies essentially equally making the sound much more natural than traditional HPDs. Dentists and hygienists have experienced noise-induced hearing loss but they require only small amounts of attenuation since they need to communicate with their patients. Bartenders and servers, as well as flight attendants, also have communication demands and a need for some hearing protection. Custom hearing protection that includes a communication connection is used in auto racing and motorcycling.

Pros

Accurate fit, with an acoustic seal, is critical to the effectiveness of hearing protectors (Voix, J. and F. Laville 2004). Time spent making the custom HPD is an excellent opportunity to explain, train, motivate and counsel a worker.

Do I need to have a license as an audiometric technician in my state?

The answer depends on the state where you are employed. There are a number of state government agencies that have jurisdiction over individuals administering hearing tests for a variety of different purposes (occupational health & safety, audiology, hearing aid dispensers, public schools). In addition, other actions associated with being an Occupational Hearing Conservationist (OHC) may be governed by state law.



For example, state Departments of Labor in Oregon and Washington require CAOHC certification for OHCs. In addition, the Texas Department of Health requires registration of all audiometers and technicians, including OHCs.

More commonly, state medical and/or audiology licensure boards may have requirements for your professional supervisor. These requirements address “support personnel.” That is, your state’s audiology board may require that, for example, a licensed audiologist register an OHC as an “audiology aide.” Likewise, OHCs operating under the supervision of a physician are typically subject to a state’s medical practice laws.

To find out more about your state’s licensure requirements, contact your hearing conservation program manager or your supervising audiologist or physician.

If you have information about your state requirements and would like to share this with UPDATE readers, please submit it to:
CAOHC, 555 E. Wells Street/Ste 1100, Milwaukee, WI 53202 or
E-mail to: info@caohc.org

Deep-insertion custom HPDs can provide excellent attenuation levels in very high noise levels. Custom-molded earplugs can last 3-5 years with proper care.

Bennet (1998) presented an interesting study comparing workers use of custom and conventional HPDs. Her study suggested that workers with custom HPDs were more likely to wear their earplugs than users of conventional types with both groups becoming less vigilant over time. She reported that the workers who received custom HPDs felt that the special attention of having an HPD “just for me” was a positive factor.

Cons

Custom HPDs require some up-front investment in time and cost. Depending on the type and features of custom HPDs, they can cost from \$30-125 per pair. Training is required to create good HPDs. Fitting by an audiologist or trained personnel is critical to success. The technique to make each of the types of custom HPDs is different and takes practice to learn the kinesthetics of each procedure. Even well-fitted custom-molded protectors are prone to leak with jaw and neck motion, unless fitted very tightly. Photo and video demonstrations of fitting are available on the web at www.sonomax.com, www.protectear.com, and www.instamold.com.

Conclusions

Custom HPDs are not for everyone. Just like any other HPD, there are people who cannot be successfully fit. Custom hearing protectors are usually replaced every three to five years. One of the most desirable features is that this type of hearing protector can be a cost efficient alternative to the disposable products. Employers who choose custom-made hearing protectors may do so for their longevity, greater likelihood of correct insertion, motivational reasons, and comfort. Workers who have tried other types of HPDs without success should try custom-molded, although it is possible that even custom-molded earplugs may not work. The best hearing protector is the one that is worn correctly with every insertion, and custom HPD’s are known for their comfort and positive reception by employees.

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Hearing Conservation in the USA – continued from page 5

of manufacturing companies in the US (OSHA 1981). In fact, there are over 10 times as many small plants as there are medium and large plants combined.

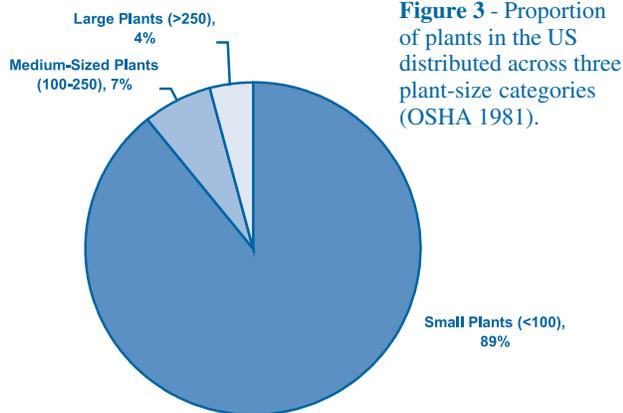


Figure 3 - Proportion of plants in the US distributed across three plant-size categories (OSHA 1981).

OK. But does that reflect how many actual workers might be affected? Data taken from the same analysis and presented in Figure 4, show that small and medium plants employ 41% of the total manufacturing workforce – not a small proportion.

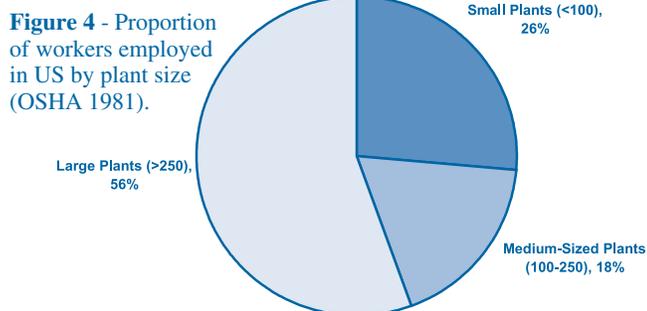


Figure 4 - Proportion of workers employed in US by plant size (OSHA 1981).

It's evident that the large companies are doing the best job of hearing conservation. But why have small and medium sized plants been remiss in HCPs? Well, large companies typically have a key individual which may include an occupational health nurse, an industrial hygienist, a safety engineer or even an audiologist or physician if the company is large enough. In contrast, medium-sized companies will often have a person with general responsibility for safety and health, but that person often lacks the education and training in hearing conservation to be fully effective. In small companies, the person in charge of safety and health is more often than not a foreman, supervisor, former production worker, plant manager, or even the plant owner himself. These people wear many different hats and hearing conservation is not a high priority for them.

If nearly half the American overexposed workforce is either not included in an HCP or included in a program that lacks all the components required by OSHA to make it effective, then we have a lot more work to do and the focus should be on the small and medium sized companies.

Attempting to help companies improve their hearing conservation efforts is not simply a matter of walking in and declaring, "OSHA says you have to do it." Savvy companies realize that OSHA is not the threat it used to be, at least in the noise arena. In a relative sense, the fines are not that big so some companies choose to defer implementing a program until

OSHA requires them to do so. Instead, the benefits of noise reduction and hearing conservation need to be addressed. The primary benefit, of course, is the reduced incidence of noise-induced hearing loss. However, as highlighted by Stephen Roth, former president of the Institute of Noise Control Engineering, additional benefits include (Roth 1999):

- A safer, less stressful, work environment
- Improved communication
- Improved worker productivity
- Fewer lost or sick days
- Improved equipment maintenance, and
- Reduced workers compensation liability.

In conclusion, most companies extol the virtue of a safe and healthy workplace. But can such a workplace exist when excessive noise levels continue to create unsafe environments and result in worker hearing loss? As stated over a decade ago by Berger and Royster in *The Development of a National Noise Strategy*, (Berger & Royster 1997): "In large part what is needed is not the development of new solutions, but rather the broad dissemination of existing techniques plus the education and motivation of management and labor alike to speed the implementation of effective programs." And given more recently in a special issue on the noise policy in America, Bruce and Wood state (Bruce & Wood 2003): "After at least 50 years of attempting to solve the industrial noise problem in the USA, we still have not solved it [because of] the lack of clear direction at the national level..."

Has OSHA made significant strides in preventing hearing loss in the last three decades? Yes, of course. But there are many more ears to protect and we need to take additional steps. We cannot depend on OSHA to lead us over a road less traveled. Instead, as hearing conservationists, we must go the extra mile, appeal to the conscience of management to "do the right thing," and use the latest NIOSH 1998 Criterion Document as our road map.

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Dr. Tom Thunder is an audiologist and board certified noise control engineer. On staff at Rush University, Tom has taught courses in acoustics, psychoacoustics, and hearing conservation. You may contact him at:

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Fall 2005 workshop for new and recertifying Course Directors

The Council will conduct a Course Director Workshop on Friday, November 4, 2005 at the Sheraton Gateway Suites Hotel, Rosemont, Illinois. This workshop is a requirement for new Course Director certification and Course Directors wishing to recertify via workshop attendance. Attendees must submit an application prior to the workshop.

All questions may be directed to Barbara Lechner, Executive Director, at 414/276-5338. CD application forms and registration is available on-line at www.caohc.org.

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Fall 2005 Council Meeting

The CAOHC Council will hold their semi-annual meeting on Wednesday and Thursday, November 2 – 3, 2005 in Rosemont, Illinois at the Sheraton Gateway Suites Hotel. The Council is comprised of two representatives from each of the Component Professional Organizations assisting CAOHC in meeting its mission (see outside back cover for these representatives and their organizations). The Council meets to report on the status of committee projects, discuss tactics for carrying out future tasks, and to review the fiscal activities of CAOHC.

Professional Supervisor Course planned for Fall 2005

Audiologists and physicians who take on supervision of audiometric testing in hearing conservation programs should be competent in “best practices” of hearing conservation. The CAOHC Council will present a course titled: “The Professional Supervisor of the Audiometric Monitoring Component of Hearing Conservation Programs” on Saturday, November 5, 2005 in Rosemont, Illinois, at the Sheraton Gateway Suites Hotel.

New federal recordkeeping and reporting requirements will stimulate interest in hearing conservation programs (HCPs) and will increase the roles of audiologists and physicians as “Professional Supervisors” of HCPs. This skills-based training will provide a comprehensive tutorial on:

- Roles and responsibilities of the Professional Supervisor
- Elements and organization of successful hearing conservation programs
- Surviving new OSHA and MSHA recordkeeping regulations
- Latest tools to identify and prevent noise-induced hearing loss
- Guidelines for audiometric baseline revision and medical referral
- Managing “problem audiograms”
- Work relatedness and workers’ compensation

Attendees will receive continuing education or medical credits, a copy of the *Hearing Conservation Manual 4th Edition*, and unique training materials. Register online at: www.caohc.org/professional.html

For further information about the course and to review “The Scope of Practice of the Professional Supervisor,” visit the CAOHC website at: www.caohc.org and select the first title box on the homepage “The Professional Supervisor.”

OHC Spotlight and YOU!

We hope you enjoyed reading about Matthew Smith in the “OHC Spotlight” on page 3 of this Summer issue. We think it’s interesting to read how OHCs, like you, are applying their knowledge and skills in diverse workplaces.

If you would like to be considered by the editorial staff for a future “OHC Spotlight” feature, please contact Barbara Lechner at the CAOHC office by e-mail: info@caohc.org or by phoning 414/276-5338.

Battlefield – continued from page 1

be a life or death matter during hostile actions. These abilities will also be required to support the latest “actionable intelligence” initiative in the US Army, where every soldier is a sensor (Iwicki, 2004).

In 1952, the Office of Naval Research reported the results of intensive interviews with hundreds of returning front-line soldiers who indicated that in combat, “sound was more important than all other means of equipment identification” (ONR, 1952). Combat-relevant sound sources included aircraft, mortar and artillery rounds, rifle and machine gunfire and various other weapons. “The men regarded the sound of enemy weapons as such an important means of identification that they rarely made use of captured equipment because it resulted in their being fired upon by friendly troops” (ONR, 1952).

The National Ground Intelligence Center (NGIC) has conducted interviews with soldiers returning from Iraq and Afghanistan and has confirmed these earlier findings with the following observations from these soldiers: (Monroe, 2004)

- “Unlike visual information, information carried by sound comes to us from all directions, through darkness and over or through many obstacles to vision.”
- “Aggressive action produces sound the enemy cannot hide or camouflage.”
- “Sound is often the first source of information a Warfighter has before direct contact with the enemy.”

Although some of these observations may be obvious to anyone with a background in acoustics, these soldiers gained such insights first hand through combat experience, not from a book. Knowing these combat-relevant sounds is a vital component to situational awareness that can provide a tactical advantage for accomplishing the mission. Dr. John Monroe of the NGIC further elaborates:

“Accurate reporting of battlefield incidents is important for proper intelligence. This is essential for reducing uncertainty regarding enemy intent, external support, enemy capabilities and weapon lethality. This factor was the catalyst to begin the ‘Sound Identification for Warfighters’ effort at the NGIC. An intelligence officer requested a product soldiers could use to learn to accurately identify a few sounds [rocket propelled grenades (RPG’s), mortars, grenades, improvised explosive devices (IED’s)] because some soldiers were misreporting...RPG launches as mortar launches, grenade explosions as IED explosions, etc; and these inaccurate incident reports were adversely affecting the quality of the military intelligence” (Monroe, 2004).

Veterans of conflict value hearing as a 360-degree warning sense, which inherently underscores the problem. These are the survivors who learned through chance encounters the value of their hearing and of combat-relevant sounds. Returning Vietnam veterans reported that bird calls in the lower jungle canopy meant that Viet Cong could be in the area because the birds had come down from the upper canopy to feed on spilled rice (US Army, 1989). After being shot at, they knew the difference between the noise signatures

of an AK-47 and an M-16. Good hearing in both ears also facilitated the localization (ability to pinpoint direction) of sniper fire and other relevant sounds.

Data that indicate a correlation between good hearing and mission performance are available, but are limited to missions in tank simulators and the detection of a handful of combat sounds (Garinther and Peters, 1990; Price et al., 1989). Results of these studies have a limited reach and application. Sound identification training, however, significantly extends the auditory advantage to individual soldiers. “Combat-relevant sound identification gives the US soldier the edge in any hostile encounter by capitalizing on the underutilized sound-identification capability of the ear” (Monroe, 2004). The NGIC is providing auditory armor that weighs nothing. The only cost is the marginal investment of time required to be exposed to relevant combat sounds through audio recordings.

From a hearing conservation perspective, we are interested in how well these combat-relevant sounds can be heard with special level-dependent (“nonlinear”) hearing protection such as the Combat Arms Earplug. Other types of hearing protectors that are designed to facilitate communication and situational awareness should also be studied.

To no avail, a compelling case was made over 50 years ago to institute sound-recognition training for our troops. Over 20 years ago, there was an attempt to obtain recordings of M-16 and AK-47 noise signatures to demonstrate to soldiers the value of protecting their hearing. Our request was blown off with the bureaucratic response that such things were classified. Thanks to the NGIC’s recent efforts, we can finally marry the objective of the Army’s Hearing Conservation Program to maintain good hearing with the objective of a training program that focuses on what is relevant to hear.

For further information on Sound Identification Recordings for Warfighters, contact Dr. John N. Monroe, Jr., The National Ground Intelligence Center, 434.980.7420 or john.monroejr@us.army.mil

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Dr. Ohlin is the Program Manager, Hearing Conservation, US Army Center of Health Promotion and Preventive Medicine at Aberdeen Proving Ground, Maryland. He has been a CAOHC Course Director since 1974.

UPCOMING OHC CERTIFICATION AND RECERTIFICATION COURSES* 2005

*The listed dates indicate day one of the scheduled classes; certification courses are 20 hours in length; recertification classes are 8 hours.

Current as of May 2005 (for a complete list of courses visit our website at www.caohc.org);
for the most current list of courses contact the CAOHC office at 414/276-5338.

Begin Date	State	City	Course Director	Phone	Begin Date	State	City	Course Director	Phone
7/18/2005	CA	Anaheim	Charles E. Fankhauser	707-746-6334	9/14/2005	CO	Greeley	Laurie Wells	970-593-6339
7/18/2005	OH	Cleveland	John H. Elmore	800-357-5759	9/14/2005	ME	Waterville	Anne Louise P. Giroux	207-872-0320
7/20/2005	AL	Montgomery	Melette L. Meloy	678-363-9897	9/14/2005	NC	Morrisville	Thomas H. Cameron	919-657-7500
7/20/2005	LA	New Orleans	Michael F. Seidemann	504-443-5670	9/14/2005	OR	Portland	Thomas G. Dolan	503-725-3264
7/20/2005	OR	Aloha	Michael Fairchild	503-259-2686	9/14/2005	PA	Philadelphia	Timothy A. Swisher	412-367-8690
7/20/2005	TX	Houston	Kathryn M. Deppensmith	281-492-8250	9/14/2005	TX	Houston	Robert C. Rhodes	281-492-8250
7/20/2005	WI	Brookfield	Edward W. Korabic	262-547-2227	9/14/2005	UT	Salt Lake City	Pamela Cronin	801-566-8304
7/27/2005	GA	Atlanta	William K. Wolfe	770-475-2055	9/15/2005	PA	Pittsburgh	Roger M. Angelelli	412-831-0430
7/27/2005	OH	Dayton	Chris M. Pavlakos	937-436-1161	9/20/2005	CA	Fremont	Kirsten R. McCall	425-254-3833
7/27/2005	TX	San Antonio	John H. Elmore	800-357-5759	9/20/2005	KS	Overland Park	Diane L. Bachman	913-748-2000
7/28/2005	PA	Kittanning	Douglas N. Callen	724-543-7068	9/20/2005	NH	Manchester	Pamela J. Gordon	860-526-8686
7/31/2005	FL	Marco Island	Thomas H. Cameron	919-657-7500	9/21/2005	CA	Fremont	Kirsten R. McCall	425-254-3833
8/3/2005	IA	Davenport	James J. Jerome	317-841-9829	9/21/2005	KS	Overland Park	Diane L. Bachman	913-748-2000
8/3/2005	IN	Indianapolis	John H. Elmore	800-357-5759	9/21/2005	MD	Baltimore	Margaret Sasscer	410-579-7717
8/4/2005	NC	Greensboro	George R. Cook, Jr.	336-834-8775	9/21/2005	NC	Greensboro	Cheryl S. Nadeau	336-834-8775
8/8/2005	MS	Hattiesburg	Robert C. Rhodes	601-264-3545	9/21/2005	NC	Greensboro	Cheryl S. Nadeau	336-834-8775
8/10/2005	AL	Birmingham	Georgia W. Holmes	205-934-7184	9/21/2005	TN	Nashville	Melette L. Meloy	678-363-9897
8/10/2005	FL	Jacksonville	Nancy N. Green	904-880-1710	9/26/2005	NJ	Piscataway	Ellen J. Kelly	732-238-1664
8/10/2005	PA	Pittsburgh	Timothy A. Swisher	412-367-8690	9/27/2005	LA	Lafayette	Jim J. Guillory	337-233-3955
8/11/2005	AL	Birmingham	Georgia W. Holmes	205-934-7184	9/28/2005	FL	Fort Lauderdale	John H. Elmore	800-357-5759
8/16/2005	MA	Auburn	Steven R. Fournier	508-832-8484	9/28/2005	TN	Memphis	Thomas W. Rimmer	501-526-6627
8/17/2005	FL	W. Palm Beach	Herbert J. Greenberg	678-352-0312	10/3/2005	OR	Aloha	Michael Fairchild	503-259-2686
8/17/2005	NC	Morrisville	Thomas H. Cameron	919-657-7500	10/5/2005	GA	Atlanta	William K. Wolfe	770-475-2055
8/17/2005	NJ	Newark	Robert C. Rhodes	281-492-8250	10/5/2005	KY	Louisville	James J. Jerome	317-841-9829
8/19/2005	OH	Cincinnati	John H. Elmore	800-357-5759	10/5/2005	MN	St Paul	Carolyn M. Cary	651-739-1648
8/22/2005	KY	Louisville	John H. Elmore	800-357-5759	10/5/2005	VA	Richmond	Timothy A. Swisher	412-367-8690
8/24/2005	GA	Atlanta	Melette L. Meloy	678-363-9897	10/6/2005	TX	Dallas	John H. Elmore	800-357-5759
8/24/2005	IL	Chicago/Schaumburg	Thomas D. Thunder	847-359-1068	10/10/2005	NE	Omaha	Thomas W. Norris,	402-391-3982
8/24/2005	IL	Chicago/Schaumburg	Thomas D. Thunder	847-359-1068	10/12/2005	GA	Augusta	Melette L. Meloy	678-363-9897
8/24/2005	MO	St. Louis	Mary E. Aubuchon	314-747-5800	10/12/2005	ID	Boise	Brek D. Stoker	208-376-3591
8/24/2005	OH	Cincinnati	Timothy A. Swisher	412-367-8690	10/12/2005	LA	New Orleans	Robert C. Rhodes	281-492-8250
8/25/2005	KY	Lexington	John H. Elmore	800-357-5759	10/13/2005	NC	Greensboro	George R. Cook, Jr.	336-834-8775
8/30/2005	WA	Bellevue	Mary M. McDaniel	206-706-7352	10/17/2005	NY	Liverpool	Dana L. Oviatt	315-428-0016
8/31/2005	OH	Toledo	James J. Jerome	317-841-9829	10/18/2005	CA	Irvine	Kirsten R. McCall	425-254-3833
8/31/2005	WA	Bellevue	Mary M. McDaniel	206-706-7352	10/18/2005	ME	Waterville	Anne Louise P. Giroux	207-872-0320
9/5/2005	OR	Portland	Rodney M. Atack	503-614-8465	10/18/2005	MI	Farmington Hills	Thomas H. Simpson	313-577-6754
9/7/2005	FL	Tampa	John H. Elmore	800-357-5759	10/19/2005	CA	Irvine	Kirsten R. McCall	425-254-3833
9/12/2005	GA	Atlanta	Herbert J. Greenberg	678-352-0312	10/19/2005	CT	Orange	Phyllis L. Sochrin	203-735-4327
9/13/2005	MO	North Kansas City	Linda Kay Ratliff-Hober	913-268-0928	10/19/2005	FL	W. Palm Beach	Herbert J. Greenberg	678-352-0312

25 MOST ACTIVE COURSE DIRECTORS IN 2004 ANNOUNCED

The CAOHC Council is pleased to announce the twenty-five most active Course Directors for 2004. A total of 2,735 new and recertifying students were certified as Occupational Hearing Conservationists from these 25 teachers alone. This represents 64% of ALL the students who certified or recertified last year. Many of these Course Directors were in CAOHC's Top 25 last year. We welcome the newcomers to this list, too. Congratulations to all!

1. Timothy A. Swisher, MA CCC-A; Hearing Safety, Pittsburgh, PA
2. John H. Elmore, AuD MBA CCC-A; Precision Hearing Conservation, Helotes, TX
3. Melette L. Meloy, MS CCC-A; Sound Solutions, Dallas, GA
4. Robert C. Rhodes, PhD; Occupational Marketing, Inc., Houston, TX
5. William K. Wolfe, MA; Environmental Technology Corp, Roswell, GA
6. James J. Jerome, MA CCC-A; Hearing Safety-Midwest, Inc., Fishers, IN
7. Thomas D. Thunder, AuD FAAA INCE Bd.Cert.; Acoustic Associates, Ltd., Palatine, IL
8. Kathryn M. Deppensmith, MS CCC-A; Occupational Marketing, Inc., Houston, TX
9. Charles E. Fankhauser, PhD; MEDI, Benicia, CA
10. George R. Cook, Jr., AuD CCC-A; Workplace Hearing, Inc., Greensboro, NC
11. Kirsten R. McCall, MS CCC-A; Center for Hearing Health, Renton, WA
12. Georgia W. Holmes, AuD CCC-A; Auburn University at Montgomery, Montgomery, AL
13. Pamela J. Gordon, MS CCC-A; Gordon Hearing Conservation, Inc., Chester, CT
14. Mary M. McDaniel, MS CCC-A; Pacific Hearing Conservation, Inc., Seattle, WA
15. Carol J. Snyderwine, CCC-A; Southpointe Hospital, Painesville, OH
16. Roger M. Angelelli, PhD; Audiometric Baseline Consulting, Bethel Park, PA
17. Tamara H. Thompson, MA CCC-A; Chapel Hill, NC
18. Mark A. Cheple, AuD FAAA; Associated Hearing & Audiology, West St.Paul, MN
19. Pamela Cronin, MS BA CCC-A; Jordan Valley Audiology, Sandy, UT
20. Thomas W. Norris, PhD; The Hearing Center, Omaha, NE
21. Melissa B. Lyon, MA CCC-A; Gunter Audiological Services, Marion, IN
22. Rodney M. Atack, PhD; Hearing Health Care, Portland, OR
23. Margaret Sasscer, AuD CCC-A; Baltimore Gas and Electric Co., Baltimore, MD
24. Laura Kauth, MA CCC-A; Audiology Consultants, Davenport, IA
25. Ellen J. Kelly; Center for Speech & Hearing Services, Inc., Asbury, NJ



New CAOHC Council members

Three new Council members participated at the March meeting in Denver, Colorado.

Lieutenant Colonel Vickie Tuten, AuD CCC-A represents the Military Audiology Association (MAA) on the CAOHC Council and is currently serving as the Chief of Hearing Conservation at Fort Hood, Texas...home to approximately 50,000 soldiers. She also serves as the Audiology and Hearing Conservation Consultant for the Great Plains Regional Medical Command. Past military audiology assignments have included serving as Chief of Audiology/Hearing Conservation at Fort Eustis, Virginia and Fort Drum, New York. Dr. Tuten has also been the Chief of Audiology at Brooke Army Medical Center in Texas. Civilian work experience includes working hearing conservation issues with industry in Florida during a break in military service.



She has been a CAOHC Course Director since 1990 and a member of the National Hearing Conservation Association since 1989. She works daily supervising OHCs and feels strongly about the quality of their training.

Dr. Tuten has been married for 20 years and has two daughters, one son and four grandchildren.



Madeleine J. Kerr, PhD, RN has been appointed a representative for the American Association of Occupational Health Nurses (AAOHN). She is an associate professor of nursing and principal investigator of the Hearing Protection Study at the University of Minnesota in Minneapolis. Her program of research focuses on developing and testing educational interventions to promote use of hearing protection among construction workers. Currently funded by NIH/NIDCD, her research team is focusing on the Latino worker population by developing and testing a bilingual culturally specific computer-based multimedia training program to promote hearing health. She teaches population-based assessment and interventions in the graduate public health nursing area of study. In the undergraduate program, she teaches public health nursing and makes sure that all nursing students learn how to use earplugs when exposed to noise.

Her doctorate in nursing, from the University of Michigan, Ann Arbor, focused on worker health promotion, emphasizing noise-induced hearing loss prevention in factory workers.

Dr. Kerr and her husband enjoy the "silent" sports of canoeing, sea kayaking and cross country skiing.

Stephen J. Wetmore, MD, MBA, FACS will represent the American Academy of Otolaryngology - Head & Neck Surgery (AAO-HNS). Dr. Wetmore attended college and medical school at the University of Michigan, where he graduated with distinction in 1971. After completing his specialty training in Otolaryngology-Head and Neck Surgery at the University of Iowa, he spent several years on staff at the University of Arkansas School of Medicine. In 1985 he did a fellowship in neurotology and skull base surgery in Zurich, Switzerland.



Dr. Wetmore came to West Virginia University in the summer of 1988 as Professor and Chairman of the Otolaryngology Department. His main area of interest is in diseases of the ear including hearing loss, dizziness, tinnitus, facial paralysis, and surgery of the ear and skull base. In 2004, he received the Distinguished Service Award from the AAO-HNS.

He has been involved in various aspects of occupational hearing loss since the early 1990's, when he chaired a committee that established the rules for compensation for hearing loss for the West Virginia Workers' Compensation Commission. He served as the chair of the Medical Aspects of Hearing Loss Subcommittee of the AAO-HNS and helped edit the Academy's revised monograph entitled *Guide for Conservation of Hearing in Noise*, published in 2003.

Hearing Conservation Receives National Attention

How to Keep Your Hearing is the cover story of NEWSWEEK magazine June 6, 2005 issue (Volume CXLV, No. 23, Page 42). The article, titled "A Little Bit Louder, Please," includes information on how noise can lead to hearing loss. There are also some colorful graphics of the ear.

CAOHC Council member, Dr. Peter Rabinowitz of Yale University, and former Council member, Dr. Robert Dobie of the University of California - Davis, were among the experts quoted in the article. CAOHC is pleased to see awareness growing and that the public is making the connection between noise and hearing loss. Your workers might enjoy reading this edition of NEWSWEEK magazine while they wait for their hearing test. You can find the article on the web at:

<http://www.msnbc.msn.com/id/8017906/site/newsweek/>

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79-0505-001

Summer 2005



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