Summer 2006

CAOHC®

UPDATE

VOLUME 18 • ISSUE 2

The Newsletter of the Council for Accreditation in Occupational Hearing Conservation

Has the OSHA Recordkeeping Rule Changed Hearing Loss Prevention Programs?

By Laurie Wells, MS FAAA

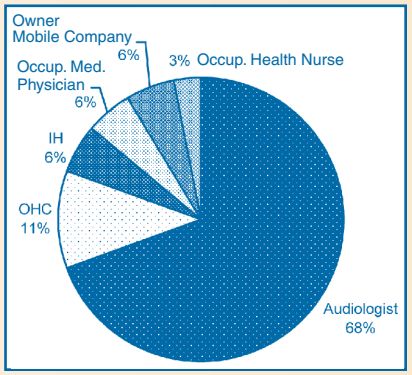
The Occupational Safety and Health Administration (OSHA) recordkeeping rule 29 CFR part 1904.10 changed the definition of recordable hearing loss and created a separate column on the OSHA 300 form to record noise-induced hearing loss (NIHL). As with all change, this one created anxiety. Those in support of refining the criteria for recordable hearing loss were hopeful that a more strict approach would provide more accurate counts of work-related NIHL and promote better hearing loss prevention practices. Those opposed to revising the criteria were fearful of the ramifications of higher recordable rates. It's been more than two full years since the recordkeeping rule's new definition of recordable Standard Threshold Shift (STS) was implemented, so, looking back, was the anxiety justified? Has the recordkeeping rule change affected the practice of hearing loss prevention programs (HLPPs)?

Informal Survey

In an effort to identify possible effects of the recordkeeping rule change, an informal written survey was distributed at the National Hearing Conservation Association (NHCA) annual conference in February, 2006. NHCA conference attendees, because they specialize in hearing loss prevention, are likely to be familiar with hearing conservation issues, so their perceptions are of particular interest. A total of 36 attendees, including audiologists, audiometric technicians, industrial hygienists, mobile test company owners, occupational medicine physicians, and occupational health nurses completed the 10 survey questions. The distribution of the respondents versus profession is provided in Figure 1. As expected, the primary job functions of the respondents varied widely, given the different professions and employment settings represented. The most common responsibilities were reported as: 1) reviewing HLPPs audiometric results, 2) performing hearing tests, 3) training employees on hearing protection, and
4) writing HLPP policies.

The presumption, prior to the survey, that the OSHA recordkeeping rule change has affected hearing loss prevention programs (HLPPs) was confirmed, with 75% of the respondents reporting so. However, there appears to be little consensus on whether or not the effects have been positive or negative, and perhaps it is too early to measure whether the change has been advantageous to HLPPs. It is useful at this stage, however, to identify trends and focus on improving employers' efforts to protect hearing.

Figure 1: Percentage of survey respondents by occupation.



Positives and Negatives

The survey questionnaire asked respondents, who affirmed that the recordkeeping rule change has affected HLPPs, to give examples of changes they have experienced for each component of a HLPP. The reported examples are summarized in Table 1, rank-ordered from the component with the most changes noted, noise measurement, to the least one with the least changes noted, HLPP effectiveness. [see page 4]
The examples were then sorted into categories of "positive" or "negative" by the author, in order to gain insight as to whether the recordkeeping rule change can be considered beneficial or detrimental to the overall goal of preventing hearing loss. Naturally, value judgments of positive and negative will differ among individuals depending on each person's point of view. For example, removing individuals from an HLPP who are not at risk of noise induced hearing loss (NIHL) may be considered a positive action by some (more accurate classification of employees in a HLPP), but a negative action by others (loss of opportunity for employees to monitor their hearing status). The key factor for removal is the criteria used to adequately determine risk of NIHL. In this survey, comments regarding removing people from an HLPP with the assumed motivation to reduce liability and minimize STS recordable incidents were listed as "negative." In contrast, a comment regarding conducting a noise survey for the first time to define risk of NIHL was listed as "positive."

continued on page 3

CONTENT	PAGE

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:*

555 E. Wells Street / Suite 1100
Milwaukee, WI 53202-3823
Phone (414) 276-5338
Fax (414) 276-2146
E-mail: info@caohc.org

- ***Editor and Publications Committee Chair***
  Elliott Berger, MS, INCE. Bd. Cert.
- ***Contributing Editor Current Issue***
  Robert Bruce, PE, INCE. Bd. Cert.
- ***Committee Members***
  Paul Brownson, MD, FACOEM, FAAFP
  Diane DeGaetano, RN BSN COHN-S COHC
  Thomas Hutchison, MA MHA FAAA CCC-A
  J. Adin Mann, III, PhD
  Mark Stephenson, PhD
- ***Executive Director***
  Barbara Lechner
- ***Administrative Assistant***
  Chris Whiting
- ***Graphic Designer***
  Kathryn Peterson

Opinions expressed in the UPDATE *are those of the authors, and do not necessarily reflect official*

Printed on recycled paper PRINTED WITH SOY INK

Opt-Out Option

If you wish to have your name removed from mail solicitations from vendors who have purchased the CAOHC database, please notify CAOHC staff via fax at 414/276-2146; or e-mail to info@caohc.org.

CAOHC Approved Courses

When you are registering for a recertification course (or if your fellow staff member is registering for the first time at a certification course), please confirm with the registrar that "this is a CAOHC approved" course. Only certified Course Directors, who have received a course approval certificate from the CAOHC Executive Office, can conduct an occupational hearing conservation course that leads to CAOHC certification or recertification. Course Directors must display this certificate of approval in view of their students. If you don't see it, please ask your Course Director.

If you are uncertain whether the course you are planning to attend is certified by CAOHC, please contact Chris Whiting at the CAOHC office at 414/276-5338 or e-mail **info@caohc.org**

Chair's Message

By James D. Banach, MBA

I remember as a kid, playing in the back yard and the sounds that caught my attention. Birds singing, a buzzing bumble bee, the bouncing of a ball in the alleyway that meant one of the other guys was out and the games were to begin. I could easily hear that stuff. And when a plane went overhead, it caused me to stop and take notice. Quiet, or at least lower noise levels, were more common then.

I also remember as a kid, my fourth grade teacher standing next to me, looking down as I squirmed in my desk. "Mr. Banach, why is it you must be so rambunctious… quiet down now. Must you always be the class comedian?" And so began a life of being immersed in paying attention to sounds and quiet.

Our senses play an important role in our lives, and add to its beauty. They can bring us warmth, joy, relaxation, excitation, and in true *Da Vinci Code* manner, even sanctification. We experience hot and cold, sweet versus sour, darkness and light, and loud as compared to quiet. Lately I've found myself in my car, listening to 70's music more and more to affect my mood. I also find myself seeking quiet places to calm my rattled nerves. The key to the puzzle is being able to experience both ends of the spectrum. Without sour, what is sweet? How do you know when you run out of invisible ink? If you can not experience the one, how can you find the wonder of the other? It is the calming quiet of the woods that enhances the energizing beat of The Grass Roots (if you have to look them up, I envy your youth).

As hearing conservationists, whether an OHC, a Course Director, or Professional Supervisor, our call is to make sure those we serve have the sense left to know and the awareness and desire to experience both the quiet and the music. It is one thing to seek a place of quiet, and quite another to live in a world of confusion, misunderstanding and isolation brought on by hearing loss. As the din increases around us, it is ever more important to be able to discriminate the signals mixed in the mess; to be able to carry on conversation while cell phones ring, announcements blare, and traffic idles. The words become a mystery, a puzzle that is often solved incorrectly when the consonants disappear in the chasm of a four-thousand hertz notch.

CAOHC has been presenting a Professional Supervisor's course to those seeking to be better leaders of hearing conservation programs. The courses have received high marks, not just because dedicated and exceptional people take their time to teach them, but because there is an ever present need for us all to bring more to the table, to have more tools to apply to the solving of the puzzle. What will you do this year, this month, today, to make yourself better at making a difference? Read this newsletter, take time to share your successes and trials with colleagues, put yourself with those you serve to better understand their needs. You can seek information, or just stop, be quiet, and think. In any case, you will be enhancing the profession of hearing conservation. A worthy

OHC Spotlight

This issue's spotlight is on CAOHC certified Occupational Hearing Conservationist (OHC) Betty Stabler, who is the occupational nurse at Sylvest Farms in Alabama. Betty is an LPN with many years of nursing experience including emergency room and critical care tours of duty. She has been the occupational health nurse at Sylvest Farms for seven years.

Her CAOHC Course Director, Georgia Holmes of the University of Alabama Deep South Center, speaks highly of Betty: "I am so impressed with Betty's level of professionalism. She understands hearing conservation inside and out and is dedicated to not only meeting the letter of the law but also helping employees understand the intent in regard to protecting hearing. I have watched her interact with workers, and it is obvious that she has built a positive, knowledgeable relationship concerning each individual, and they trust her."

Betty says, "I love what I do. The most important thing for an OHC to do is "be diligent, never give up – no matter what you have to bring upon yourself."

OHC Corner

Age Correction of Audiograms

By Theresa Y. Schulz, PhD

The effect of noise and aging on the auditory system is complex and multi-faceted. In an effort to quantify the effect of aging, NIOSH proposed a method to estimate the hearing change due to aging. It has been simplified in the age correction tables and methods included in the 1983 Hearing Conservation Amendment and other regulatory documents. But even those tables can be confusing. The following article is based on my opinion that applying age correction to an individual's audiograms is a disservice to the employee. Alfred Lord North, a 17th century mathematician, said it best — "seek simplicity, and distrust it."

The Math

Confusion exists about details of the age-correction method allowed by OSHA (Occupational Safety and Health Administration), MSHA (Mine Safety and Health Administration), and other regulations. Remember that age correction is allowed but not mandated in these standards.

Age corrections were first proposed in the original NIOSH 1972 criteria document (never adopted). That document also recommends a baseline audiogram within 30 days of assignment to noise, an additional audiogram taken every second year, and a new baseline established every sixth year.

The OSHA/MSHA procedures differ from the 1972 NIOSH proposal in several ways. The OSHA/MSHA instructions subtract the age-correction values from the most recent audiograms, where the original NIOSH instructions add the age-correction values to the baseline audiogram. The mathematical results, of course, are the same so this difference is not important. The 1972 NIOSH procedure also compared the current audiogram to the most recent previous audiogram without age corrections, whereas OSHA/MSHA always compare to baseline. Third, the 1972 NIOSH procedure called for a new baseline every 6 years, whereas OSHA/MSHA allow baseline revision after a Standard Threshold Shift (STS) but do not call for periodic baseline renewal. And, of course, the OSHA and MSHA definition of STS (10 dB average at 2000, 3000 and 4000 Hz) is quite different from the original NIOSH recommendation of "10 dB at 500, 1000, 2000, or 3000 Hz, or 15 dB at 4000 or 6000 Hz as evidenced by a comparison of that audiogram with the employee's most recent baseline audiogram and with the initial baseline audiogram as corrected to the current age by the method described…"

The age-adjustment method shown in the fourth edition of the CAOHC Hearing Conservation Manual is correct in the text, but the example inappropriately compares averages of three frequencies rather than the thresholds from each frequency. (This will be changed in the next printing of the 4th Edition of the CAOHC Hearing Conservation Manual.)

This CAOHC example illustrates the importance of not

continued on page 6

Table 1: Audiogram Example

	LEFT EAR						RIGHT EAR					
Frequency Hz	500	1000	2000	3000	4000	6000	500	1000	2000	3000	4000	6000
Current	15	10	20	25	40	45	10	15	15	30	45	40
Baseline	0	0	15	10	20	15	5	0	10	20	25	10
Shift			5	15	20				5	10	20	
Age- Correction values			3	5	8				3	5	8	
Age-Corrected shift			2	10	12				2	5	12	

Recordkeeping Rule – *continued from page 1*

Overall, there are more reported specific experiences of positive changes than of negative changes. However, when asked: "Do you believe the recordkeeping rule change has improved the prevention of hearing loss?" 65% responded "no" and only 35% said "yes." While this informal poll does not provide a conclusive answer as to whether the change in the recordkeeping rule has been positive or negative, these results do imply hearing conservation is receiving more attention from employers and perhaps new opportunity exists to improve elements of HLPPs.

Employee Removal from HLPPs

Specific to the question: "Do you believe employees have been removed from the HLPP because of the change in the OSHA recordable STS definition in the 1904.10 recordkeeping rule?" results were inconclusive. Nearly evenly split, 46% responded "yes" and 54% responded "no." Anecdotal evidence of employees being removed from HLPPs is found in the comments under audiometric testing, which indicate that fewer employees are being tested now. This survey suggests that a significant number of hearing loss prevention professionals are noticing HLPP enrollment reductions, however, not enough information exists to conclude if these reductions are appropriate.

continued on page 4

Recordkeeping Rule – *continued from page 3*

OSHA 300 Log

Three survey questions were asked concerning the practice of recording STS on the OSHA 300 log. The most definitive finding was 92% of respondents agreed STSs, identified as recordable, are being recorded on the OSHA 300 log. The recordkeeping rule allows STSs to be "lined-out" on the OSHA 300 log if a subsequent test shows sufficient improvement to negate the STS. Also, STSs can be "denied" as work related by the professional reviewer, so that hearing changes due to factors other than workplace noise exposure are not recorded on the OSHA log. The question was posed: "Do you believe that STSs, identified as recordable, are being "lined-out" or "denied" inappropriately, with the intention of reducing the recordable rate?" This question was answered "no" by 64% and "yes" by 36% of the respondents. It is of concern that anybody answered "yes" to this question. Looking at a subcategory of the respondents, those who are professional reviewers of an HLPP, the numbers are even more worrisome: 57% said "no" and 43% said "yes." This finding raises several questions, one of which is: are true cases of work-related hearing loss being under-reported? Additional investigation is needed to understand this phenomenon more clearly.

Table 1: HLPP Changes by Activity

HLPP Component Rank Ordered by % of activity experienced.	%	Positive	Negative
Noise Measurement	**67**	Updating or conducting noise surveys for the first time to define who is in the HLPP: Have added and subtracted employees in HLPP	Eliminated some Dept of Defense civilians with noise exposure less than 85 dBA TWA 3-dB Exchange Rate
		Significant increase in dosimetry	
		Increased attention to obtaining TWA to determine relationship to STS	
		More attention paid to surveys	
Hearing Protection	**52**	More HPD refit/retrain sessions after initial observance of STS	
		More emphasis on HPD compliance	
		More interest in variety of HPDs	
		Willing to learn more about attenuation characteristics	
		Company willing to spend more $$ on HPD	
		More emphasis on proper HPD fit	
Noise Control	**48**	Employers paid more attention to noise control	
		More engineering controls on equipment	
		More education on noise controls	
		More noise surveys	
Audiometric Testing	**48**	Improved the quality and sensitivity to audiograms	Testing fewer people to minimize OSHA recordable
		Improved rate of STS retests	Only testing people over action level so no comparison group
		More questioning of validity of data: Increased scrutiny of STS	Only testing people over action level reducing the hearing wellness program
Recordkeeping	**33**	Modified history form to collect more information on aural history and non-occupational noise exposure	Employers "shopped around" for work-relatedness determinations to be made in their favor
		Developed protocols for STS follow-up	
		More data review	
		Increased requests for work-relatedness determinations	
Training	**24**	Updated educational materials and content	
		More emphasis on education and training from safety officers	
Effectiveness	**19**	Determined if additional intervention needed after annual testing completed	
		More proactive follow-up	
		More internal checks	

The other question pertaining to recording STS on the OSHA 300 log was: "Do you believe the recordkeeping rule has resulted in more accurate reporting of legitimate work-related STS?" Again, there was not a definitive finding. Of all respondents, 63% said "yes" and of the professional reviewers, 60% said "yes." While not statistically significant, this finding indicates uncertainty among the professionals about the accuracy of the STS recording process. A "yes" response may indicate that the OSHA log is more reflective of actual work-related hearing loss, because the new definition detects more cases of NIHL than the previous definition of recordable STS. On the other hand, a "yes" response could also indicate that the work-related determinations are done appropriately. A "no" response may indicate either that the STS definition is not accurately identifying NIHL, or that the professional believes the numbers are being manipulated in favor of recording.

Summary

In summary, there appears to be consensus that the everyday practice of hearing loss prevention has been affected by the recordkeeping rule change, with both positive and negative influences. Employers seem to be paying more attention to HLPPs, which is, by itself, a positive outcome. Somewhat alarming, however, is the finding suggesting that recordable STSs may be being "lined-out" or "denied" inappropriately in order to keep recordable rates artificially low. Certainly, this informal survey raises many questions meriting further study so that a more definitive statement about the merits of the new recordkeeping rule can be developed. In the meantime, we have the obligation to comply with the recordkeeping rule and the opportunity to direct all efforts towards using the most effective prevention practices.

Laurie Wells, MS FAAA, is the Manager of Audiology, Associates in Acoustics,Inc., located in Evergreen, Colorado. She is also a CAOHC Course Director.

The Search for Hearing Loss Prevention Practices in School Vocational Programs

By Robert L. Folmer, PhD

I contacted a few Industrial Technology teachers in area high schools and asked if they would allow me to visit their shops to record sound levels of power tools while students were using them. I didn't inform the teachers about my other agenda: to find out what types of hearing protective devices were available in the classes and to observe their frequency of utilization. Walking down the hallway toward the woodshop at one school, I noticed two yellow signs attached to the outside of the door. One read, "Safety glasses and hard shoes must be worn by all persons entering the shop. No exceptions." The smaller sign declared, "Protect your eyes. Always wear safety glasses."

Students pictured in a high school workshop.

When I entered the room, I was transported back in time to some of my happiest days in school in the woodshop. I've always enjoyed working with wood – the fragrance of lumber, the personality of the grain, shaping, sanding and staining raw materials to create something beautiful or useful. As the students prepared to work, I revisited my past in a different way. Every student in the class put on a pair of safety glasses as soon as they entered the shop. After all, the signs on the door commanded them to do so. The instructor also wore safety glasses while he circulated among students answering questions about their projects. I noticed several pairs of earmuffs hanging near each power tool and piece of machinery in the shop. The earmuffs remained on their perches as students used table saws, radial saws, orbital sanders and routers. A dispenser box of foam earplugs gathered dust at the front of the room. I held my sound meter near students' ears and measured levels ranging from 100-120 dBA for various power tools they used. To my chagrin, this scene was reminiscent of shop classes I attended almost four decades earlier. Then, as now, no one in the shop wore any type of hearing protection.

I talked to the teacher after I completed my sound level measurements. He was surprised to learn that some of the power tools were so loud. He said that earmuffs and earplugs are always available, but students do not use them. The instructional safety video he shows at the beginning of every semester covers hearing protection, but (to no one's surprise) this does not motivate students to employ hearing loss prevention practices. A veteran of 25 years of teaching industrial technology classes, the teacher assured me that his hearing was "shot." I suppose he told me this to explain why he didn't use hearing protection devices (HPDs) in the shop. As class ended and students prepared to leave, the teacher made an observation. "Look at them shoving those earphones into their ears." It was true: most of the students were re-connecting to their iPods or MP3 players, which are banned during class. "They're getting more hearing loss from their stereos than from the machines in the shop." The truth of that observation is open to question, but the point is that like some occupational hearing conservationists he is looking elsewhere to find the problem.

Unfortunately, similar scenarios were repeated in all of the shop classes I visited. Students were exposed to hazardous sound levels on a daily basis. HPDs were available, but not used by anyone – including teachers. I was disappointed by the revelation that apparently no progress had been made in hearing conservation practices in my area of the country. To determine if this is a national trend, I contacted Dr. Charles Gagel, Professor of Professional-Technical and Technology Education at the University of Idaho (and Past-President of the National Association of Industrial and Technical Teacher Educators). Dr.Gagel responded by email, "I am not surprised by your findings thus far. Eye protection has always been the major personal safety issue in these laboratories. … it falls to the instructor to establish a culture in the lab for any kind of safety practices. Machine guarding, fall prevention, and fire prevention are the foremost issues in most labs. As for hearing protection, I have witnessed very few occasions where the instructors have promoted it ….I will say that I have noticed hearing protection devices in more labs in recent years than before – not necessarily that they were being used, by the way."

Like many aspects of hearing loss prevention, the findings and recommendations are not new. Roeser (1980) wrote about a noise survey that was conducted in Dallas Independent School District woodshops. He stated, "Three pieces of equipment exceeded 105 dBA! The findings from this survey certainly suggest the need for some form of hearing conservation program at the high school level."

Woodford & O'Farrell (1983) surveyed school shops in Alabama, Ohio, Pennsylvania and West Virginia. They concluded: 1) sound levels in most school shops were potentially hazardous to hearing; 2) only a small percentage of schools furnished hearing protection or monitored sound levels; 3) students were more likely to have high-frequency hearing loss if they engaged in noisy activities; 4) students were not motivated to use HPDs.

continued on page 8

OHC Corner–Age Correction of Audiograms – continued from page 3

averaging too early. The example on page 84 of the CAOHC Hearing Conservation Manual, 4th edition, uses a male at age 42 with a baseline at age 28. The correction values for aging are 3 dB at 2000 Hz, 5 dB at 3000 Hz and 8 dB at 4000 Hz. His audiograms are shown below in Table 1:

Correct calculation:

Left Ear: 2+10+12=24 (which is less than 30);
Right Ear: 2+5+12=19 (which is less than 30)

It is best, and easier mathematically, not to average but just to add thresholds from each frequency and compare the sum to 30. If the sum is 30 or more, an STS is present. But even if you do average at this point, you get:

Left Ear 24/3 = 8
Right Ear 19/3 = 6.33

With values rounded too early in the process:

Left Ear: Age-corrected current
[(20-3) + (25-5) + (40-8)]/3 = 23.0;
Baseline (15+10+20)/3 = 15.0
23-15 = 8

Right Ear: Age-corrected current [(15-3) + (30-5) + (45-8)]/3 = 24.67 (rounds to 25)
Baseline (10+20+25)/3 = 18.3 (rounds to 18)
25-18 = 7

But 24.7-18.3 = 6.4 (rounds to 6, vs. 7 dB shown in the line

This particular example does not effect whether an STS is identified, but if the numbers were between 9 and 10 dB, instead of between 6 and 7 dB, it would identify an STS.

It is ironic that even though NIOSH published the original age-correction study, currently, NIOSH does not recommend age correction on individual audiograms citing the delay in intervention that it can create, and the fact that applying a median population value to all individuals is not scientifically valid (NIOSH, 1998). NIOSH has also changed its recommended definition of STS. The current NIOSH recommendation for the definition of STS is a change in the HTL in either ear that equals or exceeds 15 dB at 500, 1000, 2000, 3000, 4000, or 6000 Hz that has been confirmed on a subsequent re-test.

Although the MSHA regulation included some recommendations from the 1998 NIOSH Criteria Document, it did not follow the NIOSH recommendation regarding age-correction or STS definition. MSHA currently allows age-correction using the same procedure as OSHA. (Remember that MSHA uses different recordability criteria (the old OSHA criteria of 25 dB average STS from original baseline) rather than the new OSHA criteria (a 10 dB average STS but only if it results in an average hearing loss of 25 dB).

Reasons not to age correct

It is useful and beneficial to have a way to estimate the effects of both noise and aging on hearing levels. However, the use of the 1972 NIOSH tables to age-correct individual audiograms and make decisions based on that calculation alone is not a good hearing-loss-prevention practice.

Reasons not to age correct include:

- **Applying aggregate data to an individual**
  The age-correction tables use the median or average value for a group of individuals. There are a range of values that represent the varied rate of aging. Some people have "young ears" for their age while others have "old ears" for their age. Since we don't know the aging rate for each person, we use the average rate of hearing loss due to aging for everyone. This will over age-correct for some and under age-correct for others and, of course, be just right for some people.
- **Using only 50th percentile with no standard deviation applied**
  We know there is a range of age effect on hearing but we use a single (average) number as if it were precisely correct. When you have most medical exams and lab tests, the results are reported in the context of a range of normal values. This acknowledges that each individual is different and uses a range of numbers rather than one-size-fits-all.
- **The table does not go above age 60**
  The original NIOSH data did not include people over 60 years old, so age corrections for workers over age 60 are even more inaccurate. There are increasing numbers of workers in this age range.
- **The table does not go below age 20**
  The original NIOSH data did not include people under age 20. Since little age correction is needed at these ages, we tend to over-correct by using the values for 20 year-olds.
- **The table does not consider race/ethnic differences**
  A database of non-noise-exposed population of black males and females (Royster, Royster and Thomas 1980; Royster et al. 1998) revealed better hearing than the NIOSH data. The NIOSH data included mostly Caucasian workers.
- **NIOSH does not currently recommend age correction**
  Despite the fact that age-correction procedures were modified from the original NIOSH study, NIOSH has updated its stance, and in 1998 NIOSH recommended against the use of the age-correction tables to apply to individual audiograms.
- **The Department of Defense (DoD) does not use age corrections –** nor do they "model" hearing conservation programs in industry**.**
- **Taken from hearing tests of "normals" back in early 1960s**
  The NIOSH tables are based on 380 non-noise exposed and 792 noise-exposed employee hearing tests done from 1968 to 1971 in the "steelmaking, paper bag processing, aluminum processing, quarrying, printing, tunnel police, wood working, and trucking" industries (NIOSH, 1972). These workers may not be representative of today's noise-

continued on page 7

OHC Corner–Age Correction of Audiograms – continued from page 6

Reasons – continued

exposed worker.

- **Delaying the inevitable**
  Applying an average "age-correction" to an individual audiogram may have the effect of hiding a real noise-induced hearing loss or at least delaying its identification. When a decrease in hearing of the magnitude of an STS occurs, some intervention should be taken whether the change is due to noise, aging or some other etiology, presuming there could be a noise-induced component. The individual should be made aware of the change, and an investigation as to its cause can be initiated. Medical treatment, new personal protective equipment, or a change in behavior may prevent more hearing impairment.
- **If you hadn't been age correcting, you might find STS (and intervene) BEFORE it becomes recordable**
  If you prevent noise-induced hearing loss early, OSHA recordable cases should be rare. If you do age correct, a hearing loss may reach the recordable level before you recognize it as an STS and let the worker know that they need to do something [change behavior in some way (e.g. better or different HPDs or better use of HPDs)]. In that case, you have a "hearing-loss documentation program" not a hearing conservation program.

Many "model" hearing conservation programs follow the latest NIOSH recommendation and do not use age correction to determine whether an STS has occurred. However, if you still want to use age correction, ensure the calculation is correct (see Age Correction Technique and Example Sidebar) and explain the audiogram to the worker in understandable terms. Here is an example:

Worker (as s/he steps out of booth): "How did I do?"
OHC (after quick look at results): "It looks like there has been some change in your hearing compared to your baseline of 9 years ago. Some of that change may be due to the fact that your ears are 9 years older, so we've subtracted out an **average** amount for aging. There is still some decrease in hearing that might be due to noise exposure, but after we account for an average amount of change due to aging, it is not considered an STS. However**,** we want to make sure that **any** hearing loss due to noise does not continue. Tell me about your use of hearing protection." (Ensure that the hearing protection devices provided are effective and appropriate, and that the worker knows when and how to use them – on and off the job).

Age correction should not be used without thought or to avoid addressing evidence that your hearing conservation program is not preventing noise-induced hearing loss.

AGE CORRECTION TECHNIQUE AND EXAMPLE

1. Using 29 CFR 1910.95,Table F-1 (for males) or F-2 (for females), determine age correction values at 2, 3, and 4 kHz for: **a. Current audiogram**
   b. Baseline audiogram
2. Subtract values from 1.b. from values in 1.a., yielding amount due to aging (**Diff Aging**) at 2, 3, and 4 kHz.
3. Subtract **Diff Aging** from corresponding thresholds at 2, 3, and 4 kHz found in **Current Audiogram**, to generate **Age-Corrected Current Audiogram**
4. Subtract thresholds at 2, 3, and 4 kHz in **Baseline Audiogram** from 2, 3, and 4 kHz in **Age-Corrected Current Audiogram**
5. Add the differences found at 2, 3, and 4 kHz. (STS, if sum found in #5 is ≥30 dB)

NOTE:

- If the age-correction value is greater than the actual thresh-

EXAMPLE (showing only frequencies relevant to STS determination):

MALE WORKER	2k	3k	4k	
Current Audiogram (Age 48)	25	35	40	
Baseline Audiogram (Age 30)	10	15	20	
1 Age Correction for (Age 48)	(8)	(14)	(20)	
Age Correction for (Age 30)	(4)	(6)	(9)	
2 *Diff Aging*	*4*	*8*	*11*	
3 Current Audiogram (Age 48)	25	35	40	
Diff Aging	*4*	*8*	*11*	
Current Audiogram (Age Corrected)	***21***	***27***	***29***	
4 **Current Audiogram (Age Corrected)**	*21*	*27*	*29*	
Baseline Audiogram (Age 30)	10	15	20	
5	***11***	***12***	***9***	***sums to 32 dB***

References

Dobie, R. A. (1997). "Allocation of hearing loss," J. *Acoustical Society of America. 102*(5), 3127.

OSHA (1983). "Occupational Noise Exposure Standard." 29 CFR 1910.95, *Fed. Regist.*Title 29, Chapter XVII.

NIOSH (1972). "Criteria for a Recommended Standard – Occupational Exposure to Noise." U.S. Dept. HEW (NIOSH), Rept. HSM 73-11001, I-14, I-15, III-6, III-7

NIOSH (1998). "Criteria for a Recommended Standard – Occupational Noise Exposure." U.S. DHHS (NIOSH), Publication No. 98–126.

Royster, L H., Driscoll, D. P., Thomas, W. G., and Royster, J. D. (1980). "Age effect hearing levels for a black non-industrial noise exposed population (NINEP)," J. *American Industrial Hygiene Association 41*(2), 113–119.

Royster, L. H., Royster, J. D., Dobie, R. A. (2000). "Prediction and Analysis of the Hearing Characteristics of Noise-Exposed Populations or Individuals," in *Noise and Hearing Conservation Manual, 5th Edition*, edited by E. H. Berger, L. H. Royster, J. D. Royster, D. P. Driscoll and M. Layne, American Industrial Hygiene Association, Fairfax, VA, 669-688.

Royster, L. H., Royster, J. D. and Thomas, W.G. (1980). "Representative hearing loss by race and sex in North Carolina industry." J. *Acoustical Society of America. 68*(2), 551-566.

Suter, A. H. (2002). "Hearing Conservation Manual, 4th Edition." CAOHC, Milwaukee, WI.

Theresa Y. Schulz, Lt Col, USAF (Ret), PhD is on the faculty at the Department of Public Health and the Department of Communicative Disorders at East Tennessee State University and consults on hearing conservation issues. Dr. Schulz is a former CAOHC Council Chair.

Hearing Loss Prevention Practices in School – *continued from page 5*

Plakke (1985) surveyed junior high and high school industrial arts teachers in Iowa. He found that these teachers were conscientious about eye protection, but most of them never wore or required students to use HPDs. These findings prompted Plakke and colleagues to develop a guide for industrial arts students and teachers about the hazards of excessive noise exposure; to offer hearing conservation workshops at meetings of industrial technology teachers; and to train audiologists in hearing conservation practices. In 1991, Plakke conducted another survey to determine the effectiveness of these efforts. He concluded: "While small inroads to hearing conservation training of industrial technology teachers have been made, the majority of teachers are still not using hearing conservation techniques . . . While Iowa is one of the few states to require hearing conservation in educational laboratories, very few teachers and administrators are enforcing the law . . . Administrators need to be informed of their responsibility to protect the hearing of their students and teachers. The enforcement of mandatory eye protection in laboratories is strict with no exceptions. The same attitude of instructors should be expected for use of hearing protection."

The lack of hearing loss prevention practices in school vocational programs reflects a general dearth of knowledge about noise-induced hearing loss (NIHL) in our society. For more than 30 years, numerous experts have recommended teaching hearing loss prevention practices to children in schools (see Folmer, 2004, for a list of quotes and references). In spite of mounting evidence that the prevalence of noise-induced hearing loss is increasing among children and adults – and contrary to the recommendations of countless experts in the field – basic hearing loss prevention information (that could prevent many cases of NIHL) remains conspicuously absent from school curricula.

Even though children are often exposed to excessive sound levels, there are *no* policies requiring hearing loss prevention practices to be taught in our nation's classrooms. A major reason for this omission is the fact that "hearing health" is not a priority (we could say it is not even on the radar screen) of the *Healthy Youth!* program within the Centers for Disease Control and Prevention (CDC). State Departments of Education and Health look to CDC for guidance about which health topics to address in our nation's schools. Because hearing health education is not a priority at CDC, hearing loss prevention is not taught in schools. Although teachers, parents, administrators, members of school districts and school boards might be aware that excessive noise exposure is hazardous for children and adults, CDC's Division of Adolescent and School Health provides no information or guidelines for educators about this significant problem.

Hearing specialists across the nation should ask CDC to:

1) Add "Hearing Health" to its list of "Important Health Topics" within the *Healthy Youth!* program. Contact the CDC through their website: **http://www.cdc.gov/HealthyYouth/healthtopics/index.htm**
2) Authorize and publish "Guidelines for School Programs to Prevent Noise-Induced Hearing Loss" in *Morbidity & Mortality Weekly Report (MMWR)*. CDC has published guidelines for several other school health programs in *MMWR*: **http://www.cdc.gov/HealthyYouth/publications/guidelines.htm**

These actions will facilitate implementation of hearing loss prevention education in our nation's schools. There is an abundance of hearing loss prevention curricula and materials that have already been developed for children and evaluated for effectiveness (Folmer, 2003). Broad dissemination of this information on a continuing basis in schools will eventually help to reduce the incidence and prevalence of noise-induced hearing loss in the United States. The time is **now** to wage a public health campaign against NIHL, a potentially debilitating condition that, according to *Healthy People 2010*, is fully preventable.

References

Folmer, R.L. (2003). "The importance of hearing conservation instruction," J. *School of Nursing* 19(3),140-148.

Folmer, R. L. (2004). "Why aren't hearing conservation practices taught in schools?" *Healthy Hearing,* November 15. http://www.healthyhearing.com/library/article_content.asp?article_id=151

Healthy People 2010. U.S. Department of Health and Human Services. http://www.healthypeople.gov

Plakke, B. (1991). "Hearing conservation training of industrial technology teachers," *Language, Speech, and Hearing Services in Schools*, *22*, 134-138.

Roeser, R. (1980). "Industrial hearing conservation programs in the high schools (Protect the ear before the 12th year)," *Ear and Hearing*, *1*(3),119-120.

Woodford, C. M., & O'Farrell, M. L. (1983). "High-frequency loss of hearing in secondary school students: an investigation of possible etiologic factors," *Language, Speech, and Hearing Services in Schools 14*, 22-28.

Dr. Folmer is an Associate Professor of Otolaryngology, Chief of Clinical Services, OHSU Tinnitus Clinic, Oregon Health & Science University, Portland, Oregon. www.ohsu.edu/ohrc/tinnitusclinic

OHC Spotlight and YOU!

We hope you enjoyed reading about Betty Stabler 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

Fall 2006 Council Meeting

The CAOHC Council will hold their annual committee and board meetings on Wednesday and Thursday, November 8-9, 2006 in Rosemont, Illinois at the Sheraton Gateway Suites Hotel. The Council is comprised of two representatives from each of the nine 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.

25 MOST ACTIVE COURSE DIRECTORS IN 2005 ANNOUNCED

The CAOHC Council is pleased to announce the twenty-five most active Course Directors for 2005. More than 2700 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 on CAOHC's "most active" list last year. We welcome the newcomers to this list, too. Congratulations to all!

1. John H. Elmore, AuD MBA CCC-A
   Precision Hearing, San Antonio, TX
2. Timothy A. Swisher, MA CCC-A
   Hearing Safety, Pittsburgh, PA
3. James J. Jerome, MA CCC-A
   Hearing Safety Midwest, Fishers, IN
4. William K. Wolfe, MA
   Environmental Technology Corp, Roswell, GA
5. Melette L. Meloy, MS CCC-A
   Sound Solutions, Dallas, GA
6. Charles E. Fankhauser, PhD
   MEDI, Benica, CA
7. Johnny L. Sanders, MA CCC-A
   Health Testing Solutions, Houston, TX
8. Thomas D. Thunder, AuD FAAA INCE Bd.Ct.
   Acoustic Associates, Ltd., Palatine, IL
9. Kirsten R. McCall, MS CCC-A
   Center for Hearing Health, Renton, WA
10. Robert C. Rhodes, PhD
    OMI, Hattiesburg, MS
11. Rodney M. Atack, PhD
    Hearing Health Care, Portland, OR
12. Roger M. Angelelli, PhD
    Audiometric Baseline Consulting, Bethel Park, PA
13. Pamela J. Gordon, MS CCC-A
    Gordon Hearing Conservation, Chester, CT
14. Edward W. Korabic, PhD CCC-A
    Hearing Services, Milwaukee, WI
15. Laurie Wells, MS, FAAA
    Associates in Acoustics, Loveland, CO
16. Georgia W. Holmes, AuD CCC-A
    Deep South Center UAB, Montgomery, AL
17. Cheryl S. Nadeau, MEd FAAA
    Workplace Group, Greensboro, NC
18. Thomas H. Cameron, PhD CCC-A
    Environmental Investigations, Hillsborough, NC
19. Carol J. Snyderwine, CCC-A
    South Pointe Hospital, Warrensville Hts, OH
20. Anne Louise P. Giroux, AuD CCC-A
    Anne Giroux Audiology, Winslow, ME
21. Mary M. McDaniel, MS CCC-A
    Pacific Hearing Conservation, Seattle, WA
22. Ellen J. Kelly, MS CCC-A
    Center for Speech & Hearing Sciences, Asbury, NJ
23. Thomas W. Norris, PhD
    The Hearing Center, Omaha, NE
24. Carolyn M. Cary, CCC-A/SLP
    Woodbury, MN
25. Angel Dexter Beauchamp, MA MS CCC-A
    Villa Nevarez Speech & Hearing, Rio Piedras Puerto Rico
25. Pamela Cronin, MS BA CCC-A

Professional Supervisor Course planned for Fall 2006

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 11, 2006 in Rosemont, Illinois, at the Sheraton Gateway Suites Hotel – near the Chicago O'Hare Airport.

New federal recordkeeping and reporting requirements will stimulate interest in hearing conservation programs (HCPs) and will increase 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. This course leads to certification as a Professional Supervisor of the Audiometric Component. For registration and further information about certification go to:
www.caohc.org/professional_supervisor/course.php

UPCOMING OHC CERTIFICATION AND RECERTIFICATION COURSES* 2006

*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 2006 (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
7/18/06	LA	New Orleans	Tara Allen	228-935-1447
7/18/06	MO	North Kansas City	Linda Ratliff-Hober	816-221-1401
7/19/06	GA	Atlanta	Melette Meloy	678-363-9897
7/19/06	MI	Detroit	John Elmore	800-357-5759
7/19/06	NY	Albany	Timothy Swisher	412-367-8690
7/19/06	TX	Houston	Johnny Sanders	281-492-8250
7/19/06	WA	Seattle	Sandra MacLean-Uberuaga	206-660-7097
7/22/06	TX	Houston	Johnny Sanders	281-492-8250
7/24/06	LA	New Orleans	Michael Seidemann	504-443-5670
7/26/06	NY	Rochester	Robert Rhodes	281-492-8250
7/26/06	OH	Dayton	Chris Pavlakos	937-436-1161
7/27/06	PA	Kittanning	Douglas Callen	724-543-7068
7/28/06	OH	Dayton	Chris Pavlakos	937-436-1161
7/31/06	FL	Orlando	John Elmore	800-357-5759
8/1/06	FL	Orlando	John Elmore	800-357-5759
8/2/06	AL	Birmingham	Georgia Holmes	205-934-7178
8/2/06	IN	Indianapolis	James Jerome	317-841-9829
8/3/06	NC	Greensboro	George Cook	336-834-8775
8/7/06	FL	Marco Island	Thomas Cameron	919-657-7500
8/7/06	MS	Hattiesburg	Robert Rhodes	601-264-3545
8/7/06	OR	Portland	Rodney Atack	503-614-8465
8/7/06	OR	Portland	Michael Fairchild	503-259-2686
8/8/06	WA	Walla Walla	Jay Turner	509-525-3720
8/9/06	FL	Jacksonville	Nancy Green	904-880-1710
8/9/06	OH	Cincinnati	Timothy Swisher	412-367-8690
8/16/06	MI	Detroit	Kathryn Deppensmith	281-492-8250
8/18/06	OH	Cincinnati	John Elmore	800-357-5759
8/21/06	FL	West Palm Beach	Herbert Greenberg	678-352-0312
8/21/06	KY	Louisville	John Elmore	800-357-5759
8/23/06	IL	Chicago/Schaumburg	Thomas Thunder	847-359-1068
8/23/06	MA	Auburn	Steven Fournier	508-832-8484
8/23/06	MD	Baltimore	Robert Rhodes	281-492-8250
8/23/06	PA	Pittsburgh	Timothy Swisher	412-367-8690
8/23/06	TN	Chattanooga	Melette Meloy	678-363-9897
8/25/06	MO	St. Louis	Mary Aubuchon	314-747-5800
9/5/06	WA	Bellevue	Mary McDaniel	206-706-7352
9/6/06	PA	Philadelphia	Timothy Swisher	412-367-8690
9/6/06	WI	Madison	James Jerome	317-841-9829
9/11/06	GA	Atlanta	Herbert Greenberg	678-352-0312
9/13/06	CO	Greeley	Laurie Wells	970-593-6339
9/13/06	NC	Morrisville	Thomas Cameron	919-657-7500
9/13/06	OH	Cleveland	Carol Snyderwine	216-491-6104
9/13/06	OR	Portland	Thomas Dolan	503-725-3264
9/13/06	UT	Salt Lake City	Pamela Cronin	801-566-8304
9/14/06	PA	Pittsburgh	Roger Angelelli	412-831-0430
9/19/06	CA	Fremont	Kirsten McCall	425-254-3833
9/19/06	MA	Auburn	Steven Fournier	508-832-8484
9/19/06	MO	North Kansas City	Linda Ratliff-Hober	816-221-1401
9/19/06	NH	Manchester	Pamela Gordon	860-526-8686
9/19/06	VA	Richmond	Timothy Swisher	412-367-8690
9/20/06	IL	Bloomington	Deanna Ginder	309-826-0595
9/20/06	IL	Chicago/Oak Park	Robert Beiter	708-445-7171
9/20/06	NC	Greensboro	Cheryl Nadeau	336-834-8775
9/20/06	TN	Nashville	Melette Meloy	678-363-9897
9/20/06	TX	Houston	Johnny Sanders	281-492-8250
9/20/06	TX	San Antonio	John Elmore	800-357-5759
9/26/06	TN	Cleveland	Georgia Holmes	205-934-7178
9/27/06	AR	Jonesboro	Jane Prince	870-972-1166
9/27/06	CO	Denver	John Elmore	800-357-5759
9/27/06	IA	Iowa City	Laura Kauth	563-355-7712
9/27/06	OK	Oklahoma City	Robert Rhodes	281-492-8250
10/2/06	OR	Portland	Rodney Atack	503-614-8465
10/3/06	KS	Lenexa	Diane Bachman	913-748-2063
10/4/06	AL	Birmingham	Georgia Holmes	205-934-7178
10/4/06	GA	Atlanta	William Wolfe	770-475-2055
10/4/06	ID	Boise	Brek Stoker	208-376-3591
10/4/06	KY	Louisville	James Jerome	317-841-9829
10/4/06	MN	Minneapolis	Ted Madison	651-575-5575
10/4/06	OR	Portland	Michael Fairchild	503-259-2686
10/4/06	WI	Brookfield	Edward Korabic	262-547-2227
10/11/06	MD	Baltimore	John Elmore	800-357-5759
10/12/06	NC	Greensboro	George Cook	336-834-8775
10/16/06	FL	West Palm Beach	Herbert Greenberg	678-352-0312
10/16/06	ME	Waterville	Anne Louise Giroux	207-872-0320
10/16/06	NE	Omaha	Thomas Norris	402-391-3982
10/17/06	CA	Irvine	Kirsten McCall	425-254-3833
10/17/06	MI	Farmington	Thomas Simpson	313-333-2492
10/18/06	AL	Montgomery	Melette Meloy	678-363-9897
10/18/06	AZ	Phoenix	Kathryn Deppensmith	281-492-8250
10/18/06	CT	Shelton	Phyllis Sochrin	203-735-4327
10/18/06	MA	Auburn	Steven Fournier	508-832-8484
10/18/06	VA	Richmond	Thomas Cameron	919-657-7500
10/18/06	WA	Seattle	Sandra MacLean-Uberuaga	206-660-7097
10/19/06	Mexico	Mexico City	Jorge Morales	52-55-53740625
10/23/06	NY	Liverpool	Dana Oviatt	315-428-0016
10/24/06	IL	Chicago/Schaumburg	Thomas Thunder	847-359-1068
10/24/06	LA	Scott	Jim Guillory	337-233-3955
10/25/06	IA	Des Moines	Laura Kauth	563-355-7712
10/25/06	LA	New Orleans	Robert Rhodes	281-492-8250
10/25/06	NY	Amherst	David Nelson	716-633-7210
10/25/06	NY	Buffalo	Timothy Swisher	412-367-8690
11/1/06	MI	Detroit	John Elmore	800-357-5759
11/1/06	MO	St Louis	James Jerome	317-841-9829
11/1/06	NC	Greensboro	Cheryl Nadeau	336-834-8775
11/1/06	NJ	Piscataway	Ellen Kelly	732-238-1664
11/1/06	OR	Portland	Rodney Atack	503-614-8465
11/2/06	ME	Waterville	Anne Louise Giroux	207-872-0320
11/6/06	GA	Atlanta	Herbert Greenberg	678-352-0312
11/6/06	LA	New Orleans	Michael Seidemann	504-443-5670
11/8/06	MA	Auburn	Steven Fournier	508-832-8484
11/8/06	SC	Columbia	Melette Meloy	678-363-9897
11/8/06	TX	Houston	Johnny Sanders	281-492-8250
11/14/06	MO	North Kansas City	Linda Ratliff-Hober	816-221-1401
11/15/06	NV	Las Vegas	John Elmore	800-357-5759
11/15/06	OH	Dayton	Chris Pavlakos	937-436-1161
11/16/06	PA	Pittsburgh	Roger Angelelli	412-831-0430
11/17/06	NC	Morrisville	Thomas Cameron	919-657-7500
11/17/06	OH	Dayton	Chris Pavlakos	937-436-1161

Fall 2006 Workshop for new and recertifying Course Directors

The Council will conduct a Course Director Workshop on Friday, November 10, 2006 at the Sheraton Gateway Suites Hotel, Rosemont, Illinois. This one day workshop is a requirement for new Course Director (CD) certification.

After thoughtful consideration, the Council has determined that all CDs should attend a workshop to recertify in order to take part in training that focuses on teaching techniques (including practica) and resources. The CD workshop curricula has been fully reviewed and modified in order to develop a positive and productive continuing education experience for even the most experienced of CDs.

All attendees must submit an application for approval by the CAOHC Screening Committee prior to the workshop. Questions may be directed to Barbara Lechner, Executive Director, at 414/276-5338. CD application and registration is available on-line at **http://www.caohc.org/workshop/**

Noise-Induced Hearing Loss in Children at Work and Play

An innovative conference has been designed to bring together a diverse group of basic and applied science researchers with expertise related to the prevention of noise-induced hearing loss (NIHL). The conference, scheduled for October 19-20, 2006 in Cincinnati, Ohio, will explore the most recent theoretical and experimental work in the relevant fields in an effort to expand the practical applications. The focus will be on the issue of NIHL in children who sometimes begin their employment experiences as early as age 10-12 years, often in hazardous sound environments such as construction, agriculture, entertainment and landscaping/grounds work. For more information on this conference, go to the CAOHC website under "Current Events" and select "Conferences."

Letter to the Editor

In the recent *UPDATE* article by Elliott Berger [Vol. 18(1)], he offers as one of three options for dealing with the problem of audiometer-room noise that masks thresholds and can cause erroneous results at the test frequency of 500 Hz, to drop testing at that frequency altogether. He also mentions that it would save time and that 500 Hz tells us little about the progression of noise-induced hearing loss (NIHL).

While 500 Hz may not tell us much about NIHL, it is valuable in other ways. When impedance is not done or is not available, it is possible that thresholds at 500 Hz may provide information on various conductive pathologies. Meniere's disease in its early stages typically presents with a rising (reverse) audiometric configuration, and 500 Hz may be helpful in predicting the need for surgery for patients with acoustic tumors. Yes, the object of hearing conservation programs is to reduce or prevent NIHL, but once an audiologist is involved we have a responsibility to identify other auditory pathologies that can and do occur in the noise-exposed population.

I also advocate adding 8000 Hz to the test. Note in my article *When Air Conduction is Not Enough and Related Issues: A critique of the OSHA Occupational Hearing Conservation Program*, an editorial in the Journal of Occupational Medicine (with Crane, MA and Fox J, 34:3, l992) we identified an acoustic neuroma in a non-noise exposed secretary working for an industrial operation. The only positive indication of this potentially life-threatening tumor was a significant increase in her thresholds at 8000 Hz.

Maurice H. Miller, PhD
Professor of Audiology and Vice Chair
Dept of Speech Language Pathology & Audiology
Steinhardt School of Education, New York University

Mr. Berger's reply:

Thank you for your comments on my recent article on background noise during audiometric testing. I appreciate your concern that audiograms be as effective as possible and that audiologists not just focus on detection of noise-induced hearing loss. Certainly when an audiologist reviews an audiogram, if they see suspicious conditions they may want to administer a more comprehensive follow-up test that could include additional test frequencies. The point of my paper, however, was not advocating the elimination of 500 Hz as a test frequency, but rather pointing out options to deal with background noise that causes masking at that frequency. Masked, and hence inaccurate thresholds that may be off by 5 dB, 10 dB, or more at 500 Hz, can give rise to questionable diagnoses.

I provided 3 options, and one of them, based on a recent presentation at NHCA was the elimination of testing at 500 Hz. The other options retained 500 Hz and suggested alternative strategies.

As for the addition of 8000 Hz to the standard occupational audiogram, I strongly concur with your recommendation for a number of reasons and would point readers to the recent report from the Institute of Medicine that also endorses including that test frequency and provides supporting data [Institute of Medicine (2006). *Noise and Military Service, Implications for Hearing Loss and Tinnitus*, eds. L. E. Humes, L. M. Joellenbeck, and J. S. Durch, The National Academies Press, Washington, DC].

CAOHC Council Members and The Organizations They Represent

Chair
James D. Banach, MBA
American Industrial Hygiene Association
Quest Technologies & Metrasonics, Inc.
Oconomowoc, WI

Vice Chair
Mary M. McDaniel, MS CCC-A
American Speech-Language-Hearing Association
Pacific Hearing Conservation, Inc.
Seattle, WA

Secretary/Treasurer
Paul J. Brownson, MD FACOEM FAAFP
American College of Occupational & Environmental- Medicine
The Dow Chemical Company
Indianapolis, IN

Immediate Past Chair
Richard W. Danielson, PhD
American Academy of Audiology
Baylor College of Medicine and National Space Biomedical Research Institute (NSBRI)
NASA Johnson Space Center
Houston TX

Elliott H. Berger, MS INCE. Bd.Cert.
American Industrial Hygiene Association
E•A•R/Aearo Technologies
Indianapolis, IN

Robert D. Bruce, PE INCE. Bd.Cert.
Institute of Noise Control Engineering, Inc.
Collaboration in Science and Technology, Inc.
Houston, TX 77084-5131

Diane S. DeGaetano, RN, BSN, COHN-S, COHC
American Association of Occupational Health Nurses
Merial, Ltd.
Duluth, GA

Thomas L. Hutchison, MHA FAAA CCC-A
Military Audiology Association
Naval Ambulatory Care Center
Portsmouth, NH

Madeleine J. Kerr, PhD, RN
American Association of Occupational Health Nurses
Univ. of MN/School of Nursing
Minneapolis, MN

David D. Lee, MIS CIH CSP
American Society of Safety Engineers
University of Nevada, Reno
Environmental Health & Safety
Reno, NV

J.Adin Mann, III, PhD
Institute of Noise Control Engineering
Iowa State University
Ames, IA

Peter M. Rabinowitz, MD MPH
American College of Occupational & Environmental Medicine
Yale Occupational & Environmental Medicine Program
New Haven, CT

Ronald D. Schaible, CIH CSP PE(Mass)
American Society of Safety Engineers
Robson Lapina, Inc.
Lancaster, PA

Mark R. Stephenson, PhD
American Academy of Audiology
CDC/NIOSH
Cincinnati, OH

Robert Thayer Sataloff, MD DMA FACS
American Academy of Otolaryngology - Head & Neck Surgery
Philadelphia Ear, Nose & Throat Assoc.
Philadelphia, PA

Vickie L. Tuten, AuD CCC-A
Military Audiology Association
US Army Preventive Medicine
Fort Bragg, NC

Stephen J. Wetmore, MD, MBA
American Academy of Otolaryngology - Head & Neck Surgery
R.C. Byrd Health Science/WVA Univ.
Morgantown, WV

79-0506-002

Summer 2006

CAOHC®

Council for Accreditation in Occupational Hearing Conservation
555 East Wells Street / Suite 1100
Milwaukee, WI 53202-3823

Address Service Requested

PRSRT STD
U.S. POSTAGE
PAID
MILWAUKEE, WI
PERMIT NO. 5438

Look for CAOHC on the **INTERNET**

www.caohc.org
or e-mail our office at info@caohc.org