



## Time to Change Direction... From Hearing Conservation to Total Workforce Hearing Wellness

*Submitted by: Kathy Gates, AuD*

*Dr. Kathy Gates works for the Department of Defense (DOD) Hearing Center of Excellence (HCE). Her primary area of focus within the HCE is to promote hearing loss prevention initiatives and she is currently working on launching the DOD Comprehensive Hearing Health Program/Campaign.*

*By request, this article is being republished as it resonates with the mission of CAOHC and its enthusiasts.*

Churchill's observation about change reminds us that we can be proactive, moving in the right direction to protect and improve Hearing Health. No one is immune to the hazards of noise exposure. Noise-induced hearing loss (NIHL) can affect all of us, not just those who work in noisy environments. We live in a noisy world. All workers should be taught strategies to protect their hearing, on and off the job.

With respect to hearing loss prevention, I propose a paradigm shift away from the traditional at-risk hearing conservation model toward a broader population health model. This is to embrace *Hearing Health* as part of a total workforce wellness program, rather than a *regulatory obligation*. Such a shift would offer many advantages to the employee as well as the employer. Most important, the individual worker stands to benefit through improved overall well-being and quality of life.

A total workforce wellness program can help ensure that hearing loss is identified and treated early, supporting a worker's need to function optimally on the job. It is important to understand that the American population is aging. By 2026, 30% of Americans will be over 55 years of age; 18% will be older than 65. Many older Americans still active in the workforce will have already sustained a mild to moderate initial hearing loss <sup>1</sup>.

Untreated hearing loss significantly impacts social well-being and can create an economic burden on individuals, families, and communities. Recent studies have found that unidentified or untreated hearing loss contributes to an increase in both cognitive and physical decline in adults. Psychosocial health declines with increasing hearing loss <sup>2</sup>. According to the Hearing Loss

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## Helping Make Progress in Hearing Conservation

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- **(Coming soon!)** Workplace Noise: Measurement and Controls



The go-to desk reference guide for workplace hearing concerns.

- Checklists
- Regulations
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- Best practice info.
- Ear plug fitting guide
- Log sheets



## Message from the Chair

Submitted by: James V. Crawford, MD, CPS/A, COL (Ret)

Thank you for taking a minute to read this issue of Update. Those of us involved in hearing conservation ultimately become passionate about preserving the critical sense of hearing. We realize what a disability hearing loss is and every one of us is actively engaged, in our own way, to save hearing. I feel immensely grateful to be able to serve on the CAOHC council. I look forward to learning from my colleagues; each one is an expert in their field and comes with a unique perspective and insight. I learn from every interaction and I hope that's what each of you get from CAOHC.

We continue to add resources to help in your efforts to conserve hearing. From our Hearing Conservation Manual 5th Edition, which is a complete resource for anyone in hearing conservation, to the new video "Workplace Noise: Measurement and Controls" which is currently in production, CAOHC hopes to help.

We have also recently partnered with NIOSH and NHCA to support the "Safe in Sound" award. Safe in Sound is intended to recognize programs that have demonstrated excellence in hearing conservation. We hope that hearing conservation programs apply the recommendations that are part of CAOHC's training programs and that useful information is passed along from programs that have successfully implemented those practices. Find more information at <http://www.safeinsound.us/>

Please enjoy this issue of Update. Use our website and our resources to help build the best hearing conservation program you can – and then share it with us. You'll find some examples here as you read our latest issue.

Feel free to reach out and contribute – we can always use new perspectives and efforts as we work together to save some ears!

#



## Evaluating Effective Hearing Conservation: A revised follow-up process for STS audiograms

Submitted by: Robb Campbell, MD, MPH

*Robb Campbell, MD, MPH manages the hearing conservation program at 3M Company and has practiced Occupational Medicine there for 25 years. He is a graduate of Duke School of Medicine, is Board Certified in both Occupational Medicine and Family Practice, and is a Certified Professional Supervisor of the Audiometric Monitoring Program.*

At 3M company, our goal is to prevent permanent noise-induced hearing loss. Over the years, our policies and procedures have evolved regarding employees with Standard Threshold Shift. This article reveals the observations of our Corporate Occupational Medicine team and the changes we are implementing in our STS identification and intervention practices.

**"...[here are] the changes we are implementing in our STS identification and intervention practices:"**

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## Have insight you can contribute?

Submit an article for publication to a future issue of Update. Email it with a photo of yourself to [mjanzen-holverson@caohc.org](mailto:mjanzen-holverson@caohc.org). Please indicate this is for the UPDATE Newsletter in the subject line of the email.

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## Outreach: Awareness Builds Expertise

Submitted by: L. Keeta Jones

*Keeta Jones is the Acoustical Society of America Education and Outreach Coordinator. She works closely with the Committee on Education in Acoustics and the Women in Acoustics Committee. She received her BA in Linguistics and German at the University of Toledo, OH and is completing her MA in Linguistics at The Ohio State University.*

I began as the Acoustical Society of America (ASA) Education and Outreach Coordinator in the summer of 2016 and have worked with the Society to implement acoustics education and outreach initiatives. As such, I would like to share some of the acoustics outreach work we have been doing. Nearly everything I work on aligns with the current ASA Strategic Plan, particularly Goal 1: Awareness of Acoustics and Goal 2: Member Engagement and Diversity (see the article by former ASA president, Michael Stinson in the fall 2016 issue of *Acoustics today*, to learn more about the Strategic plan) (<http://acoustical-society-of-america.epaperflip.com/v/Fall-2016/#?page=8>).

First, I think it is important to briefly discuss why outreach is important. The reality is that many people do not know what acoustics is. The field of acoustics is highly dependent on students accidentally discovering it instead of actively seeking it out. Even worse, there are very few undergraduate institutions that offer acoustics focused majors and others have only a few courses with the word acoustics in the title and/or course description. Additionally, these courses are generally found in a single department, such as physics, which does not represent how interdisciplinary the field is. So how can students get exposure to acoustics and its interdisciplinary nature if they must rely on such low odds and limited options? One answer is outreach. The ASA outreach efforts that I will be discussing promote awareness and understanding of acoustics that increase the likelihood students will discover and stay in the field.

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**“ASA outreach efforts... increase the likelihood students will discover and stay in the field.**

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### ASA Teacher Activity Kit

Several years ago, the ASA Committee on Education (EdCom) developed an activity kit for teachers that includes supplies and teaching instructions for a variety of lessons addressing acoustics for a range of K-12 students. The kit includes materials to teach a class of 30 students with over 30 research-based, interactive, student-tested lessons and laboratory exercises. In 2017, with the collaboration of the American Association of Physics Teachers (AAPT), even more lesson plans were developed. The examples and applications included in the kit relate to a range of topics including medical imaging, animal bioacoustics, physical and psychological acoustics, speech, audiology, and architectural acoustics. The ASA offers the kit free to K-12 teachers and anyone doing outreach with students in that range. To acquire the activity kit or the acoustics themed lesson plans, visit <https://exploresound.org/teacher-activity-kit/>. By using acoustics in the classroom, students will discover the field and possible career opportunities before entering

college, which means they can take the time and effort to find the right program for their own needs and wants.

### ExploreSound.org

The first version of the Explore Sound website was developed by EdCom in 2002 and was geared exclusively towards young people and teachers interested in learning about or teaching acoustics and scientists who study sound. The site was revamped in 2016 and now houses resources for K-12 students, university students, educators and anyone else who happens to search for “acoustics” in their web browser. The new and improved site includes activities for home or classrooms, lesson plans, interactive quizzes, lay language research papers, funding resources and much more. Another key component of the site is the Acoustics Program Directory where prospective students can search for specific acoustics undergraduate or graduate programs. This type of online outreach is more passive and is most likely to be used by those already interested in learning more about acoustics, however, if we did not provide it, students would struggle to find this information elsewhere.

### Demonstration Sessions

For the past 25 years, as part of the biannual ASA meetings, EdCom has hosted a hands-on demonstration session for middle-high-school students. The demonstrations are led by members of the society who introduce students to the exciting world of acoustics. For most of the students, it is the very first time that they have seen any acoustics at all. The session includes interactive demonstrations and a panel discussion about careers in acoustics. Typically, about 30 local students attend with their teacher. We also provide a pizza lunch and bus transportation to the conference center to remove financial barriers for students.

Building on the success of this demonstration session, EdCom and the Women in Acoustics Committee developed a similar session called “Listen Up and Get Involved.” This session was designed to introduce young girls to acoustics through a partnership with local Girl Scouts troops during each of the biannual ASA meetings. We now invite local area families in addition to the Girl Scout troops to reach an even wider audience. For this session, a special patch was designed for the Girl Scouts. The primary goals for both sessions was to expose young people to opportunities in science and engineering and to provide them with an opportunity to interact with professionals in many areas of acoustics.

### Public Outreach

While much of the outreach done by ASA focuses on classrooms, students and educators, some activities are geared more toward general audiences. For the 23rd International Noise Awareness Day (INAD), ASA planned a month’s worth of activities culminating in a 2-hour live stream session designed to raise awareness of the effects of noise on the health and welfare of individuals and populations worldwide. You can view the full list of activities on [exploresound.org](http://exploresound.org) and watch

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## SUCCESSFUL WEBINAR TRAINING SERIES STILL AVAILABLE

The well-attended, seven-part training series entitled “Hearing Loss Prevention: The Basics,” was compiled through a partnership with CAOHC (Council for Accreditation in Occupational Hearing Conservation) and NHCA (the National Hearing Conservation Association). This useful series has been recorded and is now available to benefit additional audiences in Hearing Loss Prevention. The seven individual recordings can be purchased through a link at the end of this article. They were assembled as a resource for professionals and combine well-rounded information within the various disciplines of hearing loss prevention, plus current updates.

Accreditations awarded to the series are testament to the value of information presented. CEUs are obtainable through the American Academy of Audiology (AAA), the American Association of Occupational Health Nurses (AAOHN) and the American Speech-Language-Hearing Association (ASHA).

Over 500 people participated in the live training webinar. Topics covered in the seven sections include: An overview, Regulations, Noise Measurements, The Audiogram, Education & Training, Hearing Protection and Recordability Issues. Reviews for each session have been very favorable as a host of esteemed professional provide relevant information on each topic.



These recorded events are now available for \$50 each, or \$25 each for students. [Click here to order.](#)

This training series is reviewed in the article below.



### Reviewing The CAOHC Recorded Webinar Training Series

*Submitted by: Marjorie Grantham*

The Council for Accreditation in Occupational Hearing Conservation (CAOHC) and the National Hearing Conservation Association (NHCA) partnered to produce a seven-part training webinar to update and educate participating professionals on “Hearing Loss Prevention: The Basics.”

The project was Sponsored by 3M, Benson Medical Instruments, Honeywell Howard Leight, Phonak, Protect Ear USA, and Tremetrics. The series was offered in a webinar format, earning CEUs through the American Academy of Audiology (AAA), the American Association of Occupational Health Nurses (AAOHN), and the American Speech-Language-Hearing Association (ASHA). Special thanks go to the training event planning team: Andrew Merkley, Jeffrey Goldberg and Amanda Rewerts.

Seven esteemed presenters provided summaries of each presentation topic: The topic of Hearing Conservation Overall was covered by Vickie Tuten, AuD, CCC-A, CPS/A. Dr. Tuten shared information and benefits about effective hearing loss prevention programs for both employees and employers. Additional topics of expertise included both the auditory and non-auditory effects of hearing loss, hearing conservation regulations and the critical hearing loss prevention roles of CAOHC and NHCA.

“Hearing Conservation Regulations and Best Practices for Prevention” was covered by Laurie Wells, AuD, FAAA, CPS/A. Dr. Wells reviewed regulations and focused on employer responsibilities. She outlined details of best practice policies that are more protective than the

OSHA (Occupational Safety and Health Administration) requirements and explained the benefits of erring on the side of more stringent protection as being a positive for employees and employers alike. She also clarified the differences between Standard Threshold Shift and recordable hearing shifts.

“Noise Measurement” was covered by Charlie Moritz, MS, INCE Bd. Cert. His contribution to this pool of knowledge focused on measurement tactics along with their administrative and engineering control factors. Part of this knowledge comes from using a Job Hazard Analysis, which he covered in specific detail along with hearing protection devices.

“The Audiogram” section was conducted by John “Andy” Merkley, AuD, CCC-A, CPS/A. LTC Merkley detailed the different types of audiograms used in hearing conservation programs. He also reviewed how to read an audiogram, identified common findings associated with each audiometric configuration and discussed what information the pure-tone, air conduction audiogram provides employees, employers and hearing health professionals.

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**Experts weigh in on hearing loss & prevention with specific skillfulness across various disciplines.**

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**Cont'd. from page 1—Time to Change Direction...**

Association of America, people tend to wait, on average, seven years before treating hearing problems. Of those who need intervention and treatment for hearing impairment, fewer than 20% will seek help<sup>3</sup>. Early identification and treatment of hearing loss may help to prevent other debilitating medical problems such as depression and cognitive decline<sup>4, 5, 6, 7, 8, 9</sup>.

With all this in mind, it's reasonable to expect that a hearing health program for all workers would promote a healthier workforce, increased productivity, and reduced downtime due to worker illness. A safer, healthier, and less stressful work environment will tend to improve employee morale and perhaps also help to reduce employee turnover. Hearing health is associated with many aspects of overall employee engagement, capability, and well-being.

How might you as a Hearing Health professional advocate for a paradigm shift to influence this type of program in your hearing conservation mission? First, you need to encourage your own management to embrace and adopt a total workforce Hearing Health Program. You have an opportunity to educate them about hearing health and encourage them to consider expanding their current programs to include all workers.

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**“Your message is simple: Healthy hearing leads to a healthy, more effective and dependable worker.” Here are several ideas to add to your promotional toolbox...**

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Expanding your hearing health mission may require creative thinking about how to integrate it into a general worker health program. Here are several suggestions to consider:

- Reach out to your customers and provide them with information about the benefits of providing hearing health services to all workers. Share with them that a program emphasizing “wellness” reflects that they care about their employees’ well-being and quality of life. Your message is simple: healthy hearing leads to a healthy, more effective and dependable worker. At a minimum, consider a group education class that serves as a touchpoint for hearing loss prevention strategies. Another option is to develop and implement a periodic hearing monitoring program to assess hearing (maybe every two years) in workers who are not routinely noise-exposed. Education and hearing protection fitting could be included as part of a periodic monitoring program. Without increasing a company’s liability, such a program would allow for early identification of workers who have hearing loss. This would provide opportunity for hearing health education about an audiological evaluation, treatments and rehabilitation. The model you use for at-risk (routinely noise exposed) workers might be useful in some modified form for all workers.
- Participate in health fairs within your company and other organizational events to provide hearing health education and hearing protection fittings. Consider an interactive display such as the Jolene (Dangerous Decibels) to measure loudness levels of individual personal listening devices. This is a great opportunity to provide education and increase awareness regarding how hearing works and how easily it can be damaged if not protected from hazardous noise.

- Work with a Health Promotion/Wellness Coordinator if available or Safety Personnel to suggest including *Hearing Health* services. Team up with these professionals to provide hearing health education classes and hearing protection fittings. This is a great opportunity to increase the awareness of other health care providers and to educate them about how hearing relates to other areas of worker wellness and quality of life. Provide educational and motivational posters in work areas, lunchrooms and breakrooms.
- Support *Hearing Health* outreach within your community.
- Additional ideas regarding total workforce Hearing Health and Hearing Loss Prevention are available on several Hearing Health websites.

**Websites for Hearing Health Information:**

- American Speech Hearing Association: <http://www.asha.org/>
- Listen to your Buds: <http://www.asha.org/buds/>
- American Academy of Audiology: <https://www.audiology.org/>
- Turn it to the Left: <http://turnittotheleft.org/>
- How’s Your Hearing? Ask an Audiologist: <http://howsyourhearing.org/>
- Defense Hearing Center of Excellence: <http://hearing.health.mil>
- National Hearing Conservation Association : <https://nhca.site-ym.com/>
- National Institute on Deafness and Other Communication Disorders: <https://www.nidcd.nih.gov/>
- It’s a Noisy Planet. Protect their Hearing: <https://www.noisyplanet.nidcd.nih.gov/>
- Hearing Education and Awareness for Rockers: <http://www.hear.net.com/>
- Starkey Hearing Foundation: <https://www.starkeyhearingfoundation.org/>
- Listen Carefully: <https://www.starkeyhearingfoundation.org/Listen-Carefully>
- Hearing Loss Association of America: <http://www.hearingloss.org>
- Deafening Sound, Nebraska Educational Telecommunications: <https://marketplace.unl.edu/net/deafening-sound.html>
- Dangerous Decibels: <http://dangerousdecibels.org/>
- Operation Bang: <http://militaryaudiology.org/resources/be-aware-of-noise-generation/>
- Hear-it (European General Public): <http://www.hear-it.org/Noise-and-hearing-loss>
- National Institute for Occupational Safety and Health (NIOSH): <https://www.cdc.gov/niosh/topics/noise/toolbox.html>
- Hearing Health Foundation-Safe and Sound: <http://hearinghealthfoundation.org/safe-and-sound>
- Occupational Safety and Health Administration: <https://www.osha.gov/SLTC/noisehearingconservation/>

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**Cont'd. from page 5—Time to Change Direction...**

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<http://nationalacademies.org/hmd/reports/2016/hearing-health-care-for-adults.aspx>

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**Cont'd. from page 2—Evaluating Effective Hearing Conservation**

Our two-tiered approach includes identifying persons showing early signs of overexposure to noise and providing effective follow-up actions. Historically, when an employee experienced an age-corrected Standard Threshold Shift (STS), the CAOHC-Certified Occupational Hearing Conservationist (COHC) (who is usually the Occupational Health Nurse at the plant) repeats the audiogram a few days after the one showing the STS. The employee is instructed to avoid noise for the 14 hours prior to the repeat audiogram and is coached on how to best take an audiogram. If the second audiogram again shows STS, the employee is referred for a professional evaluation by either an audiologist or an otolaryngologist (ENT). This always includes a diagnostic audiology evaluation.

Our Corporate Occupational Medical program reviewed all the external referrals for a given year and discovered that most of the time, the audiologist's evaluation was all that was needed to confirm and diagnose the STS. Only occasionally did the ENT have additional information that contributed to the diagnosis of the hearing shift. Therefore, in the future, our first referral will be to the audiologist. A physical examination by an ENT will be reserved for those who need additional diagnostic or medical information to manage the hearing loss.

In the past, to enable early identification of hearing change, we have applied several different metrics as possible “early warning flags.” However, when we analyzed the use of these alternative metrics we were struck by the high numbers of false positive results (persons with “early warning flags” who did not have a subsequent STS) and false negative results (persons without any “early warning flags” who later went on to develop an STS). We also observed that most persons who experienced a permanent STS also had a temporary STS first (an STS which resolves on the subsequent or re-test audiogram). Thus, our new approach defines “early warning flag” as an age-corrected STS on the annual test. Intervention is provided to these people, regardless if the STS resolves on the re-test. In other words, a first temporary STS is our warning that the employee's current exposure behavior, and PPE are insufficient protection, and unless something changes, a permanent STS will follow. Our stated goal is that no one has a second STS.

**Expanding intervention actions**

When someone has an STS on the first audiogram in a given year, we have tried to think of possible “disconnects” which might lead to excessive noise exposure contributing to the hearing shift. Our steps to address the gaps were:

1) Investigate the worksite: Do we know the sound levels and employee noise exposure at the worksite? Are the noise sources identified, and is the work area clearly labeled to be a hearing conservation area? Are the employees' preferred hearing protection devices easily obtained?

- 2) Identify hazardous noise: We used a “noise indicator badge” to demonstrate to the employee the hazardous noise at work. The noise indicator badge flashes a red light when registering noise equal to or greater than 85 dBA and green light when the noise level is less than 85 dBA. The employee was encouraged to take the noise indicator badge home and to investigate off-the-job, potentially hazardous noise levels.
- 3) Optimize hearing protection fit and use: Hearing protection fit testing technology is used to assure that the employee is using the right hearing protection and knows how to insert it properly; therefore all workers in the plants have been fit-tested. Anyone with an STS goes through fit-testing again.
- 4) Educate on the effects of noise: Finally, we wondered if employees knew about the adverse impact that hearing loss would have on them, socially and even with their family relationships. We used the National Institute for Occupational Safety and Health (NIOSH) hearing loss simulator tool (<https://www.cdc.gov/niosh/mining/works/cover-sheet1820.html>) to help employees understand the hearing loss they might incur and how it would limit, for example, their communication with family members such as grandchildren.

These interventions were not all enthusiastically received. In general, many workers were less concerned in knowing their off-the-job noise levels. The NIOSH hearing loss simulator proved cumbersome to use. After evaluating our intervention steps we discontinued these two and focused on investigating the worksite and conducting fit-testing. We now ask our COHCs to sit one-on-one with each employee to teach them about hearing loss and how to avoid it.

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**“...our Corporate Occupational Medicine team evaluated the existing hearing conservation practices and made changes.”**

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In summary, our Corporate Occupational Medicine team evaluated the existing hearing conservation practices and made changes to the early warning flag definition, follow-up referral approach, and intervention steps. It is too early to measure the outcomes of these changes however, we are gathering information and will report our findings in the future. Finding the best solution is a constant process of evaluating the effectiveness of the hearing conservation program.

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**Cont'd from page 3— Outreach: Awareness Builds Expertise**

a recording of the streamed session. ASA also performed a variety of acoustic demonstrations at the USA Science and Engineering Festival for thousands of visitors. Additionally, ASA maintains Facebook and Twitter accounts and regularly interacts with the public about acoustics.

By conducting outreach, whether that be through the activities I listed above or some other means (lecture series, hands-on demonstration

sessions, lab tours or science bloggs), we can cultivate a better appreciation and an understanding of acoustics. If you'd would like more information or would like to help with our outreach efforts, please feel free to contact me @ [kjones@acousticalsociety.org](mailto:kjones@acousticalsociety.org).

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**Cont'd from page 4—Reviewing The CAOHC Recorded Webinar Training Series**

“Education & Training” was the topic covered by Carol Snyderwine, MHA, MA, CCC-A, CPS/A. This section focused on OSHA’s education and training requirements. It detailed the importance of active employee participation, commitment, communication, and cooperation for a successful hearing loss prevention program. Ms. Snyderwine provided information on how to apply motivational interview principles to elicit positive employee behavior and change.

“Hearing Protection” expert Elliott Berger, MS, INCE Bd. Cert. presented industry information to round out the discussion on protective equipment. He detailed the types of hearing protectors currently available. The discussion also centered on testing and Noise Reduction Rating (NRR) labeling requirements. Participants could learn to gauge effectiveness between NRRs and individual-achieved

attenuation. Mr. Berger also covered recommended best practice of hearing protector fit testing.

While the entire 7 sessions garnered solid interest from the industry, the last section covering “Recordability Issues” was the highest attended. It was led by Dr. Bruce Kirchner, MD, MPH, CPS/A. This segment provided an overview of OSHA and MSHA (Mining Safety and Health Administration) recordkeeping regulations. He compared these regulations and their implications in professional reviewing of audiograms. Case studies were used to examine the recordability decision-making process.

[To order click here.](#)

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## Leadership

**The CAOHC leadership otherwise known as the Council consists of two representatives from each of the following Component Professional Organizations (CPOs).**

- **American Association of Occupational Health Nurses (AAOHN)**  
Elaine Brown, RN BS COHN-S/CM COHC  
Bryan Topp, RN MSN/MPH COHN-S COHC
- **American Academy of Audiology (AAA)**  
Laurie Wells, AuD FAAA CPS/A  
*Council Past Chair*  
Antony Joseph, AuD PhD CPS/A
- **American Academy of Otolaryngology - Head & Neck Surgery (AAO-HNS)**  
James Crawford, MD CPS/A, COL (Ret)  
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- **Institute of Noise Control Engineering (INCE)**  
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