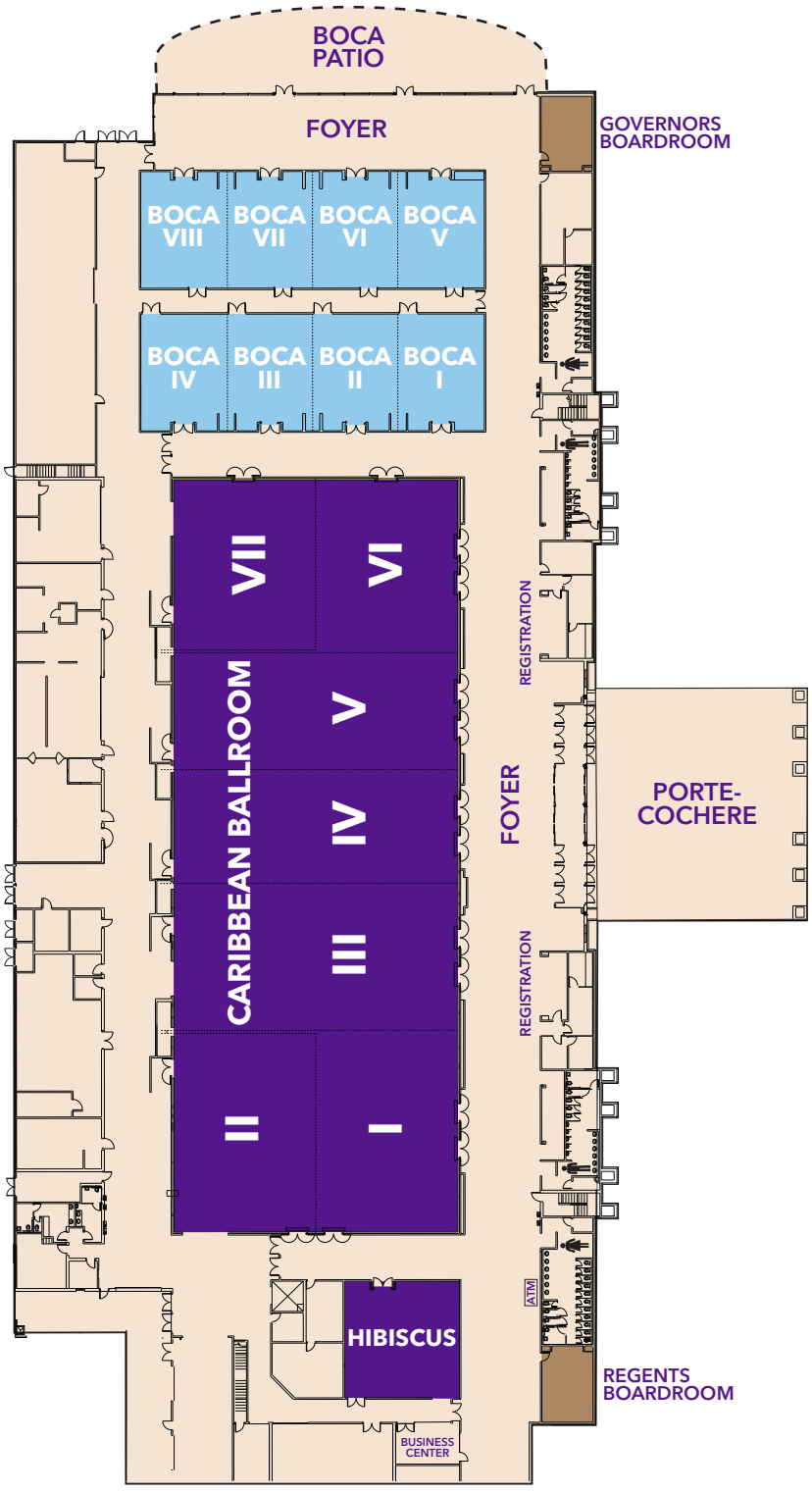
Happy Ears for Many Years

2018 NHCA ANNUAL CONFERENCE

Caribe Royale All-Suite Hotel and Convention Center
February 15-17, 2018 • Orlando, Florida

National Hearing Conservation Association • www.hearingconservation.org

CARIBE ROYAL HOTEL AND CONVENTION CENTER



CONFERENCE SCHEDULE OVERVIEW

THURSDAY

Time	Function	Room
7:30 AM - 5:30 AM	Registration	
9:45 - 10:15 AM	Morning Break	
8:30 AM - 4:00 PM	Workshop 1	Caribbean VII
8:30 AM - 4:00 PM	Workshop 2	Boca I
8:30 AM - 4:00 PM	Workshop 3	Boca II
8:30 AM - 4:00 PM	Workshop 4	Boca III
8:30 AM - 4:00 PM	Workshop 5	Boca IV
4:00 - 5:00 PM	Committee Meetings/ Networking	
5:30 - 8:30 PM	Exhibitor Reception/ Poster Sessions	Boca V-VIII

FRIDAY

Time	Function	Room
7:00 - 8:00 AM	Breakfast	
7:30 AM - 5:30 PM	Registration	
8:00 - 9:45 AM	Morning General Session	Caribbean VI
9:45 - 10:05 AM	Morning Break	
10:05 - 11:50 AM	Morning General Session	Caribbean VI
11:25 - 11:50 AM	NHCA Business Meeting	
11:50 AM - 1:00 PM	Lunch Speaker Charles Spence	Caribbean III
1:20 - 3:00 PM	Afternoon General Session	Caribbean VI
3:00 - 3:30 PM	Afternoon Break	
3:30 - 4:30 PM	Afternoon General Session	Caribbean VI
4:30 - 5:00 PM	2018 Safe and Sound Awards	
5:00 - 6:15 PM	Committee Meetings/ Networking	
5:00 - 6:15 PM	Student Meet & Greet	
6:30 - 9:30 PM	Friday Night Event	Splitsville Luxury Lanes

SATURDAY

Time	Function	Room
7:00 AM - 5:30 PM	Registration	
7:00 AM - 7:45 PM	Exhibits/Poster Sessions	Boca V-VIII
7:45 - 8:45 AM	Breakfast Round Table Chats	
9:00 - 10:00 AM	Breakout Session 1 (Military/Firearms)	Boca I
9:00 - 10:00 AM	Breakout Session 2 (Impulse Noise)	Boca II
9:00 - 10:00 AM	Breakout Session 3 (Music)	Boca III
10:30 - 11:50 AM	Breakout Session 1 (Military/Firearms)	Boca I
10:30 - 11:50 AM	Breakout Session 4 (Prevention & Education)	Boca IV
11:50 AM - 1:05 PM	Awards Luncheon	Caribbean III
1:05 - 2:15 PM	Exhibits/Poster Sessions	Boca V-VIII
2:15 - 4:50 PM	Afternoon General Session	Caribbean VI
4:50 - 5:00 PM	Closing Remarks/ Safe Travels	Caribbean VI

NHCA LEADERSHIP

2017-2017 Executive Council

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Executive Director: **Amanda Rewerts**

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PRESIDENT'S WELCOME

On behalf of the National Hearing Conservation Association (NHCA) Executive Council and the members of the 2018 Conference Program Task Force, welcome to the 42nd annual NHCA conference. Our theme this year is "Happy Ears for Many Years" and over the next few days, hearing loss prevention experts from around the world will share new data, new ideas, and practical guidance, all focused on best practices for preserving healthy hearing function.

Rachel Bouserhal, our Conference Program Chair, and Edward Lobarinas, Program Chair Elect, have worked hard to put together a great program for you, with a wide range of workshops, posters, and podium sessions to bring you up to date on all of the current issues and current advances. The Conference Program Task Force has done an outstanding job putting together an interesting and informative program with a wealth of important information, tips, and tools to consider. I can't wait to get all charged up for the next year after seeing all the advances presented at conference.

For those of you who joined us for our pre-conference workshop, the line-up promised to be interesting and informative, with a repeat offering of the always popular A-to-Z coverage of "The Basics" and multiple advanced topics to choose from, such as "Audio for Audiologists," "Fit Testing," "Forensics and Expert Witnessing for the Acoustician-Audiologist-M.D.-Engineer," "Hidden Hearing Loss: The Good, the Bad, and the Ugly," "Suppressors: Hearing Protectors and Hearing Conservation," and "The Art of Presentation".

Now, we have a phenomenal general session to look forwards to.

Our Opening Key Note Lecture will be delivered by Jérémie Voix who is working to develop leading-edge technologies that combine in-ear hardware with advanced signal processing algorithms for a variety of applications, including not only digital hearing protection but also hearing aids and perhaps even brain-computer interfaces.

Our luncheon speaker this year is Charles Spence, who will spice up the day with a discussion about how the sounds you hear might make your food taste better.

Saturday morning starts with a bang with break-out sessions on the military and firearm noise, impulse noise, and music-induced hearing loss.

Another session to watch for is the Gasaway lecture, which will be delivered by Michael Santucci this year. This invited lecture is in honor of Donald C. Gasaway in recognition of his long and exemplary years of service and contributions to NHCA.

Last but not least, I hope you will all stay for our closing session, "What have we learned in the 10 years of the Safe-in-Sound awards?" which will be presented by Thais Morata and Deanna Meinke, who have been tireless in their efforts to develop and sustain this award program.

In between sessions, our Program Task Force has been careful to carve out breaks, and dedicated time for you to visit with our exhibitors and poster authors.

Our exhibitors have brought their most recent technologies here to share with you and give you a chance for hands-on experience with their products. Please make sure you visit them, and take time to thank them and all of the other conference sponsors who support the NHCA's efforts to be leading resource for hearing loss prevention.

As for posters, our poster line-up may have more depth and breadth than ever before. Over the next few days, you will have a chance to visit a record-setting number of poster presentations – some of which come from students who are new to NHCA, some of which come from new NHCA attendees, and some of which come from seasoned NHCA member presenters. With more than 30 posters covering a wide range of hearing loss prevention tools and topics, you will want to be sure you allow plenty of time to wander the posters and talk to the poster authors.

Those of you who have attended previous NHCA meetings know that our Friday Night event is a fun networking opportunity that should not be missed. If this is your first time attending NHCA, please do come join us. NHCA members are a welcoming group and you are sure to make some new friends as we gather together for bowling and dinner at Splitsville Luxury Lanes right in the heart of Disney Springs.

Thank you for joining us, and have a great time! **Colleen Le Prell** *NHCA President*

2018 SCHEDULE OF EVENTS

Thursday • February 15 • 2018

7:30 AM - 5:30 PM	Registration and Information Desk Open
7:30 AM - 8:30 AM	Breakfast
8:30 AM - 9:45 AM	Morning Workshops
9:45 AM - 10:15 AM	Morning Break
10:15 AM - 11:30 AM	Morning Workshops
11:30 AM - 1:00 PM	Lunch On Your Own
1:00 PM - 2:15 PM	Afternoon Workshops
2:15 PM - 2:45 PM	Afternoon Break
2:45 PM - 4:00 PM	Afternoon Workshops
4:00 PM - 5:00 PM	Committee Meetings / Networking
5:30 PM - 8:30 PM	Exhibitor's Reception
5:30 PM - 8:30 PM	Poster Session
Workshops *Please Remember to sign in on the sheets provided in each workshop*	
Workshop 1	
Full Day Workshop	Hearing Loss Prevention: The Basics *Presenters: Stephanie Sayler, James Jerome, Theresa Schulz, Mary McDaniel*
Workshop 2	
Full Day Workshop	Forensics and Expert Witnessing for the Acoustician - Audiologist - M.D. - Engineer *Presenter: John G. Casali*
Workshop 3	
Morning Workshop	The Art of Presentation *Presenter: Elliott Berger*
Afternoon Workshop	Audio Basics Workshop *Presenter: Benj Kanters*
Workshop 4	
Morning Workshop	Fit Testing *Presenter: William Murphy*
Workshop 5	
Morning Workshop	PSP Workshop
Afternoon Workshop	Suppressors, Hearing Protection and Hearing Conservation *Presenter: Ryan Lee Scott*

2018 SCHEDULE OF EVENTS

Friday • February 16 • 2018

7:00 AM - 5:30 PM	Registration Open
7:00 AM - 8:00 PM	Continental Breakfast
Morning General Session Agenda	
8:00 AM - 8:15 AM	Welcome and Opening Remarks
8:15 AM - 8: 45AM	**KEYNOTE PRESENTATION:** The Ear Beyond Hearing: From Digital Earplugs to In-Ear Brain Computer Interfaces *Presenter: Jeremie Voix*
8:45 AM - 9:05 AM	Knowing Your Noise Can Change Attitudes to Hearing Health and Increase Likelihood of Healthy Hearing Behaviours: Evaluation of a HEARsmart Project *Presenter: Elizabeth Beach*
9:05 AM - 9:25AM	Hidden Hearing Loss? Effects of Recreational Noise on Evoked Potential Amplitude and Other Auditory Test Metrics *Presenter: Colleen Le Prell*
9:25 AM - 9:45 AM	Bringing Best Practices in Hearing Conservation to a Wider Audience *Presenter: Ted Madison*
9:45 AM - 10:05 AM	**BREAK**
10:05 AM - 10:25 AM	Hearing Conservation Program Costs and Effectiveness *Presenter: Rick Neitzel*
10:25 AM - 10:45 AM	Learning to Localize with Advanced Hearing Protectors and TCAPS Can Equivalent Open Ear Performance ever be Reached and How? *Presenter: Kichol Lee*
10:45 AM - 11:05 AM	Localization of Reverse Alarms with Passive and Level-Dependent Hearing Protectors *Presenter: Chantal Laroche*
11:05 AM - 11:25 AM	Hearing Protector Attenuation and Noise Exposure Among Metal Manufacturing Workers *Presenter: Stephanie K. Sayler*
11:25 AM - 11:50 AM	NHCA Business Meeting
11:50 AM -1:00 PM	**SPEAKER LUNCHEON - CHARLES SPENCE** ***SOUND BITES & SONIC SEASONING***

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2018 SCHEDULE OF EVENTS

Friday • February 16 • 2018

Afternoon General Session Agenda	
1:20 PM - 2:20 PM	The "Make Listening Safe" Campaign by the World Health Organization (WHO): Considerations and Recommendations *Presenters: Rick Neitzel, Brian Fligor, Deanna Meinke. Facilitator: Colleen G. Le Prell*
2:20 PM - 2:40 PM	Loudness in the Occluded Ear Canal: Are We Still Missing 6dB? *Presenter: Fabien Bonnet*
2:40 PM- 3:00 PM	Ambient Noise in the Sound Booth During Audiometry *Presenter: Gregory Flamme*
3:00 PM - 3:30 PM	**BREAK**
3:30 PM - 3:50 PM	Kids Nowadays Hear Better Than We Did *Presenter: Robert A Dobie*
3:50 PM - 4:10 PM	Evolution of the FitCheck! Hearing Protection Device (HPD) Field Attenuation Estimation System (FAES) *Presenter: William A. Ahroon*
4:10 PM - 4:30 PM	Validation of Clinical Techniques for Verification of Uniform Attenuation Earplugs *Presenter: Cory Portnuff*
4:30 PM - 5:00 PM	**Safe-in-Sound Excellence in Hearing Loss Prevention Awards**
5:00 PM - 6:15 PM	Break/Committee Meetings/Networking Time
5:00 PM - 6:15 PM	Student Only Meet and Greet
6:30 PM -9:30 PM	**FRIDAY NIGHT EVENT**

2018 FRIDAY NIGHT EVENT

Friday, February 16 • 6:30 - 9:30 PM

Splitsville LUXURY LANES™

It's a whole new spin on bowling! Splitsville Luxury Lanes™ is a two-story, 50,000 square-foot bowling and dining complex located in the heart of Disney Spring's West Side® at the Walt Disney World Resort.

Splitsville's atmosphere is a rare combination of upscale and nostalgic feel which is the perfect place for your party with 30 luxury bowling lanes, billiards, live entertainment, and ample indoor and outdoor seating. Splitsville is an energetic yet comfortable atmosphere that can handle parties up to 1500 guests.

It doesn't stop there! Splitsville offers an eclectic menu that features everything from fresh-rolled sushi to traditional favorites like mouth-watering cheeseburgers and hand-tossed pizzas.

Splitsville is the perfect experience for convention buyouts, cocktail receptions, corporate team-building events, and kids parties, so get ready to ROLL IN and ROCK OUT for your next event!

We hope to have a fun time at Splitsville enjoying the night networking among colleagues

2018 SCHEDULE OF EVENTS

Saturday • February 17 • 2018

7:00 AM - 5:30 PM	Registration and Information Desk Open
7:00 AM - 7:45 AM	**EXHIBITS / POSTER SESSION**
7:45 AM - 8:45 AM	**BREAKFAST ROUND TABLE CHATS**
8:45 AM - 8:55 AM	Interim Break

Breakout Session #1:	**Breakout Session #2:**	**Breakout Session #3:**
Boca I	Boca II	Boca III
Military / Firearms	Impulse Noise	Music
9:00 AM – 9:20 AM		
Risk Factors Associated with Tinnitus, and Hearing Loss in Current and Recently Separated Service Members Across Military Branches *Presenter: James A. Henry*	Laboratory Conditioning of Middle Ear Muscle Contractions *Presenter: Gregory Flamme*	Musicians with Conventional Noise Notches Have Poorer Extended High Frequency Sensitivity *Presenter: Heather Malyuk*
9:20 AM – 9:40 AM		
Landing On The Roof - Revisited *Presenter: Kurt Yankaskas*	Generalizability of Clinically-Measured Acoustic Reflexes to Brief Sounds *Presenter: Kristy K. Deiters*	OSHA Meets NIHL Music Venue Sited as Occupational Hearing Hazard The Challenge of Being a Hearing Conscious Sound Engineer *Presenter: Benj Kanters*
9:40 AM – 10:00 AM		
Auditory Hazards of Bullet N-wave Exposure *Presenter: Gregory Flamme*	Estimating Personnel Noise Exposure from Impulsive Noise When Hearing Protection Devices are Worn: IPIL vs. NRSA *Presenter: Hillary Gallagher*	An Exploratory Survey of Sound Levels in New York City Restaurants and Bars *Presenter: Greg Farmer*
10:00 AM – 10:30 AM - Break		

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2018 SCHEDULE OF EVENTS

Saturday • February 17 • 2018

Breakout Session #1:	Breakout Session #4:
Boca I	Boca IV
Military / Firearms	Prevention and Education
10:30 AM – 10:50 AM	
Noise Control on US Navy Aircraft Carriers - Methodology and Results *Presenter: Jeffery M. Kromwer*	Continuous Monitoring of Otoacoustic Emissions: A Tool to Prevent Hearing Loss *Presenter: Vincent Nadon*
10:50 AM – 11:10 AM	
MILSINT: Development of a Military Sound Recognition in Noise *Presenter: Jennifer Tufts*	Visit Whisperwell and Explore the "Song of the Star Bird" *Presenter: Deanna K. Meinke*
11:10 AM – 11:30 AM	
The Attenuation of Firearm Suppressors as a Function of Angle and Bullet Velocity *Presenter: William J. Murphy*	Jolene's Musical Instrument Adventure *Presenter: Cameron J. Fackler*
11:30 AM – 11:50 AM	
Extended High Frequency Pure Tone Audiometric Outcomes in Youth Firearm Users *Presenter: Shana Laffoon*	Centers for Disease Control and Prevention Efforts in Preventing Non-Work Related Hearing Loss *Presenter: Yulia Carroll*

11:50 AM - 1:05 PM	**HOSTED LUNCHEON AND AWARDS**
1:05 PM - 2:15 PM	Exhibit Hall and Posters
2:15 PM - 2:45 PM	**GASEWAY LECTURE - Michael Santutcci**
2:45 PM -3:05 PM	Numerical Modeling of the Ear Canal: Benefits and Challenges *Presenter: Guilhem Viallet*
3:05 PM- 3:25 PM	Experimental Validation of an Impedance Tube Measurement Method for Assessing Earplugs Insertion Loss *Presenter: Kevin Carillo*
3:25 PM - 3:50 PM	**BREAK**
3:50 PM - 4:10 PM	The Department of Defense Comprehensive Hearing Health Program: A Pilot Study *Presenter: John A. Merkley, Co-Presenter: Tanisha Hammill*
4:10 PM - 4:30 PM	Cardiovascular Conditions, Hearing Difficulty, and Occupational Noise Exposure within U.S. Industries and Occupations *Presenter: Elizabeth A. Masterson*
4:30 PM - 4:50 PM	What Have We Learned in the 10 Years of the Safe-in-Sound Awards? *Presenter: Thais C. Morata*
4:50 PM - 5:00 PM	**CLOSING REMARKS**

THANK YOU TO OUR DONORS

Elliott Berger and Ann Sharp
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Michael Stewart
Student Conference Award Donation

THANK YOU TO OUR EXHIBITORS

3M Science. Applied to Life.™

It is critical to select hearing protectors that your employees are motivated to wear. 3M has a broad selection of hearing protectors for a wide range of environments. Trouble fitting your earplugs? Need to communicate in noise? Dirty Hands? Hot, humid conditions? These are just a few of the many challenges that 3M's innovative products can help solve for you. Our products are designed for extended wear and comfort to help you prevent noise-induced hearing loss on the job.

BENSON

Benson Medical Instruments Co. designs and manufactures audiometers, spirometers, earplug fit testers, and software to manage hearing conservation and occupational spirometry programs for companies. The CCF-200 Fit Test verifies employees' earplug effectiveness. The CCF-200 integrates earplug fit testing into the annual hearing testing process, allowing for multiple subjects to be tested at one time. Moreover, the CCF-200 Fit Test can be used with a wide variety of earplugs. The CCF-200 is available in several configurations. The HIPAA-compliant Benson Cloud Services data management system features queries to easily access data, OSHA/MSHA required reports with color, STS analysis and more.

Shoe BOX AUDIOMETRY

SHOEBOX Audiometry is the world's first automated iPad audiometer optimized – and clinically validated – for use outside of a sound booth. Comprised of an iPad, software, calibrated transducers, and a web-based data management system, SHOEBOX is a complete solution for Occupational Hearing Conservation Programs. It conforms to the current ANSI S3.6 standards of a diagnostic audiometer and can be used in an OSHA-compliant workflow to help you meet your specific reporting needs. Whether your program is managed in-house, or you are a service provider interested in augmenting your mobile clinic, SHOEBOX Audiometry is revolutionizing audiometric testing. Come see us at Booth 2 for a demonstration.

National Institute for Occupational Safety and Health NIOSH

The Occupational Safety and Health Act of 1970 established NIOSH. NIOSH is part of the U.S. Centers for Disease Control and Prevention, in the U.S. Department of Health and Human Services. It has the mandate to assure "every man and woman in the Nation safe and healthful working conditions and to preserve our human resources." NIOSH has more than 1,300 employees from a diverse set of fields including epidemiology, medicine, nursing, industrial hygiene, safety, psychology, chemistry, statistics, economics, and many branches of engineering. NIOSH works closely with the Occupational Safety and Health Administration (OSHA) and the Mine Safety and Health Administration in the U.S. Department of Labor to protect American workers and miners.

ViAcoustics

ViAcoustics provides software and systems for acoustic measurement, hearing protector testing and audiometric research applications using National Instruments hardware, transducers and fixtures from GRAS Sound and Vibration, and audiometric test booths from our partners at ETS-Lindgren.

TREMETRICS®

Tremetrics designs and manufactures a complete line of innovative hearing/health testing equipment including multimedia and microprocessor audiometers, space-saving mobile testing systems, hearing test booths and health database management software. www.tremetrics.com or call (800) 825-0121.

THANK YOU TO OUR EXHIBITORS

The CDC's National Center for Environmental Health prevents and controls diseases and injuries; provides information on critical health issues; and promotes healthy living. The Agency for Toxic Substances and Disease Registry evaluates the health effects of exposure to hazardous substances at sites on the Environmental Protection Agency's National Priorities List and other sites when petitioned.

Etymotic Research, Inc. was founded by Mead Killion, Ph.D., in 1983 to design products to assess, enhance, and protect hearing. Hearing conservation is central to Etymotic's mission. Etymotic has over 100 patents issued and pending, and is a Safe-in-Sound award winner.

The Council for Accreditation in Occupational Hearing Conservation (CAOHC) is a professional organization dedicated to providing consumer safety and protection by offering credentialing to those working to prevent noise-induced hearing loss.

Sensidyne's Svantek sound and vibration instruments are designed with professional users in mind. Specifications and features are designed around their requirements. Components are carefully selected to meet strict quality specifications. Software puts the user in full control of their instrument and maximizes its capability. The results are precision instruments ready for use in industry, engineering, safety, and environmental measurements. Sensidyne also manufactures and distributes gas detection, air sampling instrumentation and gas detection tubes.

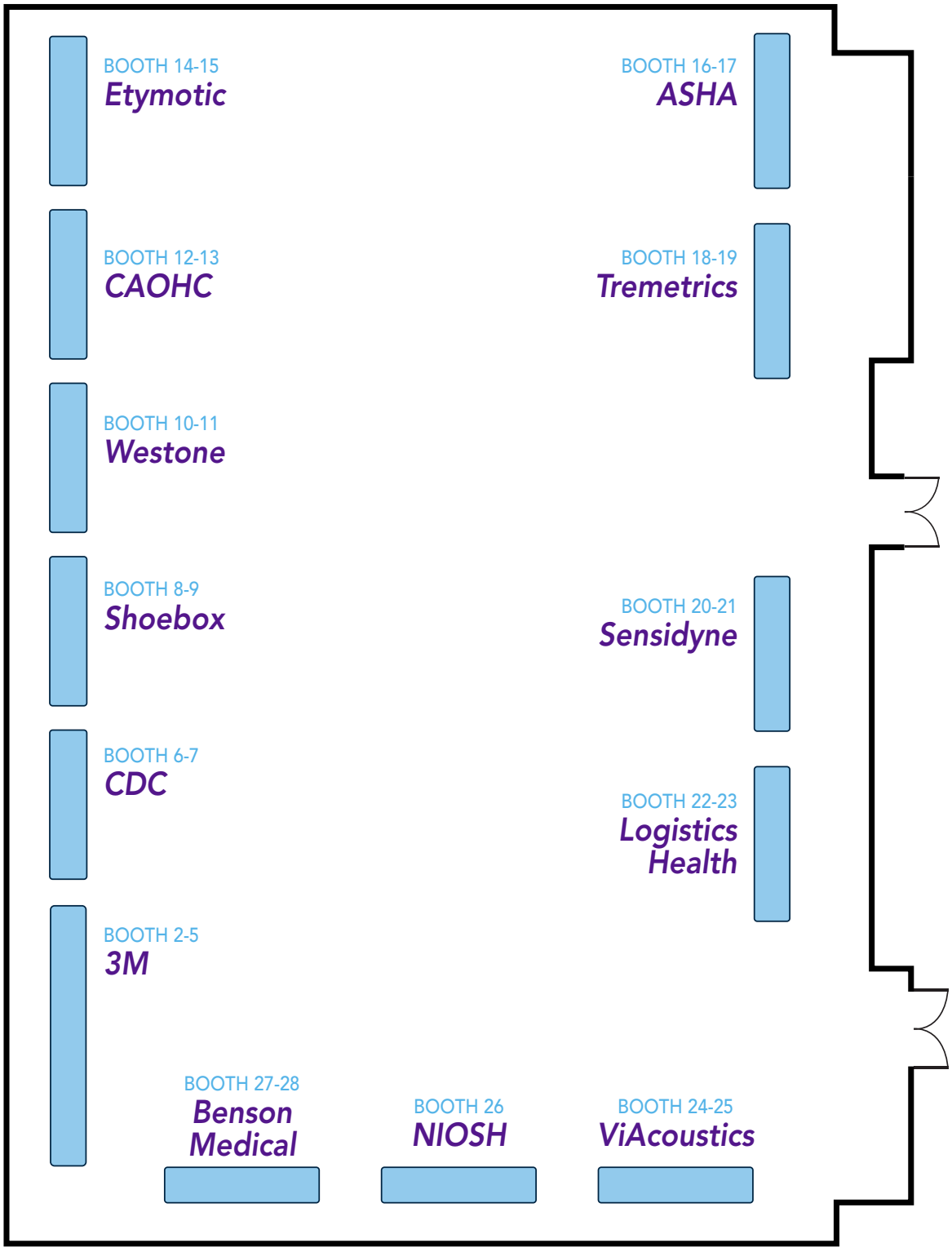
Established in 1959, Westone Laboratories has more than 55 years of experience delivering premium in-ear solutions for critical listening applications. Westone is the largest manufacturer of custom ear pieces in the world and was the first to design and manufacture a balanced armature driver earphone. With hearing healthcare and music specialists on our research and production teams, Westone invented the most ergonomic monitor design which provides the most comfortable, best fitting and quietest earphones on the market. The largest names in music turn to Westone in-ear monitors for on-stage use, just as U.S. Air Force fighter pilots depend on Westone's ACCES® in-ear communications system for mission-critical noise isolation, hearing protection and two-way communication. It is our experience, our products, and our people that make Westone The In-Ear Experts®

The NIDCD supports and conducts research and research training on the normal and disordered processes of hearing, balance, taste, smell, voice, speech, and language and also provides health information, based upon scientific discovery, to the public.

American Speech-Language-Hearing Association: Over 14,000 ASHA certified audiologists provide research, hearing conservation, diagnostic and rehabilitative services for individuals hearing loss and /or balance disorders.

EXHIBITOR BOOTH LAYOUT

BOCA V-VIII



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3M™ E-A-R™ Hearing Loss Prevention Seminars

Best practices in hearing loss prevention

Join 3M experts in hearing loss prevention for a free, full-day educational seminar. Designed to meet the continuing education requirements of safety, industrial hygiene and occupational health nursing professionals.

Learn best practice approach and latest research findings on:

- Noise monitoring
- Audiometry
- Noise-induced hearing loss
- Hearing protection selection
- Fit testing of hearing protection
- Communication in noise

2018 Scheduled Cities:
Anaheim, CA - February 8
Memphis, TN - April 12
Charlotte, NC - May 1
Detroit, MI - September 12
Philadelphia, PA - October 4
Kansas City, MO - November 6

Space is limited - registration begins one month prior to the event.

For details visit www.3M.com/HearingSeminars

OUTSTANDING HEARING CONSERVATIONIST AWARD

Established in 1990, the Award for Outstanding Contributions to the Field of Hearing Conservation is bestowed on a person whose work is exemplary in our field. It is the pleasure of the National Hearing Conservation Association to announce that this year's award recipient is Deanna K. Meinke, Ph.D., for leadership in hearing loss prevention, outstanding research, programmatic influence, presentations, publications, and her elevation of the awareness of hearing conservation.

The breadth and depth of Deanna's involvement in hearing loss prevention is truly phenomenal and our hope is to give you a sense of that in these few short words. However, what makes her accomplishments and contributions even more impactful is her kindness and generosity, and the smiles and laughter that accompany so much of who she is and what she does. Deanna is not only an exceptional scientist but also an extraordinary human being.

Although encomia often begin with citations of the awardee's notable research, with Deanna it is apt to commence by discussing her extensive mentoring and involvement with students of all ages. This includes more than 60 graduate and undergraduate students from Colorado to Singapore, and from Michigan to South Africa, as well as numerous children and parents who have participated in her research and whom she has touched and educated through her efforts. Her love for working with others is apparent from the moment you meet her. It was clearly exemplified by her 2014 NHCA Don Gasaway lecture, Of Chainsaws and Raindrops, featuring the diversity of friends, students, people, places, and events that fill her life, as she simultaneously teaches, informs, and befriends them, and in so doing expands her own understanding of human nature and safe listening practices.

Deanna has a passion for hearing loss prevention. Married to a professional tree trimmer who is an avid hunter, Deanna's experience with noise-induced hearing loss is personal, as well as clinical. Whereas some award-winning authorities primarily concentrate on publications and conferences, Deanna's contributions directly impact a much broader community, through her efforts to save other people from experiencing the disabling effects of hazardous noise. This is especially true in her work with children, whether on a tractor, a shooting range, or in a classroom. A notable example has been her collaboration with colleagues from the Oregon Health Sciences University, Portland State University and the National University of Singapore in creating and managing the Dangerous Decibels® program. It engages children in public health education in a way that is enjoyable, informative, and evidence-based.

Dangerous Decibels began as a K-12 classroom hearing health intervention program and expanded to include two-day training workshops for educators. A museum exhibit about the auditory system and safe listening practices was subsequently developed with the Oregon Museum of Science and Industry. This highly successful program has been implemented in community based interventions with Native American cultures. The key messages reach the adults through the activities and teachings for their children. Amazingly, the Dangerous Decibels program has even been repackaged and incorporated into hearing conservation education for the New Zealand military; it turns out, it isn't just effective for children. It has been adapted/translated to educate children in other countries – notably Brazil and Singapore. Such success was facilitated by Deanna's grasp of health communication theory, and by her dedication and talent for disseminating a program that could be translated and understood by diverse audiences.

Of equal significance for children as her work with the Dangerous Decibels program, has been Deanna's creative and tireless efforts to popularize Jolene, an inexpensive acoustical manikin. Jolene can not only be used by audiologists and other educators to inform the public regarding safe music listening levels, but there is a Jolene Cookbook that teaches youth how to create their own Jolene as a learning project. As of this writing Jolene manikins have been constructed in 41 countries, 50 states and 3 U.S. territories, and she has also been crafted into a permanent museum exhibition at the Musical Instrument Museum of Phoenix, AZ.

In June of 2017, the Centers for Disease Control and Prevention's, Public Health Grand Rounds focused on communicating to physicians and health professionals about issues related to excessive noise exposure. Deanna was invited to be one of four presenters. Her message was on the risk for hearing loss among adolescents – the group for whom Dangerous Decibels was

originally developed. The CDC Public Health Grand Rounds reached more than 50,000 persons.

One of Deanna's many strengths is her ability to make connections with and between people. Upon recognizing a gap in the literature on noise-induced hearing loss and recreational firearms, she teamed up with several members of NHCA to address the problem. Thus, through Deanna's leadership, the Rudyard Gang was formed, resulting in definitive research and many interesting stories. Deanna's work as a member of NHCA's Task Force on Prevention of Noise Induced Hearing Loss from Firearm Noise enabled the group to conduct the first test of the American National Standard Institute's ANSI S12.42 method to assess the performance of hearing protectors in the field with firearm noise. The task force work led to important publications, including Impulse noise generated by starter pistols, Auditory risk estimates for hearing loss for youth target shooting, and the NHCA's Position Statement on Recreational Firearm Noise. These documents inform audiologists and hearing conservation professionals who deal with clients and patients that suffer from noise induced hearing loss. Without Deanna's guidance and her perspective on audiology, these significant and influential papers would not have been published.

Deanna Meinke is not only innovative – she is fearless. Today we are faced with new technologies that are reshaping the educational system and scientific publishing. While this scenario intimidates many, Deanna critically evaluates the opportunities it offers and implements creative approaches to benefit from this technological wave. A recent example was her use of a teaching platform created by the Wiki Education Foundation to encourage students to not only read Wikipedia, but to also author their own content. Her students contributed to 15 existing Wikipedia pages (related to hearing conservation topics) that were viewed by more than 320,000 readers during the semester. Furthermore, her students reported they were motivated and derived more satisfaction as compared to traditional writing assignments, and indicated that they learned to navigate the internet more judiciously.

Beyond her many accomplishments enumerated thus far, Deanna is also a respected research audiologist, at times addressing topics heretofore unexplored in the literature, and ones that she is uniquely capable of handling. For example – how much protection can a 5 10 year-old child shooting a gun obtain with a foam earplug or an earmuff, when fitted by her or himself, or a parent? Questions such as these, of great importance to the public at large, are now answered, thanks to Deanna.

In a more conventional vein, we can report that Deanna is a co-editor of Roeser's Audiology Desk Reference and the lead editor of the upcoming 6th Edition of the AIHA Noise Manual. She is the author of more than 30 publications in peer-reviewed journals, more than 30 articles in non-peer reviewed magazines or proceedings, and more than 40 articles in electronic format. She is a skilled presenter having conducted over 60 workshops on a range of topics and more than 110 scientific presentations at conferences, and she has served as a peer reviewer for 20 professional journals. As an academic researcher, she has been successful in applying for several grants with the University, State and Federal funding agencies, and was just named the 2018 recipient of the A. M. & Jo Winchester Distinguished Scholar at the University of Northern Colorado, for her scholarship, creative works, peer recognition, and grant and contract activity.

Deanna grasps the big picture. When the aspiration is to raise hearing loss prevention awareness and effectiveness, not only must a researcher provide insights, but of equal significance is recognition and selfless promotion of the efforts of others. This she did from 2006 through 2017 as a founding member and the first chair of the NIOSH/NHCA Safe in-Sound and Excellence in Hearing Loss Prevention Award™ that annually honors excellence in workplace programs and innovators who have led the field.

In reviewing Deanna's extensive vitae, we were amazed and led to wonder: has she discovered how to extend her workday past 24 hours? Beyond the many accomplishments summarized above, she has consulted for and or been involved in projects as diverse as strategic planning for World Health Organization initiatives on hearing loss, to questions raised by the National Basketball Association on the noise exposures of their officials. And of course, our own NHCA has been the appreciative recipient of her services. She was our president from 2008-2009, was recognized with the Michael Beall Threadgill award for meritorious service in 2010, received seven Golden Lobe Awards, has been honored with our outstanding poster and lecture awards, and has led important NHCA task forces, most notably, the NHCA Task Force on Children in Noise, which paved the way for her immersion into Dangerous Decibels. Together with Billy Martin, Deanna organized and produced the first-ever scientific conference targeted at noise-related hearing loss in children, called "Noise-Induced Hearing Loss in Children at Work and Play," in 2006. This was a phenomenal collaboration between NIOSH, NIDCD, NHCA and multiple other partners.

Dr. Deanna Meinke's accomplishments have made indelible contributions to hearing loss prevention in all walks of life and especially to the National Hearing Conservation Association. She is one of those honorees who not only deserves NHCA Outstanding Hearing Conservationist Award, but increases its luster by being counted as one of its recipients. She is a foremost scholar, a mentor, a friend to many, and a shining example of kindness, grace, and what other scientists may aspire to become.

Elliott H. Berger *Division Scientist*

William J. Murphy, CAPT. *U.S. Public Health Service*

Laurie L. Wells *Senior Regulatory Affairs Specialist*

SAFE·IN·SOUND
EXCELLENCE IN HEARING LOSS PREVENTION AWARD

Safe-in-Sound Award™ Winner

Tactical Communications and Protective Systems (TCAPS) Program of Record - PEO Soldier, US Army

The U.S. Army's Tactical Communications and Protective System program supports the mission of the Program Executive Office – Soldier (known as PEO-Soldier) to develop, acquire, field, and sustain affordable integrated state-of-the-art equipment to US Army operations.

Safe-in-Sound Award™ Presenter

Scott Schneider

C.I.H. • Laborers' Health and Safety Fund of North America

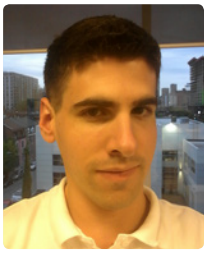
Scott Schneider is a Certified Industrial Hygienist. He has worked on occupational safety and health issues in the Labor movement for the past 37 years. He worked for the Carpenters Union, the Workers' Institute for Safety and Health (WISH), the Center for Construction Research and Training (CPWR) and the Laborers' Health and Safety Fund of North America (LHSFNA), from which he recently retired. Over his career he has helped develop standards to protect workers from Asbestos and Silica, fought to protect workers from noise exposure and ergonomic injuries as well as in areas such as work zone safety, fall prevention and improving safety climate in construction. He is a Fellow member of the American Industrial Hygiene Association and was awarded the William Steiger award by the American Conference of Governmental Industrial Hygienists (ACGIH) for his contributions to the field.

2018 STUDENT CONFERENCE AWARD WINNERS

Fabien Bonnet

After receiving a Master's Degree in Mechanical Engineering from the University of Technology of Compiègne (France, 2013), Fabien made a short stop in England where he worked as an Acoustics Consultant (URS Corporation, July 2013 - December 2014). Then his taste for Research caught up with him and brought him to Montreal where he still remains close to Acoustics, his true passion. As a PhD candidate, Fabien aims the development of an in-ear dosimetric method to help prevent noise-induced hearing loss in the work environment.

Kevin Carillo



Mechanical engineer specializing in vibratory and acoustic comfort, I am currently doing a Ph. D. in the Acoustics Laboratory ICAR (Infrastructure Commune en Acoustique pour la Recherche) at ETS (École de technologie supérieure). The field of application of my research concerns hearing protection. In particular, I study foam plugs at the macroscopic and microscopic level. The objective is to optimize their properties (material and geometry) in order to improve their noise attenuation and to minimize their occlusion effect (amplification of physiological noise at low frequencies). In parallel, an alternative method for assessing their noise attenuation has been validated.

Tess Zaccardi

Tess is a second year audiology student at the University of Texas at Dallas. Since attending the University of Florida for her undergraduate degree in Communication Sciences and Disorders, she has been assisting Dr. Colleen G. Le Prell with research projects related to hearing conservation. During her graduate studies, she has had the opportunity to build upon those research experiences and work in an industrial hearing conservation program through a clinical rotation at Lockheed Martin with Ms. Lori Prince. Tess has a passion for live music and is interested in incorporating hearing conservation in her career after graduating with her Au.D. in 2020.

2018-19 STUDENT RESEARCH AWARD WINNERS

Sarah Grinn

Dr. Grinn holds an Au.D. from the University of Florida, a bachelor s degree in CSD from Michigan State University, and is currently a Ph.D. student at The University of Texas at Dallas. Dr. Grinn has been part of audiology research teams at all 3 universities in the areas of hearing conservation and auditory perception, and aims to hold audiology leadership positions in the clinic, classroom, and laboratory. She is committed to active participation in the legislative processes that shape the scope of audiology, the gold-standards of evidence-based clinical care, and the protection of populations at risk for the development of noise induced hearing loss.

Shana Laffoon

Shana Laffoon is an audiology student at Central Michigan University. Her research interests are in the area of hearing conservation with firearm users. She is currently completing her third year in the program and is looking forward an exciting career in audiology, wherein she hopes to own a private practice.

FINANCIAL DISCLOSURES

Adriana Bender Moreira de Lacerda	No Financial Information to disclose
Angelique Scharine	No Financial Information to disclose
Antoine Bernier	No Financial Information to disclose
Benj Kanters	No Financial Information to disclose
Caleb Kronen	No Financial Information to disclose
Cameron J. Fackler	Financial - Receives a salary for employment
Chantal Laroche	No Financial Information to disclose
Cheng-Yu Ho	No Financial Information to disclose
Christa L. Themann	Financial - Receive salary for employment
Christina Hederstierna	No Financial Information to disclose
Cody Blankenship	Financial - Grants
Colleen Le Prell	No Financial Information to disclose
Cory Portnuff	No Financial Information to disclose
Deanna K. Meinke	No Financial Information to disclose
Dennis P. Driscoll	No Financial Information to disclose
Donald S. Finan	No Financial Information to disclose
Douglas N. Callen	No Financial Information to disclose
Elizabeth A. Masterson	No Financial Information to disclose
Elizabeth Beach	No Financial Information to disclose
Elliott H. Berger	Financial - Receives a salary for employment as well as ownership interest
Elon Ullman	No Financial Information to disclose
Esma Idrizbegovic	No Financial Information to disclose
Fabien Bonnet	No Financial Information to disclose
Greg Farber	No Financial Information to disclose
Gregory A. Flamme	Financial - Co-Investigator on research grant
Guilhem Viallet	No Financial Information to disclose
Hannah Speaks	No Financial Information to disclose
Heather Malyuk	No Financial Information to disclose
Hilary Gallagher	No Financial Information to disclose
James A. Henry	Financial - Employment grants
James Jerome	No Financial Information to disclose
Jan Allison Moore	No Financial Information to disclose
Jeffrey M. Komrower	No Financial Information to disclose
Jennifer Tufts	Financial - Independent Contractor research grant
Jeremie Voix	No Financial Information to disclose
John A. Merkley	No Financial Information to disclose
John Eichwald	No Financial Information to disclose
John G. Casali	No Financial Information to disclose
Kaitlin Palmer	No Financial Information to disclose
Kan Sun	No Financial Information to disclose
Karin L. Adams	No Financial Information to disclose
Kathy E. Gates	No Financial Information to disclose
Kelly Watts	Financial - Receives salary for employment Non Financial - member of ASHA
Kevin Carrillo	No Financial Information to disclose
Kevin Kock	No Financial Information to disclose
Khalid M. Khan	No Financial Information to disclose
Kichol Lee	No Financial Information to disclose
Kori Zedaker	No Financial Information to disclose
Kristy K. Deiters	Financial - Co-Investigator on research grant
Kurt Yankaskas	No Financial Information to disclose
Laurie Wells	Financial - Receives a salary for employment as well as ownership interest. Non - financial, CAOHC chair, board member
Madeline V. Smith	Financial - Paid research assistant on reseach grant
Marjorie C. McCullagh	No Financial Information to disclose
Mary McDaniel	No Financial Information to disclose
Per Muhr	No Financial Information to disclose
Rick Neitzel	No Financial Information to disclose
Robert A. Dobie	No Financial Information to disclose
Ryan Scott	No Financial Information to disclose
Sarah K. Grinn	No Financial Information to disclose
Shana Laffoon	No Financial Information to disclose
Sherilyn M. Adler	No Financial Information to disclose
Stephanie K. Sayler	No Financial Information to disclose
Stephanie M. Fleckenstein	No Financial Information to disclose
Stephen M. Tasko	Financial - Co-Investigator on research grant
Sylvanna Lauren Bielko	No Financial Information to disclose
Ted Madison	Financial - Receives salary for employment and travel expenses
Teresa Maria Momensohn-Santos	No Financial Information to disclose
Tess Alexandra Zaccardi	No Financial Information to disclose
Thais C. Morata	No Financial Information to disclose
Ulf Rosenhall	No Financial Information to disclose
Vickie L. Tuten	No Financial Information to disclose
Vincent Nadon	No Financial Information to disclose
William A. Ahroon	No Financial Information to disclose
William J. Murphy	No Financial Information to disclose
Yulia Carroll	No Financial Information to disclose
Diane Bachman	No Financial Information to disclose
Theresa Schulz	No Financial Information to disclose
Catherince Conely	No Financial Information to disclose

WORKSHOP ABSTRACTS

WORKSHOP 1

Hearing Loss Prevention: The Basics

Thursday • Full Day Workshop

Noise Measurement and Instrumentation

Thursday • 8:30 AM

Presenter: Stephanie Sayler

This presentation provides an overview of the principles of noise measurements. It includes descriptions of acoustical instrumentation, types of noise surveys, noise exposure criteria, details of hearing conservation surveys, and an overview of the principles of noise control.

The Audiogram

Thursday • 10:15 AM

Presenter: James Jerome

- Identify a standard threshold shift.
- Discuss factors that threaten achieving a valid audiogram result
- Discuss strategies for follow-up of abnormal audiograms.

Hearing Loss Recordability

Thursday • 11:00 AM

Presenter: Diane Bachman

Identification of work-related hearing loss has long been one of the most complicated and controversial areas of government-mandated injury/illness recordkeeping. This workshop presentation will focus on the basic requirements of MSHA, OSHA and FRA recordkeeping regulations, as well as implications for professional review of audiograms and determination of work-relatedness. Although compliance with recordkeeping rules are important to the ultimate goal of tracking incidence of work-related hearing loss, emphasis will also be placed on best practices for an effective hearing loss prevention program.

Effective Hearing Protection

Thursday • 2:15 PM

Presenter: Theresa Schulz

- Identify types of hearing protectors
- Regulatory requirements, appropriate fitting procedures and techniques, and NRR rating system

Education and Motivation

Thursday • 2:45 PM

Presenter: Catherine Conely

This session discusses regulatory requirements for hearing conservation education, expands upon ways to make education more effective, and delves into factors which can impact employee safety practices in the workplace.

Hearing Conservation Regulations

Thursday • 3:30 PM

Presenter: Mary McDaniel

- Overview of the Health Insurance Portability and Accountability Act (HIPAA) as it relates to the hearing conservation provider
- Recordkeeping, maintaining compliance, and available resources
- Hearing Conservation Regulations including recordability differences between MSHA and OSHA

WORKSHOP ABSTRACTS

WORKSHOP 2

Forensics and Expert Witnessing for the Acoustician - Audiologist - M.D. - Engineer

Thursday • Full Day Workshop

Presenter: John G. Casali

Co-Presenters: Robert A. Dobie, Dennis P. Driscoll, Michael F. Seidemann

This workshop was last taught at NHCA in 2013; it has been updated for 2018 by the 4 original presenters, who represent the fields of audiology, otolaryngology, engineering acoustics, and human factors engineering/safety. Attendees will be briefly exposed to the many roles of acousticians, audiologists, M.D.'s, and engineers who serve as expert witnesses for the "triers-of-fact" in civil and criminal court, arbitration, worker's compensation hearings, government/public hearings, and patent office actions. Examples from actual cases will cover, in brief: product and premises liability, personal injury, worker's compensation, intellectual property litigation, and criminal litigation. An emphasis will be placed on provision of practical guidance for expert witnesses, including: ethical issues, court procedural issues, tort law, burden of proof, comparative vs. contributory negligence, evidentiary discovery issues, depositions, written report preparation (especially for Federal Rule 26), direct- and cross-examination, and business aspects. Upon completion of this workshop, the attendee can make a very informed decision about whether expert witnessing is a professional role of interest for him or her, and understand how to approach that role.

WORKSHOP 3

The Art of Presentation

Thursday • Morning Workshop

Presenter: Elliott Berger

In a world where YouTube videos, TED talks, and other engaging content is in the palm of our hand and a finger flick away, we as speakers need to raise our bar. Imagine: you have just invented the world's best foam earplug, or perhaps you have succeeded in identifying the relationship between an otoprotectant and a particular type of noise exposure that may lead to better hearing loss prevention for millions. And now, unless you can effectively communicate that information to others, it comes to naught. Indeed, a memo, an email, or written documentation is important, but public speaking brings with it a more powerful tool set. When as listeners we peer into a speaker's eyes, hear their tone of voice, sense vulnerability, intelligence, or most importantly passion, communication is transformed to a new level. Instead, we often sit numbed or confused, by cluttered bullet point slides, tedious indecipherable charts, or a lackluster presenter who is uncomfortable or ill prepared. Come join award winning presenter, Elliott Berger, as he discusses the "laws of public speaking," engages the audience with kinetic learning and polling software, and shares his insights from over 40 years of both observing and presenting lectures in venues around the world.

Audio Basics Workshop - The Audio Technologies of Hearing and Hearing Conservation Explained

Thursday • Afternoon Workshop

Presenter: Benj Kanters

The HearTomorrow Audio Basics Workshop will teach audio and audio system theory to professionals in the hearing science industries in much the same way as the Hearing Conservation Workshop teaches hearing physiology and conservation to audio and music professionals: use the language and mindset of one field to teach the other. The workshop will cover topics pertinent

WORKSHOP ABSTRACTS

to hearing, hearing assist and hearing conservation technologies: Microphones & Loudspeakers, Analog vs Digital signals and circuits, and signal processing (frequency, dynamic and time-based). Wherever possible, audio principles will be explained using the language and theories of hearing physiology, psychoacoustics and cognition.

WORKSHOP 4

Hearing Protector Fit-Testing

Thursday • Morning Workshop

Presenter: William Murphy

For over 30 years, hearing conservation professionals have known that the Noise Reduction Rating is not necessarily representative of the protection afforded to the average user of hearing protection. NIOSH developed one of the earliest fit-test systems, however, the system was far from portable. In the mid 1990's Michaels and Associates developed FitCheck for use on a laptop computer. In recent years, other companies have developed systems: VeriPro by Honeywell, SafetyMeter by Phonak, IntegraFit by Workplace Integra, FitCheck Solo by Michael and Associates, Benson CCF-200 by Benson Medical Instruments and EARFit™ Dual-ear Validation System by 3M™. This workshop will present an overview of the technologies available to the hearing conservation professional. Attendees will learn about different methods to implement fit-testing within the workplace and have information about how different fit-test systems work. Several of the fit-test manufacturers will present the features of their particular systems. During the second half of the workshop, attendees will experience hands-on demonstrations of the various products.

WORKSHOP 5

PSP Workshop
Mission Statement & Strategic Plan Oh My

Thursday • Morning Workshop

Is the mission statement and strategic plan of NHCA in line with PSP members needs to provide them with the resources that they need to fulfill their role as the leaders of hearing conservation services. Panel Discusion: which includes General member (Education/Research), Commercial, and PSP member representatives to promote discussion and activity for future PSP workshops and other benefits for all membership with Focus on PSP members.
PSP Board Delegate: David Nelson Moderator
PSP Member: Michele Alexander
General & Educational: Jennifer Tufts
Commercial Member: Michelle Sahlin

Suppressors, Hearing Protection and Hearing Conservation

Thursday • Afternoon Workshop

Presenter: Ryan Lee Scott

Co-Presenter: Edward Lobarinas

Sound suppressors for firearms, commonly referred to as "silencers", have garnered media attention and interest from both congress and the public. The overall goal of this workshop is to present Hearing Conservationists with an overview of sound suppressors, their relative efficacy, and the role this technology could play in reducing the dangerous sound levels produced by firearms, and how suppressors can be a part of a hearing conservation program. The presenters will primarily focus on the role of suppressors as part of hearing conservation from a law enforcement perspective but will also discuss how this technology can extend to private citizens and more importantly the limitations of this technology. Specifically, data will be presented regarding the factors that affect suppressor efficacy, the likelihood that suppressors will need to be combined with traditional hearing protection and how these elements play a crucial role in education and hearing conservation.

PLATFORM SESSION ABSTRACTS

The Ear Beyond Hearing: From Digital Earplugs to In-Ear Brain Computer Interfaces

Friday • 8:15 AM

Presenter: Jeremie Voix

Wearables are everywhere – but in the ears (yet). The CRITIAS research team has been actively developing various in-ear technologies designed to complement the human ear, from smart hearing protection against industrial noise, to advanced inter-individual communication systems, to hearing health monitoring devices using otoacoustic emission (OAE), to in-ear EEG Brain Computer Interface (BCI). More fundamental research has also been conducted, particularly on the micro-harvesting of electrical power from inside the earcanal to power future auditory wearables. Recent research and developments, from CRITIAS and labs around the world, will be presented to the NHCA community who will end up with a different view on the human ear!

Knowing Your Noise Can Change Attitudes to Hearing Health and Increase Likelihood of Healthy Hearing Behaviours: Evaluation of a HEARsmart Project

Friday • 8:45 AM

Presenter: Elizabeth Beach

Co-Author Not Presenting: Megan Gilliver

Most people agree that hearing is important, and yet many, knowingly or unknowingly, put their hearing at risk through exposure to loud situations. One of the barriers preventing people from taking action is a lack of awareness about their own exposure levels, either because they have never considered them or because they underestimate the risk associated with their behaviours. During the course of our research into noise exposure, we observed that people responded positively when they were presented with their own personal noise profile, quantifying their risk. This prompted us to develop an online tool in which users could enter details of their participation in loud activities and receive a personalised risk assessment. This tool the 24 Know Your Noise risk calculator is one of a suite of HEARsmart initiatives developed by researchers at the National Acoustic Laboratories (NAL) and the HEARing Cooperative Research Centre to promote hearing health among young people. We will present results from an evaluation survey completed by over 100 users of the Know Your Noise website, which suggest that knowing one s noise improves attitudes towards hearing health. As such, this information increases the likelihood of the user adopting hearing health behaviours in future.

Bringing Best Practices in Hearing Conservation to a Wider Audience

Friday • 9:25 AM

Presenter: Ted Madison

Co-Presenter: Laurie Wells

Creating an online Center for Hearing Conservation turned out to be a much bigger project than expected. NHCA members Laurie Wells and Ted Madison spent more than 10 months writing and collaborating with digital content experts to build this web-based resource for HCP administrators and other occupational health & safety personnel. The end result is a reflection of their personal experiences in hearing conservation over 20 plus years along with the collective wisdom of the broader community of experts in NHCA, CAOHC, AIHA and NIOSH. Ted and Laurie will share stories about how the process played out, the challenge of explaining differences between regulations, and the difficulty of finding the right balance of technical details and brevity for people who look for information on their mobile devices.

PLATFORM SESSION ABSTRACTS

Hearing Conservation Program Costs and Effectiveness

Friday • 10:05 AM

Presenter: Rick Neitzel

Co-Authors Not Presenting: Stephanie Sayler, Deron Galusha, Linda Cantley, Peter Rabinowitz

This study characterized overall and specific costs associated with hearing conservation programs (HCPs), and examined the association between these costs and noise-induced hearing loss (NIHL) outcomes. We interviewed personnel and reviewed records at 14 manufacturing facilities. We also measured noise for comparison to the ten-year average of measurements made by each facility. NIHL outcomes assessed included rates of standard threshold shifts (STS) and high-frequency NIHL, as well as prevalence of hearing impairment, for each participating facility. Annual HCP costs ranged from roughly $67,000 to $400,000 (mean $30880 per person). Our noise measurements showed good agreement with measurements made by the facilities. Hearing impairment prevalence was about 15% overall. Higher expenditures for training and hearing protector fit-testing were significantly associated with reduced STS prevalence. Higher training expenditures were also related to lower hearing impairment prevalence and high-frequency NIHL rates. Increased workplace spending on training and fit-testing may help minimize NIHL.

Learning to Localize with Advanced Hearing Protectors and TCAPS: Can Equivalent Open Ear Performance ever be Reached and How?

Friday • 10:25 AM

Presenter: Kichol Lee

Co-Presenter: Dr. John Casali

Protectors and TCAPS - Can Equivalent Open Ear Performance ever be Reached and How? The objectives of this research were 1) to determine if untrained, normal-hearing listeners could learn, with regimented practice trials, to localize sounds while wearing advanced sound-transmission hearing protection devices with equivalent performance to the unoccluded ear (i.e. without any device on the ear), and 2) to determine if design differences between devices affects the localization learning curve. To accomplish these objectives, the azimuthal localization test element of the Virginia Tech DRILCOM test battery was extensively modified to enable the presentation of incremental training trials, with performance measurement on each trial, in addition to retaining the battery's original testing capability. Each single experimental session of 20 minutes consisted of presentation of paired combinations of training and testing trials, and comprised a "Learning Unit (LU)." Subjects completed 12 LUs with the open ear to establish a baseline of how quickly they reached their maximum localization capability. Then half of the subjects continued with device A (an Invisio TEA X50 TCAPS currently used by the U.S. Army) while the other half continued with device B (an experimental prototype TCAPS). The results indicated that while subjects could eventually attain their open ear cap.

Localization of Reverse Alarms with Passive and Level-Dependent Hearing Protectors

Friday • 10:45 AM

Presenter: Chantal Laroche

Several factors can contribute to the occurrence of accidents involving reversing heavy vehicles, despite the mandatory use of reverse alarms in many workplaces. Among others, reverse alarms can be difficult to localize in space, which may lead to errors in adequately identifying the source of danger. Previous studies have shown that traditional reverse alarms (beep-beep) are more difficult to localize in space than broadband alarms (pschtt-pschtt). In addition, personal safety equipment such as hearing protection devices and safety helmets, often required in noisy workplaces where reverse alarms are used, may potentially further impair localization. This study explored the effect of passive hearing protection devices and use of a safety helmet on the ability of normal-hearing individuals to localize the two types of reverse alarms, in background noise, while performing a task. Consistent with previous findings, the broadband alarm was easier to localize than the tonal alarm. While passive

PLATFORM SESSION ABSTRACTS

hearing protection can have a significant impact on sound localization (with a marked degradation in performance with double protection), use of a safety helmet has a more limited effect. Preliminary results from a study using the same methodology with level-dependent (sound restoring).

Hearing Protector Attenuation and Noise Exposure Among Metal Manufacturing Workers

Friday • 11:05 AM

Presenter: Stephanie K. Sayler

Co-Authors Not Presenting: Peter M. Rabinowitz, Deron H. Galusha, Kan Sun, Richard L. Neitzel

Workers enrolled in hearing conservation programs in many workplaces are routinely provided HPDs to attenuate their exposure. While such devices can be effective at reducing noise exposure, they may also over-attenuate noise, reducing a worker s ability to hear warning signals and other critical audible information, potentially increasing their risk of workplace injury. Our study examined the prevalence of over-attenuation among a sample of workers at two US metal manufacturing facilities. We performed personal noise dosimetry measurements and HPD fit-testing on 91 participants over multiple work shifts and compared our results with data obtained from participant questionnaires and annual audiometric hearing threshold results. The participants were exposed to a mean 8-hr noise exposure of 79.8 dBA, and demonstrated a 20.1 dB average personal attenuation rating (PAR) from fit-testing. While differences existed between sites, 84% of the PAR measurements resulted in effective protection levels below the recommended 70 dBA for safe working communication. This study demonstrates the need to incorporate fit-testing into hearing conservation programs to verify that workers are sufficiently protected from over-exposure while also minimizing instances of over-attenuation.

SPEAKER LUNCHEON: Sound Bites & Sonic Seasoning

Friday • 11:50 AM

Presenter: Charles Spence
Head of the Crossmodal Research Laboratory, Oxford University

Sound is the forgotten flavour sense. Everything from the sound of the crunch of the potato chip through the sizzle of the steak on the hotplate, the gurgling sounds of the coffee machine, and the 'ding' of the microwave. What we hear when we eat and drink can set our expectations and change our experience of taste/flavour. However, music also plays a surprisingly large role in our ability to taste, not to mention the choices we make when in the restaurant/supermarket. Background noise is becoming an increasingly important issue too, with some US restaurants now regularly exceeding 100 dB of noise/music. So loud that not only does it impair the taste of the food but is also likely leading to hearing damage for long-term staff! It is the noise of the engines (80-85 dB) that also helps explain why so many people order a tomato juice or Bloody Mary on the plane. However, what I really want to share in this talk is the latest work with world-leading modernist chefs, Michelin-starred chocolatiers, and drinks brands showing how music and soundscapes can be used to season your food and drink – welcome to the whole new world of sonic seasoning. After listening to this talk, you may never leave the music to chance at mealtimes again!

Spence, C. (2017). Gastrophysics: The new science of eating. London, UK: Viking Penguin.

PLATFORM SESSION ABSTRACTS

The "Make Listening Safe" Campaign by the World Health Organization (WHO): Considerations and Recommendations

Friday • 1:20 PM

Presenters: Rick Neitzel, Brian Fligor, Deanna Meinke

Facilitator: Colleen G. Le Prell

A subset of teenagers and young adults are at risk of developing noise-induced hearing loss as a consequence of recreational sound exposure, with one of the major components being personal audio system use. The World Health Organization (WHO) and the International Telecommunication Union (ITU) have therefore initiated a multi-faceted global campaign to "Make Listening Safe". Working group participants include experts in the fields of audiology, otology, public health, epidemiology, acoustics, sound engineering, many of whom are members of the NHCA. In addition member organizations of the ITU, standardization organizations, non-governmental organizations, professional bodies such as the NHCA, and consumer groups, have been invited to send representatives to participate in the working group. This session will include a short overview of the different areas of the campaign, followed by expert review and recommendations to WHO/ITU regarding evidence-based strategies to promote safe listening habits. The session includes time for the panel to respond to audience questions.

Loudness in the Occluded Ear Canal: Are We Still Missing 6dB?

Friday • 2:20 PM

Presenter: Fabien Bonnet

Co-Authors Not Presenting: Jérémie Voix, Hugues Nélisse

Over the last century, a large number of studies were reported as related to the "case of the missing 6 dB". Initially, this research dealt with the loudness comparison between noise induced by headphones versus that induced by a free-field loudspeaker. It was said headphones had to generate more sound pressure in the ear canal to equal the loudness that a loudspeaker would provide. Some recent work has since provided several explanations for this observed discrepancy. Three main changing parameters were identified to describe this large amount of data that may or may not have been influenced by the same factors: nature of the source (loudspeaker, headphones, in-ear monitors), characteristics of the sound stimuli (spectral and temporal features, excitation level), and the mechanical load applied to the external ear (ear covered with ear-cups, occluded ear canal). In this presentation, we intend to combine the thoughts of several decades of research to help providing the full picture on this issue for the occluded ear case. Based on our own experimental results and those from other inquisitive studies, focus will be made on the factors that should be regarded as most likely to explain the observed differences for the occluded ear to perceive the same loudness as the open ear.

Ambient Noise in the Sound Booth During Audiometry

Friday • 2:40 PM

Presenter: Gregory A. Flamme

Co-Presenter: Douglas Wilson

Audiometric threshold testing requires a test environment that is sufficiently quiet to permit measurement of unmasked thresholds. The conventional approach to determining the suitability of a test environment is the annual comparison of observed ambient noise levels with standard maximum permissible ambient noise levels for testing to 0 dB HL (higher if the limits of 29 CFR 1910.95 are used). We logged sound levels every 200 ms in a set of three audiometric booths over a period of 20 days using a Larson-Davis System 831 (~ 8.6M logged samples, parsed into 11 hours of testing). Substantial differences with annual tests were observed, and the generalizability of annual measurements to individual tests will be discussed.

PLATFORM SESSION ABSTRACTS

Kids Nowadays Hear Better Than We Did

Friday • 3:30 PM

Presenter: Robert A. Dobie

Co-Presenter: Howard J. Hoffman

Co-Authors Not Presenting: Katalin Losonczy, Chuan-Ming Li, Christa Themann, Greg Flamme

If you were born between 1940 and 1958, you might have been one of the American youths (ages 12 – 19) whose hearing was tested in the National Health Examination Survey between 1959 and 1970 (n = 7041). In that survey, 3.0% of youths (95% confidence interval = 2.5 – 3.6) had better-ear (bilateral) speech frequency (0.5, 1, 2, and 4 kHz) hearing impairment (HI), defined as average threshold e 20 dB HL; 12.3% (11.0 – 13.8) had better-ear high-frequency (3, 4 and 6 kHz) HI. Later federal surveys showed much lower prevalences with confidence intervals that did not overlap those for the 1959 – 1970 survey. In the National Health and Nutrition Examination Surveys of 1988 1994 (n = 3057) and 2005 2010 (n = 4374) better-ear speech frequency HI was found in 0.58% (0.32 – 1.06) and 0.77% (0.51 1.16) of youths respectively; better-ear high-frequency HI was found in 1.64% (1.06 – 2.51) and 1.52% (1.11 – 2.09) respectively. Trends were similar for unilateral HI. For all comparisons confidence intervals for 1988 – 1994 and 2005 – 2010 overlapped. In multivariate analysis for the most recent survey significant risk factors for better-ear speech frequency HI were low birth weight ear tube surgery and use of firearms.

Evolution of the FitCheck! Hearing Protection Device (HPD) Field Attenuation Estimation System (FAES)

Friday • 3:50 PM

Presenter: William A. Ahroon

Individual fit testing of hearing protection devices (HPDs) has become more and more common and is recommended as a best practice for hearing conservation programs. This practice involves evaluating the protection provided by an HPD for an individual user instead of relying on laboratory-based measurements and various derating schemes to estimate (i.e., guess) a devices protection. These fit-check or fit-test systems are used to train users in the proper fit of an HPD, aid in the selection of the proper HPD for individual users and in a user s exposure level(s), and provide documentation of the adequacy a hearing conservation program. Several commercial Hearing Protective Device (HPD) Field Attenuation Estimation Systems (FAESs) have become available in recent decades. This paper presents the evolution of the HDP FAES developed by Paul and Kevin Michael from State College Pennsylvania. It traces the development in 1975 of a sound-isolating circumaural headset that can be used in standard tests of insert hearing protection devices, to the first commercially available HPD FAES, the Michael & Associates FitCheck! to the NIOSH HPD WellFit"! which became the Michael & Associates FitCheck Solo"! and finally the FitCheck F-MIRE"! introduced in 2017.

PLATFORM SESSION ABSTRACTS

Validation of Clinical Techniques for Verification of Uniform Attenuation Earplugs

Friday • 4:10 PM

Presenter: Cory Portnuff

Uniform Attenuation Earplugs (UAE) theoretically provide even attenuation across frequencies when built to a manufacturer s specifications. Unfortunately, there is no current research available confirming if custom UAEs are made to specifications, nor is there guidance available on clinical methods of measuring attenuation of UAE devices. This presentation reports on a study that evaluated different procedures for UAE measurement to determine the most effective and efficient clinical verification protocols. Attenuation was measured using probe microphone measures and real-ear attenuation at threshold (REAT) measurements under circumaural earphones, soundfield speakers, and supra-aural earphones. Comparisons were then made to a reference system created in the laboratory. The results of this study demonstrated that the REAT measured in the soundfield using a narrowband noise stimulus with masking in the contralateral ear is currently the most accurate and widely available method of verifying UAEs This presentation will discuss the study s recommendations and best use of these in clinical practice.

2018 Safe-in-Sound Excellence in Hearing Loss Prevention Awards

Friday • 4:30 PM

Presenter: Thais C. Morata

Co-Presenter: Deanna Meinke

In this 10th round of the Safe-in-Sound Excellence in Hearing Loss Prevention Awards, the National Institute for Occupational Safety and Health (NIOSH) and the National Hearing Conservation Association (NHCA) will recognize organizations that document measurable achievements in hearing loss prevention and practices. The submissions are evaluated against key performance indicators in a rigorous review process designed to capture and evaluate the successes. The attendees will get to hear about the innovative strategies and the success stories from the winners themselves firsthand; information which will be shared later to a broader community. Join us for the remarkable presentations! #wewanttohear!

SATURDAY BREAKOUT SESSION ABSTRACTS

BREAKOUT SESSION #1
ROOM BOCA I

1.1 Risk Factors Associated with Tinnitus, and Hearing Loss in Current and Recently Separated Service Members Across Military Branches

Saturday • 9:00 AM

Presenter: James A. Henry

Co-Presenters: Susan Griest, Cody Blankenship, Rozela Melgoza

Background: Military Service Members are exposed to high levels of occupational noise, chemicals and solvents, and other exposures that can damage the auditory system. Little is known about hearing loss and how it progresses in Veterans following military service. The Institute of Medicine (IOM) recommended research be completed, to fill the void for prospective, longitudinal, epidemiological data on noise-induced hearing loss and tinnitus in military personnel. In response to this recommendation, The Noise Outcomes in Servicemembers Epidemiology Study (NOISE Study), was funded by Congressionally Directed Medical Research Programs (CDMRP) in 2013. This study is designed to evaluate and monitor a cohort of current Military Service Members and recently-separated Veterans (within 2.5 years), for 20 years or more, to determine long-term risk of delayed onset hearing loss and tinnitus. Methods: Data reported are from baseline assessments of the first 400 study participants (81% male; mean age 33.9; range 19-61), and include audiologic examination, sociodemographic characteristics, exposure to noise and solvents, other health conditions, and the social and emotional consequences of possible damage to the auditory system. Differences across military branches will be presented.

1.2 Landing On The Roof - Revisited

Saturday • 9:20 AM

Presenter: Kurt Yankaskas

Landing on the Roof - Revisited is an update to a seminal paper (NHCA 2003) examining operations in high noise environments - aircraft carrier flight decks. Noise remains the most prevalent occupational hazard associated with defense systems and operations critical to operational sustainment. This talk reviews noise exposures typical in various military settings, and the operational challenges these noise levels present. The understanding of the environment is needed to develop suitable solutions for the Warfighter. The ONR's (Office of Naval Research) Noise Induced Hearing Loss (NIHL) Research Program expands research to include hearing restoration. This overview presentation is of recent scientific and engineering developments to increase understanding and develop solutions aimed at optimizing warfighter performance and enhance the flexibility, efficiency and safety of all warfighter missions and civilian applications. The multi-discipline approach has four research lanes: Source Noise Reduction; Incidence, Susceptibility & Evaluation; Medical Prevention & Treatment; & PPE will be reviewed. Outcomes from recent research will enable the military to reduce tinnitus and NIHL, and thereby improve auditory readiness and health.

1.3 Auditory Hazards of Bullet N-wave Exposure

Saturday • 9:40 AM

Presenter: Gregory A. Flamme

Co-Presenter: William J. Murphy

A bullet traveling at supersonic speeds produces a ballistic shock-wave that is N-shaped (N-wave) with properties that are determined by the speed and dimensions of the projectile. The sound levels of these N-waves can be hazardous, and can be comparable to the blast wave received at the shooter's ear. The present study was undertaken to assess the noise produced by 0.50 caliber Beowulf bullets fired from a semiautomatic rifle with a 16" barrel at a distance of approximately 6.4 meters downrange from the muzzle. The width of the measurement plane ranged between 0.6 and 1.2 meters, and the nominal height of the measurement plane was 1.3 m. Bullet paths were identified using combinations of differences in arrival times of the N-wave on a 3-microphone array. Results confirmed that the sounds produced

SATURDAY BREAKOUT SESSION ABSTRACTS

by a passing supersonic bullet are hazardous and are more hazardous than the blast noise reaching the shooter's ear at 6.4 meters downrange and within 1.2 meters of the trajectory of the bullet.

1.4 Noise Control on US Navy Aircraft Carriers - Methodology and Results

Saturday • 10:30 AM

Presenter: Jeffrey M. Komrower

Co-Author Not Presenting: Kurt Yankaskas

Modern weapon systems, particularly those existing on aircraft carriers, expose naval personnel to extremely high levels of noise for prolonged periods of time. The Veterans Administration currently pays in excess of $3B dollars annually to veterans as a direct result of noise induced hearing loss (NIHL) disabilities. NIHL related issues have the direct effect of decreasing the quality of life of those affected, and in addition to this, increasing warfighter down-time, decreasing productivity and effectiveness (thus survivability) and losing good personnel through medical disqualifications. The development of effective treatments, which can be applied to high noise areas and reduce the overall noise exposure of the ship s force can help to reverse these undesirable trends. Initial efforts validated the effectiveness of a novel damping treatment on an aircraft carrier in reducing noise levels which resulted in extensive installation on a ship during overhaul. This paper documents the results of tests to validate treatment effectiveness as well as the methodology of developing the treatment design. Tools and techniques developed under this effort have applications in other areas, including non-military situations, where engineering noise controls are needed.

1.5 MILSINT: Development of a Military Sound Recognition in Noise

Saturday • 10:50 AM

Presenter: Jennifer Tufts

Hearing loss is prevalent throughout the active duty military forces. However, there are no validated standards for assessing a service member's functional hearing ability and how it relates to his or her ability to accomplish the mission. In many cases, hearing-critical tasks take place in non-optimal environments with background noise or competing speech from multiple sources. Presently, hearing abilities are primarily assessed via pure-tone audiometry, without regard for the hearing-critical needs and noise environment of the individual. The development of a test battery to evaluate functional hearing ability is a highly sought-after goal. The MILSINT, a new sound recognition in noise test geared specifically for application to the US Army, is being developed at Creare, Inc. and the University of Connecticut under the sponsorship of the Department of Defense. The MILSINT is one component of an auditory fitness-for-duty test battery that at present also includes the MILHINT, a military-specific speech-in-noise test. This presentation will describe the development of the MILSINT, its proposed physical implementation, and the data gathered to date on the performance of trained civilians on the MILSINT.

1.6 The Attenuation of Firearm Suppressors as a Function of Angle and Bullet Velocity

Saturday • 11:10 AM

Presenter: William J Murphy

Co-Authors Not Presenting: Adam R. Campbell, Gregory A. Flamme, Stephen M. Tasko, James E. Lankford, Deanna K Meinke, Donald S. Finan, Edward L. Zechmann, Michael Stewart

Suppressors use a combination of baffles and ports within a canister at the end of a firearm to disrupt the high-pressure shock wave that follows the expulsion of the projectile. This study evaluated fourteen different firearms with and without a suppressor. Different loads of ammunition were used to vary the speed of the projectile. For ten of the guns, both supersonic and subsonic conditions were measured. Twelve microphones were positioned at 30-degree spacing in 3-meter ring. One microphone was positioned at 1 meter to the left of the muzzle and two microphones were positioned at 15 centimeters from the right and left ears. The suppressors were

SATURDAY BREAKOUT SESSION ABSTRACTS

effective in reducing the peak sound pressure levels between 3 and 28 dB and 8-hour equivalent energy (LAeq8) between 2 and 24 dB. Correlations between the peak and LAeq8 reductions will be reported between locations on the ring and the muzzle and ear microphones. In 16 out of 27 cases, the reduction of sound pressure levels at frequencies from 200 Hz to 4 kHz was greater for the microphones located behind the line of fire compared to the reduction in sound pressure levels for the microphones down range in front of the guns. The supersonic projectile s shock-wave contributes significantly to the noise levels in front of the muzzle.

1.7 Extended High Frequency Pure Tone Audiometric Outcomes in Youth Firearm Users

Saturday • 11:30 AM

Presenter: Shana Laffoon

Co-Authors Not Presenting: Michael Stewart, Yunfang Zheng, Deanna K. Meinke

Purpose: To determine if firearm impulse noise exposure is related to auditory damage in the cochlea. Extended high frequency (EHF) pure tone audiometry (PTA) and EHF distortion product otoacoustic emissions (DPOAES) are sensitive measures of cochlear status. Design: Pilot study, convenience sample of youth firearm users. Methods: Participants were evaluated with EHF PTA using ER-2 insert earphones (.25-16k Hz) and EHF pressurized DPOAEs (1-10 kHz) in both ears. Analysis: Multivariate analysis of variance (MANOVA) with repeated measures. The statistically significant level was $p < .05$. Results: PTA hearing thresholds were elevated at 14 kHz and/or 16 kHz. There was no significant difference between the hearing thresholds for the left versus right ears (P=.79). DPOAE amplitudes were reduced (SNR < 6 dB or DP level < -10 dB SPL) at 8 kHz and/or 10 kHz. However, DPOAE results suggest more left ear cochlear damage for right-handed subjects. Conclusion: Both EHF PTA and DPOAE appear to be tools for early detection of NIHL in youth. It is suggested that EHF PTA and DPOAEs be included in audiological protocols for young firearm users to facilitate early identification and intervention for NIHL.

BREAKOUT SESSION #2
ROOM BOCA II

2.1 Laboratory Conditioning of Middle Ear Muscle Contractions

Saturday • 9:00 AM

Presenter: Gregory A. Flamme

Co-Authors Not Presenting: Stephen M. Tasko, Kristy K. Deiters, Nathaniel T. Greene, William J. Murphy, Heath G. Jones, William A. Ahroon

The Auditory Hazard Assessment Algorithm for Humans (AHAAH) employs the response of the Middle Ear Muscle Contraction (MEMC) as a protective mechanism against high-level impulse noise. The Warned condition in the AHAAH model assumes that the MEMC is conditioned to activate prior to the noise when a person fires a weapon. This study evaluated three tasks for eliciting a conditioned MEMC in a group of normal hearing adults. The tasks varied on the sensory modality of the conditioning stimulus and attention. A conditioned response was defined as an MEMC occurring prior to the unconditioned stimulus and when only the conditioned stimulus was presented. Conditioned MEMC were absent in the majority of participants.

2.2 Generalizability of Clinically-Measured Acoustic Reflexes to Brief Sounds

Saturday • 9:20 AM

Presenter: Kristy K. Deiters

Co-Authors Not Presenting: Gregory A. Flamme, Stephen M. Tasko, William J. Murphy, Nathaniel T. Greene, Heath G. Jones, William A. Ahroon

Damage-risk criteria for impulsive noise have frequently assumed a protective role for middle-ear muscle contractions (MEMC). Acoustically-elicited MEMC (i.e., acoustic reflexes, AR) are common but not pervasive when measured using clinical protocols, and reliance on clinical AR to support a role for MEMC for these criteria involves an assumption that clinical AR results are generalizable to impulsive stimuli. In the current study, the probability of detecting MEMC on over

SATURDAY BREAKOUT SESSION ABSTRACTS

190 participants with excellent hearing sensitivity is examined as a function of demographic and conventional audiometric variables, including AR magnitude and latency.

2.3 Estimating Personnel Noise Exposure from Impulsive Noise When Hearing Protection Devices are Worn: IPIL vs. NRSA

Saturday • 9:40 AM

Presenter: Hillary Gallagher

Exposure to hazardous noise, both continuous and impulsive, may result in hearing loss and/or hearing related disabilities. Hearing protection devices were designed to reduce the risk of auditory injury and are qualified by metrics that describe the estimated noise level reduction when hearing protection is worn. For continuous noise, the metrics include the octave-band method, Noise Reduction Rating (NRR), and Noise Level Reduction Statistic for use with A-weighting and Graphical (NRSA and NRSG). For impulsive noise, the metric is called Impulsive Peak Insertion Loss (IPIL). IPIL, similar to NRR, is a single number value that is simply subtracted from the peak impulse level. Unfortunately, there are few manufacturers that measure and report IPIL values for their products. MIL-STD-1474E states that when IPIL values are not available, NRSA values are appropriate to use when estimating personnel noise exposures. AFRL conducted noise attenuation measurements on multiple hearing protection devices. Personnel noise exposure estimates were calculated using both IPIL and NRSA metrics for impulses generated from a single weapon. This presentation will describe the differences in the metrics and the overall differences in estimated personnel impulsive noise exposure.

BREAKOUT SESSION #3
ROOM BOCA III

3.1 Musicians with Conventional Noise Notches Have Poorer Extended High Frequency Sensitivity

Saturday • 9:00 AM

Presenter: Heather Malyuk

Co-Presenter: Michael Santucci

Co-Authors Not Presenting: Kathleen Dunckley, Matthew O'Shea

Musicians are a high-risk population for noise-induced hearing loss (NIHL) clinically detected in the conventionally evaluated frequency range (CFR, .25-8 kHz). Extended high frequency (EHF) audiometry tests sensitivity at frequencies above 8 kHz. Using a dataset collected at Sensaphonics Hearing Wellness spanning nearly thirty years we compared the EHF thresholds of groups of musicians with bilateral CFR audiometric notches and age matched participants without notches. Locally-weighted regression analysis (LOESS) of the two distributions of EHF thresholds revealed that the bilateral notch group did not overlap with the no-notch group, indicating a significant difference and worse sensitivity. This finding is clinically relevant because the pervasive view that NIHL occurs only in the CFR must be questioned. Further, EHF thresholds may be the most sensitive way to detect the early effects of music-related noise exposure on the peripheral auditory system. We identified all participants in the data set with at least one noise notch in the CFR for each of 6 music industry roles: audio engineers, disc jockeys, jobbers, live performers, music teachers and studio workers, and non-musicians to act as a control group. The industry role with the highest prevalence was music educators.

SATURDAY BREAKOUT SESSION ABSTRACTS

3.2 OSHA meets NIHL - Music Venue Sited as Occupational Hearing Hazard The Challenge of Being a Hearing Conscious Sound Engineer

Saturday • 9:20 AM

Presenter: Benj Kanters

In November of 2015, OSHA and The Department of Labor sited The 9:30 Club in Washington DC as a hearing health hazard for the club s sound engineers. I was contacted in April of 2016, and later vetted as expert witness on behalf of OSHA. I would argue OSHA s case, justifying the practicality (and value) for a sound engineer to use hearing protection in compliance with OSHA exposure limits, without risk of compromising the quality of his or her work. This presentation will chronicle the progression of the case, which led to the club owners, Sledge, Inc. to settle out of court in December of 2106, three days before the trial was to begin. Further, this presentation will illustrate the growing trend among sound engineers to take advantage of current conservation technologies ensuring both the quality of their work and the acuity of their hearing.

3.3 An Exploratory Survey of Sound Levels in New York City Restaurants and Bars

Saturday • 9:40 AM

Presenter: Greg Farber

Media reports in the United States and the United Kingdom have reported increasingly high sound levels in restaurants and bars over the past ten years, but accurate sound measurements are lacking. The Zagat survey found noise to be the second most common complaint among diners, barely behind poor service. This paper presents sound level measurements from more than 2400 restaurants and bars in New York City, using the novel SoundPrint smartphone app. The average sound level was found to be 78 dBA in restaurants and 81 dBA in bars . These sound levels do not allow ready conversation and pose an auditory health danger for noise-induced hearing loss and other non-auditory health issues. The reported sound levels by venue managers generally underestimated actual sound levels. Of interest are the findings that venues in certain neighborhoods and also of certain types of cuisine tend to be louder or quieter than others. The sound level values measured by the SoundPrint app have been tested against class 1 sound level meters and found to be reasonably close (within 1-2 dB). This report is a proof-of-concept study of crowd-sourced sound measurements, which can provide valuable data for the general public and health officials.

BREAKOUT SESSION #4
ROOM BOCA IV

4.1 Continuous Monitoring of Otoacoustic Emissions: A Tool to Prevent Hearing Loss

Saturday • 10:30 AM

Presenter: Vincent Nadon

Co-Author Not Presenting: Jérémie Voix

Although health and safety professionals in the workplace periodically perform audiometric measurements to monitor workers hearing thresholds, occupational hearing loss remains one of the biggest causes of invalidity and indemnity in North America.Current advances in hearing research showed that noise exposures that were thought benign fordecades are not without any risks and moderate levels of noise exposuremight not induce hearing threshold changes in quiet conditions in the short term, but damageto inner hair cells synapses and the auditory nerve fibres might occur. Since synaptopathic noise exposure also has temporary effects on otoacoustic emission (OAE) levels, it could be possible to prevent the onset of synaptopathy by monitoring outer hair cells activity with very high temporal resolution OAEs. A new research platform, designed for high temporal resolution OAE monitoring of the temporary outer hair cells status changes, will be presented. The use of this tool along with common clinical electroencephalography techniques on a regular basis, will be discussed as to provide the necessary information to identify the early signs of damage to the auditory system.

SATURDAY BREAKOUT SESSION ABSTRACTS

4.2 Visit Whisperwell and Explore the "Song of the Star Bird"

Saturday • 10:50 AM

Presenter: Deanna K. Meinke

There is an emerging field of research dedicated to game-based learning which can facilitate health behavior change. "Song of the Star Bird" is a top-down exploration game (in early stages of development) designed to teach Science, Technology, Engineering and Math (STEM) concepts through problem and puzzle solving in order to address predicated shortages of STEM educated workers in the next decade. The game, is inspired by Dangerous Decibels, an inquiry-based hearing health promotion program that improves knowledge, attitudes, beliefs and intended behaviors regarding hazardous sound exposure and use of hearing protective strategies in the K-12 populations (Griest et al. 2008; Martin et al, 2013). The primary objective of the game is to teach STEM concepts and critical thinking within a fun and enjoyable framework. The secondary objective is to encourage positive knowledge, attitudes and intended behavior change in 5th to 7th grade children with respect to protection from the harmful effects of hazardous noise. Qualitative results from a pilot study with a single-level version of the game with students and teachers will be summarized with regard to study outcomes and implications for future game development.

4.3 Jolene's Musical Instrument Museum Adventure

Saturday • 11:10 AM

Presenter: Cameron J. Fackler

Co-Presenter: Donald S. Finan

Co-Authors Not Presenting: Elliott H. Berger, Deanna K. Meinke, Michael E. Stergar, Sean Finan, Brian Dredla, Katie Runyan, Kortney Carr, and Justin Gillespie

Jolene is an acoustic manikin for measuring the sound levels of personal audio systems. She was originally created by Genna Martin as part of a student internship at the Oregon Health & Science University. Jolene is used as a research and hearing health education tool to promote safe music listening strategies. She has proven to be popular: since her creation in 2006, the Jolene Cookbook has been downloaded in all 50 U.S. states, 4 U.S. territories, and 41 countries! However, until now, Jolene has been accompanied by an audiologist, researcher, or educator who directs her interactions with the public. In mid-2017, we were approached by the Musical Instrument Museum in Phoenix, Arizona to make a Jolene intended for use as a permanent, unsupervised, interactive museum exhibit. This talk discusses several interesting new challenges that were overcome in redesigning Jolene to create a stand-alone exhibit. Additionally, we show how Jolene was calibrated by comparison to a KEMAR manikin to ensure her readings may be compared to damage-risk criteria. We also developed health communication displays and messages in collaboration with museum exhibit designers and builders.

4.2 Centers for Disease Control and Prevention Efforts in Preventing Non-Work Related Hearing Loss

Saturday • 11:30 AM

Presenter: Yulia Carroll

The Centers for Disease Control and Prevention (CDC) has conducted more than 40 years of research on noise-induced hearing loss (NIHL) in the workplace. Recent research has indicated that non-work related noise, such as at concerts, sports events, personal listening devices, etc. is of greater concern than previously known. In response to public and medical community inquiries regarding environmental noise, as well as a 2016, National Academies of Sciences report Hearing Health Care for Adults: Priorities for Improving Access and Affordability , the National Center for Environmental Health (NCEH) initiated a research workgroup. Its initial first year efforts were to study the knowledge gap about the effect of noise in homes and communities, raise awareness about excessive exposure to loud sounds, and prevention. The first priority of the NCEH research workgroup was to analyze data regarding prevalence of non-occupational NIHL. The workgroup also raised awareness and provided information on early detection and prevention in a CDC vital signs publication and a new CDC website. We also utilized a structured customer discovery process to identify public health needs and strategies to increase communication outreach. We will present current CDC research and prevention efforts.

PLATFORM SESSION ABSTRACTS

Gasaway Lecture: What a Long Strange Trip it's Been

Saturday • 2:15 PM

Presenter: Michael Santucci

One lecture at the annual conference will be designated the Gasaway Lecture in honor of Donald C. Gasaway in recognition of his long and exemplary years of service and contributions to NHCA and the field of Hearing Conservation. Lecture content and speaker should be commensurate with the intended honor of the lecture title. The Gasaway lecturer is selected by the Director of Education or his/her designee. In recent years, the Gasaway lecturer has received a copy of an original work of art prepared for Don Gasaway's book.

Numerical Modeling of the Ear Canal: Benefits and Challenges?

Saturday • 2:45 PM

Presenter: Guilhem Viallet

Co-Author Not Presenting: Jérémie Voix

This presentation focuses on three practical cases where the use of a numerical model of the occluded human ear canal, in replacement or in complement to measurements on human subjects, has proved to be relevant. The first case deal with the mechanical coupling between the ear canal and earplug which is not yet fully understood and is difficult, if not impossible, to measure on a human subject. In this case, the use of a numerical model can help quantify the different energy interactions that are involved when the earplug is submitted to an acoustical excitation. For the second case, such a model is also used to statistically quantify the optimal compromise between comfort and attenuation by simulating acoustic attenuation and mechanical contact between the ear canal and an earplug as a function of the mechanical properties of the earplug. For the third case, the model is used to determine the minimal distance an in-ear microphone can be placed away from the earplug without the acoustic pressure being affects by its closed acoustic field effects. Challenges encounters for the multiphysics modeling will be also presented together with future research works.

Experimental Validation of an Impedance Tube Measurement Method for Assessing Earplugs Insertion Loss

Saturday • 3:05 PM

Presenter: Carillo Kévin

Co-Authors Not Presenting: Olivier Doutres, Franck Sgard

Passive earplugs are commonly used when the sound level cannot be reduced at the source. One of their main characteristics is their sound attenuation which can be quantified using the insertion loss (IL). In this work, an objective method for assessing earplugs normal incidence IL using a classical impedance tube is presented and compared to more commonly used objective method based on acoustic test fixtures (ATF). Contrary to ATF, the proposed method does not need cumbersome experimental facilities (e.g., reverberant or anechoic chambers) and allows for fast and simple measurements of earplugs IL that could be very useful for manufacturers during the design phase. In this method, the earplug is inserted into a 29 mm inner diameter impedance tube using a sample holder reproducing the ear canal and the transfer matrix of the system is measured. The IL of the earplug is then back-calculated using the measured transfer matrix and a one-dimensional model of the occluded ear canal taking into account the tympanic membrane through an acoustic impedance. This method, already validated numerically [Doutres et al., Internoise conference, San Francisco, 2015], will be evaluated experimentally by comparison with standard ATF measurements for various types of earplugs.

PLATFORM SESSION ABSTRACTS

Cardiovascular Conditions, Hearing Difficulty, and Occupational Noise Exposure within U.S. Industries and Occupations

Saturday • 4:10 PM

Presenter: Elizabeth A. Masterson

Co-Author Not Presenting: Ellen Kerns

Hazardous noise is one of the most common occupational hazards and has been linked to many health effects including cardiovascular disease. The purpose of this study was to estimate the prevalence of occupational noise exposure, hearing difficulty and cardiovascular conditions within U.S. industries and occupations, and to examine any associations with occupational noise exposure. Methods: National Health Interview Survey data from 2014 were examined for individuals working in the 12 months preceding interview; denoted 'current workers'. Weighted prevalence and weighted adjusted prevalence ratios were estimated. Results: Twenty-five percent of current U.S. workers reported a history of occupational noise exposure (14% with exposure in the last year), 12% reported hearing difficulty, 24% reported hypertension, and 28% reported elevated cholesterol. Among these workers, 58% of hearing difficulty cases, 14% of hypertension cases, and 9% of elevated cholesterol cases can be attributed to occupational noise exposure. Conclusions: Hypertension, elevated cholesterol and hearing difficulty are more prevalent among noise-exposed workers. Reductions in workplace noise levels are needed. Workplace-based health and wellness programs should also be considered.

What Have We Learned in the 10 Years of the Safe-in-Sound Awards?

Saturday • 4:30 PM

Presenter: Thais C. Morata

Co-Presenter: Deanna Meinke

How might a results-driven hearing loss prevention program look like? The National Institute for Occupational Safety and Health and the National Hearing Conservation Association are helping answer this question through the Safe-in-Sound Excellence in Hearing Loss Prevention Awardâ„¢. Information on proven approaches in hearing loss prevention is gathered, organized and disseminated to industry and other stakeholders. By disseminating evidence-based strategies, "Safe-in-Sound"! aims to enable other organizations to effectively advance hearing loss prevention practice. The award not only highlights accomplishments but also reminds a larger audience of the importance of promoting and maintaining excellent hearing health. Some winners report that the award provided leverage and opportunities to expand the reach of the current approaches; pilot programs have been adopted by other entities or in other geographical regions. Beyond recognizing those that have reached a pinnacle of achievement, the award motivates winners to pursue additional program improvements and to reach higher goals. In addition, the award has facilitated the extension of successful hearing loss prevention activities and strategies toward workers that are not traditionally considered in typical workplace programs.

POSTER PRESENTATIONS

Accuracy of NIOSH SLM and Sound Level Analyzer Lite Sound Level Meter Apps for iPhone
Presenter: Kaitlin Palmer, Co-Presenters: Tess A. Zaccardi, Sarah K. Grinn, Colleen G. Le Prell

Advancements on an Active Hearing Protection Device for Musicians
Presenter: Antoine Bernier

Assessing Auditory Localization with Hearing Protection: A Screening Measure
Presenter: Angelique Scharine, Co-Presenter: Morgan C. Domanico

Attenuation Using High Fidelity Hearing Protection Devices
Presenter: Tess A. Zaccardi, Co-Presenters: Kaitlin Palmer, Sarah K. Grinn, Colleen G. Le Prell

Audiometric Notches and Hearing Loss in Adolescents: Analyses of NHANES 2007-2010
Presenter: Yulia Carroll, Co-Presenter: Franco Scinicariello

Bus Noise and Annoyance: What Drivers and Collectors Think About.
Presenter: Teresa Maria Momensohn-Santos

Concomitant Head/Neck Muscle Activity and Middle Ear Muscle Contractions
Presenter: Stephen M. Tasko

Dangerous Decibels Programme Implementation in Brazil
Presenter: Adriana Bender Moreira de Lacerda, Co-Presenter: Lys Maria Allenstein Gondim

Effect of Helmet Visor Length on Hockey Officials Exposure to Whistle Noise
Presenter: Karin L. Adams

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Hearing Hazards at Church: Trials & Tribulations of Awareness & Hearing Loss Prevention
Presenter: Jan A. Moore

Hearing Health Education Programs for Rural Youth: Lessons Learned From Recent Studies
Presenter: Khalid M. Khan, Co-Presenter: Marjorie McCullagh

Hearing Impairment and Audiometric Configurations as Predictive Factors of Presbyacusis Decline
Presenter: Christina Hederstierna, Co-Presenters: Ulf Rosenhall, Esma Idrizbegovic

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Perception, Attitude, and Knowledge of Hearing Health Among Two Groups of Young Farm Workers From Rural Indiana
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Plugs in the Clubs: An independent audit of San Francisco's Earplug Ordinance
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The Subjective Wearer Comfort and Sound Attenuation Performance: a Comparison between Custom-moulded Earplugs Made by Manual and 3D-printing Processing
Presenter: Cheng-Yu Ho

Time to Change Direction: Advocate for a Total Worker Hearing Health Program versus the Status Quo
Presenter: Kathy E. Gates, Co-Presenter: Vickie L. Tuten

Usability Study of the War fighter
Presenter: Kelly Watts

Use of Hearing Protection among Noise-Exposed Populations in the US: What Can National Surveys Tell Us?
Presenter: Christa L. Themann

Using Smart Devices to Measure Intermittent Noise in the Workplace
Presenter: Ben Roberts

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Accuracy of NIOSH SLM and Sound Level Analyzer Lite Sound Level Meter Apps for iPhone

Presenter: Kaitlin Palmer

Co-Presenters: Tess Zaccardi, Sarah K. Grinn, Colleen G. Le Prell

There are several sound level meter apps available for iPhones, which have the potential to serve as an affordable alternative to SLMs and dosimeters, when individuals need quick information about noise conditions. Last year, we analyzed the accuracy of two apps, SLM Graph and SLM Meter (Grinn, Palmer, Zaccardi, Le Prell), and found that on all iPhone models except SE, the apps were accurate within 2-dB of the Class 1 SLM for music, broadband and steady-state up to 110-dB, with significant errors emerging at 120 dB SPL and with impulse noise. Recently, the National Institute for Occupational Safety and Health (NIOSH) developed and released an SLM app titled NIOSH SLM. This poster will present data describing the accuracy of NIOSH SLM as well as another free app, Sound Level Analyzer Lite , with data collected on new and used iPhones that documents variability as a function of everyday wear and tear. These two apps were tested using music, broadband, steady-state, and impulse noise stimuli from 90 to 120 dB SPL and compared to the control of a Class 1 SLM. These results highlight the potential strengths and weaknesses of SLM app use in real-world settings to make decisions about safe listening time and the potential need for HPDs.

Advancements on an active hearing protection device for musicians

Presenter: Antoine Bernier

Co-Author Not Presenting: Jérémie Voix

Professional musicians are exposed to high levels of sound and should protect their hearing to avoid permanent hearing loss which could compromise their career. Since high sound pressure levels are an inherent part of a musician's work, the logical solution would be to wear hearing protection devices when appropriate. However, they alter the auditory perception on which musicians rely heavily to perform. This poster presents a system that aims at solving this perceptual discomfort.

Assessing auditory localization with hearing protection: A screening measure

Presenter: Angelique Scharine

Co-Presenter: Morgan C. Domanico

Co-Author Not Presenting: Ashley Foots

In an effort to establish a uniform method for assessing localization performance with military tactical communications and hearing protection systems (HPD/TCAPS), several methods have been proposed by an ANSI/ASA working group. The first of these, Method 1, is intended as a quick screening method with a pass/fail criterion for use in down-selecting from a larger set of candidate devices. It specifies an array of four loudspeaker pairs arranged at 90° increments. Listeners are tested on short (250ms) burst of pink noise and on longer pulse trains of noise, while sitting in each of two orientations relative to the loudspeakers. Auditory localization performance was measured for twelve listeners wearing each of five HPD/TCAPS devices (Combat Arms! IV Earplugs Invisio® X5 3M"! Peltor ComTac"! III 3M"! E-A-R earplugs and 3M"! E-A-R"! earmuffs) and was compared that that obtained with the ears unoccluded. The HPD/TCAPS were selected with the intent of providing varying levels of spatial information to assess whether Method 1 is sensitive to those differences. The resulting data will be discussed in terms of whether the measurement configuration allows the use of a pass/fail criterion and will be compared to previously collected data obtained using other configurations."

Attenuation Using High Fidelity Hearing Protection Devices

Presenter: Tess Alexandra Zaccardi

Co-Presenters: Kaitlin Palmer, Sarah K. Grinn

Co-Author Not Presenting: Colleen G. Le Prell

The requirements for when hearing protective devices (HPDs) must be worn by covered workers are codified in 29 CFR 1910.95. Additionally, listeners exposed to high-level recreational sound at concerts or other music venues are generally encouraged to wear HPDs to comply with National Institute for Occupational Safety and Health

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(NIOSH) guidance. Musicians and concert-goers are frequently concerned about sound quality, and a variety of high-fidelity ear plugs are now available to consumers. In this study, we are assessing the flatness of attenuation from 250 Hz to 20 kHz using a Real Ear Attenuation at Threshold (REAT) protocol (i.e., threshold comparison between conditions with and without HPDs). This method provides information about the effectiveness of the HPD at quiet levels. Because HPDs are intended to protect individuals at higher sound levels, additional data are being collected using a mannequin with an artificial ear. Microphone in Real Ear (MIRE) data are of interest, but achieving a good seal of the earplug with Verifit in-ear tubing in place confounds sound level measurements. Flatness of attenuation, reliability of attenuation across users, and attenuation at high levels in an artificial ear canal will be presented for a variety of high-fidelity HPDs.

Audiometric Notches and Hearing Loss in Adolescents: Analyses of NHANES 2007-2010

Presenter: Yulia Carroll

Co-Presenter: Franco Scinicariello

Co-Authors Not Presenting: John Eichwald, John Decker,

Hearing loss (HL) is the third most common chronic physical condition in the United States and noise is the most common preventable cause of HL among young and middle-aged adults. We analyzed noise-induced hearing loss (NIHL) data among adolescent participants (12 to 19 years old) in the National Health and Nutrition Examination Surveys (NHANES) 2007-2010. We also compared prevalence rates between NHANES 2005-06 to NHANES 2007-2010. Our study showed that noise-induced hearing loss is of concern starting as young as teenagers as 16.5% of them had audiometric notches, 7% showed Speech Frequency Hearing Loss (SFHL), and 13% High Frequency Hearing Loss (HFHL). Prevalence rate of audiometric notches among females increased from 15.5% in the 2005-2006 survey to 19.6% in 2007-2010, whereas in males the rate decreased from 17.4% to 14.7%. Audiometric notches and HFHL were more common among obese adolescents. The prevalence rates of HFHL and SFHL decreased from NHANES 2005-06 to 2007-2010, while the prevalence of an audiometric notch slightly increased. Future NHANES surveys can reveal if this trend continues.

Bus noise and annoyance: What drivers and collectors think about

Presenter: Teresa Maria Momensohn-Santos

Co-Authors Not Presenting: Roseane de Jesus Sena, Ana Carolina Sena Barboza

Noise may cause damage to the work performance and can be the cause of absenteeism at work, increasing social conflicts between drivers and colleagues or between drivers and passengers. Objective: to evaluate the level of nuisance caused by noise on the bus and whether there is an association between the nuisance caused by noise and its effects on the health of drivers and collectors. Method: transversal descriptive exploratory epidemiological study in a cooperative of urban transport, through inquiry based on Bruno et al 2013 with closed questions, held in 2015 in the city of Camaçari, Bahia/Brazil. Sample was composed of 62 employees, being drivers and collectors aged between 18 and 64 years old of both sexes. Results: the majority of respondents do not have complaints about the noise of the engine of the bus, of the traffic or of the passengers. Only 39% of respondents reported sleep with bad quality, 29% have tinnitus at the end of the day, 19% reported dizziness and 37% headaches. The results indicate that there was no statistical significance difference between drivers and collectors in relation to gender, working time and presence of dizziness at the end of the day.

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Concomitant head/neck muscle activity and middle ear muscle contractions

Presenter: Stephen M. Tasko

Co-Authors Not Presenting: Gregory A. Flamme, Kristy K. Deiters, Madeline V. Smith, William J. Murphy, Heath G. Jones, Nathaniel T. Greene, William A. Ahroon

Middle ear muscle contractions (MEMC) are often included as a protective mechanism in damage-risk criteria for impulsive noise. Explanations for inclusion of MEMC emphasize the role of acoustic elicitors, though it is known that non-acoustic stimuli such as head/neck motor activity also elicit MEMC. Studies rarely monitor motor activity at the time elicitors are delivered. In this study MEMC elicitors were presented to human volunteers to identify the relationships between MEMC and electromyographic (EMG) activity of the selected head and neck muscles. The relative timing of MEMC and smoothed EMG activity was examined. Implications for damage risk criteria will be discussed.

Dangerous decibels programme implementation in Brazil

Presenter: Adriana Bender Moreira de Lacerda

Co-Presenter: Lys Maria Allenstein Gondim

Co-Authors Not Presenting: Andrea Cintra Lopes, Carla Bahillo Neves, Cleide Fernandes Teixeira, Evelyn Joice Albizu, Isabel Kuniyoshi, Renata Coelho Scharlach, Roberta Alvarenga Reis, Thais Morata, Wanderleia Blasca

The Dangerous Decibels® Brazil Program is addressed to all concerned in the prevention of noise induced hearing loss and tinnitus. Exposure to intense sounds can cause irreversible hearing loss and tinnitus in people of any age, including children and adolescents. Thinking on hearing health promotion of Brazilian population, a group of Brazilian researchers, with the support of the Brazilian Academy of Audiology (ABA), has partnered with the American Program Dangerous Decibels®(DD) and in April 2015 the Dangerous Decibels Brazil Program was created (http://www.audiologiabrasil.org.br/ddbrasil/). The goals of Dangerous Decibels® Brazil are, among others, disclosing information about hearing for children, adolescents and adults; implement an interactive education model in hearing health, and promote the training of professionals for the use of Dangerous Decibels® Program. In September 2016 the first Training Workshop for the use of the Dangerous Decibels® program was held in two Brazilian cities (São Paulo and Curitiba), where 10 tutors who nationally represents the program and 62 educators were trained to use the DD program. The purpose of the poster is to present the Dangerous Decibels® Brazil actions in different regions of Brazil.

Effect of Helmet Visor Length on Hockey Officials Exposure to Whistle Noise

Presenter: Karin L. Adams

Co-Author Not Presenting: William J. Brazile

The effect of the helmet visor length on the level of whistle noise to which hockey officials are exposed was evaluated to determine if visors may introduce a reflective plane for the whistle noise, resulting in increased noise exposure. A Knowles Electronic Manikin for Acoustic Research (KEMAR) head and torso assembly with a left ear microphone, in conjunction with the Larson Davis Sound Level Meter (SLM)/Octave Band Analyzer (OBA), was used to measure the peak sound pressure levels from the noise generated from whistle blowing. The KEMAR was equipped with a Bauer 4500 hockey helmet and three visor configurations for the study: without a visor, 2.75 visor, and 4.0 visor. A Fox 40 Superforce pea whistle was mounted close to the manikin s mouth and attached to a portable air compressor to produce approximately 115 dB of whistle noise. Whistle noise was measured in an empty indoor ice arena and the KEMAR assembly was placed on the ice in the five, face-off locations. The whistle was blown five times in each location with a total of 25 samples for each configuration. Measured peak noise levels in the manikin ear were significantly different between the helmet/visor configuration with the long (4.0) visor and the other configurations ($p<0.05$).

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Evaluation of Noise Exposures and Hearing Loss at a Hammer Forge Company

Presenter: William J Murphy

Co-Presenter: Scott E. Brueck

Co-Authors Not Presenting: Judith Eisenberg, Edward L. Zechmann, Thais C. Morata, Edward F. Krieg

The NIOSH Health Hazard Evaluation program evaluated employee exposures to high level continuous and impact noise at a hammer forge company. Personal dosimetry data were collected from 38 employees and noise exposure recordings were collected during two facility visits. Extensive audiometric records were reviewed and trends for hearing loss, threshold shifts and risk of hearing loss were assessed. Heari ng protector effectiveness was evaluated for hammer forging with an acoustic test fixture. A longitudinal analysis was conducted on the audiometric data set that included 4750 audiograms for 483 employees for the years 1981 to 2006. The analysis of the audiometric history for the employees showed that 82% had experienced a NIOSH-defined hearing threshold shift and 63% had experienced an OSHA-defined standard threshold shift. The mean number of years from a normal baseline audiogram to a threshold shift was about 5 years for a NIOSH threshold shift and was about 9 years for an OSHA threshold shift. Overall hearing levels among employees worsened with age and length of employment. The NIOSH audiometric test criteria in addition to OSHA threshold shift criteria to assess threshold shifts could provide an opportunity for early intervention to prevent future hearing loss.

Following the Tech Tide

Presenter: Kan Sun

Co-Authors Not Presenting: Chucri A. Kardous, Peter B. Shaw, Jessie J. Mechling, Amanda S. Azman

Smartphone technology is widely used nowadays. Many built-in or fit-in sensors are being developed for smartphones, which make this technology a promising candidate to monitor occupational exposure. Measuring noise is one example. The primary concern is whether a smartphone can accurately and precisely measure sound levels in comparison to a professional instrument. Therefore, the NIOSH Division of Applied Research and Technology (DART), developed the NIOSH SLM application. Then, this application was tested against a professional instrument using pink noise at different sound levels (65 dB to 95 dB). Results showed that the average agreement between the professional instrument and the NIOSH SLM application is within 1 dB. Large mining machines can generate noise above 95dB. Since the frequency content of industrial noise is different from that of pink noise, a follow-up study was conducted in which the noise source was a jumbo drill machine in operation. Tests were conducted at various distances from the machine to measure a range of sound levels. Results showed that the average accuracy of the NIOSH SLM application is within 1 dB compared to a professional sound level meter, and the precision between different units/measurements is similar to that of a professional dosimeter

Hawkeyes Wear Their HawkEars – A Healthy Hearing Initiative at The University of Iowa

Presenter: Kevin Kock

Co-Presenter: Stephanie M. Fleckenstein

Co-Author Not Presenting: Danielle M.R. Kelsay

This presentation will explain the process of creating HawkEars, an endeavor that focuses on creating hearing protection products that targets all individuals within the University of Iowa, Hawkeye community. Furthermore, this presentation will provide a guide on how to utilize local/university resources and icons to improve hearing protection usage, while providing a source of funding for patients who cannot afford amplification services and/or products. In addition, the presentation will explain methodology to partner with members in the community (e.g. local/university staff, distributors, vendors, etc.) to spread the message that while hearing protection is safe, it can also be cool! This presentation will detail the work of AuD students and faculty at the University of Iowa, along with hearing conservationists from Your Ears Rock, to create the HawkEars project. The presenters hope to inspire the audience to target their own communities and create a similar initiative on a local and state level.

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Hearing Hazards at Church: Trials & Tribulations of Awareness & Hearing Loss Prevention

Presenter: Jan Allison Moore

Over the last several years I have completed a number of studies to document the hazard of noise levels in contemporary Protestant worship services. These services are characterized by extended periods of rock music and signing. Young families are often drawn to the casual nature of these services and many protestant churches have implemented such services. Noise measurements in 3 different churches on multiple occasions during the fall indicated music levels ranged from 93 112 dBA over 30 minute periods of music. In a separate study, the hearing sensitivity of young adult Praise Band members was assessed in a baseline and post-service exposure paradigm. Although hearing levels were within the normal range over half of the participants demonstrated a negative change in their hearing status after noise exposure during the service. Despite evidence that contemporary church services expose parishioners including infants and children to extreme levels of sound, it has been difficult to effect change. This presentation will discuss the challenges of changing church culture and a public awareness program developed to inform church leadership of the hazards of noise at church.

Hearing health education programs for rural youth: Lessons learned from recent studies

Presenter: Khalid M. Khan

Co-Presenter: Marjorie McCullagh

Children and adolescents in rural areas experience hearing health disparities compounded by lack of access to hearing health education. Although small-scale hearing health education programs for rural youth have been successful in changing hearing health behavior over short time periods, effectiveness of these programs has been limited by a number of factors, including lack of systems to deliver programs widely to at-risk youth, and at an effective frequency to maintain change over time. Interventions using technologies such as Web- and computer-based training, smartphone applications and messaging have recently been tested. Results of these interventions are reviewed, and implications for future development of programs are discussed.

Hearing impairment and audiometric configurations as predictive factors of presbyacusis decline

Presenter: Christina Hederstierna

Co-Presenter: Ulf Rosenhall

Objective: In a previous study we found that exposure to occupational noise did not accelerate hearing decline. We have used the same longitudinal material from the Swedish Gothenburg Gerontological and Geriatric Study (H70) to study possible influences of grade of hearing impairment and audiometric configuration on age-related hearing decline. Material: Three different cohorts of 70-year old men and women, born in 1901-2, 1906-7 and 1930, were included. Out of 1013 subjects, 365 had had audiometry performed at 70 and 75 years. Method: Hearing decline between 70 and 75 (dB/year) for the frequencies 0.25, 0.5, 1, 2, 4, and 8 kHz was calculated. The results are reported by quartiles based on 4-frequency average (0,5-1-2-4 kHz) at 70, and by audiometric configuration (based on the original classifications of presbycusis by Schuknecht and Gacek). The results are further sub-classified by gender and previous occupational noise-exposure. Results: Participants belonging to the quartiles with the poorest hearing, and those with combined low- and high-frequency loss, had significantly higher hearing decline at the low and mid frequencies than the other groups. Conclusion: Subjects with the best hearing at 70 have the most favorable rate of hearing decline between 70 and 75 years of

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In-ear and On-body Measurements of Impulse Noise Exposure

Presenter: William J Murphy

Co-Author Not Presenting: Chucri A. Kardous, Shakti Davis, Christopher Smalt

"In-ear dosimetry for high-level impulse noise presents significant challenges. External peak sound pressure levels (>140 dB SPL) combined with hearing protection can result in earcanal levels approaching 140 dB. MIT Lincoln Laboratory has developed a modified commercial-off-the-shelf recorder that simultaneously measures signals from both ear canal and just outside the ear at a sample rate of 96 kHz. Validation measurements were conducted with a GRAS 45CB fixture and an acoustic shock tube. An exploratory study was conducted with a small sample of experimenters during a recent Navy-sponsored noise survey conducted at Quantico Marine Corps Base. Results will be presented from the nominal instructor's position as well as from bystanders observing at a firing range.
Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the National Institute for Occupational Safety and Health. Mention of any company or product does not constitute endorsement by NIOSH.

Influence of environmental noise in reading

Presenter: Teresa Maria Momensohn-Santos

Co-Author Not Presenting: Michele Picanço do Carmo

Research has shown that children performing reading in noisy environment presents greater number of errors when reading. Objective: demonstrate the interference of background noise in reading abilities of children. Method: sample composed of 42 children (9-10 years old) with no hearing, visual and learning problems. All of them were invited to read a paper in three conditions: with maximum ambient noise of 45 dB (A), with cafeteria noise presented with TDH39 headphones at intensities of 76 dB (A) and 95 dB (A).Results: words /minute/condition showed that average words/minute: for silence -97,6; for 76dBA was 94,1 and for 95dBA was 83,2. Inferential analysis showed that there is evidence of noise on this task (p=0,001). Data from number of errors/condition showed average values: silence 1,8; 76 dB A 2,8 and 95 dB A 3,2 errors). There is evidence that the number of errors/condition is not the same (p=0,001). Descriptive measures of the number of omissions/ condition showed average values of 1,8 for silence; 2,8 for 76 dBA and 1,6 for 95dBA. The inferential analysis let us see that there is no evidence (p-value = 0.979) of Condition effect. Conclusion: Noise can interfere on performance of children ins a reading task.

Integrating Audiological Assessment in Farm & Tractor Safety Training

Presenter: Jan Allison Moore

Federal law mandates farm and tractor safety training for children under the age of 16 who will be operating machinery on non-family farms. In Nebraska the training is implemented through a joint effort between The University of Nebraska Medical Center (UNMC) College of Public Health, University of Nebraska Extension, and Central States Center for Agricultural Safety and Health (CS-CASH) and held in approximately 10 towns across the state and about 100 youth per year participate. The two-day program stresses farm safety including prevention of hearing loss. In our pilot study, I examined how a hearing assessment could be included as part of the program. Within day two of the training, the youth are doing their practical portion of the program including tractor driving and ATV safety. It was feasible and timely to integrate hearing testing into this day. Ten children were assessed in the pilot. Students were assessed from 250 8000 Hz including inter-octave frequencies associated with noise exposure. In order for the program to be viable, some logistics regarding the testing equipment, mobile audiometric van, and funding will need to be addressed.

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Middle ear muscle activity associated with mastication

Presenter: Madeline V. Smith

Co-Presenter: Stephen M. Tasko

Co-Authors Not Presenting: William J. Murphy, Heath G. Jones, Nathaniel T. Greene, William A. Ahroon

Damage-risk criteria frequently include middle-ear muscle contractions (MEMC) as a protective mechanism against impulsive noise. In addition to acoustic elicitors, activities such as chewing and swallowing have also been reported to elicit MEMC. Careful examination of the various acoustic and non-acoustic sources of MEMC is necessary to properly assess its role as a protective mechanism. In this study, middle ear impedance was monitored while healthy human volunteers chewed and swallowed small candies. Electromyographic (EMG) activity of masseter was used to detect onset and offset of chewing behaviors. Evidence for MEMC associated with chewing-related EMG activity will be reported and implications for damage-risk criteria will be discussed.

Music induced hearing loss in band students and directors: a review of the literature

Presenter: Hannah Speaks

Co-Presenter: Sherilyn Adler

Concern for classical musician exposure to intense sound through music has resulted in a plethora of research and reports of high measured sound exposure, music induced hearing loss (MIHL) symptoms, and poor hearing protection utilization among professional musicians. Consensus that professional musicians experience significant sound exposure and are at risk for subsequent symptoms of MIHL has provoked a small body of research examining the same factors in student musicians and directors in school bands and similar non-orchestral wind ensemble groups which are widespread across the United States. In the present study, we assess the risk of MIHL for students and directors in high school bands, university bands, and non-orchestral wind-ensembles by conducting a systematic review of the extant published research literature was conducted. Current studies infer that high school and university musicians have potential exposure to sound levels capable of causing permanent hearing damage, and young musicians may be more susceptible to music induced hearing loss than more experienced professional musicians. These findings suggest that hearing loss prevention is effective if implemented early in a musician s career, contributing to a band culture centered on minimizing hearing loss risk.

OHC Training using alternative instruction methods

Presenter: John A. Merkley

Co-Presenter: Kim J. Stanton

In 2016 the Council for Accreditation in Occupational Hearing Conservation modified policies related to additional discipline instructors used during training. Additional instructors could now be recorded and shown during the class, dial into the class through VTC, Webinar, or other online or distributed learning modality. This presentation will look at how CAOHC approved Course Directors have implemented this policy, review the various methods for providing alternative training and its effect on overall training, and identify recommended practices or areas where improvement is needed.

Output levels of volume-limiting earphones

Presenter: Caleb Kronen

Co-Presenter: Cory Portnuff

Co-Author Not Presenting: Kathryn Arehart

With the advent of tablets, smart phones and many other portable ways of accessing media, children ages 8 to 18 spend an average of over seven hours per day to the use of entertainment media (Rideout et al., 2010). The headphone industry has responded to concerns of music-induced hearing disorders by creating a class of volume-limited earphones marked for children. Unfortunately, there has yet to be peer-reviewed scientific research examining the sound level produced by volume limiting earphones. This study measured the

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output levels produced by 30 of these products using measurements on an acoustical manikin. By recording the root-mean-square and the peak intensity level output of the earphones for inputs of pink noise and music, the results of this study show which earphones meet their manufacturer s claims regarding their maximum output. The percentage of earphones which actually limited per manufacturer's claims are 76% when the signal was music and 92% when the signal was pink noise. The earphones that did not have claims were examined to see which earphones limit to the World Health Organization of at least 85 dBA. Of the earphones without manufacturer claims, 25% limited output to 85 dBA when the input was music and 37.5% when the input was pink noise.

Perception, attitude, and knowledge of hearing health among two groups of young farmworkers from rural Indiana

Presenter: Sylvanna Lauren Bielko

Co-Presenter: Khalid M. Khan

Numerous hearing conservation programs have been developed in the United States targeting adult agriculture workers. However, intervention studies for rural young farmworkers has been very limited in the literature. As new technologies and new formats of training have evolved across the country to improve hearing health behavior among youth more information is necessary regarding the perception, attitude, and knowledge of hearing health and preferences for specific formats of hearing education. We have recently conducted two pilot surveys on two age groups of young farmworkers living in rural Indiana to generate data on these outcome variables. In one study, 91 college-aged students in Indiana were interviewed to identify what formats of hearing conservation training were preferred by the participants for effective change in hearing protection behavior. The other study captured hearing health knowledge and attitude among 141 adolescent farmworkers enrolled in high school agriculture classes to determine specific areas of knowledge and attitude that they lack. Results from the two studies and implications of the findings for designing future hearing health interventions are presented.

Plugs in the Clubs: An independent audit of San Francisco's Earplug Ordinance

Presenter: Elon Ullman

Co-Authors Not Presenting: Kathy Peck, Helen Simon

In 2002, H.E.A.R. worked with a coalition of San Francisco city officials and night life advocates to pass an ordinance that requires all large San Francisco music venues to have earplugs available. Although the San Francisco ordinance was an amendment to the San Francisco Police Code, no official regulations were put in place to validate compliance with the ordinance. Recognizing the lack of an official auditing process, H.E.A.R. launched the Plugs In The Clubs Initiative, starting with a survey of earplug availability in the clubs of San Francisco.

Tactical Communication and Protective Systems - Saving Hearing and Enhancing Mission Success

Presenter: John A. Merkley

Co-Authors Not Presenting: Robert A. Williams, Jeremy T. Nelson, Julieta F. Scalo,

Tactical Communication and Protective Systems (TCAPS) have been fielded to Army units since 2014. Approximately 24,000 TCAPS have been fielded to date. This study looked at the effectiveness of TCAPS in preventing hearing loss by comparing PTS rates for units receiving TCAPS prior to and at least one year following fielding with comparable units who have not received TCAPS.

The Effects of Hunting on the Canine Brainstem Auditory Evoked Response

Presenter: Kori Zedaker

Co-Authors Not Presenting: Tina M. Stoody, Deanna K. Meinke, Kathryn E. Bright, Peter M. Scheifele

Individuals who participate in waterfowl and/or dove hunting are at high risk for damage to the auditory system from unprotected exposure to high-level impulse noise from firearms. The purpose of this study was to determine the effects of impulse noise exposure from firearms on the estimated hearing sensitivity of sporting group

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canines (n=18) that actively participate in waterfowl and/or dove hunting with their owners. Human (owner) participants completed a detailed survey regarding their hunting/shooting habits, canine noise exposure and subjective judgments of auditory risk from shooting firearms. Canine hearing sensitivity was assessed using BAER testing, performed with click and 4000 Hz tone burst stimuli. Canine participants were separated into four experimental groups based on age and years of hunting experience. Ranked mean BAER thresholds were compared using the Mann-Whitney U test. Click-evoked BAER thresholds were ranked as significantly elevated ($p<0.05$) for hunting dogs after controlling for age. No differences were evident when measured using the 4000 Hz tone burst stimulus. There is a need to educate hunters regarding the risk of impulse noise exposure from recreational firearms damaging the hearing of their hunting dogs and potential strategies to reduce the risk.

The Subjective Wearer Comfort and Sound Attenuation Performance: a Comparison between Custom-moulded Earplugs Made by Manual and 3D-printing Processing

Presenter: Cheng-Yu Ho

Co-Authors Not Presenting: Pei-Chun Li, Shuenn-Tsong Young

Traditionally the manufacturing of Custom-moulded earplugs (CMEP) is manual processing, which is time-consuming and the quality of earplugs depends on the skill of the technician. With the advent of three-dimensional (3D) scanning earmold and 3D-printing processing technology, the fully digital process supports a more efficient and reliable production flow and the final products may have better comfort and noise reduction performance. This study aimed to compare earplug wearers subjective preference and real-ear attenuations for CMEPs made by manual and 3D-printing processing. Subjects ear impressions were taken and then digitally scanned. The ear impressions were used for producing earplugs by manual processing, and the 3D digital model of ear impression was then used for 3D-printing. The single blind test of subjective preference of comfort for CMEPs by manual and 3D-printing processing was conducted in the noise environment. The preferences of comfort for CMEPs were scored by Likert scale. The attenuation was determined by real ear measurement with the subjects ear occluded by CMEPs. Results suggest that subjects find 3D-printing CMEPs more comfortable and the average amount of attenuation of 3D-printing CMEPs is higher.

Time to Change Direction: Advocate for a Total Worker Hearing Health Program versus the Status Quo

Presenter: Kathy E. Gates

Co-Presenter: Vickie L. Tuten

As Winston Churchill states, There is nothing wrong with change, if it is in the right direction. Churchill s observation about change reminds us that we can be proactive, moving in the right direction to expand Hearing Conservation to a Hearing Health Program focusing on education, protection and monitoring services for all workers regardless of their noise exposures. We live in a noisy world and noise-induced hearing loss (NIHL) can affect all of us, not just those who work in noisy environments. This presentation will attempt to explore and answer two "Whys": Why is it important to prevent NIHL and Why should all workers be provided Hearing Health Services? We must clearly understand the "Why" before we can move forward with the "What" and "How" to accomplish the program. This presentation will provide a common sense approach leading with "Why" a hearing health program is important for all workers and not just the occupationally noise-exposed. We will offer a proactive way to implement using the hearing health triad approach of Educate, Protect, and Monitor and discuss practical strategies to develop and implement a hearing health program into your local hearing conservation practice.

POSTER ABSTRACTS

Usability Study of the Warfighter s Hearing Health Instructional Primer (WHHIP) App

Presenter: Kelly Watts

The Warfighter s Hearing Health Instructional Primer (WHHIP) is an app for military hearing conservation programs. The WHHIP is intended to be a supplemental training tool that can be used on personal smartphones. The WHHIP is available as a free download for both Android and iOS devices. A usability study was undertaken in order to determine whether or not any underlying problems existed within the design of the app that would prohibit or impair use of the app by Warfighters. The focus was on the user interface and the function of the individual features (activities) that are included in the WHHIP. A small group consisting primarily of sailors participated in the usability study, which was performed at the Naval Submarine Medical Research Laboratory. User experience was directly observed and recorded via note takers. User experience was also provided by the subjects through the think-out-loud or talk-aloud procedure and completion of surveys. The first survey obtained information about the subject. Subsequent surveys focused on the activities of the WHHIP. The last survey inquired about the app as a whole. Results are undergoing aggregation; the information provided will be used to improve both platform versions of the app. This project was funded by the Office of Naval Research.

Use of Hearing Protection among Noise-Exposed Populations in the US: What Can National Surveys Tell Us?

Presenter: Christa L. Themann

Co-Author Not Presenting: Howard J. Hoffman

Use of hearing protection devices is essential among individuals exposed to hazardous noise when sounds levels cannot be reduced by other means in order to prevent hearing loss and other adverse health effects. The Occupational Health and Safety Administration requires workers to wear hearing protection when average daily exposures exceed safe levels; the National Institute for Occupational Safety and Health and other organizations encourage the use of hearing protection whenever sound levels are at or above 85 dB(A). One of the goals of the nation's public health agenda – Healthy People 2020 – is to increase the use of hearing protection among adolescents and adults. The National Health Interview Survey (NHIS) collects health data annually from a large, nationally-representative sample of the US civilian noninstitutionalized population. The 2014 NHIS asked participants about their use of hearing protection when exposed to various types and levels of occupational and/or non-occupational noise. These data are essential in understanding the current use of hearing protection among noise-exposed populations. When compared to results from earlier surveys, the data provide information about trends in hearing protector use.

PRESENTER BIOGRAPHIES

Karin L. Adams, PhD

Boise State University

Karin Adams is an Assistant Professor in the Department of Community and Environmental Health and is the Director of the Environmental and Occupational Health program at Boise State University. She earned a Ph.D. and M.S. in Environmental Health from Colorado State University and a B.S. in Chemistry from Centenary College of Louisiana. Dr. Adams is a Certified Occupational Hearing Conservationist with over a decade of program management experience in the discipline of Industrial Hygiene. Peer-reviewed publications include a pilot and follow-up study characterizing the noise exposure and temporary hearing loss of indoor hockey officials in northern Colorado and southeastern Wyoming.

Sherilyn M. Adler, Ph.D.

Ear Peace: Save Your Hearing Foundation (aka Ear Peace Foundation)

Sherilyn M. Adler, Ph.D. is a licensed psychologist and educator from South Florida who has been active in the hearing loss community for the last twenty years. She received her Bachelors degree from UCLA and her masters and doctoral degrees from the University of Miami. She served for over eight years as an active member of the Florida Coordinating Council for the Deaf and Hard of Hearing, which she Chaired from 2010-2013. Dr. Adler is the Executive Director of Ear Peace: Save Your Hearing Foundation, a non-profit organization established to educate young people about Noise-Induced Hearing Loss and its prevention.

William A. Ahroon, Ph.D., OHC

U.S. Army Aeromedical Research Laboratory

William A. Ahroon is a research psychologist with over 40 years of experience in hearing research and research on the effects of noise on hearing. Since 1999, he has been the senior hearing scientist at the US Army Aeromedical Research Laboratory at Fort Rucker, Alabama where he conducts research on hazards to hearing, hearing protection, auditory performance in noise and bioacoustic and noise standards. Dr. Ahroon holds a Ph.D. in Experimental Psychology from Binghamton University and has been elected a Fellow of the Acoustical Society of America. He serves on a number of national and international committees and working groups in the areas of hearing, hearing protection, and acoustics.

Diane Bachman

An audiologist since 1985, Diane initially worked in clinical settings. She has worked in the area of hearing conservation since 2003. As an occupational audiologist with Examinetics, she and the audiology staff work with 5000 facilities nationwide, ensuring regulatory compliance and program excellence.

Carla Souto Bahillo-Neves, PhD

FEDERAÇÃO DA INDUSTRIA DE MINAS GERAIS

Speech therapist formed by the Methodist Institute Izabela Hendrix in 1993. Master's degree in speech at the Catholic University of São Paulo in 2012. Expert in Audiology by the Federal Board of speech. Member of the Brazilian Academy of Audiology. Teaching the course on Expertise in Audiology and Clinical Audiology. PhD in Child and Adolescent the medical school of the Federal University of Minas mines in 2014. Dangerous Decibels Educator training - 2013. Health Analyst executive directors of health SESI / FIEMG. Coordinator of hearing conservation project of students in vocational education SESI / MG.

PRESENTER BIOGRAPHIES

Elizabeth Beach, PhD

National Acoustic Laboratories/ The HEARing CRC

Elizabeth Beach is a senior researcher at the National Acoustic Laboratories. With a background in linguistics and psychology, she has been researching in the area of hearing loss prevention since 2009. Her areas of interest are leisure noise; its impact on overall noise exposure, particularly in relation to the music and entertainment industry; and ways of motivating young adults to change their hearing health behaviour. She leads the HEARing CRC's HEARsmart program - a hearing loss prevention initiative focussed on young people and the music industry. She is also leading a large research project into behavioural and electrophysiological markers of noise-induced 51 hidden hearing loss.

Elliott H. Berger, M. S.

3M

Elliott is a Division Scientist for 3M s Personal Safety Division. For over 40 years he has studied hearing protection, hearing conservation, and related topics, and authored 17 textbook chapters and over 75 published articles. He chairs the ANSI working group on hearing protector attenuation, served on a National Academy of Science committee on hearing loss in the military, is a Fellow of the ASA, Past President of NHCA, Fellow of the AIHA and Past-Chair of its Noise Committee, a past Board Member of CAOHC, and a recipient of NHCA s Lifetime Achievement Award. Among his favorite sounds is the silvery flutter of the leaves of a stand of river birch tickled by a cool evening breeze.

Antoine Bernier, M.Sc.A

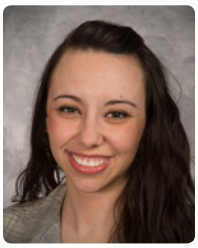
École de technologie supérieure

Antoine Bernier is a PhD candidate, passionate researcher and electrical engineer specialized in audio. His theoretical knowledge and practical mind have allowed him to make multiple tangible contributions to the world of hearing protection and audio in the form of prototypes, publications and a patent. His research work focuses on the development of an active musician earplug that integrates active noise control and allows the musician to play in loud environment safely while hearing himself and others naturally. This project involves acoustics, psychoacoustics, signal processing, programming, electronics, embedded systems, and 3D design.

Sylvanna Lauren Bielko, MS

Indiana University

Sylvanna Bielko is a doctoral candidate in the Department of Environmental and Occupational Health. Her research interest focus on health effects of individuals living in rural areas and includes the health effects of agrochemical exposures, hearing health screening within rural communities, and hearing health interventions in adolescent farmworkers. She is currently working on her dissertation titled Review and evaluation of various formats of educational interventions to increase hearing protection use among youth farmworkers.



Cody Blankenship, B.S

NCRAR/OHSU

Cody Blankenship B.S. is the Program Coordinator for the multi-site longitudinal study referred to as the Noise Outcomes in Servicemembers Epidemiology Study (NOISE Study). She currently works at the National Center for Rehabilitative Auditory Research, located at the VA Portland Health Care System in Portland, Oregon. She is also currently pursuing her MPH at Oregon Health and Science University.

PRESENTER BIOGRAPHIES

Fabien Bonnet, M.Sc, PhD Candidate

École de Technologie Supérieure

After receiving a Master's Degree in Mechanical Engineering from the University of Technology of Compiègne (France, 2013), Fabien made a short stop in England where he worked as an Acoustics Consultant (URS Corporation, July 2013 - December 2014). Then his taste for Research caught up with him and brought him to Montreal where he still remains close to Acoustics, his true passion. As a PhD candidate, Fabien aims the development of an in-ear dosimetric method to help prevent noise-induced hearing loss in the work environment.

Douglas N. Callen, Ph.D., CCC/SPA, FAA

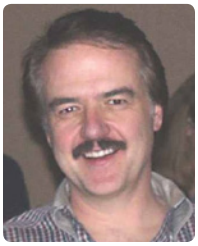
Hearing Conservation Associates & The Armstrong Speech & Hearing Aid Center

Doug is the owner of a private audiology clinic, the Armstrong Speech & Hearing Aid Center, & an industrial hearing conservation company, Hearing Conservation Associates. He serves both companies as Senior Audiologist & Program Director. He earned his B.S., M.Ed., & M.S. degrees from Clarion State College and his PhD from the University of Pittsburgh. Doug is a CAOHC course director; he holds dual certification from ASHA (CCC/SPA). A long time PSP member of NHCA he is also a Fellow of the American Academy of Audiology, Fellow & Charter member of the PA Academy of Audiology, Fellow of the Academy of Doctors of Audiology, and a member of the American Speech-Language and Hearing Association.

Yulia Carroll, MD, PhD

Centers for Disease Control and Prevention

Yulia Carroll, MD, PhD serves as a senior medical officer at the CDC Office of Science at the National Center for Environmental Health (NCEH) and the Agency for Toxic Substances and Disease Registry (ATSDR), where she advises on various scientific issues and more recently has been assisting with the development of the noise-induced hearing loss initiative. Her professional focus is research of environmental exposures, prevention and disease protection, including noise and its health effects. She holds both medical and industrial hygiene degrees.



John G. Casali, Ph.D., CPE

Virginia Tech & Hearing, Ergonomics & Acoustics Resources (HEAR), LLC

Dr. Casali is the Grado Chaired Professor of Industrial and Systems Engineering at Virginia Tech, and a Board-Certified Professional Ergonomist (CPE). He founded the Auditory Systems Laboratory in 1983, a versatile auditory/acoustics research facility at Virginia Tech that he directs today. He also is CTO of HEAR, LLC, a design, testing, and litigation support company. He is a Fellow of the Human Factors and Ergonomics Society and the Institute of Industrial Engineers, and a former President of the National Hearing Conservation Association. He was the recipient of the NIOSH-NHCA Safe-in-Sound Award for Innovation in Hearing Conservation in 2016, and the NHCA's Outstanding Hearing Conservationist Award in 2009. His research at Virginia Tech has been sponsored by various government agencies and corporations to a total of over $10 million. Dr. Casali holds 5 patents and has authored over 200 publications. He enjoys working with the U.S. military, various companies, and community groups on auditory situation awareness, hearing protection and earphone design, community noise, ergonomics, and patent and product liability litigation. In his spare time, he serves as a trial-and-error mechanic to his old sports cars.

PRESENTER BIOGRAPHIES

Catherine Conely

Aurora Sheboygan Clinic

As a clinical audiologist, Dr. Conely provides complete audiology services at Aurora Sheboygan Clinic. She strives to provide comprehensive hearing care for patients of all ages - regardless of their degree of hearing loss. Dr. Conely is experienced in hearing conservation, advanced audiological testing, and hearing aid consultation and fitting. She has participated in clinical research to study the effects of nutritional supplements on tinnitus (ringing in the ears) and has special expertise in advanced audiological testing, including electronystagmogrpahy (ENG). Dr. Conely holds a Certificate of Clinical Competence (CCC) credential.

Kristy K. Deiters, Au.D.

Stephenson and Stephenson Research Consulting LLC

Kristy Deiters is a clinical audiologist and researcher with a clinical doctorate in Audiology from Western Michigan University and a Bachelor of Arts degree in Marketing and Economics from Alma College. She spends part of her time at Hearing Services & Systems, specializing in adult diagnostics and hearing aid care. She has also been involved in various research activities with topics ranging from changes in hearing configurations over time, reliability of hearing thresholds over time, and most recently, middle ear muscle contractions.

Robert A. Dobie, MD

Dobie Associates

Robert Dobie MD is clinical professor of otolaryngology at the University of Texas and partner in Dobie Associates, providing consultation in hearing, balance, hearing conservation, and ear disorders (www.dobieassociates.net). After residency training at Stanford, he completed fellowships in auditory physiology and otoneurosurgery. Previous positions included professor (University of Washington), department chair (University of Texas), and director of extramural research (NIDCD). Dr. Dobie s research interests include age-related and noise-induced hearing loss and tinnitus. He is the author of Medical-Legal Evaluation of Hearing Loss (3rd edition, 2015) and more than 200 other publications.

Dennis P. Driscoll, P.E.

Associates in Acoustics, Inc.

Dennis has both a Bachelor of Science and Master of Science degrees from North Carolina State University. Since 1980, his specialties in acoustics include measurement of equipment noise levels and employee noise exposures, the design of engineering controls, and environmental surveys. From 1980-1988 he managed Amoco and BP Corporation's hearing conservation program, and has been an acoustical consultant to industry since 1988. Toward professional certification, he is a registered Professional Engineer and a Board Certified Noise Control Engineer. He is a Past President of the National Hearing Conservation Association (NHCA), a Fellow Member of the American Industrial Hygiene Association (AIHA), and past Chair of the AIHA Noise Committee. Finally, Dennis is one of the Editors and participating author of The Noise Manual, 5th and 6th Editions, by AIHA.

John Eichwald, MA

Centers for Disease Control and Prevention

John Eichwald is an audiologist currently detailed to the Office of Science in CDC's National Center for Environmental Health in Atlanta, Georgia working on non-occupational noise induced hearing loss. John began his career at CDC in 2004 as the Team Lead for the Early Hearing Detection and Intervention program within the National Center on Birth Defects and Developmental Disabilities. Prior to CDC, he spent nearly 20 years at the Utah Department of Health serving in both clinical practice and administrative positions. His

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professional focus has been on the early identification of hearing loss; weaving in various aspects of data management, analysis, integration and public health informatics.

Cameron J. Fackler, Ph.D.

3M Personal Safety Division

Cameron J. Fackler obtained his Ph.D. in Architectural Acoustics from Rensselaer Polytechnic Institute. During his studies, he interned with the Hearing Loss Prevention Team at the National Institute for Occupational Safety and Health, where he worked on the evaluation of hearing protectors in high-level impulsive sounds. Cameron is currently employed as an Acoustical Engineer with 3M's Personal Safety Division, and he works on research and development of the next generation of hearing protectors, as well as methods for measuring and evaluating HPD performance.

Greg Farber

SoundPrint

Greg is the founder of the SoundPrint app that allows the general public to crowdsource sound levels of venues (i.e. restaurants, bars, coffee shops) by measuring a venue s sound level and submitting it to the SoundPrint database. The database is searchable by anyone such that people can discover the average noise level of a specific venue in their area. Greg deeply cares about the dangers of noise pollution and believes a publicly accessible venue sound level database can not only educate the public about the dangers of noise pollution, but also help preserve their hearing health.

Donald S. Finan, PhD

University of Northern Colorado

Donald Finan, Ph.D., is a Professor in the Audiology and Speech-Language Sciences program at the University of Northern Colorado. He is a speech scientist with a background that encompasses speech-language pathology and audiology, speech physiology, neuroscience, and instrumentation. His research interests include the measurement of noise in relation to auditory exposure, normal speech motor control over the lifespan, the use of technology in clinical and research settings, and developing innovative tools and pedagogies for speech science instruction.

Gregory A. Flamme, Ph.D.

Stephenson and Stephenson Research Consulting LLC

Greg Flamme, Ph.D. is the Senior Scientist and Chief Operating Officer of Stephenson and Stephenson Research and Consulting (SASRAC), which is a company founded by Dr. Mark Stephenson and Dr. Carol Stephenson. Dr. Flamme has a Ph.D. in Audiology from the University of Memphis, completed post-doctoral work in Epidemiology and Biostatistics at the University of Iowa, and was an Associate Professor in the Department of Speech-Language Pathology and Audiology at Western Michigan University prior to joining SASRAC. Dr. Flamme's research interests include the prevention, treatment, and epidemiological study of hearing impairment.

Stephanie M. Fleckenstein, AuD, CCC-A

University of Iowa

Stephanie M. Fleckenstein received her M.A. in Audiology from the University of Iowa and AuD. from AT Still University. She has worked as a Clinical Professor at the University of Iowa for the past 14 years. Stephanie's current responsibilities in-

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clude clinical instruction of graduate students in the areas of hearing loss prevention and identification, business practice, diagnostic audiology, and aural rehabilitation. Stephanie received Dangerous Decibels training in 2013. She is a member of National Hearing Conservation Association, American Academy of Audiology, American Speech and Hearing Association and Iowa Speech and Hearing Association.

Hilary Gallagher

Air Force Research Laboratory

Ms. Gallagher is a research engineer at the Air Force Research Laboratory. She conducts bioacoustic and physical acoustic research as part of the 711th Human Performance Wing. She is also partially funded by the F-35 Joint Program Office to support pilot and maintainer hearing protection and communications.

Kathy E. Gates, AuD, CCC-A

Defense Hearing Center of Excellence

Dr. Kathy Gates joined the Defense Hearing Center of Excellence (HCE) in October 2012 and is currently working under the Prevention Branch. One of her primary roles is to work on launching the Comprehensive Hearing Health Program to Audiology and Hearing Conservation/Program Clinics across the DOD and VA. Colonel (Retired) Gates served twenty-six years in the U.S. Army Medical Service Corps as an Army Audiologist. Her last assignment was Integrated Service Chief, Audiology and Speech Center, Walter Reed National Military Medical Center.

Sarah K. Grinn, Au.D.

The University of Texas at Dallas

Dr. Grinn holds an Au.D. from the University of Florida, a bachelor s degree in CSD from Michigan State University, and is currently a Ph.D. student at The University of Texas at Dallas. Dr. Grinn has been part of audiology research teams at all 3 universities in the areas of hearing conservation and auditory perception, and aims to hold audiology leadership positions in the clinic, classroom, and laboratory. She is committed to active participation in the legislative processes that shape the scope of audiology, the gold-standards of evidence-based clinical care, and the protection of populations at risk for the development of noise induced hearing loss.

Christina Hederstierna

Karolinska University Hospital

Christina Hederstierna, MD, PhD, works in The Department of Hearing and Balance at the Karolinska University Hospital in Stockholm Sweden since 1995. She is a specialist in ENT and in neurotology. Her main clinical interests lie in diagnostics of all kinds of hearing loss in children and in adults. Her PhD thesis concerned the potential protective effect of estrogen on hearing function. Currently her research interests involve studies of hearing in women with Turner syndrome, hearing in the elderly, hearing and cognition, noise-induced hearing loss, hearing in patients treated with ototoxic drugs, hearing in patients with vestibular schwannoma.

James A. Henry, PhD

VAPORHCS

James Henry, Ph.D. is a VA Rehabilitative Research & Development (RR&D) Research Career Scientist at the NCRAR, and Research Professor,Department of Otolaryngology/Head and Neck Surgery at Oregon Health & Science University (OHSU).Dr. Henry has been employed at the VA Portland Health Care System (VAPORHCS) for over 29 years, and has been funded by VA RR&D continuously since 1995 to conduct numerous studies addressing various clinical aspects of tinnitus. He has received funding for over 25 tinnitus-research grants and is considered a leading expert in the field of tinnitus clinical measurement and intervention. Dr. Henry is PI on the currently funded longitudinal epidemiology NOISE Study.

PRESENTER BIOGRAPHIES

Cheng-Yu Ho, Ph.D.
Mackay Medical College

Cheng-Yu Ho received the B.S. degree in electronic engineering from Chang Gung University, Taoyuan City, in 2006 and the Ph.D. degree in biomedical engineering from National Yang-Ming University, Taipei City, Taiwan, in 2015. In 2010, he served as a project manager of newborn hearing screening for the Taiwan Speech-Language-Hearing Association, devoting to promote universal newborn hearing screening in Taipei, Taiwan. Since 2015, he has been a Postdoctoral Researcher with the Hearing and Speech Technology Lab. at Mackay Medical College, New Taipei City, Taiwan. His research interests include psychoacoustics, hearing conservation, hearing assistive devices, electro-acoustical measurement.

Esma Idrizbegovic, MD, PhD
Karolinska University Hospital

Esma is an Associate Professor at the Department of Hearing and Balance at the Karolinska University Hospital in Stockholm Sweden. She is a senior specialist in clinical Audiology and her main clinical interest is diagnostics of hearing loss in children and adults. Her PhD thesis was about Calcium Binding Protein Immunoreactivity in the Central Auditory System, during aging and after noise exposure. This research was done at the department of Pharmacology and Physiology at the Karolinska Institutet and at the Northern Illinois University, USA. In recent years Esma's clinical research has been about hearing, cognition and aging. The auditory function, both peripheral and central, have been studied in subjects with early Alzheimer's disease, mild cognitive impairment and in subjects with subjective memory complaints, in search of signs of central auditory processing dysfunction even in early stages of cognitive impairment.

James J. Jerome
Occupational Audiologist

James has over thirty-seven years of experience in the field of Audiology. He retired as a Lieutenant Colonel from the U.S. Army in 1998, devoting twenty-one years to clinical audiology and hearing conservation. From 1998 to 2002, he was an Occupational Audiologist with the Indianapolis office of Health & Hygiene (later U.S. HealthWorks). From 2002 to 2006, he was President of Hearing Safety- Midwest, Inc, in Indianapolis, Indiana, a hearing conservation consulting and service firm. Since January 2007, he has become a member of and currently consults for Workplace INTEGRA out of their Indianapolis office. In addition, the Council for Accreditation in Occupational Hearing Conservation (CAOHC) has recognized him as one of the most active Course Directors in the nation since 2003.

Benj Kanters, MM
Columbia College Chicago

Benj has been a professor at Columbia College since 1993, after 20 years in the audio and music industries, including 14 years teaching audio at Northwestern University. Through the 70s, he was partner and sound engineer with the Chicago area concert club, Amazingrace. During the 80s, he was partner and head engineer of Studiomedia Recording Company. After studying hearing physiology at NU, he developed the course Studies in Hearing to teach physiology and conservation to audio students. In 2007, he founded The Hearing Conservation Workshop, presenting over 90 seminars on hearing physiology and conservation for students and professionals in the audio, music and hearing science industries.

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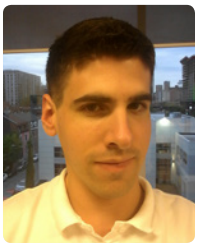


Carillo Kévin

École de technologie supérieure

Mechanical engineer specializing in vibratory and acoustic comfort, I am currently doing a Ph. D. in the Acoustics Laboratory ICAR (Infrastructure Commune en Acoustique pour la Recherche) at ETS (École de technologie supérieure). The field of application of my research concerns hearing protection. In particular, I study foam plugs at the macroscopic and microscopic level. The objective is to optimize their properties (material and geometry) in order to improve their noise attenuation and to minimize their occlusion effect (amplification of physiological noise at low frequencies). In parallel, an alternative method for assessing their noise attenuation has been validated.

Khalid M. Khan

Indiana University, Bloomington

Dr. Khan's research interests are centered on the broad area of environmental epidemiology with specific emphasis on rural and global environmental health. His research program has two major components: 1) understanding the mechanisms of neurobehavioral effects of environmental and occupational exposures and 2) evaluating the efficacy of community-based interventions for reducing the risks of environmental exposures and chronic health effects. His recent projects have focused on the training and participation of children, adolescents, school teachers and rural families in the areas of safe water, noise exposure prevention and hearing health.

Kevin Kock, B.S.

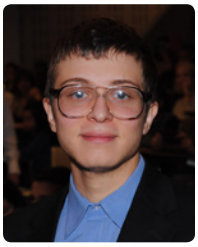
University of Iowa

Kevin Kock is currently a Doctorate of Audiology student at the University of Iowa. He graduated in 2016 from the University of Houston, with a double degree in Communication Sciences and Disorders/Psychology. Clinically, Kock enjoys working with all patients to provide them appropriate amplification. Academically, Kock enjoys learning about hearing technology, auditory ecology, language outcomes through device usage, and methods to improve hearing conservation. Kock is the acting treasurer of the UI Student Academy of Audiology. He also started HawkEars, an initiative to increase safe hearing practices and give back to clinic patients by producing Iowa Hawkeye hearing products.

Jeffrey M. Komrower

Noise Control Engineering

Mr. Komrower is a Sr. Engineer at Noise Control Engineering in Billerica, MA. He is Project Manager on a major Navy program to reduce Noise Induced Hearing Loss of our warfighters and is working with the US Bureau of Reclamation to reduce noise levels in HydroPower plants. He has been in the noise, vibration and shock field for over 38 years with experience at LMS North America, Zonic Corporation, NKF Engineering and General Dynamics Electric Boat Division. Mr. Komrower received his BS in Mech, Engr. from Rensselaer Polytechnic Institute in Troy, NY and his MS in Ocean Engr. from Florida Atlantic University in Boca Raton, FL. He is the author of over 70 technical papers and reports.



Caleb Kronen, B.A., Audiology Doctoral Student

University of Colorado, Boulder

Caleb Kronen is a third-year audiology doctoral student at the University of Colorado. After dedicating three years of research in the area of hearing loss, at the University of Colorado Hearing Research Laboratory, and working with patients of all ages in clinical rotations, Caleb Kronen has focused his research on noise-induced hearing loss in young children. He also has spent two years working on studies in the Laboratory of Dr. Yoshinaga-Itano, examining the effects that hearing loss has on the language, speech and social-emotional development of children.

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Shana Laffoon, Au.D. Student

Central Michigan University

Shana Laffoon is an audiology student at Central Michigan University. Her research interests are in the area of hearing conservation with firearm users. She is currently completing her third year in the program and is looking forward an exciting career in audiology, wherein she hopes to own a private practice.

Chantal Laroche, Ph.D.

University of Ottawa

Chantal Laroche is a Professor in Audiology and Speech-Language Pathology at the University of Ottawa. She has obtained funding from many Canadian government agencies in collaboration with colleagues in psychology and engineering. She has published in excess of 100 scientific articles and conference proceedings in international and national journals throughout her career. Her research interests are diversified and include the effects of noise on health and quality of life, noise and communication, hearing protection, auditory fitness for duty, the perception and localization of warning signals and the prevention of noise-induced hearing loss.

Kichol Lee, Ph.D.

Virginia Tech

Kichol Lee is a research assistant professor of Industrial and Systems Engineering at Virginia Tech. He received a Ph.D. in Human Factors Engineering at Virginia Tech in 2011. As a manager of Auditory Systems Lab at Virginia Tech, he conducts various projects related to product design and human audition. His current research interests include development of methods to quantify auditory situation awareness of various hearing protection/enhancement devices.

Colleen Le Prell, PhD

University of Texas at Dallas-Callier Center

Dr. Colleen Le Prell is the Emilie and Phil Schepps Professor of Hearing Science at the University of Texas at Dallas, and head of the UTD Doctor of Audiology (AuD) Program. She has received research funding from the National Institutes of Health, the Department of Defense, and several foundations, and has led industry-sponsored contracts. Current research programs in her laboratory include translational research programs directed at prevention of noise-induced hearing loss. She has published 55 research articles in peer-reviewed journals, contributed chapters to 10 books and edited 3 books, and has served as Director of Education for the National Hearing Conservation Association.

Ted Madison, M.A., CCC-A

3M Personal Safety Division

Ted Madison is a Technical Service Specialist at 3M, providing technical support, education and training in hearing loss prevention and hearing protection. He is also a CAOHC-certified course director at the University of Minnesota. Ted served as President of NHCA in 2004-2005. He received the Michael Beall Threadgill Award in 2008 and the Outstanding Lecture Award in 2002. He is a member of ASHA, AAA, ASA, and the ANSI S3 Bioacoustics committee. When time allows, he brings his passion for hearing loss prevention into the classroom as a Dangerous Decibels! educator teaching young people about the joy of hearing and encouraging them to make healthy hearing choices.

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Heather Malyuk, AuD

Self Employed

Doctor Heather Malyuk hails from northeast Ohio and holds a degree in Music History & Literature from the University of Akron, and a clinical doctorate in audiology from Kent State University. She was the director of the Musicians Hearing Clinic at Sensaphonics, Inc. for 4 years, and now owns and directs Soundcheck Audiology, specializing in hearing wellness services and products for a diverse clientele of musicians, from well-known touring artists to local bands. Heather is an internationally acclaimed old time Appalachian fiddler and guitarist. She has toured, taught, and performed extensively and was recently recognized for her soundtrack performance on an Emmy Award-winning documentary.

Elizabeth A. Masterson, PhD, CPH, COHC

National Institute for Occupational Safety and Health

Elizabeth Masterson is an Epidemiologist in the Surveillance Branch of the Division of Surveillance, Hazard Evaluations and Field Studies at the National Institute for Occupational Safety and Health, Cincinnati, Ohio. She has been working in public and environmental health for 21 years. Her work has focused on occupational hearing loss surveillance since 2010. She received a PhD in Environmental Health/Epidemiology from the University of Cincinnati in 2012 and is certified in Public Health and Occupational Hearing Conservation.

Marjorie C. McCullagh, PhD, RN

University of Michigan School of Nursing

Marjorie McCullagh is a Professor and Director of the Occupational Health Nursing Program at the University of Michigan School of Nursing. In this role, she collaborates with an interdisciplinary faculty to prepare future occupational health professionals for roles in promoting the health of the nationâ€™s workforce. Her NIH-funded program of research focuses on prevention of noise-related problems among farm operators and farm youth. Dr. McCullagh is a registered nurse, a board-certified advanced public health nurse, and a certified occupational health nurse-specialist. She holds a PhD in nursing from the University of Michigan and has 20 years of professional experience in hearing conservation, specifically, promotion of behavior change as it relates to hearing protection. She has served in a variety of leadership roles in professional organizations regionally and nationally.

Mary M. McDaniel, Au.D.

Pacific Hearing Conservation, Inc.

Mary M. McDaniel, Au.D., is the owner of Pacific Hearing Conservation, Inc. and has worked exclusively in occupational audiology since 1984. She's been an active member of the NHCA, serving as President in 1997-98 and was the recipient of the Michael Beall Threadgill Award in 2003. She served on the CAOHC Council for ten years and was Council Chair 2007-09. Mary is a certified CAOHC Course Director and a certified Profession Supervisor of the Audiometric Monitoring Program©. She is a member of ASHA, Past Chair of ASHA's Special Interest Division #8, and fellow of AAA. She is licensed to practice in Washington, Oregon, California, Alaska, Nevada, Arizona, North Dakota, Missouri, Texas

PRESENTER BIOGRAPHIES

Deanna K. Meinke, PhD, CCC-A

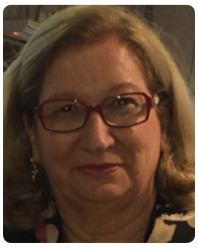
University of Northern Colorado

Deanna Meinke is currently a Professor in the Audiology and Speech-Language Sciences program at the University of Northern Colorado where her research is focused on the early detection and prevention of noise-induced hearing loss. Current research projects are implemented in the topic areas related to auditory risk of impulse noise, educational gaming to prmote hearing loss prevention, and the use of wireless automated hearing test systems for use outside of a sound-booth. She has served as past president of the NHCA. Presently, she chairs the NIOSH "Safe-in-Sound Expert Committee" and is Co-director of the Dangerous Decibels program. Her favorite sound is the call of Sandhill cranes at dawn.

John A. Merkley, AuD, CCC-A, CPS/A

Defense Hearing Center of Excellence

LTC John 'Andy' Merkley is an Army Audiologist assigned to the Department of Defense Hearing Center of Excellence. He holds a Master of Science in Communicative Disorders from Utah State University and a Doctor of Audiology from Central Michigan University. LTC Merkley's professional associations include AHSA, the Military Audiology Association (MAA) and the National Hearing Conservation Association (NHCA). In addition, LTC Merkley represents the Military Audiology Association on the CAOHC Council and serves as the CAOHC Vice Chair of Education. Interests include OHC training, hearing health education, and professional supervision of audiometric monitoring programs.



Teresa Maria Momensohn-Santos

IEAA - Instituto de Estudos Avançados da Audição

Clinical audiologista. PhD in Communication Disorders. Full teacher at PUC São Paulo, Brasil. Advisor of MSC and PhD. Researcher on Noise effects on Learning.

Jan Allison Moore, Ph.D., CCC-A/SLP

University of Nebraska Kearney

Jan Allison Moore received graduate degrees from the University of Illinois (Ph.D.) and Purdue University (M.S.) and her undergraduate degree from the University of Central Arkansas. She also completed a graduate certificate program in Public Health at the University of Nebraska Medical Center. She was a Fulbright scholar to Canada in 1993. She is a full Professor at the University of Nebraska Kearney. Her primary research interests include speech production children with hearing loss. Most recently, she has embarked on a new area of research focusing on prevention of noise-induced hearing loss in persons attending contemporary worship services.

Adriana Bender Moreira de Lacerda

Universidade Tuiuti do Paraná

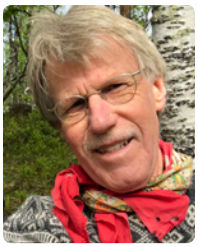
Audiologist, Doctorate in Biomedical Sciences Audiology Universite de Montreal, Canada, Professor at Universidade Tuiuti do Parana (UTP), Brazil.

PRESENTER BIOGRAPHIES

Thais C. Morata, Ph.D.

National Institute for Occupational Safety and Health

Thais C. Morata earned a doctoral degree in Communication Sciences and Disorders from the University of Cincinnati in 1990. Currently she is a Research Audiologist at the National Institute for Occupational Safety and Health (NIOSH, Cincinnati) and the Coordinator of the National Occupational Research Agenda Manufacturing Sector Council, a network of partners and stakeholders who collaborate through activities encompassing the entire research continuum. Dr. Morata created and directs the Safe-in-Sound Excellence in Hearing Loss Prevention Awards!. She is a Founding Associate Editor for the International Journal of Audiology and for the Cochrane Work Review Group.



Per Muhr, Ph.D.

Karolinska Institute

Per Muhr is a BA in chemistry, limnology and statistics in Sweden since 1973; Occupational Hygienist in 1979; Master studies in Environmental Medicine and Epidemiology in 1987-89; Doctorial dissertation in Technical Audiology at the Karolinska Institute of Stockholm, Sweden, in 2010. Laboratory manager in water treatment 1973-1979; Occupational Hygienist at Occupational Health Services and at the Swedish Armed Forces 1980-2011 (retirement); From 2012 senior researcher at the Karolinska Institute, Stockholm. His primary research interest includes different aspects of occupational and noise-induced hearing loss and auditory epidemiology with emphasis on effects of military noise exposures and management of Hearing Conservation Programs.

William J. Murphy, PhD

CDC / NIOSH

CAPT William J. Murphy is the coordinator for the Hearing Loss Prevention cross sector and works in the Division of Applied Research and Technology, National Institute for Occupational Safety and Health in Cincinnati. A graduate in physics of Iowa State University (B.S. and M.S.), he completed his Ph.D. in physics at Purdue University and joined NIOSH in 1992. In 2012, he completed a M. Eng. in Acoustics at Penn State University. He was commissioned as a scientist officer in 1993 and holds the rank of Captain in the U.S. Public Health Service. He is an active member of the National Hearing Conservation Association and a Fellow of the Acoustical Society of America.

Vincent Nadon, M.A.Sc., B.Eng

Ecole de technologie superieure

Vincent has always sought to understand how the acoustics and electronics work in music, which quickly led him to the specialization in digital signal processing. In order to find a sequel to his undergraduate studies at the École de technologie supérieure and undertake projects that motivate him, he approached Jeremie Voix and EERS Inc. After completing his Master in april 2014 with the NSERC-EERS Industrial Research Chair in in-ear technologies (CRITIAS), Vincent still focuses his energy, during his Ph.D., on developing a system to monitor otoacoustic emissions in industrial workers in a noisy environment.

PRESENTER BIOGRAPHIES

Rick Neitzel

University of Michigan School of Public Health

Dr. Rick Neitzel is an Associate Professor and Associate Chair of the Department of Environmental Health Sciences. He is the exposure scientist whose research focuses on the characterization of exposures to noise, heavy metals and other ototoxins, psychosocial stressors, and injury risk factors, as well as a range of adverse health effects associated with these exposures. His work takes place in occupational and community settings both domestically and abroad. He is particularly interested in incorporating new methodologies and exposure sensing technologies into research, and also has a strong interest in translating his research findings into occupational and public health practice.

Kaitlin Palmer, B.A.

University of Texas at Dallas

Kaitlin is a third year AuD student at the University of Texas at Dallas. She received her Bachelor of Arts with a double major in Communicative Disorders and Spanish from the University of Alabama. Her research interests include noise induced hearing loss, hearing conservation, and humanitarian audiology.

Cory Portnuff, AuD, PhD

University of Colorado Hospital

Cory Portnuff is a clinical audiologist at the University of Colorado Hospital and an Assistant Clinical Professor at the University of Colorado Denver School of Medicine. In the clinic, he works with patients of all ages, with a focus on audiologic rehabilitation, treatment for tinnitus and services for musicians. Dr. Portnuff is board certified in audiology with a specialty certification in pediatric audiology. His research focuses on noise-induced hearing loss in children, with a particular emphasis in understanding music-induced hearing loss and music players using health belief modeling.

Ulf Rosenhall, M.d., Ph.D.

Karolinska Institute

Ulf Rosenhall is emeritus professor at the Karolinska Institute, Stockholm, Sweden. He is a licensed Medical Doctor since 1967, and a specialist in Otorhinolaryngology and Audiological Medicine. His previous positions include Karolinska University hospital, Stockholm (head of the dept. of Audiology 1993-99); Sahlgrenska University hospital, Gothenburg; Uppsala University hospital (Ph.D.-degree in 1974); and Tulane University, New Orleans. He works at present part time in Stockholm, and at the Vastra Gotaland Region, Sweden. His research is focused on age-related hearing loss, noise induced hearing loss, and epidemiological audiology. His publication list includes 139 articles indexed in PubM.

Stephanie K. Sayler, MS, OHC, CIH

University of Michigan

Stephanie Sayler is a Research Area Specialist Senior at the University of Michigan School of Public Health. She is a CAOHC-certified Occupational Hearing Conservationist, Certified Industrial Hygienist, and has a Master of Science degree in Industrial Hygiene from the University of Michigan. While her work primarily focuses on noise and hearing loss, she is also involved in global industrial hygiene research and outreach that aims to identify and address health and safety issues among underserved workers.

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Angelique Scharine, PhD

US Army Research Laboratory

Angelique Scharine has worked for the U.S. Army Research Laboratory since receiving her PhD in psychology from Arizona State University in 2002. Working with a number of Army materiel development programs, she researches the effects of Soldier headgear, communications headsets and hearing protection on Soldier situation awareness and communication. Her goal is to facilitate the development of augmented communication technology that increases compliance with hearing safety practices. She is the author of numerous technical reports, papers and book chapters on the topic of hearing related human factors issues due to helmets, hearing protection and communications systems.

Theresa Schulz

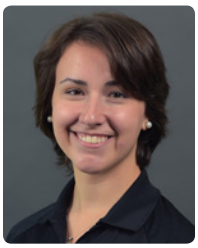
Honeywell Safety Products

Dr. Theresa Y. Schulz is the hearing conservation manager for Honeywell Safety Products, manufacturer of Howard Leight® hearing protection products. She is a past president and has been an active member of the National Hearing Conservation Association [NHCA] for 30 years. Dr. Schulz served in the U.S. Air Force for over 20 years as an audiologist.

Ryan Scott

Santa Fe College

Ryan Lee Scott is an Adjunct Professor with Santa Fe College teaching criminal justice and firearms to law enforcement officers and has been a sworn law enforcement officer since 2010 . During his time in law enforcement he has been assigned to patrol, criminal investigations, agency training, radio and IT systems management. He has advanced certifications and experience as a traffic homicide investigator, firearms and use of force instructor, and field training officer. In additional to Ryan Lee Scott's law enforcement activities he has also conducted research in mechanical engineering, materials science and engineering, pharmacology and therapeutics, and hearing science.



Madeline V. Smith, B.S. Student

Western Michigan University

Madeline Smith is a fourth year undergraduate student studying at Western Michigan University. Madeline will graduate from WMU and the Lee Honors College in April 2018 with a Bachelor of Science degree in Speech Language Pathology. She is currently a research assistant in the Hearing Loss Prevention Lab in the Department of Speech, Language and Hearing Sciences at Western Michigan University.

Hannah Speaks, BS

University of Miami

Hannah Speaks is currently a MSPH candidate at the University of Miami Miller School of Medicine, Department of Public Health and an ambassador for the Ear Peace Foundation. She holds a BS in chemistry and industrial hygiene from the University of North Alabama, and after completing two industrial hygiene internships, remains an active member in the American Industrial Hygiene Association. A trombone player herself, she

PRESENTER BIOGRAPHIES

has remained a drum corps and marching band enthusiast, and hopes to continue researching music induced hearing loss and the prevalence of audiological disorders among young musicians.

Prof. Charles Spence

Oxford University

Professor Charles Spence is a world-famous experimental psychologist with a specialization in neuroscience-inspired multisensory design. He has worked with many of the world's largest companies across the globe since establishing the Crossmodal Research Laboratory (CRL) at the Department of Experimental Psychology, Oxford University in 1997. Prof. Spence has published over 800 articles and edited or authored, 10 academic volumes including, in 2014, the Prose prize-winning "The perfect meal", and "Gastrophysics: The new science of eating" (2017; Penguin Viking). Much of Prof. Spence's work focuses on the design of enhanced multisensory food and drink experiences, through collaborations with chefs, baristas, mixologists, perfumiers, and the food and beverage, and flavour and fragrance industries. Prof. Spence has also worked extensively on the question of how technology will transform our dining experiences in the future.

Kan Sun, MPH

Workplace Health Branch, Pittsburgh Mining Research Division, NIOSH

Kan Sun is graduated from Industrial Hygiene Program of the Environmental Health Sciences Department, School of Public Health, University of Michigan in 2013, with a MPH degree. She had worked in Physical Hazard Laboratory in the University of Michigan for 2 years after her graduation, where she focused on research in noise exposure and hearing loss prevention. She joined Hearing Loss Prevention Team of the Workplace Health Branch in the Pittsburgh Mining Research Division, NIOSH, in early 2016. Since then, she has been working with acoustic engineers to develop engineering noise controls on mining equipment and conducting field exposure assessment, etc.

Stephen M. Tasko, Ph.D. CCC-SLP

Western Michigan University

Stephen Tasko, Ph.D. is an Associate Professor in the Department of Speech, Language and Hearing Sciences at Western Michigan University. Prior to joining WMU, Dr. Tasko earned his Ph.D. in Communication Disorders from the University of Wisconsin-Madison and completed post-doctoral work in the Audiology and Speech Center at Walter Reed Army Medical Center. Dr. Tasko has a wide range of research interests that include assessment of firearm noise, mechanisms of middle ear muscle function, and normal and disorder speech motor control.

Christa L. Themann, MA, CCC-A

NIOSH

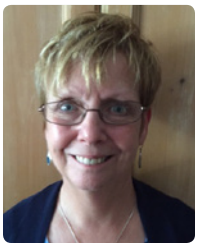
Health. Her research experience includes animal studies on the effects of impulse noise on hearing, methods for assessing hearing protector attenuation, and developing effective hearing conservation strategies for workers with impaired hearing. Currently, Christi manages audiometric testing for several large epidemiologic studies including the National Health and Nutrition Examination Survey, the Early Childhood Longitudinal Study, and the Age Gene/Environmental Susceptibility - Reykjavik Study. She is also interested in using new media to promote healthy hearing. Christi is pursuing a doctorate in epidemiology.

PRESENTER BIOGRAPHIES

Jennifer Tufts, Ph.D., CCC-A, PS-A

University of Connecticut

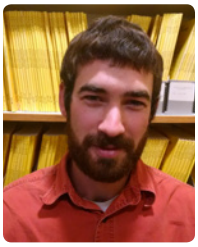
Jennifer Tufts is a past president of NHCA. She is an associate professor of audiology in the Department of Speech, Language, and Hearing Sciences at the University of Connecticut. Previously, she completed postdoctoral clinical and research training at Walter Reed Army Medical Center in Washington DC. Her current research areas include hearing loss prevention and auditory fitness for duty in diverse populations.



Vickie L. Tuten, AuD, CCC-A

Defense Hearing Center of Excellence

Dr. Tuten is Branch Chief, Prevention and Surveillance, for the Defense Hearing Center of Excellence. She retired from the Army with experience in hearing conservation program management and served as an instructor. Dr. Tuten has an Audiology Doctorate from Central Michigan University. She is Associate Coordinator, Specialty Interest Group (SIG 8), American Speech Language and Hearing Association (ASHA). She is President Elect, National Hearing Conservation Association (NHCA). She has previously represented MAA on the Council for Accreditation in Occupational Hearing Conservation (CAOHC). She holds certification as a CAOHC Course Director and Professional Supervisor.



Elon Ullman

Hearing Education and Awareness for Rockers

Elon Ullman is a Research Associate at Advanced Hearing Concepts and a Volunteer at Hearing Education and Awareness for Rockers. He graduated from Bard College with a B.A. in psychology, where he focused on the neurophysiological basis of tinnitus. His current areas of interest include hearing loss prevention, recreational noise exposure, and public health.

Guilhem Viallet, PhD

Ecole de technologie supérieure

Guilhem Viallet has been passionate about acoustics for more than ten years. He is currently a postdoctoral researcher for the eers-CRSNG ÉTS industrial research chair in In-Ear Technologies, with a focus on additive manufacturing technologies. With a master s degree in environmental acoustics, from the University of Maine (France), he acquired professional experiences as acoustic consultant in private and public domain. Then he joined the ÉTS (Montreal) to continue with a Ph.D. in modeling of hearing protectors to better understand the physics of the sound transmission through the earplug coupled to the human ear. Three scientific papers emerged from this research.

Jeremie Voix, P.Eng, PhD

Universite du Quebec

Professor Jérémie Voix is an acoustics specialist with 20 years of experience in workplace noise mitigation. Since 2000, he has worked concurrently in academic and industrial settings, published his fundamental and applied research results, and continued to register patents for an advanced individual hearing protection solution. He has authored or co-authored over 100 scientific publications as well as a dozen patents. Professor Voix is President of the Canadian Acoustical Association (CAA), and Associate Director at the Centre for Interdisciplinary Research in Music Media and Technology (CIRMMT), housed at McGill University where he is also Adjunct Professor.

Kelly Watts, Au.D.

NSMRL / HCE / zCore Business Solutions

Dr. Kelly Watts is the Northeast Regional Research Administrator for the DoD Hearing Center of Excellence (HCE). She has served in this role for over 5 years. Her prior experience was as a research audiologist at the James H. Quillen VAMC in Mountain Home, TN. She is a graduate of Arizona State University (ASU) and the University of Rochester (UofR).

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Laurie Wells, Au.D.

3M Company Personal Safety Division

Laurie Wells, Au.D., is a Doctor of Audiology and Senior Regulatory Affairs Specialist for 3M Personal Safety Division, where she works with hearing protection and hearing conservation program regulatory issues around the globe. Her responsibilities include supporting evidenced-based standards development and providing subject matter expertise to regulatory issues in hearing loss prevention. Dr. Wells has been a long-time co-presenter for the highly regarded 3M Hearing Loss Prevention Seminars. Before coming to 3M, Dr. Wells worked for a consulting firm, Associates In Acoustics, Inc., where as Manager of Audiology, she provided professional audiology review of hearing loss cases, audiometric database analysis, assessment of hearing protection devices, audits of hearing conservation programs and conducted employee noise exposure assessment, audiometric testing and employee education. Dr. Wells is the current Chair of the Council for Accreditation in Occupational Hearing Conservation (CAOHC), representing the American Academy of Audiology and a past-president of the National Hearing Conservation Association. One of her favorite sounds is the special "pop" made when the lid seals canning jar.

Kurt Yankaskas

Office of Naval Research

Kurt Yankaskas is the Noise Induced Hearing Loss (NIHL) Program Officer for the Office of Naval Research (ONR) in the Warfighter Performance Department. Mr. Yankaskas has a broad background in shipboard noise control and is the Navy s SME in noise induced hearing loss. His efforts have been utilized throughout DoD and other Federal Agencies. Mr. Yankaskas joined ONR in 2009 from Naval Sea Systems Command. He serves on several interagency organizations (including DoD s Hearing Center of Excellence), joint panels and working groups that shape policy for DoD and DON policy and research strategies and had assignments at DASN Safety and DASN RDT&E. LOTR revisited is an update from NHCA 2003.

Tess Alexandra Zaccardi, B.H.S., Au.D. student

University of Texas at Dallas

Tess is a second year audiology student at the University of Texas at Dallas. Since attending the University of Florida for her undergraduate degree in Communication Sciences and Disorders, she has been assisting Dr. Colleen G. Le Prell with research projects related to hearing conservation. During her graduate studies, she has had the opportunity to build upon those research experiences and work in an industrial hearing conservation program through a clinical rotation at Lockheed Martin with Ms. Lori Prince. Tess has a passion for live music and is interested in incorporating hearing conservation in her career after graduating with her Au.D. in 2020.

Kori Zedaker, B.S.

University of Northern Colorado

Kori Zedaker is currently a Doctor of Audiology student at the University of Northern Colorado (UNC), where she is also completing coursework to obtain her Certificate in Animal Audiology. She is certified by the Council for Accreditation in Occupational Hearing Conservation (CAOHC) as an occupational hearing conservationist and she is a certified Dangerous Decibels® educator. Her capstone research project received a competitive Student Research Fund award from the UNC College of Natural and Health Sciences in 2016. Ms. Zedaker is currently completing her fourth-year audiology externship at Ear Associates, P.C., located in Albuquerque, New Mexico.

NATIONAL HEARING CONSERVATION ASSOCIATION

Certificate of Completion

This is to certify that

_____

Attended NHCA's 2018 Annual Hearing Conservation Conference
February 15-17, 2018
Orlando, FL

American Speech-Language-Hearing Association
Approved 14.75 CEUs
Provider code: AAOF
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Amanda Rewerts
NHCA Executive Director


NHCA
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IN DALLAS!