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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Kathy Gates
Lead Author Credentials (i.e., M.D., R.N., etc)	AuD
Lead Author's Job Title or Role	Prevention Audiologist, Prevention Branch
Lead Author's Company/University	DoD Hearing Center of Excellence
Lead Author's Address	18 Vincent Place Queesnbury, NY 12804
Lead Author's Phone	(518) 223-0677
Lead Author Email	kgates@blueearthmarketing.com
Lead Author Biography	Kathy Gates, Department of Defense (DoD) Hearing Center of Excellence (HCE): Dr. Gates supports the Prevention and Surveillance Branch for the DoD Hearing Center of Excellence (HCE). Her primary role is to promote hearing loss prevention initiatives and total worker hearing health promotion. Her passion for hearing loss prevention began in 1987 when she was commissioned in the U.S. Army as an Army Audiologist. Colonel (Retired) Gates served over 26 years in the Army. Today she serves as the associate coordinator, Specialty Interest Group (SIG 8), American Speech Language and Hearing Association (ASHA). She holds certification as a CAOHC Course Director and Professional Supervisor.
If you have additional co-presenters or co-authors, please tell us how many?	5
Name (Additional Presenter or Co-author #1)	Andrew Fallon
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	AuD
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Both a Presenter and Co-Author

Name (Additional Presenter or Co-author #2)	Jameel Muzaffar
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	M.D
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Presenter
Name (Additional Presenter or Co-author #3)	Dirk Koekemoer
Additional Presenter or Co-author #3 Credentials (ie: M.D., R.N., etc)	M.D.
Is this person a co-author, presenting or both a co-author and presenting? (#3)	Presenter
Name (Additional Presenter or Co-author #4)	Renee Lefrancois
Is this person a co-author, presenting or both a co-author and presenting? (#4)	Presenter
Name (Additional Presenter or Co-author #5)	Laura Prigge
Additional Presenter or Co-author #5 Credentials (ie: M.D., R.N., etc)	AuD
Is this person a co-author, presenting or both a co-author and presenting? (#5)	Presenter

Presentation & Abstract Information

Paper Title	Boothless Audiometry Workshop
Preferred Session Type	Thursday All Day Workshop

Abstract	A sound booth has long been the gold standard of equipment needed to conduct hearing conservation and audiological examinations. Within the past 10-years, several companies have worked to develop novel approaches to enable hearing assessment outside of the sound booth, to make services more accessible and increase efficiencies. Acceptable solutions must include specialized capabilities to meet additional requirements for specialty populations and markets, including foreign and domestic militaries as well as U.S. Veterans. It can be challenging to keep up with current technological advancements in boothless audiometry products. This workshop will present an overview of boothless audiometry technologies currently available to the hearing conservation professional. In the first part of the session, participants will learn about the military, Veteran, and civilian requirements, including a current summary of technologies available to meet them. It will also include overview presentations from participating boothless audiometry representatives. The second part of the session will include hands-on demonstrations of individual devices, allowing participants to become familiar with each device and how it can be used for hearing conservation services.

Learning Objective #1	1. As a result of this activity, the participant will be able to identify and become familiar with various boothless audiometry products and their individual capabilities.
Learning Objective #2	As a result of this activity, the participant will be able to provide recommendations about devices to meet their HC needs in terms of specifications, company requirements,and business models.
Learning Objective #3	As a result of this activity, the participant will understand the full perspective of driving requirements behind the development of current boothless technologies.
Special Accommodations for presenter(s)/presentation	There are additional speakers --I will send all forms and additional speaker information to Dani per her guidance
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Electronic Signature	Kathy Gates

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Unique ID:	522414624
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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Kara Cave
Lead Author Credentials (i.e., M.D., R.N., etc)	Ph.D.
Lead Author's Job Title or Role	Researcher
Lead Author's Company/University	U.S. Army Aeromedical Research Laboratory
Lead Author's Address	Building 6901, Farrel Road Fort Rucker, AL 36362
Lead Author's Phone	(240) 620-8069
Lead Author Email	karacave@gmail.com
Lead Author Biography	MAJ Kara Cave is currently assigned to the U.S. Army Aeromedical Research Lab at Fort Rucker, AL. Currently, her research interests include human factors issues involved in tactical communication and protective systems use, auditory localization, blast related noise-induced hearing injury, and fitness-for-duty standards. Her previous assignments include: Walter Reed Army Medical Center, Washington, D.C; Army Research Laboratory, Aberdeen Proving Ground, MD; 10th Combat Support Hospital, Baghdad, Iraq; William Beaumont Army Medical Center, Fort Bliss, TX; Blanchfield Army Community Hospital, Fort Campbell, KY; and Martin Army Community Hospital, Fort Benning, GA;. She received her B.A. from Boston College in 1999 and her Ph.D. in Audiology from James Madison University in 2005.
If you have additional co-presenters or co-authors, please tell us how many?	3
Name (Additional Presenter or Co-author #1)	Brandon Thompson
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	M.S.

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Name (Additional Presenter or Co-author #2)	John Casali
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author
Name (Additional Presenter or Co-author #3)	Kichol Lee
Additional Presenter or Co-author #3 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#3)	Co-Author

Presentation & Abstract Information

Paper Title	Field validation assessment of a portable auditory localization training system for instilling azimuthal localization skills with and without electronic hearing protectors
Preferred Session Type	Friday/Saturday Platform
Abstract	This study assessed training transfer from azimuth localization training conducted in-lab to a field localization test.Specifically, the studies evaluated the sensitivity of in-lab training, using a broadband tonal complex, and in-field testing, using live blank gunshots, to differences among three listening conditions.The listening conditions included two currently-fielded military Tactical Communication and Protective Systems (TCAPS) and the open ear.Localization performance was compared between trained and untrained participants using an in-lab pretest with the dissonant signal and a field-conducted posttest using gunshots.Participants assigned to the training group underwent training under each listening condition.Participants in the untrained group only underwent the pretest and posttest.Results showed a statistically-significant effect for listening condition.Open ear localization accuracy was significantly better than either TCAPS condition.No significant effect existed in localization accuracy between the two TCAPS conditions.At posttest, the trained group performed significantly better than the untrained group.The open ear showed significantly fewer front-back reversals compared to either TCAPS condition.Implications for military and worker populations will be discussed.

Learning Objective #1	Identify auditory localization differences associated with different listening conditions including electronic hearing protectors of the TCAPS variety.
Learning Objective #2	Understand the evaluation criterion for assessing the generalizability of an in-lab training system to a field environment.
Learning Objective #3	Illustrate how field-validated, in-lab portable systems, employing specially-designed dissonant tonal complex training stimuli, can be integrated into fitness-for-duty assessments.
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Electronic Signature	Kara Cave

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Jennifer Cumming
Lead Author Credentials (i.e., M.D., R.N., etc)	B.S., COHC
Lead Author's Job Title or Role	Research Assistant
Lead Author's Company/University	US Army Aeromedical Research Laboratory
Lead Author's Address	6901 Farrel Rd. Fort Rucker, AL 36362 United States
Lead Author's Phone	(334) 255-6799
Lead Author Email	jennifer.o.cumming.ctr@mail.mil
Lead Author Biography	Jennifer Cumming has served as a research assistant at the U.S. Army Aeromedical Research Laboratory since November 2018. Her current projects involve hearing enhancement, speech intelligibility in noise, and improving warfighter performance through the use of cognitive enhancement drugs. Ms. Cumming received her COHC certification in October 2018. She has a bachelor's degree magna cum laude in Chemistry and minor in Biology from Troy University and a bachelor's degree in Religion from Liberty University. In her spare time she serves as a Board Member of the American Behcet's Disease Association. She also enjoys watercolor painting and spending time with her three children and husband. Her future plans include pursuing a PhD in Neuroscience.
If you have additional co-presenters or co-authors, please tell us how many?	1
Name (Additional Presenter or Co-author #1)	Efrem Reeves
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	PhD, COHC

Is this person a co-author, presenting or both a co-author and presenting? (#1)	Both a Presenter and Co-Author

Presentation & Abstract Information

Paper Title	Effects of Seating Position and Flight Conditions on Potential Noise Dose Accumulation in a UH-60 Black Hawk Helicopter
Preferred Session Type	Friday/Saturday Platform
Abstract	The interior of a UH-60 Black Hawk helicopter is an environment in which some military aircrew members are exposed to noise that exceeds established exposure limits. Recent measurements show sound levels within a UH-60 Black Hawk can vary throughout the passenger cabin. This variation leads to an accelerated noise dose accumulation in some parts of the aircraft, increasing the risk for temporary and permanent threshold shifts. The aim of this study was to measure sound levels throughout the aircraft under three flight conditions: 10ft hover, 70ft hover, and 120 knots, with aircraft doors open and closed, and calculate the potential noise exposure and noise dose based on the occupant wearing one of three types of hearing protection: the David Clark H10-13HXP headset, the HGU-56/P helmet, and the combined HGU-56/P and communications earplug (CEP). The results show that the rate of noise dose accumulation varies greatly with seating position, which should be taken into consideration on longer flights.
Learning Objective #1	Identify areas of the UH60 where the noise dose accumulation rate is the highest.
Learning Objective #2	Compare and Contrast the noise dose accumulation under the three hearing protection devices: David Clark H10-13HXP headset, the HGU-56/P helmet, and the combined HGU-56/P, and communications earplug.
Learning Objective #3	Compare and Contrast sound levels during the three flight conditions, with doors open and closed: 10ft hover, 70ft hover, and 120 knots.
Special Accommodations for presenter(s)/presentation	I would like a chair in the presentation area so that I may sit if necessary during my presentation.
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Electronic Signature	Jennifer Cumming

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IP Address:	158.111.236.165
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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Elizabeth Masterson
Lead Author Credentials (i.e., M.D., R.N., etc)	PhD, CPH, COHC
Lead Author's Job Title or Role	Epidemiologist
Lead Author's Company/University	National Institute for Occupational Safety and Health
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Lead Author's Phone	(513) 841-4291
Lead Author Email	emasterson@cdc.gov
Lead Author Biography	Elizabeth (Liz) Masterson is an Epidemiologist in the Health Informatics Branch (previously Surveillance Branch) of the Division of Field Studies and Engineering at the National Institute for Occupational Safety and Health, Cincinnati, Ohio. She is the Project Officer for the NIOSH Occupational Hearing Loss Surveillance Project and serves as an Assistant Coordinator for the NIOSH Hearing Loss Cross-sector Prevention. She also serves on the NIOSH Hearing Loss Prevention Cross-sector Council. Liz has a PhD in Environmental Health/Epidemiology from the University of Cincinnati and is certified in Public Health and Occupational Hearing Conservation.
If you have additional co-presenters or co-authors, please tell us how many?	1
Name (Additional Presenter or Co-author #1)	Nimarpreet Sekhon
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	MPH
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Presentation & Abstract Information

Paper Title	Prevalence of Hearing Loss among Noise-Exposed Workers within the Services Sector, 2006-2015
Preferred Session Type	Poster Presentation
Abstract	Background: The purpose of this study was to estimate the prevalence of hearing loss among noise-exposed U.S. workers within the Services sector. Methods: Audiograms for 1.8 million workers (158,436 within the Services sector) from 2006-2015 were examined. Prevalence and adjusted risk for hearing loss as compared with the reference industry (Couriers and Messengers) were estimated for the Services sector and sub-sectors, and all industries combined. Results: The prevalence of hearing loss within the Services sector was 17% compared to 16% for all industries combined. Many sub-sectors exceeded the overall prevalence by large margins (10-33% higher) and/or had adjusted risks significantly higher than the reference industry. Within Solid Waste Combustors and Incinerators, 44% of workers had hearing loss and more than double the risk, the highest of any sub-sector. Some sub-sectors traditionally viewed as 'low-risk,' such as those grouped under Professional, Scientific and Technical Services, and under Educational Services, also had high prevalences and risks. Conclusions: Large numbers of workers within the Services sector have an elevated risk of hearing loss and need immediate hearing conservation efforts. Additional research and surveillance are also needed for sub-sectors for which there is low awareness of hearing hazards or a lack of hearing data.
Learning Objective #1	The learner will be able to discuss the differences in the prevalence of hearing loss among industries within the U.S. Services sector.
Learning Objective #2	The learner will be able to discuss the differences in the adjusted risk of hearing loss among industries within the U.S. Services sector.
Learning Objective #3	The learner will recognize that there are higher risk industries within this sector.
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Electronic Signature	Elizabeth Masterson

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Unique ID:	523881367
Location:	45.552700042725, -73.175498962402

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Rachel Bouserhal
Lead Author Credentials (i.e., M.D., R.N., etc)	PhD
Lead Author's Job Title or Role	Postdoctoral Fellow
Lead Author's Company/University	Ecole de technologie superieure
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Lead Author's Phone	(514) 569-9490
Lead Author Email	rachel.bouserhal@etsmtl.ca
Lead Author Biography	Rachel is a passionate teacher, an inquisitive researcher, an adventurous cyclist and an ardent music lover. She completed her B.S and M.S in Electrical Engineering at MSU. She moved to Montreal in 2012 to follow her research interests. In June 2016, she completed her PhD at École de technologie supérieure (ÉTS). During her PhD she developed a low-complexity in-ear speech enhancement algorithm and modeled the vocal effort of talkers wearing HPDs. She is now a postdoctoral fellow at NSERC-EERS Industrial Research Chair in In-Ear Technologies. She works on understanding the audio-phonation loop and the role of signal processing and machine learning in the advancement of in-ear technologies.
If you have additional co-presenters or co-authors, please tell us how many?	1
Name (Additional Presenter or Co-author #1)	Jeremie Voix
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	PhD
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Both a Presenter and Co-Author

Presentation & Abstract Information

Paper Title	SpEAR: A speech database for the advancement of hearing protection devices equipped with in-ear microphones
Preferred Session Type	Thursday Afternoon Workshop
Abstract	With the rise of hearing protection devices that use in-ear microphones, accessibility to an in-ear speech database in adverse conditions is essential. Speech captured inside the occluded ear is limited in its frequency bandwidth and has an amplified low frequency content. In addition, occluding the ear canal affects speech production, especially in noisy environments. These changes to speech production have a detrimental effect on speech-based algorithms. Yet, to the authors' knowledge, there are no speech databases that account for these changes. This paper presents a speech-in-ear database, of speech captured inside an occluded ear in noise and in quiet. The database is bilingual (in French and in English) and is intended to aid researchers in developing algorithms for intra-aural devices utilizing in-ear microphones.
Learning Objective #1	Identify the advantages of use in-ear microphones
Learning Objective #2	Understand the changes in speech caused by bone and tissue conduction
Learning Objective #3	Compare the changes caused by noise on speech when occluded vs. with open ears
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Electronic Signature	Jeremie Voix

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Chandran Achutan
Lead Author Credentials (i.e., M.D., R.N., etc)	PhD
Lead Author's Job Title or Role	Associate Professor
Lead Author's Company/University	University of Nebraska Medical Center
Lead Author's Address	984388 Nebraska Medical Center Omaha, Nebraska 68198 United States
Lead Author's Phone	(402) 559-8599
Lead Author Email	cachutan@unmc.edu
Lead Author Biography	Dr. Chandran Achutan is an Associate Professor at the University of Nebraska Medical Center College of Public Health.
If you have additional co-presenters or co-authors, please tell us how many?	5
Name (Additional Presenter or Co-author #1)	Abolore Idris
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	MPH
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author
Name (Additional Presenter or Co-author #2)	Tika Nepal
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	MPH
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author

Name (Additional Presenter or Co-author #3)	Elizabeth Lyden
Additional Presenter or Co-author #3 Credentials (ie: M.D., R.N., etc)	MS
Is this person a co-author, presenting or both a co-author and presenting? (#3)	Co-Author
Name (Additional Presenter or Co-author #4)	Marissa Pepper
Is this person a co-author, presenting or both a co-author and presenting? (#4)	Co-Author
Name (Additional Presenter or Co-author #5)	Olakunle Olarenwaju
Additional Presenter or Co-author #5 Credentials (ie: M.D., R.N., etc)	MS
Is this person a co-author, presenting or both a co-author and presenting? (#5)	Co-Author

Presentation & Abstract Information

Paper Title	Noise Exposures in a Meat Processing Facility
Preferred Session Type	Either Poster of Platform Format (Please select this if you do not have a preference)

Abstract	We evaluated personal noise exposures at a meat processing facility, where a majority of workers did not speak English. We collected full-shift personal dosimetry on thirty-six production floor employees, one quality control employee, and four maintenance employees. We also collected point source noise measurement at eight workstations from precook. We administered a questionnaire to assess employees' hearing loss perception and non-occupational source of noise exposure. We also documented how well employees inserted earplugs. Thirty-three of the measured personal noise level exceeded the NIOSH Recommended Exposure Limit. The point source noise levels ranged from 81.5 dBA to 97.5 dBA. Only 15% of the workers inserted earplugs correctly. Thirteen reported they experience ringing in the ear, and of these nine reported improvements in the ear over time. There was a significant association (p-value 0.002) between employees' use of hearing protection device (HPD) outside of work around loud noise and the way they inserted earplugs. Production floor employees and maintenance employees are exposed to excessive loud noise level, and they are at risk of developing noise-induced hearing loss. Better training on the proper use of earplugs, and provision of varieties of earplug may increase employees' compliance with the proper use of hearing protectors.
Learning Objective #1	Identify sources of excessive noise in the meat processing industry
Learning Objective #2	Educate employees on proper insertion of earplugs by breaking down the process in small steps
Learning Objective #3	Articulate training strategies for non-English speakers
Special Accommodations for presenter(s)/presentation	None
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Electronic Signature	Chandran Achutan

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	M. Samantha Lewis
Lead Author Credentials (i.e., M.D., R.N., etc)	Ph.D.
Lead Author's Job Title or Role	Associate Professor
Lead Author's Company/University	Pacific University
Lead Author's Address	190 SE 8TH AVE HILLSBORO, OR 97123 United States
Lead Author's Phone	(503) 352-3111
Lead Author Email	slewis@pacificu.edu
Lead Author Biography	M. Samantha Lewis, PhD, is an associate professor in the School of Audiology at Pacific University located in Hillsboro, Oregon. She joined the School of Audiology in 2017, after a 15-year career as a research investigator/audiologist at VA Rehabilitation Research and Development (RR&D) Service National Center for Rehabilitative Auditory Research (NCRAR) at the VA Portland Health Care System in Portland, Oregon. During her time at the NCRAR, she received funding for her research activities through the VA RR&D Service, the Department of Defense, industry, and a foundation. Dr. Lewis maintains her affiliation with the NCRAR today, as well as an affiliation with the Department of Otolaryngology/Head & Neck Surgery at the Oregon Health & Science University in Portland, Oregon. Her areas of specialty include auditory rehabilitation, audiologic counseling, (central) auditory processing, geriatrics, and tinnitus.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Considering Models and Approaches to Health Behavior Change in the Prevention of Auditory Dysfunction
Preferred Session Type	Thursday Afternoon Workshop
Abstract	Exposure to loud noise has the potential to cause auditory dysfunction. Preventing or limiting this exposure could prevent (or at least minimize) noise-induced auditory dysfunction. Researchers and clinicians, therefore, have tried educating the public about noise exposure and hearing conservation practices. Despite these efforts, there remain individuals who do not follow through with these recommendations. Why is that? What can we be doing better to enhance awareness and compliance? These are good questions. The challenge, however, is not unique to hearing conservation efforts. The literature is full of examples of patients who have failed to start or maintain a recommended behavior change (e.g., exercising, quitting smoking). Recognizing this issue, other fields have evaluated models to understand the behavior change process and have recommended approaches to help support patients in making behavior changes. Researchers have explored the potential applicability of some of these models and approaches, such as the Transtheoretical Stages-of-Change Model (Prochaska & DiClemente, 1983) and the Theory of Reasoned Action/Planned Behavior (Ajzen, 1991), to hearing healthcare, and to hearing conservation practices, specifically. This workshop will review these models and approaches and discuss potential strategies for improving hearing conservation efforts.
Learning Objective #1	Describe approaches to health behavior change that have been presented in the scientific hearing healthcare literature.
Learning Objective #2	Discuss the scientific evidence regarding the application of these models to hearing conservation practices.
Learning Objective #3	Describe the various factors that may influence a patient when it comes to initiating and maintaining a behavior change.
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Electronic Signature	M. Samantha Lewis

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Location:	33.77730178833, -84.336601257324

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	John Eichwald
Lead Author Credentials (i.e., M.D., R.N., etc)	M.A.
Lead Author's Job Title or Role	Health Scientist, Audiologist
Lead Author's Company/University	Centers for Disease Control and Prevention (CDC)
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Lead Author's Phone	(404) 498-3961
Lead Author Email	jeichwald@cdc.gov
Lead Author Biography	John Eichwald is an audiologist within the Office of Science in the Centers for Disease Control and Prevention (CDC) National Center for Environmental Health, working on non-occupational noise induced hearing loss. John has over 40 years' experience in the field of Audiology. He has published extensively and made numerous presentations on the early identification of hearing loss in newborns and most recently the prevention of non-occupational noise induced hearing loss. Prior to CDC, he spent nearly 20 years at the Utah Department of Health serving in both clinical practice and administrative positions.
If you have additional co-presenters or co-authors, please tell us how many?	1
Name (Additional Presenter or Co-author #1)	Lauren Benet
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Both a Presenter and Co-Author

Presentation & Abstract Information

Paper Title	Comic Books to Scientific Guidelines: Effective Strategies in the Fight Against Noise-Induced Hearing Loss
Preferred Session Type	Friday/Saturday Platform
Abstract	The CDC National Center for Environmental Health (NCEH) developed a strategic program plan to support the reduction of hearing loss, tinnitus and other non-auditory health effects resulting from non-occupational noise exposure. NCEH has developed a suite of materials using creative formats (interactive infographic, fact sheets, and graphics) and communication channels (twitter, Facebook, Instagram) to engage individuals, organizations, and communities in prevention efforts. To ensure that these important messages reached teens and young adults, NCEH developed partner advisories and a promotional toolkit to support partners and intermediaries in disseminating these materials. Sharing these materials during national health observances, e.g., World Hearing Day, allows NCEH to capitalize on the momentum of these events. NCEH is gathering information on current evidence, methods and practical approaches for development of a public health guideline(s) on exposure to excessive sound levels outside of a working environment-at home, recreational venues and in the community. NCEH is seeking collaborative relationships with subject matter experts and potential representatives from public health partner organizations, industry, academic institutions, and other relevant Federal agencies.
Learning Objective #1	At the end of this session, attendees should be able to describe at least one communication material developed by NCEH.
Learning Objective #2	At the end of this session, attendees should be able to locate NCEH shareable communication materials on noise-induced hearing loss.
Learning Objective #3	At the end of this session, attendees should be able to summarize the NCEH approach for developing a public health guideline(s) on noise exposure.
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Acceptance and Electronic Signature

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Electronic Signature	John Eichwald

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	William Murphy
Lead Author Credentials (i.e., M.D., R.N., etc)	Ph.D.
Lead Author's Job Title or Role	Coordinator Hearing Loss Prevention Research
Lead Author's Company/University	National Institute for Occupational Safety and Health
Lead Author's Address	Noise and Bioacoustics Team, Division of Field Studies and Engineering 1090 Tusculum Ave, Mailstop C-27 Cincinnati, OH 45226 United States
Lead Author's Phone	(513) 533-8125
Lead Author Email	wjm4@cdc.gov
Lead Author Biography	William J. Murphy is a Captain in the United States Public Health Service Commissioned Corps and is coordinator for the Hearing Loss Prevention cross sector for the National Institute for Occupational Safety and Health. He is an active member of the National Hearing Conservation Association and a Fellow of the Acoustical Society of America. He is currently the chair for the ASA's American National Standards Institute (ANSI) Accredited Standards Committee S3 for Bioacoustics. He has provided leadership to the ASA as chair of the Technical Committee on Noise and through work with the national and international standards on noise.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Comparison of hearing protector test results
Preferred Session Type	Friday/Saturday Platform

Abstract	During the development of the ANSI S12.68 standard for estimating effective A-weighted sound pressure levels when hearing protector device (HPD) are worn, the need to provide a mechanism to compare HPD ratings was identified. The current Noise Reduction Rating (NRR) is a single number that describes the potential of a product to reduce noise at the user's ears. The Noise Reduction Statistic for A-weighting (NRSA) developed in ANSI S12.68 describes a range of protection performance and estimate the uncertainty associated with the protector's rating. The uncertainty for the NRSA is estimated using a bootstrap procedure (sampling with replacement). The bootstrap technique can be applied to the current protector ratings (e.g. NRR) and comparisons between rating evaluations from different laboratories can be compared. This paper will discuss the error bars for NRR and NRSA ratings and present a modification of the bootstrap method to estimate directly the statistical significance of ratings from different laboratories. Data from the NIOSH/EPA interlaboratory study and other published studies will be used to illustrate how the method is applied.
Learning Objective #1	To inform participants about Noise Reduction Ratings
Learning Objective #2	Provide a theoretical mechanism to compare noise reduction ratings
Learning Objective #3	To address a current topic regarding hearing protection performance
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Electronic Signature	William Murphy

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Location:	39.764801025391, -106.17990112305

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Abby Maurer
Lead Author Credentials (i.e., M.D., R.N., etc)	B.S
Lead Author's Job Title or Role	Doctorate of Audiology candidate
Lead Author's Company/University	Purdue University
Lead Author's Address	12015 Bottom Road Dresden, OH 43821 United States
Lead Author's Phone	(740) 607-1867
Lead Author Email	maurer15@purdue.edu
Lead Author Biography	My name is Abby Maurer and I am a third year Doctorate of Audiology Candidate at Purdue University. I was born and raised in a rural community in central Ohio near the foothills of the Appalachian Mountains. I then earned my Bachelor of Science degree in Communication Sciences and Disorders at Ohio University in Athens, Ohio. As graduation from Ohio University drew closer I knew I wanted to pick a school that had a strong agriculture community so I could use my passion for audiology to educate and assist rural communities just like the one I was raised in. This lead me to begin earning my Doctorate of Audiology at Purdue University in West Lafayette, Indiana. Since starting at Purdue I have been able to network and build relationships with academic faculty in both Human and Health Sciences and Agriculture to help bring hearing health awareness to all involved.
If you have additional co-presenters or co-authors, please tell us how many?	2
Name (Additional Presenter or Co-author #1)	Elizabeth Strickland

Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	Ph.D, CCC-A
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Both a Presenter and Co-Author
Name (Additional Presenter or Co-author #2)	Anne Sommer
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	Au.D., CCC-A
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Both a Presenter and Co-Author

Presentation & Abstract Information

Paper Title	"Assessing the need for hearing conservation programs in agriculture-based organizations to improve self-awareness of Purdue University students."
Preferred Session Type	Poster Presentation
Abstract	There are an estimated 3.2 million farmers in the United States (2% of the population) and an additional several million that work in direct contact with the field of agriculture. Previous research reveals individuals that work in the field of agriculture are exposed to dangerous noise levels while on the job (e.g. tractors, animals, grain bins, equipment, etc.) and during recreational activities (e.g. gunfire, concerts, ATVs, etc.). Currently, there is no standardized education program on hearing conservation or unsafe noise levels for this population. We are conducting this research study to determine if there is a need for hearing education and hearing conservation programs within the Purdue University College of Agriculture, Indiana FFA, Indiana 4-H, and Indiana public schools. To do this we will be conducting research through surveys with Purdue University College of Agriculture undergraduate students, the current Indiana FFA advisor, current Indiana 4-H leaders, and current Indiana agriculture teachers. These surveys will assess respondents' exposure to harmful sounds and their confidence level in their understanding of the hearing system and hearing conservation. After the surveys are analyzed the need for hearing conservation programs in these programs will be determined and educational tools and support will be developed.
Learning Objective #1	Associate the need for research on hearing health within agriculture's youth
Learning Objective #2	Determine individual's education level and self-awareness to noise induced hearing loss and dangerous noise levels

Learning Objective #3	Assess the need for educational programs in agriculture education and organizations
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Electronic Signature	Abby Maurer

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IP Address:	158.111.236.60
Unique ID:	525010070
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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	William Murphy
Lead Author Credentials (i.e., M.D., R.N., etc)	Ph.D.
Lead Author's Job Title or Role	Coordinator, Hearing Loss Prevention Research
Lead Author's Company/University	National Institute for Occupational Safety and Health
Lead Author's Address	Noise and Bioacoustics Team, Division of Field Studies and Engineering 1090 Tusculum Ave, Mailstop C-27 Cincinnati, OH 45226 United States
Lead Author's Phone	(513) 533-8125
Lead Author Email	wjm4@cdc.gov
Lead Author Biography	William J. Murphy is a Captain in the United States Public Health Service Commissioned Corps and is coordinator for the Hearing Loss Prevention cross sector for the National Institute for Occupational Safety and Health. He is an active member of the National Hearing Conservation Association and a Fellow of the Acoustical Society of America. He is currently the chair for the ASA's American National Standards Institute (ANSI) Accredited Standards Committee S3 for Bioacoustics. He has provided leadership to the ASA as chair of the Technical Committee on Noise and through work with the national and international standards on noise.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Characterization of Firearms suppressor performance with a microphone array
Preferred Session Type	Friday/Saturday Platform

Abstract	In 2017, firearm suppressors were evaluated with several rifles and pistols firing low- and high-velocity ammunition. Peak-impulse level reductions, ?LPeak, ranged between 13 and 31 dB at the ear for low-velocity ammunition and 13 to 29 dB for high-velocity ammunition. Integrated-energy levels reductions at the ear, ?LAeq, were between 10 and 31 dB and 9 and 25 dB for low- and high-velocity ammunition. The noise reductions at twelve microphone locations on a 3-m ring are compared with the muzzle microphone (1-m left) and microphones 15 cm from the shooter's right and left ears. The between correlations of the one-third octave band noise reduction spectra suggested that positions behind the shooter provided the best agreement with the microphones at the shooter's left and right ears. The microphone at 3 meters, and 15 degrees in front of the firing line to the right of the shooter in front of the firing line was better than the 3-m microphones to the left of the shooter 15 degrees in front and behind the firing line.
Learning Objective #1	Participants will learn about the noise reduction of various firearm suppressors
Learning Objective #2	Participants will learn about two different damage risk criteria used to characterize the risk of hearing loss with firearm noise.
Learning Objective #3	Participants will learn about which microphone locations might be preferred to evaluate firearm suppressor noise.
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Electronic Signature	William Murphy

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Unique ID:	525170907
Location:	45.552700042725, -73.175498962402

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Jérémie Voix
Lead Author Credentials (i.e., M.D., R.N., etc)	PhD
Lead Author's Job Title or Role	Full Professor
Lead Author's Company/University	Universite du Quebec (ETS)
Lead Author's Address	1100 Notre-Dame West Montreal, QC H3C1K3 Canada
Lead Author's Phone	(514) 396-8437
Lead Author Email	jeremie.voix@etsmtl.ca
Lead Author Biography	Professor Jérémie Voix is an acoustics specialist with over 20 years of experience in occupational noise control. He has authored or co-authored over 100 scientific publications as well as over a dozen awarded patents and contributed significantly to several American (ANSI S12/WG11), Canadian (CSA Z94) and ISO (TC43/WG17) standards. Professor Voix is President of the Canadian Acoustical Association (CAA), and Associate Director (Scientific and technological research) at the Centre for Interdisciplinary Research in Music Media and Technology (CIRMMT), housed at McGill University's Schulich School of Music, where he is also an Adjunct Professor. He is as well an associate member of the International Laboratory for Brain, Music and Sound Research (BRAMS) and co-founder of the ÉTS-IRSST joint infrastructure laboratory for acoustic research (ICAR-Infrastructure commune en acoustique pour la recherche). Prof. Voix leads the NSERC-EERS Industrial Research Chair in In-Ear Technologies (CRITIA
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	The connected protected worker at the age of IoT
Preferred Session Type	Poster Presentation
Abstract	At this age of Internet of Things (IoT), wearables are now everywhere, sometimes even in your earcanal. The research team from the NSERC-EERS Industrial Research Chair in In-Ear Technologies (CRITIAS) has been actively developing various in-ear technologies designed to complement the human ear, from "smart" hearing protection against industrial noises, 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. Current state of the research conducted within CRITIAS will be presented in this poster.
Learning Objective #1	Identify the many opportunities offered by the human earcanal for protection, communication and bio-sensing.
Learning Objective #2	List the possible benefits of in-ear technologies for hearing-loss prevention programs
Learning Objective #3	Compare the various research activities in in-ear technologies against existing product
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Electronic Signature	Jeremie Voix

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Location:	39.190601348877, -84.454299926758

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Thais Morata
Lead Author Credentials (i.e., M.D., R.N., etc)	Ph.D.
Lead Author's Job Title or Role	Research Audiologist
Lead Author's Company/University	National Institute for Occupational Safety and Health
Lead Author's Address	1090 Tusculum Avenue Cincinnati, OH 45226 United States
Lead Author's Phone	(513) 533-8487
Lead Author Email	tmorata@cdc.gov
Lead Author Biography	Thais C. Morata is a Research Audiologist at the National Institute for Occupational Safety and Health (Cincinnati, OH, USA). Her pioneering work in the area of noise interactions in the workplace has influenced national and international occupational safety and health policies. She has published and lectured extensively in the United States and abroad, having presented keynotes in international fora. Dr. Morata is recognized as a mentor and collaborator with researchers all across the globe. She has been a Founding Associate Editor for the International Journal of Audiology since 2003, and a founding member of the Cochrane Work review group. Dr. Morata also directs the Safe-in-Sound Excellence in Hearing Loss Prevention Awards™. In 2008 she received the Outstanding Hearing Conservationist Award from the National Hearing Conservation Association for her contributions to hearing loss prevention.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Hands-on workshop: how you (or your students) can contribute to Wiki4YearOfSound2020

Preferred Session Type	Thursday Afternoon Workshop
Abstract	How can we boost the implementation of evidence-based practices that will improve the health and well-being of the populations we serve? As people are turning to Wikipedia for information, we want the information they find to be complete, up-to-date, and accurate. For the International Year of Sound (IYS 2020), NHCA is supporting Wiki4YearOfSound2020, a campaign by NIOSH and the Acoustical Society of America to improve Wikipedia articles related to sound. IYS 2020 highlights the importance of sound in all aspects of life and aims to improve public awareness of sound-related issues at an international level. One can participate by promoting the project, suggesting a topic that should be a Wikipedia article and improving or translating existing articles. Educational programs can count on Wiki Education Foundation tools to train students to contribute high-quality content to Wikipedia as a course assignment. The Wikimedia outreach dashboard allows anyone to contribute and monitor progress. Workshop attendees will learn the basics of Wikipedia editing, make substantive changes to Wikipedia articles within their area of expertise, and find out more about the Wiki Education Foundation's classroom program. ***Please create a Wikipedia account in advance of the event and bring your computer to the workshop. ***
Learning Objective #1	Understand the rationale and the scope of science communication efforts that include Wikimedia's free knowledge platforms
Learning Objective #2	Compare and contrast differences between writing for scientific journals, writing a report for a class or writing for an encyclopedia
Learning Objective #3	Identify how elements such as critical thinking, reliability of online sources, digital literacy, and ethical principles are involved in different forms of science communication
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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Hannah Speaks
Lead Author Credentials (i.e., M.D., R.N., etc)	MSPH
Lead Author's Job Title or Role	ORISE Research Fellow
Lead Author's Company/University	NIOSH
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Lead Author's Phone	(786) 427-5623
Lead Author Email	ORY9@cdc.gov
Lead Author Biography	Hannah Speaks is currently an ORISE research fellow on the Noise and Bioacoustics team at the US National Institute for Occupational Safety and Health (NIOSH). She holds a MSPH from the University of Miami and a BS in chemistry and industrial hygiene from the University of North Alabama. She has been involved on and off with hearing conservation and fit-testing since her first IH internship in 2014. While attending the University of Miami she began volunteering with the Ear Peace Save Your Hearing Foundation, and is now on the board of directors. Her research interests include epidemiology of occupational hearing loss and evaluating preventative interventions for effectiveness.
If you have additional co-presenters or co-authors, please tell us how many?	1
Name (Additional Presenter or Co-author #1)	Thais Morata
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	PhD

Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author

Presentation & Abstract Information

Paper Title	How do we know it works? Evaluating hearing loss interventions for effectiveness
Preferred Session Type	Friday/Saturday Platform
Abstract	Hearing conservation by nature is a preventative field, rooted in implementing behavioral and technical interventions. Although epidemiological outcomes have been monitored for hearing loss, those statistics have not been tied to interventions for promoting behavior change or reducing noise exposure. This presents a dilemma for the field, as many classic interventions, such as hearing protection devices or educational efforts, have yet to be proven as widespread, effective preventative measures. Attempts to implement new research and controls have become complex, as there is no current model for comparison. However, with combined efforts from the multiple professions involved in the field, the quest for effective hearing conservation can be achieved. This review covers generalized strategies for evaluating interventions for various facets of hearing conservation including: how to set up programs to collect meaningful data, how to interpret and analyze outcomes, how to collaborate to continue to enhance intervention effectiveness, and how to continue to monitor effectiveness over time. Moving forward, hearing conservationists should not only work towards developing solutions for hearing loss prevention but also focus on evaluating interventions for long and mid-term impacts on behavior and hearing health outcomes.
Learning Objective #1	Identify types of preventative interventions and their related outcomes.
Learning Objective #2	Interpret and analyze intervention outcome data to assess hearing conservation measures.
Learning Objective #3	Apply assessment techniques for continually improving hearing conservation programs and related preventative measures.
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Electronic Signature	Hannah Speaks

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Ursula Brogan
Lead Author's Job Title or Role	ORISE Communication Specialist
Lead Author's Company/University	National Institute for Occupational Safety and Health
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Lead Author's Phone	(740) 602-2540
Lead Author Email	ono1@cdc.gov
Lead Author Biography	Ursula "Asha" Brogan is currently an ORISE research fellow on the Noise and Bioacoustics team at the US National Institute for Occupational Safety and Health (NIOSH). She is a recent graduate from the University of Cincinnati where she received a BA in health communication and a certificate in public relations. While in school Asha helped launch a brand new Instagram account for the Communication department, as well as helping to analyze and improve existing social media account. She completed an internship for NIOSH in 2018 completing numerous communication tasks, and is happy to be back and continuing work and research on social media and other communication projects.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	A 10th Anniversary Look at the NIOSH Noise Twitter Account
Preferred Session Type	Poster Presentation

Abstract	The @NIOSHNoise twitter account run by the Noise and Bioacoustics team at the National Institute for Occupational Safety and Health was created in 2010, and since has gained over 5,000 followers. While the account has been active since its conception, it has never been formally evaluated for its direct or indirect impact on workers. This study measured engagement (e.g. "liking" a post, retweeting a post, or mentions of the @NIOSHNoise twitter account on other platforms) as a function of twitter practices (e.g. partnering with external organizations, formality of posted tweets, inclusion of visual media in posts, targeting of audiences, and hashtag use) and their impact on level of engagement. The study then examined accounts with similar messaging, such as @NIOSH, @CDC, @USCPSC and @CPWR to determine the most impactful practices for reaching their targeted audiences. Practices that resulted in the highest engagements were identified and incorporated into the @NIOSHNoise daily posting schedule. The level of engagement with the @NIOSHNoise Twitter account was then reevaluated to determine the impact of these changes. Increasing the engagement not only gives the account more visibility, but is a measureable tool to prevent hearing loss in a modern digital age.
Learning Objective #1	Identify more effective strategies to use twitter to convey scientific content to audience
Learning Objective #2	Learn how to analyze current social media usage for scientific purposes
Learning Objective #3	Understand if social media is right for your audience
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Electronic Signature	Ursula Brogan

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IP Address:	192.138.72.196
Unique ID:	525257955
Location:	33.480400085449, -82.094100952148

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	William Ahroon
Lead Author Credentials (i.e., M.D., R.N., etc)	Ph.D.
Lead Author's Job Title or Role	Research Psychologist
Lead Author's Company/University	US Army Aeromedical Research Laboratory
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Lead Author's Phone	(334) 255-6828
Lead Author Email	william.a.ahroon.civ@mail.mil
Lead Author Biography	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.
If you have additional co-presenters or co-authors, please tell us how many?	1
Name (Additional Presenter or Co-author #1)	JR Stefanson
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	B.S., OHC
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Both a Presenter and Co-Author

Presentation & Abstract Information

Paper Title	Preventing Iatrogenic Injuries for Custom Earpieces
Preferred Session Type	Friday/Saturday Platform
Abstract	Hearing protection devices (HPDs), tailor-made to fit an individual's ears, are often referred to as custom earplugs or custom-molded HPDs. Custom earplugs, if made well, fit the individual's anatomy ideally to create an acoustical seal with the ear canal, thereby blocking the air conduction pathway of the ear and reducing the risk of noise-induced injuries. However, producing a custom earplug may sometimes result in iatrogenic injuries. While rare, such iatrogenic injuries can have severe consequences for the individual, including temporary or permanent hearing loss. New technologies in optical scanning have been developed, which may replace the need to make physical earmold impressions and thus reduce the risk of such injuries. These technologies were evaluated and compared to traditional custom earplug fabrication methods. Results suggest optical scanning technologies may be used to reduce the risk of iatrogenic injury associated with producing custom earpieces (e.g., hearing aids, communications, HPDs).
Learning Objective #1	Compare and contrast differences between custom earpiece fabrication methods
Learning Objective #2	How to reduce or prevent iatrogenic injuries when making custom earpieces
Learning Objective #3	Risks and benefits of traditional and new methods of creating custom earpieces
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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Sridhar Krishnamurti
Lead Author Credentials (i.e., M.D., R.N., etc)	Ph.D.
Lead Author's Job Title or Role	Professor of Audiology
Lead Author's Company/University	Auburn University
Lead Author's Address	1199 Haley Center Auburn University Auburn, United States (1) 36849 United States
Lead Author's Phone	(334) 844-9627
Lead Author Email	krishsr@auburn.edu
Lead Author Biography	Dr. Sridhar Krishnamurti is Professor of Audiology in the Department of Communication Disorder and also serves as Graduate program coordinator. Prior to his appointment as ssistant professor at Auburn in 1996, Sridhar Krishnamurti completed a clinical fellowship in audiology at the Massachusetts Eye and Ear Infirmary at Harvard Medical School. He currently serves on the research grants review panel for the Alzheimer's Association and is also on the review board of several agencies and journals including Ear and Hearing, American Journal of Public Health, and Journal of the American Academy of Audiology. Dr. Krishnamurti has authored and co-authored journal articles and book chapters that cover the areas of electrophysiology, aging, hearing conservation, auditory processing disorders, and hearing aids.
If you have additional co-presenters or co-authors, please tell us how many?	2
Name (Additional Presenter or Co-author #1)	Shabnam Habibi

Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	B.S.
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author
Name (Additional Presenter or Co-author #2)	Katie Wills
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	B.S.
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Both a Presenter and Co-Author

Presentation & Abstract Information

Paper Title	Characterizing the effects of occupational noise noise exposure using Otoacoustic Emissions
Preferred Session Type	Friday/Saturday Platform
Abstract	Evoked otoacoustic emissions (EOAEs) may provide a more direct and reliable measurement than audiometric testing to investigate early changes in inner ear function. EOAEs can detect outer hair cell damage related to Noise Induced Hearing Loss in manufacturing workers, even when audiometric thresholds are not affected (Helleman et al., 2010). In this study, we evaluated the diagnostic effectiveness of two types of OAEs: 1) Transient Evoked Otoacoustic Emissions (TEOAEs) in 192 exposed and 120 control ears and 2) Distortion Product Otoacoustic Emissions (DPOAEs) in 128 exposed and 80 control ears. The Signal to Noise Ratio (SNR) was used as the criterion to evaluate the effectiveness of OAEs; optimal SNR was defined as 6 dB (TEOAE amplitude-Noise Floor>6 dB; DPOAE amplitude-Noise Floor>6 dB). Statistical Analysis of variance (ANOVA) showed significant differences in SNR between ears in the exposure group versus control group for both: a) DPOAEs ($dF=1, 288$; $F=61.54$; $p<0.01$) b) TEOAEs ($dF=1, 193$; $F=72.93$; $p<0.01$). Only 27.3% of ears with noise exposure passed while 82.5% of control ears passed TEOAE analysis criteria. In contrast to the TEOAEs, 64% of ears with occupational noise exposure passed DPOAE analysis criteria, as opposed to 87% of control ears.
Learning Objective #1	Understand measurement of Otoacoustic emissions (OAEs)
Learning Objective #2	Differentiate between DPOAEs and TEOAEs
Learning Objective #3	Recognize utility of OAE measurements in Hearing Conservation Programs

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Electronic Signature	Sridhar Krishnamurti

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Unique ID:	525265151
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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	John Casali
Lead Author Credentials (i.e., M.D., R.N., etc)	Ph.D., Certified Professional Ergonomist (CPE Reg. # 222)
Lead Author's Job Title or Role	Grado Chaired Professor, Industrial & Systems Engineering and Director, Auditory Systems Lab, Virginia Tech; CTO, Hearing, Ergonomics & Acoustics LLC (H.E.A.R.)
Lead Author's Company/University	Virginia Tech & HEAR LLC
Lead Author's Address	385 Emerald Blvd Christiansburg, VA 24073 United States
Lead Author's Phone	(540) 230-5037
Lead Author Email	jcasali@vt.edu
Lead Author Biography	Dr. John Casali is the Grado Chaired Professor of Industrial & Systems Engineering at Virginia Tech and Director of the Auditory Systems Lab. He also is Founder of Hearing, Ergonomics and Acoustics Resources (HEAR) LLC, a product design, testing, and litigation support company. A Fellow of the Human Factors & Ergonomics Society and the Institute of Industrial Engineers, he received the NIOSH-NHCA Safe-in-Sound Award for Innovation (auditory situation awareness-ASA) in 2016, and the NHCA Outstanding Hearing Conservationist Award in 2009. He has directed over 110 research projects sponsored by U.S. government/military agencies as well as many corporations, totaling over $14M. Many of the 200+ publications emanating from his research concern hearing protection, ASA, military hearing scenarios, and auditory displays/warnings. Dr. Casali also holds 6 Patents. During the past decade, he led the development of the "DRILCOM" indoor ASA test facility and the "PASAT" ASA training system.
If you have additional co-presenters or co-authors, please tell us how many?	1

Name (Additional Presenter or Co-author #1)	Lee Kichol
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Both a Presenter and Co-Author

Presentation & Abstract Information

Paper Title	What you don't hear can kill you - the Conundrum of Balancing Hearing Protection and Auditory Situation Awareness: Guidance for the Hearing Conservationist
Preferred Session Type	Thursday Morning Workshop
Abstract	Hearing is a critical sense for maintaining vigilance to events in our realm and a keen realization of our surroundings, essentially providing a state of "auditory situation awareness" or "ASA." Protection against noise-induced hearing loss (NIHL) via the use of hearing protection devices (HPDs) or Tactical Communications & Protective Systems (TCAPS), together with concomitant preservation of one's ASA to the surrounding environment, is critical in many dynamic civilian work situations as well as in the military. Devices designed toward this objective should aim to be as auditorially "transparent" as possible to the wearer, with minimal impact of attenuation, occlusion, gain compression and pass-through frequency response on the wearer's auditory perception. This workshop will review and demonstrate various "augmented" HPDs and TCAPS that are intended (but are not always successful) to provide ASA while protecting the wearer. Products which provide either passive or active (battery-electronic) level-dependent attenuation and pass-through of certain sound frequencies will be included. The ASA impacts of these products will be covered, relying on evidence from 14 experiments at Virginia Tech, as well as surveys from elsewhere, that show the sometimes deleterious effects on wearer's detection, recognition/identification, localization and communications abilities, as compared to performance with the open (i.e., natural) ear. Live auditory demonstrations of HPD and TCAPS effects on ASA tasks, including localization, will be provided where possible. The importance and potential effectiveness of training HPD users for ASA skills acquisition, prior to being deployed with the products, will be covered. Guidance for selecting HPDs given certain ASA needs to accommodate given operational tasks will be offered. Examples of actual accidents that stemmed from the loss of ASA, resulting in injury, death and sometimes litigation, will be covered briefly.

Learning Objective #1	Understand the various task elements of auditory situation awareness and their importance to civilian worker and military personnel functionality, with a particular emphasis on safety.
Learning Objective #2	Understand the design differences among various level-dependent HPDs and TCAPS, and how these products may affect, in a positive or negative manner, the wearer's auditory situation awareness.
Learning Objective #3	Via research results and some limited experience, understand why training of users to instill auditory situation awareness skills with assigned HPDs or TCAPS, may provide pre-deployment benefits.
Special Accommodations for presenter(s)/presentation	Room sized to allow setup audio demostrations near the front -- a space of about 10x10 feet.
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Electronic Signature	John Casali

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Location:	36.916999816895, -76.290100097656

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Kari Buchanan
Lead Author Credentials (i.e., M.D., R.N., etc)	M.P.H.; M.A.
Lead Author's Job Title or Role	Program Manager
Lead Author's Company/University	zCore Business Solutions/DoD Hearing Center of Excellence
Lead Author's Address	310 North Shore Rd Norfolk, Virginia 23505 United States
Lead Author's Phone	(757) 770-5923
Lead Author Email	kbuchanan-hce@outlook.com
Lead Author Biography	Kari Buchanan, M.P.H., M.A. is a retired U.S. Navy Industrial Hygiene Officer providing contract support through zCore Business Solutions to the DoD Hearing Center of Excellence. Ms. Buchanan is currently managing efforts on developing a hearing protective device evaluated products list and associated assessment methods for hearing protective devices. She received her M.P.H. in Environmental Health Sciences from Columbia University and her M.A. in National Security and Strategic Studies from the U.S. Naval War College. She has a broad background in military operations, occupational hazards in the military, DoD organization and risk assessment.
If you have additional co-presenters or co-authors, please tell us how many?	1
Name (Additional Presenter or Co-author #1)	Robert Williams
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	M. Eng
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Both a Presenter and Co-Author

Presentation & Abstract Information

Paper Title	Selecting hearing protection devices using new and updated standards
Preferred Session Type	Thursday Morning Workshop
Abstract	Hearing is a critical sense for individuals engaged in many occupations, occupational settings, and related activities. However, noise can interfere with their ability to communicate and to detect, identify, and localize sounds that may be crucial to work performance. Instituting noise controls is the primary method to reduce exposure and allow critical sounds to be heard, though administrative controls and personal protective equipment are often necessary. Hearing protection devices (HPDs) with newer technologies have been introduced with sound localization capabilities. Hearing conservation programs need to know what criteria to use to assess HPD capabilities and when to select newer HPDs. Participants in this course will learn (1) how to identify hearing critical tasks (HCT) in the workplace, (2) how HPDs differ in their abilities to suppress different types of noise, (3) what assessment methods can be used to determine localization, and (4) how to select hearing protection based upon all available information. Participants will also learn how to instruct hearing protection users in the selection of HPDs appropriate for specific tasks.
Learning Objective #1	Analyze jobs, missions, and work processes for hearing critical tasks (HCTs)
Learning Objective #2	Analyze noise reduction capabilities of HPDs based upon product labeling, real ear attenuation threshold (REAT), and noise reduction statistics (NRS)
Learning Objective #3	(3) Recommend hearing protection based upon noise environment, HCTs, and HPD capabilities
Special Accommodations for presenter(s)/presentation	None
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Electronic Signature	Kari Buchanan

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Katherine Steffen
Lead Author Credentials (i.e., M.D., R.N., etc)	B.A.
Lead Author's Job Title or Role	Audiology Graduate Student
Lead Author's Company/University	University of Northern Colorado
Lead Author's Address	2084 Stratford Court Highlands Ranch, CO 80126 United States
Lead Author's Phone	(720) 382-0150
Lead Author Email	stef3774@bears.unco.edu
Lead Author Biography	Katherine Steffen, B.A., is a 4th year audiology doctoral student/research assistant and will graduate from the University of Northern Colorado in May 2020 with her Au.D. She is currently completing her externship at Denver Hearing Specialists in Lone Tree, Colorado. Katies's interests lie in working in hearing conservation and vestibular diagnostics
If you have additional co-presenters or co-authors, please tell us how many?	3
Name (Additional Presenter or Co-author #1)	Deanna Meinke
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	Ph.D. CCC-A
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author
Name (Additional Presenter or Co-author #2)	Kathryn Bright

Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author
Name (Additional Presenter or Co-author #3)	Tina Stoody
Additional Presenter or Co-author #3 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#3)	Co-Author

Presentation & Abstract Information

Paper Title	Effects of Written Instructions on Field Real Ear Attenuation at Threshold Measurements
Preferred Session Type	Either Poster of Platform Format (Please select this if you do not have a preference)
Abstract	Hearing protector fit-testing is an essential part of a hearing conservation program to ensure that hearing protection devices are effectively protecting the wearer from hazardous noise. The NIOSH HPD Well-Fit™ device was used to measure the personal attenuation rating for each individual's 3M EAR Classic hearing protection device. The NIOSH HPD Well-Fit™ does not have official instructions for finding the personal attenuation rating. The purpose of this capstone research project was to investigate if there was a difference between Personal Attenuation Rating (PAR) scores utilizing different methods of instruction (Ascending, Descending, or Békésy). Each method required the participant to go through different steps to obtain a threshold at each octave from 125-8000 Hz to calculate a PAR score. Three different written instruction methods were used to obtain PAR scores on 29 participants. A repeated measures analysis of variance showed there was not a significant difference for PAR scores based on instruction method ($F = 2.46286$, $p < .05$). These results suggested that no method of instruction used in this study produces a different PAR score than another and that any of these methods of instruction would be appropriate to complete fit-testing. These results may be used to help simplify the process for completing fit-testing in real-world situations and streamlining hearing conservation programs.
Learning Objective #1	Discuss the potential influence of test instructions on PAR scores obtained during REAT testing.

Learning Objective #2	Compare and contrast differences between PAR scores obtained with three different versions of written instructions; Ascending, Descending and Bekesy when using the HPD WellFit.
Learning Objective #3	Identify whether a learning effect on PAR scores occurs when a sequence of three field-REAT measurements are taken.
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Electronic Signature	Katherine Steffen

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IP Address:	73.142.193.12
Unique ID:	526236464
Location:	42.33459854126, -71.036201477051

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Madeline Smith
Lead Author Credentials (i.e., M.D., R.N., etc)	BS
Lead Author's Job Title or Role	Research Consultant
Lead Author's Company/University	Stephenson and Stephenson Research and Consulting, LLC (SASRAC)
Lead Author's Address	27 Caldwell St #2 Boston, MA 02129 United States
Lead Author's Phone	(248) 835-7920
Lead Author Email	madeline.v.smith@outlook.com
Lead Author Biography	Madeline Smith is a research consultant for Stephenson and Stephenson Research and Consulting, LLC (SASRAC). Madeline's hearing-related research experiences include data collection and analysis at Western Michigan University and the United States Army Aeromedical Research Laboratory. Madeline is currently a second-year graduate student at MGH Institute of Health Professions. Madeline will graduate from MGH Institute of Health Professions in September 2020 with a Master of Science degree in Communication Sciences and Disorders. She plans to pursue a PhD in Speech Science.
If you have additional co-presenters or co-authors, please tell us how many?	5
Name (Additional Presenter or Co-author #1)	Heath Jones
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	PhD

Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author
Name (Additional Presenter or Co-author #2)	Nathaniel Greene
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	PhD
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author
Name (Additional Presenter or Co-author #3)	William Ahroon
Additional Presenter or Co-author #3 Credentials (ie: M.D., R.N., etc)	PhD COHC
Is this person a co-author, presenting or both a co-author and presenting? (#3)	Co-Author
Name (Additional Presenter or Co-author #4)	Gregory Flamme
Is this person a co-author, presenting or both a co-author and presenting? (#4)	Co-Author
Name (Additional Presenter or Co-author #5)	Stephen Tasko
Additional Presenter or Co-author #5 Credentials (ie: M.D., R.N., etc)	PhD
Is this person a co-author, presenting or both a co-author and presenting? (#5)	Co-Author

Presentation & Abstract Information

Paper Title	Does knowledge of an impending impulse elicit early middle ear muscle contractions?
Preferred Session Type	Friday/Saturday Platform

Abstract	Multiple damage-risk criteria (DRC) for impulsive noise have included middle ear muscle contractions (MEMC) as a protective mechanism. One DRC proposes that if an individual expects an impulse, an MEMC will occur in the listener in anticipation of the impulse. In this study, we examined whether knowledge of an impending impulse influences the likelihood of an early MEMC (i.e., prior to weapon discharge) in a group of 59 adult participants with good hearing. Participants attended to downrange targets and were assigned to either a shooter or spotter role. Early MEMC were identified by changes in the sound levels developed in the ear canal from a click-based probe signal. Results of MEMC for warned and unwarned conditions will be described and compared with related lab-based results and observations made with soldiers firing weapons loaded with live ammunition.
Learning Objective #1	Participants will recognize differences in MEMC dependent on a listener's warned/unwarned status.
Learning Objective #2	Participants will recognize similarities in MEMC dependent on a listener's warned/unwarned status.
Learning Objective #3	Participants will recognize the implication of warned/unwarned listener status on damage-risk criteria for impulsive noise that include MEMC as a protective mechanism.
Special Accommodations for presenter(s)/presentation	N/A
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Electronic Signature	Madeline Smith

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Location:	41.592098236084, -87.456398010254

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	BANKOLE FASANYA
Lead Author Credentials (i.e., M.D., R.N., etc)	PhD.
Lead Author's Job Title or Role	Assistsant Professor
Lead Author's Company/University	Purdue University Northwest
Lead Author's Address	2200, 169th Street Hammond, IN 46323 United States
Lead Author's Phone	(219) 989-8130
Lead Author Email	fbankole@pnw.edu
Lead Author Biography	Dr. Fasanya has more than 10 years' experience in noise control and auditory process research. His long-term research interests involve the development of a comprehensive model and guidelines to reduce environmental hazards and to improve human safety and health in the environment. Dr. Fasanya is an OSHA authorized train-the-trainers personnel and is a Certified Occupational Hearing Conservationist. His academic training and research experience to date have provided him with an excellent background in Ergonomics and Human Factors specifically, environmental and occupational noise control, and auditory protection and prevention. Dr. Fasanya has developed and taught courses on noise control at graduate level during his faculty position at North Carolina Agricultural and Technical State University in the department of Built Environment. He has also developed and taught Industrial Hygiene course in his current position at Purdue University Northwest, a course that demonstrate good practice
If you have additional co-presenters or co-authors, please tell us how many?	2
Name (Additional Presenter or Co-author #1)	Efrem Reeves

Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	PhD
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author
Name (Additional Presenter or Co-author #2)	Alexander Francis
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	PhD.
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author

Presentation & Abstract Information

Paper Title	Correlations between Headphones output in Decibel and Electronic Devices Volume
Preferred Session Type	Thursday Afternoon Workshop
Abstract	Hearing loss among the younger generation is escalating every year along with the rate of sales of headphones and its usage. An American Osteopathic Association report confirmed the rate of hearing loss in teens to be 30% higher than it was in the 1990s before headphones became incredibly common. Today, many students are in the habit of using headphones on daily basis when studying or doing other activities. This study investigated the average sound level (LAeq) output of two cellphone connected with eight different headphone types. A GRAS 45CB acoustic test fixture (ATF) was used to measure the headphone output. Output on the right ear at 40% volume level on an Android Blackberry cellphone produced 60.1 dB(A) with Panasonic earbuds, 58.3 dB(A) with Philips earbuds, 61.7 dB(A) with Samsung earbuds. And 48.1 dB(A) with both Inland and Snug circumaural headphones, 59.6 dB(A) with Billboard earbuds, 83.6 dB(A) with Audioflex Bluetooth wireless, and 68.4 dB(A) Pasonomi Bluetooth. With iPhone 6x, Panasonic earbuds produced 39.5 dB(A), 41.3 dB(A) with Philips earbuds, 41.2 dB(A) with Samsung earbuds, 38.5 dB(A) with Inland circumaural headphones, 39.3 dB(A) with Snug circumaural headphones. Billboard earbuds produced 42.4 dB(A), Audioflex Bluetooth wireless produced 64.6 dB(A), and 52.8 dB(A) with Pasonomi Bluetooth. Findings from this study could be a useful tool for audiologists during headphone usage counseling.
Learning Objective #1	Identify corresponding decibel outputs of headphones connected with different devices.
Learning Objective #2	Compare different headphones decibel outputs (dBA) on one cellphone device.

Learning Objective #3	n/a
Special Accommodations for presenter(s)/presentation	No special devices needed except computer and projector.
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Electronic Signature	BANKOLE FASANYA

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Unique ID:	527737342
Location:	37.750999450684, -97.821998596191

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Robert Anderson
Lead Author Credentials (i.e., M.D., R.N., etc)	BME; INCE
Lead Author's Job Title or Role	Principal Consultant
Lead Author's Company/University	Robert Anderson Group, Inc.
Lead Author's Address	3815 West St. Joseph Suite C-300 Lansing, MI 48917 United States
Lead Author's Phone	(517) 290-5245
Lead Author Email	robertanderson@robertandersongroup.com
Lead Author Biography	Robert Anderson is Principal and Co-Founder of Anderson Consulting Associates, a noise control consulting firm in Lansing, Michigan. He has been actively involved in the field of noise control for over 40 years, supervising and participating in projects related to control of occupational and community noise in industry. His experience includes noise control within the agricultural implement, appliance, automotive, brewing, chemical, logistics, glass container, petroleum, pharmaceutical, plastics and rubber manufacturing industries. He has been a guest lecturer at The Eugene Applebaum College of Pharmacy and Health Sciences of Wayne State University and at the University of Michigan's School of Public Health; and is currently an adjunct faculty member of Central Michigan University, where he teaches sound exposure monitoring and hearing loss prevention programs to audiology graduate students.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Noise Exposure Risk Assessment in Various Workplace Environments
Preferred Session Type	Thursday Morning Workshop
Abstract	Worker sound exposure risk assessment is the cornerstone for a successful occupation hearing loss prevention program. Besides being the primary mechanism for determining the nature and degree of sound exposure risk, it can also interrelate with other program elements including tracking progress of a noise control program. Issues that can govern an effective assessment procedure include sufficiency, reliability, utility and cost-effectiveness. Above all, the strategy chosen for exposure assessment must also be failsafe. This workshop will reference specific paragraphs of the OSHA regulation covering monitoring and discuss in detail the methodologies covered in ANSI S12.19-1996 (R2016) and evaluation methods contained in other reference books and documents. It will cover monitoring criteria, instrumentation, and the potential impact of both on monitoring results. The workshop will also include examples of multiple work environments ranging in complexity and discuss how different monitoring strategies can lead to varying results. The object is to provide a more complete understanding of how to approach the important process of assessing noise exposure risk. Attendees of the workshop will be given access to a software application useful in computing sound exposures.
Learning Objective #1	Attendees will be able to recognize the appropriate monitoring strategy for the type of work environment.
Learning Objective #2	Attendees will be able to understand the concept of "Similar Exposure Group" and its importance in exposure assessment.
Learning Objective #3	Attendees will be able to distinguish monitoring instruments and their uses.
Special Accommodations for presenter(s)/presentation	Computer projector and amplification system
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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	William J Murphy
Lead Author Credentials (i.e., M.D., R.N., etc)	Ph.D.
Lead Author's Job Title or Role	Coordinator, Hearing Loss Prevention Research
Lead Author's Company/University	National Institute for Occupational Safety and Health
Lead Author's Address	1090 Tusculum Ave. Mailstop C-27 Cincinnati, Ohio 45226 United States
Lead Author's Phone	(513) 533-8125
Lead Author Email	wjm4@cdc.gov
Lead Author Biography	William J. Murphy is a Captain in the United States Public Health Service Commissioned Corps and is coordinator for the Hearing Loss Prevention cross sector for the National Institute for Occupational Safety and Health. He is an active member of the National Hearing Conservation Association and a Fellow of the Acoustical Society of America. He is currently the chair for the ASA's American National Standards Institute (ANSI) Accredited Standards Committee S3 for Bioacoustics. He has provided leadership to the ASA as chair of the Technical Committee on Noise and through work with the national and international standards on noise.
If you have additional co-presenters or co-authors, please tell us how many?	3
Name (Additional Presenter or Co-author #1)	Gregory A. Flamme
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	Ph.D. CCC-A
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Both a Presenter and Co-Author

Name (Additional Presenter or Co-author #2)	Deanna K Meinke
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	Ph.D., CCC-A
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Name (Additional Presenter or Co-author #3)	Michael Stewart
Additional Presenter or Co-author #3 Credentials (ie: M.D., R.N., etc)	Ph.D., CCC-A
Is this person a co-author, presenting or both a co-author and presenting? (#3)	Both a Presenter and Co-Author

Presentation & Abstract Information

Paper Title	Impulsive Noise: Understanding, Measuring, and Mitigating the Risk of Noise Induced Hearing Loss
Preferred Session Type	Thursday Morning Workshop
Abstract	This half-day workshop will provide current information to attendees regarding the effects of impulsive noise, ways to measure it, techniques to mitigate the exposure, and how to assess impulsive noise exposures. Exposure to high-level impulse noises such as firearms and explosions is significant risk factor for noise induced hearing loss. When peak exposure levels exceed 140 dB SPL, the risk of permanent hearing loss increases rapidly. Although Impulse and impact noise are generated through different processes, they are often grouped into impulsive noise. When measuring impulsive, sound level meters may not be the best choice. In many cases, recordings are more beneficial to understand the exposure and to mitigate the risk. Hearing protection devices are not the only tool in the hearing-loss prevention toolbox. Level dependent passive or electronic protectors, mufflers and noise suppressors can provide a range of noise level reductions and improve communication in critical jobs. Estimating the risk of hearing loss has been challenging due to the range of damage risk criteria (DRC) available to the occupational safety and health professional. The advantages and disadvantages of several DRCs will be presented. By attending this workshop, should help the safety and health professional to understand, measure, and mitigate the risk of noise exposure to high-level impulsive noise.
Learning Objective #1	Participants will understand the differential risk of hearing loss due to impulsive noise exposure

Learning Objective #2	Participants will learn about methods to measure impulsive noise regarding microphone selection, dynamic range, sampling rates, and resolution of data acquisition systems
Learning Objective #3	Participants will learn about the variety of damage risk criteria available to assess the hazard of impulse noise exposures.
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Electronic Signature	William Murphy

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Gregory Flamme
Lead Author Credentials (i.e., M.D., R.N., etc)	Ph.D.
Lead Author's Job Title or Role	Senior Scientist
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Lead Author's Phone	(269) 569-5668
Lead Author Email	gflamme@sasrac.com
Lead Author Biography	Gregory A. Flamme, Ph.D. is a Senior Scientist with Stephenson and Stephenson Research and Consulting (SASRAC). Prior to joining SASRAC, Dr. Flamme held faculty positions at Western Michigan University and The University of Iowa. He completed his Ph.D. in Audiology at The University of Memphis and conducted post-doctoral studies in Epidemiology and Biostatistics at The University of Iowa. His research interests include the assessment of hearing status and the identification and mitigation of risk factors for hearing impairment.
If you have additional co-presenters or co-authors, please tell us how many?	5
Name (Additional Presenter or Co-author #1)	Stephen Tasko
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author

Name (Additional Presenter or Co-author #2)	Kristy Deiters
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	Au.D.
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author
Name (Additional Presenter or Co-author #3)	Madeline Smith
Additional Presenter or Co-author #3 Credentials (ie: M.D., R.N., etc)	B.A.
Is this person a co-author, presenting or both a co-author and presenting? (#3)	Co-Author
Name (Additional Presenter or Co-author #4)	William Murphy
Is this person a co-author, presenting or both a co-author and presenting? (#4)	Co-Author
Name (Additional Presenter or Co-author #5)	Heath Jones
Additional Presenter or Co-author #5 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#5)	Co-Author

Presentation & Abstract Information

Paper Title	Middle ear muscle contractions do not provide dependable protection: Implications for impulsive noise damage risk criteria
Preferred Session Type	Friday/Saturday Platform

Abstract	Numerous damage-risk criteria (DRC) for impulsive noise have assumed a protective role for middle ear muscle contractions (MEMC). However, there is scant empirical evidence to support MEMC inclusion in DRC. The aim of this presentation is to summarize the results of a multi-year, multi-site, multi-method series of laboratory and field studies involving live fire of military rifles. Studies included epidemiological estimates of acoustic reflexes, identification of reflexive responses to brief tones, noise, and recorded gunshots, attempts to condition an early/warned contraction, and assessments of MEMC status among soldiers while firing military rifles. Results indicate that MEMC are not dependable, either in anticipation of, or in response to an impulsive noise. Therefore, MEMC should not be included in DRC for impulsive noise.
Learning Objective #1	Participants will recognize the role played by middle ear muscle contractions in damage-risk criteria for impulsive noise.
Learning Objective #2	Participants will understand the comprehensive approach used to assess MEMC in response to impulsive noise.
Learning Objective #3	Participants will recognize that laboratory and field studies described in this presentation provide no support for including MEMC in DRC.
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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Stephen Tasko
Lead Author Credentials (i.e., M.D., R.N., etc)	Ph.D.
Lead Author's Job Title or Role	Associate Professor
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Lead Author's Phone	(269) 387-8049
Lead Author Email	stasko@sasrac.com
Lead Author Biography	Stephen Tasko, Ph.D. is an Associate Professor in the Department of Speech, Language and Hearing Sciences at Western Michigan University and Research Consultant with Stephenson and Stephenson Research and Consulting (SASRAC). 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 disordered speech motor control.
If you have additional co-presenters or co-authors, please tell us how many?	5
Name (Additional Presenter or Co-author #1)	Gregory Flamme
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author

Name (Additional Presenter or Co-author #2)	Kristy Deiters
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	Au.D.
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author
Name (Additional Presenter or Co-author #3)	Madeline Smith
Additional Presenter or Co-author #3 Credentials (ie: M.D., R.N., etc)	B.A.
Is this person a co-author, presenting or both a co-author and presenting? (#3)	Co-Author
Name (Additional Presenter or Co-author #4)	William Murphy
Is this person a co-author, presenting or both a co-author and presenting? (#4)	Co-Author
Name (Additional Presenter or Co-author #5)	Heath Jones
Additional Presenter or Co-author #5 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#5)	Co-Author

Presentation & Abstract Information

Paper Title	An approach to identification of middle ear muscle contractions that controls for the effect of incidental motor activity
Preferred Session Type	Poster Presentation

Abstract	Evidence that motor activity can reliably elicit middle ear muscle contractions (MEMC) is increasing. This observation complicates the interpretation of experiments that focus on acoustically elicited MEMC. For example, is a given MEMC due to the acoustic elicitor, concomitant motor activity or both? This question is particularly relevant since some damage risk criteria (DRC) for impulsive sound suggest a protective role of MEMC. Recently, our research team described a multiple regression approach to quantify associations between electromyographic (EMG) activity recorded from muscles in the head, neck and upper extremity and middle ear activity. For a substantial minority of participants, 20-60 percent of the variance in middle ear activity was predicted by EMG activity in the head, neck and upper extremity. The current study expands these methods to the detection of MEMC in response to brief acoustic elicitors that controls for possible EMG-related contributions. The results suggest that facial muscle activity may inflate estimates of the prevalence of MEMC for brief sounds. Results will be discussed in the context of DRC for impulsive noise that include MEMC as a protective mechanism
Learning Objective #1	Participants will recognize that other motor activity can elicit middle ear muscle contractions in the absence of an acoustic elicitor.
Learning Objective #2	Participants will understand that motor activity can interact with acoustic elicitors and influence the likelihood of observing a middle ear muscle contraction.
Learning Objective #3	Participants will be able to describe analytical procedures that can help disambiguate the relative contributions of acoustic elicitors and motor activity for assessment of MEMC.
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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Kristy Deiters
Lead Author Credentials (i.e., M.D., R.N., etc)	Au.D.
Lead Author's Job Title or Role	Research Audiologist
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Lead Author's Address	2264 Heather Way Forest Grove, OR 97116 United States
Lead Author's Phone	(517) 505-2773
Lead Author Email	kdeiters@sasrac.com
Lead Author Biography	Kristy K. Deiters, Au.D. is a research audiologist working with Stephenson and Stephenson Research and Consulting (SASRAC). Prior to her work with SASRAC, she was a research audiologist and study coordinator in the Department of Speech Pathology and Audiology at Western Michigan University and a clinical audiologist at Hearing Services and Systems in Portage, MI. She completed her Au.D. at Western Michigan University. Her research interests include evaluating damage-risk metrics for impulsive noise, the epidemiology of hearing impairment, and the evaluation of hearing status.
If you have additional co-presenters or co-authors, please tell us how many?	5
Name (Additional Presenter or Co-author #1)	Stephen Tasko
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author

Name (Additional Presenter or Co-author #2)	Gregory Flamme
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author
Name (Additional Presenter or Co-author #3)	Madeline Smith
Additional Presenter or Co-author #3 Credentials (ie: M.D., R.N., etc)	B.A.
Is this person a co-author, presenting or both a co-author and presenting? (#3)	Co-Author
Name (Additional Presenter or Co-author #4)	William Murphy
Is this person a co-author, presenting or both a co-author and presenting? (#4)	Co-Author
Name (Additional Presenter or Co-author #5)	Heath Jones
Additional Presenter or Co-author #5 Credentials (ie: M.D., R.N., etc)	Ph.D.
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Presentation & Abstract Information

Paper Title	Distinguishing between middle ear muscle contractions and the eye-blink startle response: A preliminary study
Preferred Session Type	Poster Presentation

Abstract	Intense acoustic stimuli and brief somatosensory stimuli can elicit middle ear muscle contractions (MEMC). However, the same stimuli can produce relatively short latency motor responses in other motor systems such as the muscles that close the eyelids. This is commonly termed the eye-blink startle response. The relationship between these response classes is not well understood. The aim of the current study is to examine the relationships between MEMC and eye-blink startle activity in response to somatosensory stimuli. Responses to bursts of air delivered to four areas on the face were obtained from over 190 adults with no signs of active middle ear disorders. Results will be discussed with specific reference to MEMC in the context of damage-risk criteria for impulsive noise.
Learning Objective #1	Participants will recognize the differences between responses to acoustic and somatosensory stimuli, as measured in the ear.
Learning Objective #2	Participants will understand that responses in the middle ear can differ substantially based on the characteristics and sensory mode of the elicitor.
Learning Objective #3	Participants will be able to describe the potential impact of startle responses on estimates of the influence of middle ear muscle contractions on auditory risk.
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Lead Author's Address	1305 East Broomfield Road Mount Pleasant, MI 48858 United States
Lead Author's Phone	(517) 243-2674
Lead Author Email	sarah.grinn@cmich.edu
Lead Author Biography	Dr. Grinn is a new faculty member at Central Michigan University, having recently earned her Ph.D. at The University of Texas at Dallas, and her Au.D. and The University of Florida. Her research interests include the role of pre-cochlear amplification in NIHL vulnerability, and the auditory effects of isolated and frequent recreational noise insults sustained in normal hearing populations. Dr. Grinn first joined and presented research at the NHCA as an Au.D. student, then earned the NHCA Student Research Award as a Ph.D. student, and is proud to continue supporting and promoting the NHCA at the faculty-academic level.
If you have additional co-presenters or co-authors, please tell us how many?	1
Name (Additional Presenter or Co-author #1)	Colleen Le Prell
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author

Presentation & Abstract Information

Paper Title	Words-in-Noise Performance in Normal-Hearing Young Adults with Isolated or Frequent Firearm Exposure
Preferred Session Type	Friday/Saturday Platform
Abstract	Audiology's greatest present-day mystery concerns real-world, auditory performance deficits observed in patients who meet "normal-hearing" criteria for audiometric examination. As such, the audiogram, which detects peripheral auditory dysfunction, is under intense scrutiny as researchers and practitioners look past explanations of peripheral-auditory injury in favor of possible central-auditory injury. Of specific interest is the site of synaptic connectivity (or disconnectivity) between hair cells and the auditory nerve, following a dangerous noise-exposure. Studies of severely noise-exposed animals (mice, guinea pig, non-human primates) provide evidence that such an injury can occur at this site without affecting the peripheral-auditory system; however, attempts at human translational studies have yielded highly inconsistent conclusions and heated controversy. The last decade of literature surrounding the search for evidence of this disconnectivity - a noise-induced cochlear synaptopathy (NICS) ("hidden hearing loss") - in humans suggests that subsequent investigations should be reasonably limited to populations who endure severe isolated or frequent temporary threshold shift (TTS). Firearm discharge is the most similar, real-world noise-exposure that would be able to induce the severe degree of TTS that is necessary to observe NICS in animal science. Studying central-auditory injury in firearm users presents a challenge in that many already exhibit peripheral-auditory injury (i.e., overt hearing loss) from frequent firearm use, which masks the present ability to reveal any central-auditory injury that may have preceded it. Therefore, a young, normal-hearing, firearm-using population constitutes the highest potential for identifying an "at-risk" NICS population. We conducted a retrospective study enrolling 92 normal-hearing adults (.5-8 kHz thresholds <15 dB-HL, 18-25 years), including frequent and infrequent firearm users, and non-firearm users as a control measure. We analyzed correlations between participant's noise-exposure history, hearing protection use, audiometric thresholds .5-18 kHz, otoacoustic emission amplitude 1-12 kHz, 90 dB-nHL cochlear nerve response to click, 1 and 4 kHz tone-burst stimuli, ear-level and free-field Words-in-Noise objective performance, and self-reported speech-in-noise subjective performance. These correlations contribute important developments towards a damage-risk criteria for human synaptopathic injury.
Learning Objective #1	Compare clinically "normal-hearing" participant's firearm exposure history with their current auditory performance on a clinically comprehensive peripheral and central auditory evaluation.

Learning Objective #2	Observe the frequency of self-reported hearing protection device (HPD) use in firearm users and non-firearm users, compared to their HPD performance tested in a laboratory setting.
Learning Objective #3	Compare differences in self-reported speech-in-noise performance and objective Words-in-Noise performance between and within firearm users and non-firearm users.
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Electronic Signature	Sarah Grinn

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Brendan Fitzgerald
Lead Author Credentials (i.e., M.D., R.N., etc)	M.M. (Master of Music)
Lead Author's Job Title or Role	Fourth Year AuD Extern
Lead Author's Company/University	University at Buffalo/ Cleveland Clinic
Lead Author's Address	75 Hillside Drive Orchard Park, NY 14127 United States
Lead Author's Phone	(716) 361-3271
Lead Author Email	bpffitz@gmail.com
Lead Author Biography	Brendan Fitzgerald is a currently a student at the State University of New York at Buffalo in his externship year at the Cleveland Clinic. Formerly a music educator, his clinical and research interests in audiology include tinnitus and hearing conservation, particularly for musicians.
If you have additional co-presenters or co-authors, please tell us how many?	1
Name (Additional Presenter or Co-author #1)	Juan Vasquez
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	AuD
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Both a Presenter and Co-Author

Presentation & Abstract Information

Paper Title	Impacts of HPDs on Ear Canal Acoustics during Music Performance

Preferred Session Type	Either Poster of Platform Format (Please select this if you do not have a preference)
Abstract	Musicians are routinely exposed to environments and situations that reach potentially hazardous sound pressure levels, which contribute to an increased risk for music induced hearing disorders. Because hearing protection can perceptually alter the timbre and subtle spectral qualities of music for musicians, many express negative attitudes toward the use of hearing protection. This ongoing study investigates the specific acoustic properties of the ear canal when naturally open and occluded with hearing protection in performing and non-performing conditions for woodwind and brass instrumentalists and vocalists (target n=15). In this population, ear canal resonance can create even greater perceptual difficulties due to the fact that their means of sound production depends on contact with the body or the body being the instrument itself. By utilizing Real Ear Measures (REM) and self-rating scales, we will compare various playing and listening conditions with musicians. First, changes in ear canal acoustics with three different hearing protection devices will be measured using REM. Musicians will then rate their performance and the willingness to accept or tolerate the perceptual changes. We hypothesize that differences in ear canal acoustics created with various hearing protection devices will predict musicians' preference and acceptance of those devices.
Learning Objective #1	Participants will identify unique difficulties faced by musicians seeking to protect their hearing without negatively impacting their performance.
Learning Objective #2	Participants will consider differences in ear canal acoustics created by a performer's anatomy and their instrument.
Learning Objective #3	Participants will apply their knowledge to their practice and recommendations for musicians, specifically in the area of hearing protection.
Special Accommodations for presenter(s)/presentation	If presenting, please ensure access services to Deaf and hard of hearing participants.
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Electronic Signature	Brendan Fitzgerald

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Elon Ullman
Lead Author Credentials (i.e., M.D., R.N., etc)	B.A.
Lead Author's Job Title or Role	Research Assistant
Lead Author's Company/University	University of Michigan
Lead Author's Address	2484 Parkwood Ave Ann Arbor, Michigan 48104 United States
Lead Author's Phone	5106841142
Lead Author Email	elonu@umich.edu
Lead Author Biography	Elon is a second year Master of Science candidate in Industrial Hygiene at the University of Michigan. He obtained his bachelor's degree in psychology from Bard College, where he wrote his undergraduate thesis on the neural correlates of hearing loss and tinnitus. Before attending the University of Michigan, Elon worked as a Research Associate developing novel tests for audiology clinics. His passion for hearing loss prevention stems from his experience volunteering with Hearing Education and Awareness for Rockers, a nonprofit that focuses on preventing hearing loss in musicians and live music attendees.
If you have additional co-presenters or co-authors, please tell us how many?	4
Name (Additional Presenter or Co-author #1)	Lauren Smith
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	M.S.
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author

Name (Additional Presenter or Co-author #2)	Sandar Bregg
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	B.S.
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author
Name (Additional Presenter or Co-author #3)	Abas Shkembi
Is this person a co-author, presenting or both a co-author and presenting? (#3)	Co-Author
Name (Additional Presenter or Co-author #4)	Richard Neitzel
Is this person a co-author, presenting or both a co-author and presenting? (#4)	Co-Author

Presentation & Abstract Information

Paper Title	Predictors for Hearing Protection Attenuation Among Miners
Preferred Session Type	Poster Presentation

Abstract	Noise exposure is among the most prevalent occupational hazards in the United States. Excessive noise exposure can lead to hearing loss and tinnitus and has been linked with additional chronic diseases such as cardiovascular disease. Hearing protection devices (HPDs), such as earplugs and earmuffs, are required by law to be used in occupational environments with hazardous noise levels. A measure known as the Personal Attenuation Rating (PAR) is currently considered to be the gold standard for measuring how well an earplug is fit by calculating the attenuation achieved by an individual wearing an HPD. PARs are commonly calculated using "Real Ear at Threshold" (REAT) systems, which measure the threshold that an individual can hear across a range of frequencies with and without their HPD. Despite being the gold standard for measuring earplug fit, there is a current gap in knowledge concerning the predictors of PARs. This study utilized data collected under a larger study on noise exposure and injury rate among miners to investigate the predictors of PARs, with a focus on the association between hearing loss and personal attenuation ratings. Hearing loss was assessed using both audiometric testing and a speech-in-noise test. PARs were assessed using a REAT system. Predictors of PARs were modeled using both simple and multiple linear regression, with hearing loss as the primary predictor of interest. The main objective of this study is to shed light on risk factors for poor earplug fit. This knowledge can be integrated into hearing protection programs to target individuals most at risk for excessive noise exposure due to poor earplug fit.
Learning Objective #1	Explain the role of hearing protection device fit checking in hearing conservation programs.
Learning Objective #2	Differentiate between a Personal Attenuation Rating and a Noise Reduction Rating.
Learning Objective #3	Recognize the risk factors that lead to poor hearing protection device fit.
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Electronic Signature	Elon Ullman

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Sridhar Krishnamurti
Lead Author Credentials (i.e., M.D., R.N., etc)	Ph.D.
Lead Author's Job Title or Role	Professor of Audiology
Lead Author's Company/University	Auburn University
Lead Author's Address	1199 Haley Center Auburn University Auburn, United States (1) 36849 United States
Lead Author's Phone	3348449627
Lead Author Email	krishsr@auburn.edu
Lead Author Biography	Dr. Sridhar Krishnamurti is a Professor of Audiology in the Department of Communication Disorders at Auburn University. He currently serves on the research grants review panel for the DOD and is also on the review board of several agencies and journals including Ear and Hearing, American Journal of Public Health, and Journal of the American Academy of Audiology. Sridhar Krishnamurti has served as the past-continuing education administrator for Audiology Special Interest Divisions 6-9 and a Fellow of the American Academy of Audiology. Sridhar Krishnamurti has authored and co-authored journal articles and book chapters that cover the areas of electrophysiology, aging, hearing conservation, auditory processing disorders, and hearing aids.
If you have additional co-presenters or co-authors, please tell us how many?	2
Name (Additional Presenter or Co-author #1)	Mary Holland
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	B.S.

Is this person a co-author, presenting or both a co-author and presenting? (#1)	Both a Presenter and Co-Author
Name (Additional Presenter or Co-author #2)	Shabnam Habibi
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	B.S.
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author

Presentation & Abstract Information

Paper Title	Evaluating effects of insertion and measurement techniques on attenuation characteristics of industrial earplugs
Preferred Session Type	Friday/Saturday Platform
Abstract	Industrial workers often use the wrong technique to insert their ear plugs, making the hearing protection values lower than predicted by the earplug manufacturer labels. Noise Reduction Rating (NRR) is a single number printed on labels by manufacturers that do not accurately reflect the frequency-specific attenuation offered by ear plugs. In the current study, personal attenuation ratings (PARs) were first computed in two conditions: 1) self-insertion by worker and 2) insertion by experienced investigator. A paired samples T-Test showed significant differences between self-insertion and investigator-insertion conditions ($df= 22$; $t=-8.56$; $p< .01$). These results show that training for proper insertion must be considered strongly during the fitting process. In the second phase of the study, an objective measure of hearing protection offered by ear plugs was evaluated by use of probe microphone testing in real ears of participants in two conditions. Sound pressure levels (SPLs) In the first open ear (unoccluded) condition were compared with SPLs in a plugged (occluded) condition for all participants. There were significant effects of frequency ($df=8$; $f= 10.45$; $p< .01$); with the highest noise reduction seen at 3000 Hz. These results indicate that a frequency-specific NRR value can be used to effectively label hearing protectors.
Learning Objective #1	Learner should be able to identify subjective estimates of hearing protector attenuation
Learning Objective #2	Learner should be able to contrast between subjective and objective measures of hearing protector effectiveness
Learning Objective #3	Learner should be able to understand how probe microphone measures can be used for study of hearing protector attentuation

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Electronic Signature	Sridhar Krishnamurti

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Christopher Smalt
Lead Author Credentials (i.e., M.D., R.N., etc)	PhD
Lead Author's Job Title or Role	Technical Staff
Lead Author's Company/University	MIT Lincoln Laboratory
Lead Author's Address	244 Wood St Lexington, MA 02421 United States
Lead Author's Phone	781 981 4186
Lead Author Email	Christopher.Smalt@LL.mit.edu
Lead Author Biography	Christopher J. Smalt is a technical staff member in the Human Health and Performance Systems Group at the MIT Lincoln Laboratory. His current work focuses on computational modeling of hearing damage mechanisms and the effect of noise exposure on hearing and cognitive performance. As part of this research, he has developed a personal noise monitoring technologies for industrial and tactical environments. Dr. Smalt received a BS degree in computer engineering from Clarkson University and earned both MS and PhD degrees in electrical engineering from Purdue University. Dr. Smalt's other research interests include 3D virtual audio, cognitive load, machine learning, and electrophysiology.
If you have additional co-presenters or co-authors, please tell us how many?	2
Name (Additional Presenter or Co-author #1)	William Murphy
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	PhD
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author

Name (Additional Presenter or Co-author #2)	Gregory Ciccarelli
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	PhD
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author

Presentation & Abstract Information

Paper Title	Stand-off, Photograph-Based Estimation of Hearing Protection Attenuation and Fit
Preferred Session Type	Either Poster of Platform Format (Please select this if you do not have a preference)
Abstract	The Occupational Safety and Health Administration guidelines for noise exposure require protecting workers for noise levels over 90 dBA based on a worker's time weighted average over an 8-hour day (29 CFR 1910.95) while the National Institute for Occupational Safety and Health recommends hearing protection for noise levels over 85 dBA averaged over an 8-hour workday. Industrial and military noise environments are frequently above these sound levels, so in addition to other noise controls, hearing protection devices (HPDs) are often used to prevent permanent, non-reversible hearing damage. One challenge with the use of hearing protection is training and maintaining compliance, particularly in industrial settings. In this study, we estimated the adequacy of fit of a foam hearing protector using only a photograph of the inserted foam plug. An image-based classifier was trained with 200 photographs and associated attenuation data and tested with 40 additional images. The classifier, which predicted either "good or "bad" fit, achieved 73% accuracy for earplugs that had an average of 35 dB attenuation across frequencies. This algorithm could be incorporated in an application for training as well as for automated compliance monitoring in noisy environments for preventing hearing loss.
Learning Objective #1	Understand hearing protection fit and its effect on exposure and health
Learning Objective #2	Identify some of the current techniques for assessing HPD fit
Learning Objective #3	Describe preliminary findings of image-based classification of HPD fit
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Electronic Signature	Christopher Smalt

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Frank Wartinger
Lead Author Credentials (i.e., M.D., R.N., etc)	Au.D.
Lead Author's Job Title or Role	Audiologist
Lead Author's Company/University	Children's Hospital of Philadelphia
Lead Author's Address	2752 S KENT RD BROOMALL, Pennsylvania 19008-2019 United States
Lead Author's Phone	9147870806
Lead Author Email	Frank.Wartinger@gmail.com
Lead Author Biography	Frank Wartinger is a clinical audiologist at Children's Hospital of Philadelphia, a certified CAOHC course director, and owner of Earmark Hearing Conservation, a private practice serving musicians in Philadelphia. He is an active member of the American Academy of Audiology (AAA) and the National Hearing Conservation Association (NHCA) for which he served as Director of Communications 2017 - 2019. He received a Bachelors of Music degree in Studio Production from Purchase Conservatory and a Doctorate in Audiology degree from Salus University. Dr. Wartinger co-authored the AAA 2019 "Guidelines for Audiological Treatment of Musicians and Music Industry Personnel", the NHCA 2018 Position Statement on "Recreational Music Exposure", and has been published in Hearing Journal, Journal of the Acoustical Society of America, NHCA Spectrum, and Audiology Today. Outside of the clinic, he is also an active professional musician with hundreds of credits as performer, composer, producer, and engineer.
If you have additional co-presenters or co-authors, please tell us how many?	4
Name (Additional Presenter or Co-author #1)	Michael Santucci

Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	Au.D.
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Both a Presenter and Co-Author
Name (Additional Presenter or Co-author #2)	Heather Malyuk
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	Au.D.
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Both a Presenter and Co-Author
Name (Additional Presenter or Co-author #3)	Colleen Le Prell
Additional Presenter or Co-author #3 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#3)	Both a Presenter and Co-Author
Name (Additional Presenter or Co-author #4)	Cory Portnuff, AuD PhD
Is this person a co-author, presenting or both a co-author and presenting? (#4)	Both a Presenter and Co-Author

Presentation & Abstract Information

Paper Title	Music Audiology: Updates and Best Practices
Preferred Session Type	Friday/Saturday Platform

Abstract	Music Induced Hearing Disorders (MIHD) are pervasive among music industry professionals as well as the music-listening public. Hearing impairment which results from music and noise exposure can lead to communication difficulties and health related quality of life degradation in the general population. To professionals in the music industry, hearing disorders can pose a severe threat to their career stability, artistic performance, and personal satisfaction from involvement in music. These risks are generally not well appreciated by the at-risk individuals, and best practice guidance from professional organizations has been sparse. This session will introduce best practice and position statement documents pertaining to the Music Audiology, namely the NHCA 2018 Position Statement on "Recreational Music Exposure" and the AAA "Guidelines for Audiological Treatment of Musicians and Music Industry Personnel" (pending publication). A panel of co-authors of the papers will highlight clinical recommendations and considerations for the care of those who experience occupational and recreational music exposures. Further research directions and needs will be emphasized in an effort to promote the field of Music Audiology. Additional resources will be discussed, including the NHCA "Hearing Wellness for Musicians and Music Industry Professionals" educational brochure (2019).
Learning Objective #1	Identify at least three resource documents pertaining to the clinical practice of Music Audiology and hearing loss prevention for music exposed individuals.
Learning Objective #2	Describe interventions and hearing devices used to mitigate noise exposures for music industry professionals.
Learning Objective #3	Compare and contrast clinical services for various patient populations including occupational and recreational music exposed individuals.
Special Accommodations for presenter(s)/presentation	Presentation would ideally be presented as a panel discussion with 3 - 5 co-authors of the highlighted documents with a duration of 40 - 60 minutes.
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Electronic Signature	Frank Wartinger

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Kirk Ohnstad
Lead Author Credentials (i.e., M.D., R.N., etc)	B.S. Physics
Lead Author's Job Title or Role	CMR-D General Manager
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Lead Author's Address	2873 22nd ST. SE Salem , OR 97302 United States
Lead Author's Phone	503.409.2216
Lead Author Email	kohnstad@cmr-d.com
Lead Author Biography	Kirk Ohnstad is a physicist at CMR-D, a small business located in Salem, Oregon. Mr. Ohnstad spearheaded the commercialization of the flight deck cranial (FDC) developed by the US NAVY. Because of the commercial success (particularly via working with industrial hygienists), the NAVY has re-engaged the development of the helmet for use by NAVAIR F-35 ground crew operators. Only the passive FDC solution can provide the NRR values required by the NAVY.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Optimized Passive Hearing Protection
Preferred Session Type	Thursday Morning Workshop

Abstract	BACKGROUND: The US NAVY funded development of the FDC helmet which provides the highest passive sound-attenuation available on the market; this is accomplished via a complete cranial-seal which isolates human head tissues from air and bone conduction. KEY RESULTS: An independent third-party Norwegian laboratory (SINUS AS) tested the FDC alongside other helmet competition. These key results yielded selection of the FDC helmet by several Norwegian hygienists for their personnel. Currently, there are over 330 FDC users over 5 countries. Norwegian heli-crew clients include: CONOCOPHILLIPS, STATOIL, SHELL, CHC, OSM, etc. USA heavy industrial clients include: DOW, TRANSCANADA, SHELL, MOTIVA, etc. SIGNIFICANCE: Due to the unmatched hearing protection of the FDC and the adoption by oil and gas industries, the US NAVY (NAVAIR) has reengaged FDC program, and is currently in phase 2.5. The FDC helmet design allows for longer noise-exposure times, critical for optimizing work-time limitations for key crew-members such as pilots and SAR. Increased communication abilities, due to optimized sound-protection, yield many additional benefits to the use of the FDC helmet. The FDC has been acquired by individual clients with issues such as inner-ear psoriasis, tinnitus and hyperacusis.
Learning Objective #1	Understand more clearly how required PPE NRR values are derived by industrial hygienists for particularly aggressive noise-fields and applications.
Learning Objective #2	Identify key industries that can benefit from passive hearing protection and isolation of the skull from air and bone conduction.
Learning Objective #3	Compare dose % requirements of OSHA and MSHA, and understand how they approach calculation.
Special Accommodations for presenter(s)/presentation	None
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Electronic Signature	Kirk Ohnstad

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Location:	37.750999450684, -97.821998596191

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Christa Themann
Lead Author Credentials (i.e., M.D., R.N., etc)	MA, CCC-A
Lead Author's Job Title or Role	Audiologist
Lead Author's Company/University	National Institute for Occupational Safety and Health
Lead Author's Address	1090 Tusculum Avenue Mail Stop C-27 Cincinnati, OH 45226 United States
Lead Author's Phone	513-533-8485
Lead Author Email	CLT6@cdc.gov
Lead Author Biography	Christi is a Research Audiologist at the National Institute for Occupational Safety and Health in Cincinnati, Ohio. She received her master's degree in audiology from the University of Cincinnati and is a doctoral candidate in epidemiology. Her research experience includes animal studies on the effects of impulse noise on hearing, new methods for assessing hearing protector attenuation, and developing effective hearing loss prevention 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 Reykjavik Study of Healthy Aging for the New Millennium. Christi is also interested in promoting public health practice in audiology and raising awareness about healthy hearing through social media, education, and outreach.
If you have additional co-presenters or co-authors, please tell us how many?	2
Name (Additional Presenter or Co-author #1)	Howard Hoffman

Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	MA
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author
Name (Additional Presenter or Co-author #2)	Edward Krieg
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	PhD
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author

Presentation & Abstract Information

Paper Title	Prevalence of noise exposure and hearing loss: Data from U.S. health surveys
Preferred Session Type	Either Poster of Platform Format (Please select this if you do not have a preference)
Abstract	Although exposure hazardous noise is generally considered to be the major cause of preventable hearing loss among adults, the U.S. does not have a measurement-based surveillance system to track noise exposure. However, several national health survey systems collect self-reported noise exposure information as well as self-rated and/or audiometrically-measured hearing data. This presentation will provide estimates of exposure to loud workplace noise, very loud workplace noise, non-work noise, and firearm noise among a nationally-representative sample of U.S. adults based on data from the National Health Interview Survey and the National Health and Nutrition Examination Survey. Prevalence of self-reported and measured hearing impairment as well as tinnitus will also be reported and examined in relation to the various types and combinations of exposure. In addition, the frequency of hearing protector use and audiometric monitoring among individuals exposed to various types of noise will be examined to evaluate their possible influence on the prevalence of auditory symptoms and identify groups in particular need of targeted interventions. This presentation will provide a snapshot of the noise exposure problem in the U.S., illustrate its effects on hearing ability among U.S. adults, and highlight the most significant hearing-related public health needs.
Learning Objective #1	State the number of U.S. adults exposed to various types of hazardous noise.
Learning Objective #2	Summarize the relative effects of each type of exposure on hearing and tinnitus.

Learning Objective #3	Identify one group of noise-exposed individuals in particular need of targeted hearing loss prevention interventions and explain the data which point to this need.
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Electronic Signature	Christa Themann

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Stephanie Sayler
Lead Author Credentials (i.e., M.D., R.N., etc)	CIH, COHC
Lead Author's Job Title or Role	PhD Pre-Candidate
Lead Author's Company/University	University of Michigan
Lead Author's Address	1415 Washington Hts Ann Arbor, MI 48109 United States
Lead Author's Phone	7573744553
Lead Author Email	sksayler@umich.edu
Lead Author Biography	Stephanie Sayler is a doctoral pre-candidate 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 research has primarily focused 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.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Noise Measurement and Instrumentation - Basics Workshop
Preferred Session Type	Thursday Morning Workshop

Abstract	This workshop lecture will describe different types of noise instrumentation, including the settings, operation, principles of use, and application. A demonstration will be provided on conducting both a personal and area noise measurement using common instruments found in industry and research. The lecture will also include a description of common regulatory standards for noise and gold-standard practices and recommendations, and methods used to reduce noise levels and human exposure.
Learning Objective #1	Explain noise instrumentation settings and applications for their different uses
Learning Objective #2	Describe how to conduct a personal measurement and area noise survey for evaluating employee exposure and identifying noise sources for control
Learning Objective #3	Compare noise sampling results to both regulatory standards and best-practice recommendations for noise exposure
Special Accommodations for presenter(s)/presentation	na
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Electronic Signature	Stephanie Sayler

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Unique ID:	536176981
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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Yulia Carroll
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Lead Author's Job Title or Role	Associate Director for Science
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Lead Author Biography	Yulia Carroll serves as the Associate Director for Science at the Division for Environmental Health Service and Practice at the Centers for Disease Control and Prevention (CDC), National Center for Environmental Health (NCEH). She advises on various scientific environmental health issues, including health effects of noise, promotion and prevention. She has been instrumental in the development of the noise-induced hearing loss initiative at CDC. Dr. Carroll started her CDC career as an EIS officer at the National Institute for Occupational Safety and Health (NIOSH) in 2007, where she led investigations into emerging work related diseases. She then worked as the Division epidemiologist at the Agency for Toxic Substances and Disease Registry, where she assisted in the development of toxicological profiles, exposure level recommendations, and field investigations. Prior to joining the CDC, Dr. Carroll worked as a research scientist at the University of Cincinnati Center for Health Relate
If you have additional co-presenters or co-authors, please tell us how many?	2

Name (Additional Presenter or Co-author #1)	Padma Vempaty
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	MPH
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author
Name (Additional Presenter or Co-author #2)	Mahad Gudal
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Presenter

Presentation & Abstract Information

Paper Title	Too Loud! An Analysis of Community Noise Ordinances
Preferred Session Type	Either Poster of Platform Format (Please select this if you do not have a preference)
Abstract	Introduction: Noise exposure is an environmental health problem that affects millions in the U.S. and even more across the globe. Since the defunding of the U.S. Office of Noise Abatement and Control, local and state governments are tasked with the responsibility of creating policy to abate noise. There is a need to analyze the different noise control methods and laws in the U.S. Methods: 60 community noise ordinances in the U.S. were surveyed using the legal assessment framework developed by LawAtlas. A 22-question coding scheme was created to identify key aspects of noise ordinances. Geospatial mapping was used to find regional patterns and a word cloud visualization was produced by analyzing the frequency of terms for the different sound sources used in ordinance language. A literature review was conducted to find gaps and develop recommendations. Results: After analyzing the primary reasons for the noise ordinances, 72% list annoyance or nuisance while 60% list health. Only 50% of noise ordinances include quiet zones as a noise control method. Conclusions: Listing health as a primary reason in ordinances can help citizens understand the implications of noise. Quiet zones, or noise-sensitive zones, could be used in ordinances to protect vulnerable communities.
Learning Objective #1	1. Recognize the different noise control methods and sound sources utilized in U.S. community noise ordinances.
Learning Objective #2	2. Identify the regional differences among noise control methods in the U.S.

Learning Objective #3	3. Contrast the U.S. community noise laws with those of the E.U. and understand the gaps and recommendations.
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Electronic Signature	Yulia Carroll

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Author Information

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Lead Author Biography	BIOGRAPHICAL SKETCH Tim Swisher, MA, CCC-A, FAAA Tim is an occupational audiologist and president of Hearing Safety. He received his B.S. at Indiana University of Pennsylvania and his M.A. in Audiology at Western Illinois University. He began his audiological career as an Army audiologist, retiring as a major after 20 years service. He credits his time in the service as developing his primary interest in hearing conservation and expanding his skills as a hearing conservationist. In his current capacity he provides full time hearing conservation consultant services. Tim has been a long term member of NHCA and is an active CAOHC course director.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	The Audiogram and How To Use It.
Preferred Session Type	Thursday Morning Workshop
Abstract	ABSTRACT: The Audiogram and How To Use It. The audiogram is the tool used to record hearing test results. It is the primary vehicle used to evaluate the effectiveness of the Hearing Conservation Program. As such, it is necessarily implemented to monitor the hearing sensitivity of noise affected employees. This presentation will discuss the employment of the audiogram, and hearing testing, in Hearing Conservation Programs. The basis for valid audiograms, the different styles of audiograms, purposes for hearing testing, and examples of audiometric results will be shown and deliberated. Standard Threshold Shift (STS) determination will be presented and age correction calculation and influence examined. STS follow-up procedures, to include baseline revision, will be reviewed. The NHCA guidelines for baseline audiogram revision will be examined. In summary, the audiogram will be discussed as an invaluable asset for the Hearing Conservationist during employee education and training. Presented by: Timothy A. Swisher NHCA Basics Workshop February 27, 2020
Learning Objective #1	Identify hearing levels on various audiogram styles.
Learning Objective #2	Recognize the reasons for hearing testing in Hearing Conservation Programs.
Learning Objective #3	Explain STS calculation and follow-up procedures.
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Electronic Signature	Timothy Swisher

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Author Information

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Lead Author's Job Title or Role	Injury Prevention Portfolio Manager
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Lead Author's Phone	301-619-7303
Lead Author Email	richard.o.shoge.civ@mail.mil
Lead Author Biography	Dr. Richard O. Shoge is the Injury Prevention and Reduction Portfolio Manager at Military Operational Medicine Research Program (MOMRP) within the US Army Medical Research and Development Command (MRMC) at Ft. Detrick, MD. His current duties include managing multiple blast, neurosensory and musculoskeletal injury prevention programs for MOMRP and the Defense Health Agency. Previously, Dr. Shoge did his post doctoral fellow at Walter Reed Army Institute of Research (WRAIR) for two years investigating pre-clinical animal models of blast related mild traumatic brain injury. He obtained his B.S. in mechanical engineering from the University of Maryland, Baltimore County and his Ph.D. from the joint Biomedical Engineering Program at the University of North Carolina-Chapel Hill and North Carolina State University.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Military Operational Medicine Research Program: Curent and Future Needs of Auditory Injury Prevention Research

Preferred Session Type	Either Poster of Platform Format (Please select this if you do not have a preference)
Abstract	The US Army Military Operational Medicine Research Program (MOMRP) areas of concentration include medically driven research on medical criteria that will drive the development of better passive and active hearing and vestibular-cochlear protection devices, quantification of impulse noise, blast, and acceleration, assessment of auditory and vestibular effects of hazardous exposures, and computer modeling to predict hearing protection in known hazard environments and with known auditory thresholds. Current and future needs of the Department of Defense to succeed in Multi-Domain Operations (MDO) are enhanced capabilities to protect the Warfighter against performance degradation and injury from hazardous noise, pressure, and extreme acceleration. The Warfighter will need to be able to shoot, move, and communicate in all types of environments to include subterranean spaces and dense urban environments. MOMRP will continue to look for laboratory-based research, coupled with field studies, injury epidemiology, and engineering expertise that will lead to the development of optimal prevention strategies for peripheral and central auditory and vestibular disorders and hearing protection recommendations that will minimize performance degradation on the modern battle field.
Learning Objective #1	Understand the DoD needs for auditory prevention research.
Learning Objective #2	Understand the future battle space and how civilian expertise can support and enhance the research mission of the DoD.
Learning Objective #3	Identify the best methods to integrate with DoD led efforts in auditory injury prevention and hearing performance.
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Electronic Signature	Richard Shoge

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Author Information

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Lead Author Email	rneitzel@umich.edu
Lead Author Biography	Richard L. Neitzel, PhD, CIH is an Associate Professor and Associate Chair of the Department of Environmental Health Sciences at the University of Michigan (UM) School of Public Health. He has published nearly 100 peer-reviewed manuscripts focused on exposures to, and impacts of, noise and other occupational and environmental hazards. He is particularly interested in incorporating new methodologies and exposure sensing technologies into research and has a strong interest in translating his research findings into occupational and public health practice. He has created a job-exposure matrix for occupational noise exposures in the U.S. and Canada, available at http://noisejem.sph.umich.edu/. Dr. Neitzel is Chair of the ACGIH® Threshold Limit Values for Physical Agents (TLV®-PA) Committee. He is also a Fellow of the American Industrial Hygiene Association and has been a Certified Industrial Hygienist since 2003.
If you have additional co-presenters or co-authors, please tell us how many?	1
Name (Additional Presenter or Co-author #1)	Lauren Smith

Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	MPH
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author

Presentation & Abstract Information

Paper Title	University of Michigan/Apple Hearing Health Study
Preferred Session Type	Friday/Saturday Platform
Abstract	The impacts of noise-induced hearing loss (NIHL) resulting from excessive noise exposure are extensive, severe, and widespread. However, there is little information available about music exposure levels and listening patterns among adults in the United States. As a result, we do not have a good understanding of the relationship between listening to music and risk of hearing loss. The introduction of new technology and software into mobile devices has created exciting new opportunities for us to learn more about these issues. The University of Michigan School of Public Health has partnered with Apple to take advantage of these opportunities in a new research study. This presentation will provide an overview of the study, and also identify ways in which the results of the study will be useful to hearing conservation practitioners. As part of this study, we will evaluate the levels of sound at which iPhone users listen to music and other media on their mobile devices, as well as how long and how often they listen. We will also measure environmental noise levels, and deliver several different types of hearing tests to participants. We will collect this information from tens of thousands (or more!) of volunteer adults who use iPhones or iPods, and from the subset of volunteers who also use Apple Watches. This unique dataset will allow us to create something the United States has never had: national-level estimates of exposures to music and environmental sound. It will also give us a better understanding of the relationship between these exposures and hearing health. Collectively, this information will help give us a clearer picture of hearing health in America, and will increase our knowledge about the impacts of our daily exposures to music and noise. This information is critical for us to address and reduce the major public health impacts of hearing loss in the United States.
Learning Objective #1	Identify new, mobile device-based approaches to assessing music and noise exposures in the public
Learning Objective #2	Identify new, mobile device-based approaches to evaluating changes in hearing

Learning Objective #3	Understand challenges to quantifying exposures to noise and music
Special Accommodations for presenter(s)/presentation	None
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Electronic Signature	Richard Neitzel

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Author Information

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Lead Author's Phone	503-220-8262 x 52015
Lead Author Email	Melissa.Papesh@va.gov
Lead Author Biography	Dr. Papesh is a research investigator at the VA RR&D National Center for Rehabilitative Auditory Research in Portland, OR. Her research focuses on diagnosis and rehabilitation of Veterans and Service Members with auditory processing disorders (APD). Her credentials include a clinical doctorate of audiology (Au.D.) and a dual Ph.D. in Hearing Science and Neural Science, as well as a postdoctoral Advanced Research Fellowship in Polytrauma and Traumatic Brain Injury Rehabilitation awarded by the VA Office of Academic Affiliations. Currently, Dr. Papesh is the Principal Investigator on a VA RR&D Career Development Award entitled "Physiological Assessment of Auditory Processing Disorders in TBI", and is a co-Investigator on several other projects related to hearing difficulties in patients with clinically normal hearing thresholds.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Auditory Deficits Associated with Exposure to High-Intensity Blast Waves: Evidence from Military Veterans

Preferred Session Type	Either Poster of Platform Format (Please select this if you do not have a preference)
Abstract	Military Veterans who have been exposed to high-intensity blast waves often experience auditory difficulties that persist long after the blast incident, even in the absence of hearing loss. The unprecedented use of improvised explosive devices in ongoing military conflicts has helped to fuel a substantial increase in the number of Veterans seeking help for auditory processing difficulties, as well as growing interest among VA audiologists in clinical assessment and management strategies for this population. Research in our labs and others reveals that many different types of processing deficits may arise following blast exposure, and that additional comorbid health factors are very common in this patient population. This presentation will review the unique nature of blast-exposure injuries and the complex factors that may underlie auditory processing deficits in the Veteran population, including potential associations with other comorbid health factors such as post-traumatic stress disorder. We will discuss the findings from previous research studies exploring hearing-related outcomes following blast exposure as well as the current state of clinical care for these patients.
Learning Objective #1	Describe how blast exposure differs from other types of traumatic brain injuries and noise exposure
Learning Objective #2	Describe the most common comorbid diagnoses among Veterans with auditory processing disorders following blast exposure
Learning Objective #3	List the types of auditory processing deficits that may arise from blast exposure
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Electronic Signature	Melissa Papesh

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Stephanie Sayler
Lead Author Credentials (i.e., M.D., R.N., etc)	CIH, COHC
Lead Author's Job Title or Role	PhD Pre-Candidate
Lead Author's Company/University	University of Michigan
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Lead Author's Phone	7573744553
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Lead Author Biography	Stephanie Sayler is a doctoral pre-candidate 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 research has primarily focused 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.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Noise, hearing loss, and physical function in midlife women: The Study of Women's Health Across the Nation (SWAN)
Preferred Session Type	Friday/Saturday Platform

Abstract	Noise and hearing loss have been studied widely in occupational settings, specifically within industries employing a majority male workforce, making hearing loss data on women sparse. The University of Michigan houses a research center for the Study of Women Across the Nation, which began in 1996 and includes a large cohort of women who were at their midlife upon initial enrollment. Using data from this cohort, we compared hearing loss in 449 Michigan women to self-reported personal noise exposure metrics, including perceived noisiness of work and home environments. We used job exposure matrices to create occupational noise and ototoxin exposure variables from self-reported job at baseline, which were then compared to measured hearing loss. Lastly, we compared all noise exposure and hearing loss metrics to measured changes in balance. Fifty-four women reported working in a noisy job (25 at an ototoxic job), although self-reported noise levels on average were low. At baseline, 413 women had no measured hearing impairment, 24 had mild, and 12 had moderate/severe hearing impairment. Working in a noisy job was associated with measured hearing impairment, and both measured and perceived hearing were related to reduced balance metrics. These results highlight the importance of continued evaluation of noise and hearing among women, and how noise and hearing may affect balance and increase risk of injury in an aging population. ACKNOWLEDGMENTS The Study of Women's Health Across the Nation (SWAN) has grant support from the National Institutes of Health (NIH), DHHS, through the National Institute on Aging (NIA), the National Institute of Nursing Research (NINR) and the NIH Office of Research on Women's Health (ORWH) (Grants U01NR004061; U01AG012505, U01AG012535, U01AG012531, U01AG012539, U01AG012546, U01AG012553, U01AG012554, U01AG012495). The content of this abstract is solely the responsibility of the authors and does not necessarily represent the official views of the NIA, NINR, ORWH or the NIH.
Learning Objective #1	Summarize the population disparities of workplace noise and hearing loss research
Learning Objective #2	Describe the development of noise, hearing loss, and balance variables as the pertain to the Study of Women Across the Nation (SWAN) cohort
Learning Objective #3	Explain the relationship between noise exposure, and hearing and balance outcomes as they pertain to the SWAN cohort, and the potential implications of the study findings
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Electronic Signature	Stephanie Sayler

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Author Information

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Lead Author Biography	Gregory Ciccarelli performed his doctoral research in electrical engineering and computer science at the intersection of speech, neuroscience, and computational modeling at the Massachusetts Institute of Technology. Since joining the Human Health and Performance Systems group at MIT Lincoln Laboratory, he has engaged in various sensorimotor applications leveraging modeling, high performance computing, and artificial intelligence techniques. His research interests also include auditory attention decoding and EEG signal processing.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Developments in Artificial Intelligence to Prevent and Mitigate Hearing Loss
Preferred Session Type	Friday/Saturday Platform

Abstract	AI holds promise for empowering the lay individual and trained clinicians to better prevent hearing loss and mitigate its effects. However, despite the substantial press AI has received, it is often unclear how it may shape one's own field. This overview will provide a description of the AI space, the technologies that have driven its recent success in multiple domains, and future AI trends and challenges in a manner accessible to working professionals in audiology, engineering, and healthcare. We will then show examples of how work at MIT Lincoln Laboratory and other research centers are harnessing AI for hearing conservation and for reducing the debilitating effects of hearing loss. These examples include fast, efficient feedback on hearing protection status and re-imagining (and making real) the "hearable" of the future.
Learning Objective #1	Describe what is meant by artificial intelligence
Learning Objective #2	Predict trends in AI that will shape hearing conservation and treatment
Learning Objective #3	Summarize two instances of AI for auditory applications
Special Accommodations for presenter(s)/presentation	I'm not sure of the difference between workshop and platform, but any oral presentation would be fine.
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Electronic Signature	Gregory Ciccarelli

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Lead Author Biography	Jiong "Joe" Hu, PhD earned his bachelor of science in physics from Nanjing University in China. He became interested in the field of audiology and continued his education at Ohio University where he earned his doctor of philosophy in 2013, and his doctor of clinical audiology in 2016. Dr. Hu is a member of the American Academy of Audiology. His primary research interests are auditory electrophysiology and neuroplasticity. Most recently his research has focused on examining the impact of bilirubin-induced neurotoxicity on the auditory system in newborns and infants, as well as the effect of long term auditory exposure on pitch coding ability at the brainstem level in adults with different language backgrounds.
If you have additional co-presenters or co-authors, please tell us how many?	4
Name (Additional Presenter or Co-author #1)	Laura Street

Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	Au.D.
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author
Name (Additional Presenter or Co-author #2)	Jan de la Cruz
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	Au.D.
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author
Name (Additional Presenter or Co-author #3)	Peter Witte
Additional Presenter or Co-author #3 Credentials (ie: M.D., R.N., etc)	M.M.
Is this person a co-author, presenting or both a co-author and presenting? (#3)	Co-Author
Name (Additional Presenter or Co-author #4)	Ruth Brittin
Is this person a co-author, presenting or both a co-author and presenting? (#4)	Co-Author

Presentation & Abstract Information

Paper Title	A Hearing Conservation Education Program for Early Career Music Professionals
Preferred Session Type	Thursday Afternoon Workshop

Abstract

Previous research has shown that music professionals are routinely exposed to hazardous levels of occupational noise. Musical instruments commonly seen in practice rooms and auditoriums often produce noise levels that meet or exceed those deemed safe by industrial standards (e.g., OSHA regulations). In addition, most musicians are not fully aware of the damaging effects associated with prolonged noise exposure in their occupational setting. As such, the aim of this study is to provide music majors with information pertaining to hearing loss, noise exposure, and hearing protection use during practice and performance sessions where exposure to loud noise exists.

Specifically, this study will provide students majoring in music at the University of the Pacific with information on hearing conservation and occupational noise exposure through an educational program. The objective is to examine whether knowledge, attitudes, and/or beliefs will change after completing such a program. Attitudes and beliefs about noise exposure will be investigated during the dean's seminar that these students (n=75) will attend. A questionnaire will then be administered before and immediately after the dean's seminar as well as one year after the educational intervention program has been completed.

The Perception on Hearing Protection and Hearing Loss Questionnaire was adapted from the U.S. National Institute for Occupational Safety and Health (NIOSH) for this study. Eight subcategories of questions will be analyzed including: 1) perceived susceptibility to hearing loss, 2) perceived severity of consequences, 3) perceived benefits of preventive action, 4) perceived comfort, 5) perceived important sound awareness, 6) social norms, 7) behavioral intentions, and 8) self-efficacy. The program will focus on the potential causes of hearing loss, hearing conservation, and occupational noise exposure. Finally, a non-parametric Wilcoxon Ranked Test will be utilized to examine the statistical significance of any change in the above mentioned eight categories.

In summary, this study will investigate the efficacy of a hearing conservation program as it is used to educate early career music professionals about the dangers of occupational noise exposure. If successful, this program could be adopted and used with other early-stage professionals who may be exposed to occupational noise in their future careers.

Learning Objective #1	Identify the need for hearing conservation programs in music education programs.
Learning Objective #2	Identify the perception of occupation related noise induced hearing loss in early career musicians.

Learning Objective #3	Identify the change of understanding and perception of hearing protection as a result of the hearing conservation program
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Electronic Signature	Jiong Hu

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Author Information

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Lead Author Credentials (i.e., M.D., R.N., etc)	Richard L Stepkin, MS, CCC-A
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Lead Author Biography	Eagle Scout; U.S. Naval Submarine Service 1964 - 1967; Florida State University, Audiology MS,1972 ASHA Certs 1973; U.S. Army Medical Service Corps 1972-1975 Major, Military Audiologist Initiating and Maintaining Hearing Conservation Programs at Ft. Devens MA and Ft. Drum NY; Worked at Hearing Conservation Noise Control (HCNC) 1975-1977 Occupational Audiologist with Dr. Joseph Sataloff, MD Consulting Industry Nationwide in Hearing Conservation -- ENVIROMED CORP 1977 to 2018, Lindenwold NJ - Founder & CEO All areas of Hearing Conservation, Loss Prevention & OSHA Compliance, Nationwide Mobile Audiometry, STS Determination's; Educational Training; Noise Surveys; CAOHC Course Director since 1973, Served on CAOHC Board; NHCA since 1980; Served on NHCA Board as PSP Representative; NHCA Editor; Many local, regional, national presentations on Best Practices Hearing Conservation.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	In Search of "Best Practices Hearing Conservation" - A World-Wide Review of Regulations

Preferred Session Type	Thursday Afternoon Workshop
Abstract	Exactly what is a "Best Practice Hearing Conservation Program". The intent of a Regulation is to protect hearing - isn't it? Regulations & Criteria within U.S. vary significantly among Govt, Military, Construction, Railroads, other trades - why so? Aside from the many variances within our own Country, how do other Countries from Asia to the EU handle the issue of protecting hearing? If we are "engaged" in protecting hearing why are we so "disengaged" - It's confusing! Employer's are confused because OSHA (and others) view work related hearing loss and Log 300 "differently" than Workers Compensation and AAO. Employers comply with Regulations feeling good about their program but then get surprised on Workers Compensation. I thought we were protecting our employees hearing - yes? NO! The intent of this presentation is to review all these issues and propose a Best Practices HC Program designed to protect hearing and liabilities.
Learning Objective #1	To Identify and understand the differences between Regulation Compliance and Loss Prevention
Learning Objective #2	To explain to a Company why the best method in protecting hearing is to protect liability
Learning Objective #3	To identify and construct a best practices approach in protecting hearing loss of employees and the liabilities of their employers
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Electronic Signature	Richard Stepkin

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Author Information

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Lead Author Biography	Theresa H. Small, Au.D., CPS/A is an occupational audiologist consultant, CAOHC certified professional supervisor and course director and owner of Associates In Audiology, Inc., a professional consulting firm specializing in occupational audiology, and hearing loss prevention. Dr. Small has been practicing audiology since 1999, with a 100% focus on hearing loss prevention since 2007. She wrote an article for the CAOHC Update in June 2013, "Applying GINA in the Occupational Hearing Conservation Program". Dr. Small has been a member of NHCA since 2007 and has attended every conference since. She is currently on the NHCA executive council as the secretary/treasurer.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Hearing Loss Recordability Issues (The Basics Workshop)
Preferred Session Type	Thursday All Day Workshop

Abstract	This section 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.
Learning Objective #1	Identify a MSHA "reportable" hearing loss.
Learning Objective #2	Identify a OSHA/FRA "recordable" hearing loss.
Learning Objective #3	Collect resources for work related determinations of hearing loss.
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Electronic Signature	Theresa Small

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Lead Author Biography	LTC John 'Andy' Merkley is an Army Audiologist currently serving as the Army Hearing Division Chief at the Army Public Health Center in Aberdeen, Maryland. 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 American Speech-Language-Hearing Association (ASHA), the Military Audiology Association (MAA) and the National Hearing Conservation Association (NHCA). LTC Merkley represents the MAA on the Council for Accreditation in Occupational Hearing Conservation (CAOHC) and serves as the vice-chair of education on the CAOHC Executive Committee.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Distributed Leaning Hearing Technician Training - A Joint Incentive Fund Initiative
Preferred Session Type	Friday/Saturday Platform

Abstract	Distributed learning (DL) is a model of instruction permitting the instructors, students, and course content to be located in different areas and for learning to take place independent of time and place. Increasing pressure to move education into an online format, and greater need for trained hearing technicians (HT) in the Department of Defense (DoD) and Veterans Administration (VA), has prompted the organizations to support a Joint Incentive Fund (JIF) initiative to pilot a HT training course through DL. Efforts to improve access to care prompted the VA to change policies allowing certified HTs to conduct pure tone audiometric exams on established patients. Changes in DoD regulations have increased the need for certified HTs across the DoD and especially the Army Reserve and Army National Guard. The DoD Hearing Center of Excellence (HCE) in collaboration with the Army Hearing Program and with support of Council for Accreditation in Occupational Hearing Conservation (CAOHC), submitted a proposal for JIF funding to pilot a DL HT training course consisting of a didactic phase of instruction through DL followed by a practical phase completed on-site with either a CAOHC certified Course Director or trained audiology practicum instructor. The Pilot study started in April 2019 and will continue through April 2021. This presentation will introduce the JIF program, discuss DL methods and how they can be applied to HT certification training, and review briefly the progress of the pilot study.
Learning Objective #1	At the end of this session, the learner should be able to define synchronous and asynchronous learning.
Learning Objective #2	At the end of this session, the learner should be able to explain the value of hearing technician training through distributed learning.
Learning Objective #3	At the end of this session, the learner should be able to discuss the benefits of distributed hearing technician training to the DoD and VA.
Special Accommodations for presenter(s)/presentation	None
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Electronic Signature	John Merkley

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Arunraj Karuppannan
Lead Author Credentials (i.e., M.D., R.N., etc)	Mr.
Lead Author's Job Title or Role	In-Service Ph.D Candidate
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Lead Author Email	nahularun@gmail.com
Lead Author Biography	Completed my Masters in Audiology and currently pursuing my Ph.D. (In-service Candidate) in Audiology and my research area is of Middle ear disorders. My area of interest is of Newborn Hearing Screening, Industrial Audiology, Pediatric Audiology, Community Based Rehabilitation, and Public Health. Working in the Department of Prevention of Communication Disorders and Audiology at All India Institute of Speech and Hearing, India to provide outreach services to the rural population mainly focusing on prevention activities. Involved in implementation of the Hearing Conservation Program in the industries as well as training of medical professionals for the same.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Hearing Conservation Program: Knowledge and attitudes of the Employees and the need for intervention module
Preferred Session Type	Either Poster of Platform Format (Please select this if you do not have a preference)

Abstract

Rationale: The prevalence of Noise-Induced Hearing Loss is increasing worldwide (WHO, 2018). Major factors contributing to this condition is the lack or poor execution of the preventive measures (Razman eta al., 2008). Even though standards and policy are well established in India, poor enforcement in all industrial sectors is a major concern. It is understood that identifying the prominent causes for hearing loss and implementation of suitable preventative action could control the risk of an increase in hearing loss (WHO 2018). This project aimed to ascertain such factors that caused the industrial workers on the usage of protection device (HPD) and their knowledge/attitudes on hearing conservation program (HCP).

Goal:
1. To investigate the employee' awareness of the noise and its effect on hearing through a self-reporting questionnaire.
2. To provide hearing conservation education program and measure its outcome for employees.
Methods: A total of 261 employees from 05 different industries participated. A questionnaire was administered to the participants prior and post to the 'Hearing Conservation Education' program which included awareness of sources of noise, the effect of noise exposure and its consequences and their attitude towards HCP. A descriptive analysis was performed to measure the knowledge/attitudes of the workers.

Results/Conclusions: The results revealed very low knowledge about the HCP and its usefulness. In terms of awareness, only 12.26% reported to be aware of the permissible level of noise; 1.16% on consequences of Noise on hearing; 15.71% were aware of HPDs in which only 2.3% were wearing HPDs and none of them had undergone training on HCP and audiometric testing. The results on attitudes of the workers were very low which could be a major drawback. However, post-evaluation results of the data for employees after the training revealed that 'Hearing conservation program' provided them consciousness about health and safety issues in their workplace. Similarly, pre and post descriptive analysis of the questionnaire indicates that there was a pronounced change in the attitude and their improvement in their knowledge in terms of health and safety measure. The study highlights the importance and the need for such 'Hearing Conservation Education' program to be established as a nationalized program.

Learning Objective #1	Understand the conditions on lack of knowledge to the employees/management.
Learning Objective #2	Understand the factors that could prevent the implement the usage of Hearing Protection Devices

Learning Objective #3	Importance of Implementation of the hearing conservation program which would provide a solution for the prevention of Noise-Induced Hearing loss (NIHL)
Special Accommodations for presenter(s)/presentation	Yes
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Electronic Signature	Arunraj Karuppannan

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Arunraj Karuppannan
Lead Author Credentials (i.e., M.D., R.N., etc)	Mr.
Lead Author's Job Title or Role	In-Service Ph.D. Candidate
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Lead Author's Address	Naimisham Campus, Manasagangothri Mysuru, Karnataka 570006 India
Lead Author's Phone	8792731707
Lead Author Email	nahularun@gmail.com
Lead Author Biography	Completed my Masters in Audiology and currently pursuing my Ph.D. (In-service Candidate) in Audiology and my research area is of Middle ear disorders. My area of interest is of Newborn Hearing Screening, Industrial Audiology, Pediatric Audiology, Community Based Rehabilitation, and Public Health. Working in the Department of Prevention of Communication Disorders and Audiology at All India Institute of Speech and Hearing, India to provide outreach services to the rural population mainly focusing on prevention activities. Involved in implementation of the Hearing Conservation Program in the industries as well as training of medical professionals for the same.
If you have additional co-presenters or co-authors, please tell us how many?	2
Name (Additional Presenter or Co-author #1)	Swapna S
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	Dr
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author

Name (Additional Presenter or Co-author #2)	Prawin Kumar
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	Dr
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author

Presentation & Abstract Information

Paper Title	Effect of occupational noise on hearing in industrial workers
Preferred Session Type	Friday/Saturday Platform

Abstract

Objective: The present study aimed to assess the effect of occupational noise on the auditory system in industrial workers. The audiometric thresholds of industry workers exposed to occupational noise were periodically (over the years) assessed and compared with the duration of exposure.
Method: The study included 99 male industry workers in the age range of 30 to 60 years (mean age: 52 years). The participants were exposed to occupational noise with an average loudness of 95 dBA during working hours. Participants were evaluated yearly and followed up further for 2 years. They were divided into 2 groups based on the duration of noise exposure. All participants underwent otoscopic evaluation followed by a comprehensive audiological assessment which included pure tone audiometry, speech audiometry, tympanometry, acoustic reflexes and transient evoked otoacoustic emission. The audiometric thresholds obtained for 3 different evaluations (evaluation I, II, & III) were compared for all the participants. The pattern of the audiometric thresholds over a while i.e. for 3 years with an interval of one year between each evaluation was documented.
Results: Results reveal the presence of 4 kHz dip which is a hallmark of noise-induced hearing loss. The study reflects 4 kHz dip sharper in the evaluation I (baseline) initially and over the years i.e. in evaluation III, 4 kHz notch becomes broader. These findings were common for both the groups irrespective of the duration of noise exposure among the industrial workers.

Conclusion: Present study highlights the importance of regular audiological evaluations for industry workers. Further, the duration of noise exposure had a significant impact in terms of deterioration in the hearing thresholds. Hence this study also reflects the deterioration effect of noise on industry workers auditory system. Further to prevent the deterioration of hearing thresholds, industry workers are advised to use ear protective devices regularly during working hours.

Key Words: noise-induced hearing loss; occupational noise; effect of noise; industrial workers

Learning Objective #1	Importance of regular audiological evaluations for industry workers
Learning Objective #2	Duration of noise exposure had a significant impact in terms of deterioration in the hearing thresholds
Learning Objective #3	Importance of using ear protective devices on a regular basis during working hours
Special Accommodations for presenter(s)/presentation	YES

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Electronic Signature	Arunraj Karuppannan

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Author Information

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Lead Author Biography	Dr Jameel Muzaffar is a Royal College of Surgeons Research Fellow at the UK Military Hearing Research Collaboration. His clinical background is in ENT and alongside this he is currently in the final year of a PhD in the Department of Clinical Neurosciences at the University of Cambridge investigating the effects of noise and blast on the auditory system.
If you have additional co-presenters or co-authors, please tell us how many?	1
Name (Additional Presenter or Co-author #1)	Linda Orr
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	MB ChB DM FRCS(Eng) FRCS (ORL-HNS)
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author

Presentation & Abstract Information

Paper Title	Glucocorticoid Therapy for Acute Acoustic Trauma: Current and emerging evidence from the UK Military Hearing Research Program
Preferred Session Type	Friday/Saturday Platform
Abstract	Acute Acoustic Trauma remains an ever lurking hazard for military populations amongst other high risk occupational groups. Whilst a number of therapeutic options have been suggested for the treatment of AAT the evidence base for their effectiveness is limited. This has resulted in a wide variety of strategies currently in place across NATO partners, ranging from watchful waiting through oral, intratympanic and intravenous treatments. This presentation will describe the historical context of AAT before describing UK efforts to mitigate acute acoustic trauma illustrated by data from a series of >30 patients treated with steroid therapy, including by intratympanic injection. The presentation will include discussion of the challenges involved in early identification, access and treatment and measures taken to expedite this process.
Learning Objective #1	Describe the evidence base for rescue therapies in acute acoustic trauma
Learning Objective #2	Understand the emerging role for steroid therapy in this patient group
Learning Objective #3	Identify the barriers to prompt identification of injury and instigation of treatment
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Author Information

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Lead Author Biography	Miss Amy Gosling is the Program Manager for the UK Military Hearing Research Collaboration. She holds a Bachelor's degree in Psychology and a Master's degree in Health, Bioethics and Law. Her previous projects include the Human Feasibility of an Implantable Middle Ear Microphone and a number of clinical trials for cancer therapies.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Patient and Public Involvement in Research for Hearing and Balance
Preferred Session Type	Friday/Saturday Platform

Abstract	Considerable resource is committed to research and delivery of studies relating to noise induced hearing loss and tinnitus. Historically patients have been involved in studies only as subjects with their views typically sought through validated questionnaires. Whilst there has been an encouraging general trend towards increasing patient and public involvement in research this has been much less marked in the field of hearing research. This presentation will describe our group's efforts to improve patient and public engagement in military hearing research through every stage of the research process, including setting the research agenda by identification of key topics, grant writing, contributing to the design and delivery of studies, subsequent dissemination of results and the lessons learned from this process.
Learning Objective #1	Describe the evidence base for public and patient involvement in research in general and hearing research in particular
Learning Objective #2	Understand the emerging role for public and patient groups and how this can help your studies
Learning Objective #3	Describe ways that public and patient participation has been used already and the potential for enlargement of this contribution
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Electronic Signature	Amy Gosling

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Lead Author Email	Frank.Wartinger@gmail.com
Lead Author Biography	Frank Wartinger is a clinical audiologist at Children's Hospital of Philadelphia, a certified CAOHC course director, and owner of Earmark Hearing Conservation, a private practice serving musicians in Philadelphia. He is an active member of the American Academy of Audiology (AAA) and the National Hearing Conservation Association (NHCA) for which he served as Director of Communications 2017 - 2019. He received a Bachelors of Music degree in Studio Production from Purchase Conservatory and a Doctorate in Audiology degree from Salus University. Dr. Wartinger co-authored the AAA 2019 "Guidelines for Audiological Treatment of Musicians and Music Industry Personnel", the NHCA 2018 Position Statement on "Recreational Music Exposure", and has been published in Hearing Journal, Journal of the Acoustical Society of America, NHCA Spectrum, and Audiology Today. Dr. Wartinger is also an active professional musician with hundreds of album credits as performer, composer, and producer.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	The Basics: Effective Hearing Protection
Preferred Session Type	Thursday All Day Workshop
Abstract	Hearing Protection Devices (HPD) are one of the most visible portions of a hearing conservation program, but they are generally considered the last resort intervention after administrative and engineering controls have been implemented and have failed to reduce noise exposures sufficiently. Effective HPD implementation will be reviewed, including proper device selection, fitting strategies, and motivation. Available fit verification methods will be discussed.
Learning Objective #1	Differentiate types of HPDs including considerations for proper selection.
Learning Objective #2	Compare NRR to achieved real-world values, and identify methods to verify personal attenuation.
Learning Objective #3	Describe end-user aspects of HPD fitting, including device maintenance and motivation for effective use.
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Electronic Signature	Frank Wartinger

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Khalid Khan
Lead Author Credentials (i.e., M.D., R.N., etc)	Dr.PH.
Lead Author's Job Title or Role	Assistant Professor
Lead Author's Company/University	Indiana University Bloomington
Lead Author's Address	1025 E Seventh Street Room 029 Bloomington, IN 47401 United States
Lead Author's Phone	8128562229
Lead Author Email	kmkhan@indiana.edu
Lead Author Biography	Khalid Khan is an Assistant Professor of Environmental and Occupational Health at the Indiana University School of Public Health at Bloomington. His research interests are centered on the broad area of environmental epidemiology with specific emphasis on prevention of environmental and occupational exposures in vulnerable populations including youth. Also, he examines how these exposures affect neurobehavioral functions in children and adolescents. Dr. Khan obtained his doctoral degree from Columbia University Mailman School of Public Health and has about 10 years of research experience in rural, agricultural and low-income communities.
If you have additional co-presenters or co-authors, please tell us how many?	3
Name (Additional Presenter or Co-author #1)	Rossmary D. Marquez-Lameda
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	MPH
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author

Name (Additional Presenter or Co-author #2)	Rebecca Tugan
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	BS
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author
Name (Additional Presenter or Co-author #3)	Marjorie McCullagh
Additional Presenter or Co-author #3 Credentials (ie: M.D., R.N., etc)	PhD
Is this person a co-author, presenting or both a co-author and presenting? (#3)	Both a Presenter and Co-Author

Presentation & Abstract Information

Paper Title	Effectiveness of a Smartphone-based Hearing Conservation Intervention among Farm Youth
Preferred Session Type	Friday/Saturday Platform
Abstract	Farm and rural youth experience noise-induced hearing loss (NIHL) from a very young age. Interventions using technologies such as smartphone applications and text messaging, and other Internet-based resources have been conducted among youth in various community settings. However, evidence regarding the effectiveness of these approaches is weak due to multiple methodological shortcomings of studies. Furthermore, it is unclear whether these interventions are feasible in hard-to-reach rural and agricultural populations. To address these gaps in knowledge, we will compare the effectiveness of a novel intervention (i.e., smartphone apps plus printed NIHL prevention leaflets and a control intervention (printed NIHL prevention leaflets only) in changing hearing conservation knowledge and behavior. Students from six high schools in rural Indiana are participating is this intervention study. We will report on preliminary data of this study, in progress.
Learning Objective #1	Compare rates of NIHL among farm and rural youth to those of their urban peers.
Learning Objective #2	Discuss the methodological shortcomings of recent NIHL prevention studies using learning technologies.
Learning Objective #3	Describe the research team's approach to comparing the feasibility and effectiveness of use of technology in changing hearing conservation knowledge and behavior among farm and rural youth.

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Electronic Signature	Khalid Khan

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Jenny Rajan
Lead Author Credentials (i.e., M.D., R.N., etc)	AuD.
Lead Author's Job Title or Role	Assistant Professor
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Lead Author Biography	Dr. Rajan s a PhD. student in the Biomedicine program at Salus University. Her research interest includes hearing loss prevention education in children and youth. She has over 17 years of experience as a clinical audiologist. She is currently an Assistant Professor at Salus University, where she teaches AuD. students both in the classroom as well as in the on-campus clinic. Her clinical and teaching focus is in pediatric audiology.
If you have additional co-presenters or co-authors, please tell us how many?	1
Name (Additional Presenter or Co-author #1)	Deanna Meinke
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	PhD.
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author

Presentation & Abstract Information

Paper Title	Exploring the Prevalence of Noise-Induced Hearing Loss in Children and Youths. A Literature Review
Preferred Session Type	Poster Presentation
Abstract	Noise-induced hearing loss (NIHL) is a public health issue that is preventable. Hazardous noise exposure is one of the major causes of preventable permanent hearing loss throughout the world. Children and youth may participate in activities, which put them at risk for auditory damage. Such as attending concerts, listening to personal audio systems, riding recreational vehicles and attending sporting events. It is challenging to fully understand the ideal metrics for quantifying NIHL in youth in the context of epidemiological trends. A literature review was performed to gain an understanding of the prevalence of noise-induced hearing loss (NIHL) in youth (aged 6 to 19 years). This poster will provide historical insight and perspectives on this topic. Peer-reviewed articles which date back as early as 1943 to the more recent in 2019 were reviewed Despite the evidence suggesting a decrease in the prevalence of NIHL, the actual numbers of youth at risk of NIHL in the U.S. is high. Hearing health promotion and education has been called for in response to these outcomes. There is a need for the U.S. to work towards disseminating a nation-wide, evidence-based public health intervention program to prevent NIHL in youth.
Learning Objective #1	Describe the prevalence of noise-induced hearing loss in children and youth over the past 75 years.
Learning Objective #2	Identify at least 3 metrics that are used in research to define noise-induced hearing loss in youth.
Learning Objective #3	Discuss the on-going call for public health efforts to address the prevention of noise-induced hearing loss in youth.
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Electronic Signature Jenny Rajan

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Linda Orr
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Lead Author's Job Title or Role	Director, UK Defence Military Hearing Research Collaboration (hearWELL). Consultant Ear, Nose and Throat Surgeon Queen Elizabeth Hospital, Birmingham. A/Professor Academic Department of Military Surgery and Trauma, Royal Centre for Defence Medicine / Royal College of Surgeons of England.
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Lead Author's Address	Military Hearing Research Collaboration, 4th Floor, Institute for Translational Medicine Queen Elizabeth Hospital Birmingham Birmingham, West Midlands B15 2TH United Kingdom
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Lead Author Email	linda.orr1@nhs.net
Lead Author Biography	Lt Col Linda E Orr BSc(Hons) MB ChB DM FRCS(Eng) FRCS (ORL-HNS) is a serving Ear, Nose and Throat - Head and Neck Surgeon in the British Royal Army Medical Corps. She has served operationally over the last 30 years initially as a doctor within the infantry and SF and more latterly as a trauma surgeon. Her clinical work is based at the Queen Elizabeth Hospital Birmingham, the UK Role 4 facility where she leads on neck trauma and noise induced hearing loss. Her doctoral research utilised both her chemistry and medical degrees by focusing on the use of Ramen Spectroscopy for the diagnosis of laryngeal dysplasia. More recently her research has been primarily on noise induced hearing loss, both as a collaborator in research studies and as the Director of the hearWELL Collaboration. The latter being the organisation through which UK Defence coordinates all research into NIHL and tinnitus. She serves on the Royal College of Surgeons of England Research Committee, including on the selection pa

If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	UK Military Hearing Collaboration - An overview of progress across prevention, detection and treatment of noise induced hearing loss and tinnitus
Preferred Session Type	Friday/Saturday Platform
Abstract	Prevention, detection and treatment of NIHL and tinnitus are the core mission of the UK Military Hearing Research Collaboration (UK-MHRC). The UK-MHRC brings together partners across government, academia, industry and NATO allies with the aim of coordinating and stimulating research activity in this area. This presentation will provide an overview of current UK-MHRC activities including studies of a new model of occupational hearing screening incorporating telemedicine and endoscopic examination of the ear, investigation of boothless audiometry, studies of hidden hearing loss in blast and acutely noise exposed personnel, efforts to understand the anatomical site of lesion in sensorineural hearing loss and drug treatments for tinnitus and acute acoustic trauma. The second part of the presentation will identify near and medium term goals across all three key areas for the UK-MHRC and discuss projected steps to meet these.
Learning Objective #1	Understand the differences between provision of hearing healthcare research and development between the US and UK
Learning Objective #2	Identify common problems and potential synergies/collaborations
Learning Objective #3	Improve knowledge of near term pharmacological therapies and emerging evidence base for these
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Electronic Signature	Linda Orr

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Douglas Brungart
Lead Author Credentials (i.e., M.D., R.N., etc)	PhD
Lead Author's Job Title or Role	Chief Scientist
Lead Author's Company/University	Walter Reed NMMC
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Lead Author's Phone	301-319-7044
Lead Author Email	douglas.s.brungart.civ@mail.mil
Lead Author Biography	Douglas S. Brungart, PhD, is the Chief Scientist of the National Military Audiology and Speech Pathology Center at Walter Reed and is currently also serving as the Chief Scientist for the Department of Defense Hearing Center of Excellence. From 1993 to 2009, he was a research engineer at the Air Force Research Laboratory with research focusing on advanced auditory displays for spatial and speech information. Since 2009, he has been at Walter Reed focusing on the application of advanced technology to improve the prevention, diagnosis, and treatment of hearing loss and other hearing and speech disorders. He holds a MS and PhD in Electrical Engineering from the Massachusetts Institute of Technology and a BS in Computer Engineering from Wright State University.
If you have additional co-presenters or co-authors, please tell us how many?	1
Name (Additional Presenter or Co-author #1)	Nathaniel Spencer
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	PhD

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Presentation & Abstract Information

Paper Title	Evaluation of Extended Wear Earplugs: Lessons for Hearing Conservation
Preferred Session Type	Friday/Saturday Platform
Abstract	The extended-wear hearing aid is a commercially-available linear amplification device that is inserted deeply in the ear canal by an audiologist and can be worn continuously for extended periods lasting 60 days or more. The device has two potential advantages that have major implications for hearing conservation. First, the device fits deeply enough that it does not require venting to avoid issues with the occlusion effect. This means the device provides substantial attenuation when it is inserted in the ear in the "off" mode, and substantial protection from impulse or blast exposure when it is inserting in the ear in Active mode. Second, the device fits deeply enough in the ear canal that it has no effect on the directional characteristics of the head-related transfer function. This means that the device should be capable of providing attenuation without having an effect on localization accuracy. We have just completed a multi-year evaluation of these devices to determine their suitability as hearing protection devices, and the results show that the devices have the potential to provide persistent protection from intermittent noise exposure with only a minimal impact on situation awareness. The evaluation also has provided some valuable insights with broad implications in many areas with relevance to hearing protection. [The views expressed in this abstract are those of the author and do not reflect the official policy of the Department of Army/Navy/Air Force, Department of Defense, or U.S. Government.]
Learning Objective #1	Describe the features of an extended-wear hearing aid
Learning Objective #2	Explain why an extended-wear hearing aid has relevance to hearing conservation
Learning Objective #3	Describe the relationship between sound level and localization accuracy for deep-inserted earplugs
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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Douglas Brungart
Lead Author Credentials (i.e., M.D., R.N., etc)	PhD
Lead Author's Job Title or Role	Chief Scientist
Lead Author's Company/University	Walter Reed NMMC
Lead Author's Address	Building 19, Room 5600 4954 North Palmer Rd Bethesda, Maryland 20889 United States
Lead Author's Phone	3013197044
Lead Author Email	dsbrungart@gmail.com
Lead Author Biography	Douglas S. Brungart, PhD, is the Chief Scientist of the National Military Audiology and Speech Pathology Center at Walter Reed and is currently also serving as the Chief Scientist for the Department of Defense Hearing Center of Excellence. From 1993 to 2009, he was a research engineer at the Air Force Research Laboratory with research focusing on advanced auditory displays for spatial and speech information. Since 2009, he has been at Walter Reed focusing on the application of advanced technology to improve the prevention, diagnosis, and treatment of hearing loss and other hearing and speech disorders. He holds a MS and PhD in Electrical Engineering from the Massachusetts Institute of Technology and a BS in Computer Engineering from Wright State University.
If you have additional co-presenters or co-authors, please tell us how many?	2
Name (Additional Presenter or Co-author #1)	Julieta Scalo
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Name (Additional Presenter or Co-author #2)	Rob Williams
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author

Presentation & Abstract Information

Paper Title	Subjective Evaluation of Hearing Protection Devices in a Military Population
Preferred Session Type	Either Poster of Platform Format (Please select this if you do not have a preference)
Abstract	To assess their experiences with and attitudes toward different types of hearing protection devices (HPDs), Service members were asked to complete a brief survey either 1) at the time of training for using a Tactical Communication and Protection Device (TCAP); 2) at their annual hearing-conservation auditory exam; or 3) after a recent deployment during which HPDs were used. In addition to answering questions about job duties, noise exposure, and type of hearing protection currently used, participants rated their satisfaction with their HPDs in several dimensions, including comfort, protection, communication, and localization. Participants were also asked to indicate their willingness to accept some degradation in certain HPD features in exchange for improvement in other features. Analyses to be presented will include regression modeling to evaluate relationships between satisfaction and type of hearing protection used, while controlling for location, experience, and other covariates. In preliminary evaluations, satisfaction scores were higher for electronic hearing protectors than for passive hearing protection devices, particularly with regard to factors related to situation awareness. [The views expressed in this abstract are those of the author and do not reflect the official policy of the Department of Army/Navy/Air Force, Department of Defense, or U.S. Government.]
Learning Objective #1	What subjects were tested in this study
Learning Objective #2	What kind of factors might differ across different types of hearing protectors
Learning Objective #3	What subjective factors did subjects tend to prefer about electronic hearing protectors
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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Donald Finan
Lead Author Credentials (i.e., M.D., R.N., etc)	Ph.D.
Lead Author's Job Title or Role	Professor
Lead Author's Company/University	University of Northern Colorado
Lead Author's Address	Gunter 1400 Campus Box 140 University of Northern Colorado Greeley, Colorado 80639 United States
Lead Author's Phone	9702034949
Lead Author Email	don.finan@unco.edu
Lead Author Biography	Don Finan is a Professor of Audiology and Speech-Language Sciences at the University of Northern Colorado. His research interests include measurement of noise and associated auditory exposure, normal speech motor control, technology use in clinical and research settings, and developing innovative tools and pedagogies for instruction in the speech and hearing sciences.
If you have additional co-presenters or co-authors, please tell us how many?	1
Name (Additional Presenter or Co-author #1)	Deanna Meinke
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author

Presentation & Abstract Information

Paper Title	Musical Acoustics and Health: A Hands-On Approach to Learning and Applying
Preferred Session Type	Friday/Saturday Platform
Abstract	Learning fundamental knowledge is typically approached as a gauntlet to be run instead of an opportunity to generalize and connect related concepts. However, the ability to apply knowledge to complex and new situations, "transfer of learning", is critically important in the real world. To that end, we have developed a novel interdisciplinary undergraduate course: Musical Acoustics and Health Issues. The course covers biophysics of sound production and reception and associated hearing and vocal health issues by utilizing a hands-on project-based approach to teaching and learning in the context of music. The overarching theme of course topics is "sound as energy". Issues related to auditory and vocal mechanism health are presented from preventative perspectives. This active learning class is structured on the 5e pedagogical model, with principles of Engage, Explore, Explain, Elaborate, and Evaluate. Real-world activities are utilized so as to maximize transfer of learning. Projects include building musical instruments (cigar box guitars & PVC pipe didgeridoos), researching and interpreting parameters of sound capture and playback systems, sound level measurement (including dosimetry), hearing protector use, and acoustic voice assessment and interpretation. The course design will be presented, and projects will be described and linked to the 5e pedagogical model.
Learning Objective #1	Describe the five elements of the 5e pedagogical model and how they relate to hands-on projects for learning about acoustics and associated health issues.
Learning Objective #2	Apply the concept of "sound as energy" when teaching fundamental acoustical principals.
Learning Objective #3	Formulate transfer of learning by applying fundamental acoustics knowledge to real world situations.
Special Accommodations for presenter(s)/presentation	NA
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Author Information

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Lead Author's Phone	410-955-1909
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Lead Author Biography	Jennifer A. Deal is an epidemiologist and gerontologist with expertise in hearing loss and cognitive aging. She is an Assistant Scientist of Epidemiology and Otolaryngology-Head & Neck Surgery at the Johns Hopkins University and Core Faculty and Associate Director for Academic Training with the Johns Hopkins Cochlear Center for Hearing and Public Health, a first-in-kind research center dedicated to training a generation of clinicians and researchers to understand and address the impact of hearing loss on older adults and public health. Dr. Deal completed an undergraduate degree in biology from Indiana University and received Master of Health Science and Doctor of Philosophy degrees from the Johns Hopkins Bloomberg School of Public Health. Trained in the epidemiology of aging, Dr. Deal studies how hearing loss and vascular factors impact the aging brain and cognition to provide insight into mechanistic pathways involved and to inform development of public health prevention strategies.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Hearing, Aging, and Public Health - From Epidemiology to Public Policy
Preferred Session Type	Friday/Saturday Platform
Abstract	Medicine and public health have evolved through three eras over the past century. Beginning in the first half of the 20th century, infectious diseases were controlled for the first time in human history through vaccinations, antibiotics, and other strategies. Subsequently, throughout the 20th century, chronic diseases of middle and later life (e.g., cardiovascular disease, cancers) became the leading causes of mortality but have also increasingly been better controlled. These successes of public health have led to a rapidly increasing population of older adults living longer than ever before. In this third era of public health and medicine, we are now confronting the challenges of aging and how to best optimize the health and functioning of a growing population of older adults. In this era, hearing and our ability to engage effectively with the environment around us are critically important but not yet priorities in the spheres of public health and public policy. I will discuss research over the past several years that has demonstrated the broad implications of hearing loss for the health and functioning of older adults, particularly with respect to cognitive functioning, brain aging, and dementia. I will then discuss how this epidemiologic research has directly informed and led to current national initiatives in the United States focused on hearing loss and public health. These initiatives include the Aging and Cognitive Health Evaluation in Elders (ACHIEVE) randomized controlled trial and recent passage of the bipartisan Over-the-Counter Hearing Aid Act in 2017. This federal law overturns over 40 years of regulatory precedent around hearing aids in the U.S. in order to directly improve the accessibility and affordability of hearing care for older adults.
Learning Objective #1	To describe how hearing loss in older adults is relevant to broader population health
Learning Objective #2	To describe public health approaches to studying and addressing hearing loss
Learning Objective #3	To describe policy changes relevant to hearing loss
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Author Information

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Lead Author's Job Title or Role	Professor
Lead Author's Company/University	University of Nebraska Kearney
Lead Author's Address	1615 W. 24th Street University of Nebraska Kearney Kearney, Nebraska 68849 United States
Lead Author's Phone	3088658301
Lead Author Email	mooreja2@unk.edu
Lead Author Biography	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 research interests include prevention of noise-induced hearing loss in persons attending contemporary worship services. In addition, she is investigating cognitive and balance changes in aging agricultural workers with histories of noise-induced hearing loss.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Healthy Hearing, Healthy Aging: Inital Results
Preferred Session Type	Either Poster of Platform Format (Please select this if you do not have a preference)

Abstract	Progressive and permanent sensorineural hearing loss associated with noise exposure (NIHL) is a chronic health condition in agricultural workers. In addition to the impact of hearing loss on communication, hearing loss and exposure to noise have negative impacts on balance, cardiovascular health, mental health, and cognitive skills. Recent large-scale public health studies among elderly and middle-aged persons indicated hearing loss presents a significant and independent risk factor for the development of dementia. This project will examine the hearing status and cognitive skills of aging farmers and ranchers over the age of 50. The research proposal was previously presented at the 2019 NCHA annual conference. This presentation will report the initial findings of data collected since that time including audiological and cognitive screening results. The following screening tests have been used for the first phase of this study: The Montreal Cognitive Assessment (MOCA), Stroop Color and Word Test (STROOP), and the Digit Symbol Digit Symbol Substitution Test (DSS). Our data will provide novel information on the impact of long-term hearing loss on the cognitive status in older agricultural workers.
Learning Objective #1	Describe the impact of hearing loss on cognitive status in aging agricultural workers.
Learning Objective #2	Describe screening tasks used to screen cognitive status in older adults.
Learning Objective #3	Describe the relationship between hearing, age, and cognitive status and how these outcomes can inform public health messages and policy.
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Electronic Signature	Jan Moore

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IP Address:	73.212.182.168
Unique ID:	537252214
Location:	39.264198303223, -76.589401245117

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	John Merkley
Lead Author Credentials (i.e., M.D., R.N., etc)	AuD
Lead Author's Job Title or Role	Army Hearing Program Manager
Lead Author's Company/University	U.S. Army Public Health Center
Lead Author's Address	8424 Corporal St. Gunpowder, Maryland 21010 United States
Lead Author's Phone	7196408831
Lead Author Email	hcofficer@yahoo.com
Lead Author Biography	LTC John 'Andy' Merkley is an Army Audiologist currently serving as the Army Hearing Division Chief at the Army Public Health Center in Aberdeen, Maryland. 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 American Speech-Language-Hearing Association (ASHA), the Military Audiology Association (MAA) and the National Hearing Conservation Association (NHCA). LTC Merkley represents the MAA on the Council for Accreditation in Occupational Hearing Conservation (CAOHC) and serves as the vice-chair of education on the CAOHC Executive Committee.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Just-In-Time Learning and Hearing Conservation
Preferred Session Type	Friday/Saturday Platform

Abstract	Learners today expect to get information quickly and in a format that is easy to access, easy to understand, available at a time and place of the learner's choice, and relevant to what the learner needs to know at the moment. Training no longer needs to take place just once every month, quarter, or even year. Effective learning can take place throughout the workday, workweek, or even work year. In fact, even one minute of effective just-in-time learning delivered weekly to a worker on any particular subject can be as effective or even more effective than a one-time 52-minute-long training event on the subject. This presentation will introduce learners to the just-in-time learning theory and how it can be effectively applied to the required hearing conservation program training as explained in OSHA, MSHA, FRA, DoD, and a variety of other regulations. Tips for developing just-in-time learning events will be discussed including training that is being developed and used by the Army Hearing Program and DoD Hearing Center of Excellence.
Learning Objective #1	By the end of this presentation, learners will be able to list three best practice tips for just-in-time training.
Learning Objective #2	By the end of this presentation, learners will be able to describe just-in-time learning theory.
Learning Objective #3	By the end of this presentation, learners will be able to identify three topics of required hearing conservation training that can be effective just-in-time learning subjects.
Special Accommodations for presenter(s)/presentation	None
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Electronic Signature	John Merkley

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Browser:	Mozilla rv:11.0 / Windows
IP Address:	164.251.181.222
Unique ID:	537273129
Location:	37.750999450684, -97.821998596191

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Malisha Martukovich
Lead Author Credentials (i.e., M.D., R.N., etc)	Au.D.
Lead Author's Job Title or Role	DoD Hearing Center of Excellence Air Force Liaison
Lead Author's Company/University	USAF
Lead Author's Address	1100 Wilford Hall Loop Bldg 4554 JBSA Lackland, TX 78236 United States
Lead Author's Phone	210-292-5430
Lead Author Email	malisha.l.martukovich.mil@mail.mil
Lead Author Biography	Major Malisha Martukovich serves as the Air Force Audiology Liaison to the Defense Hearing Center of Excellence at Joint Base San Antonio-Lackland, Texas. As an advocate for hearing health issues within the DOD, she works on outreach activities, prevention branch initiatives and is a member of several DoD working groups. Maj Martukovich earned her Doctoral degree in Audiology from Arizona School of Health Sciences, A.T. Still University in Mesa, Arizona, as well as a Master's and Bachelor's degree from The Ohio State University.
If you have additional co-presenters or co-authors, please tell us how many?	3
Name (Additional Presenter or Co-author #1)	LaKeisha Henry
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	M.D.
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Both a Presenter and Co-Author

Name (Additional Presenter or Co-author #2)	Theresa Schulz
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Both a Presenter and Co-Author
Name (Additional Presenter or Co-author #3)	Kathy Gates
Additional Presenter or Co-author #3 Credentials (ie: M.D., R.N., etc)	Au.D.
Is this person a co-author, presenting or both a co-author and presenting? (#3)	Both a Presenter and Co-Author

Presentation & Abstract Information

Paper Title	Building an effective Hearing Conservation Program (HCP) and the value of prevention
Preferred Session Type	Friday/Saturday Platform
Abstract	This presentation will be a DoD Hearing Center of Excellence (HCE) panel/discussion on building effective Hearing Conservation Programs and the value of prevention of hearing loss. Background information will be presented through a case analysis example of the following: In 2013, the HCE led efforts to standardize accession (entry onto active duty) and separation audiometric testing standards across the DoD. Because of this effort, the USAF (US Air Force), through HCE funds set up accession testing using Defense Occupational Environmental Hearing Readiness System-Hearing Conservation (DOEHRS-HC) at Basic Military Training (BMT) at Lackland AFB TX and Officer Training School (OTS) at Maxwell AFB AL. Prior to implementation, a Capabilities Based Assessment (CBA) was conducted to identify gaps in the process in the USAF. Past and current data will be presented that validates the effectiveness of the program. This led to the AF taking over financial and manning responsibility for testing in 2018. Additionally the USAF adopted the Separation History and Physical Examination (SHPE) process. This was the first time, every Airman in the USAF would receive an initial DOEHRS-HC exam and separation exam. Policy change became effective in Feb 2016 with AFI 48-127 including requirements for accession and separation hearing tests. Cost savings and return of investment data of the DoD/AF accession hearing test program will be presented. Discussion of the value of audiometric monitoring as a component of an effective HCP will follow.

Learning Objective #1	Describe gaps identified by the CBA in the USAF Hearing Conservation Program.
Learning Objective #2	Describe the policy change that happened as a result of DOEHRS-HC testing at accession.
Learning Objective #3	Describe the cost savings to the DoD/AF associated with hearing testing at accession for enlisted and officers.
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Acceptance and Electronic Signature

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Electronic Signature	Malisha Martukovich

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Browser:	Firefox 69.0 / Windows 7
IP Address:	68.118.180.230
Unique ID:	537288849
Location:	41.79109954834, -72.253402709961

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Jennifer Tufts
Lead Author Credentials (i.e., M.D., R.N., etc)	Ph.D.
Lead Author's Job Title or Role	Professor
Lead Author's Company/University	University of Connecticut
Lead Author's Address	Speech, Language, and Hearing Sciences 2 Alethia Dr., Unit 1085 Storrs, CT 06269 United States Minor Outlying Islands
Lead Author's Phone	8604864082
Lead Author Email	jennifer.tufts@uconn.edu
Lead Author Biography	Jennifer Tufts, Ph.D. is a 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. She is a past-president of the National Hearing Conservation Association (NHCA) and a winner of NHCA's Outstanding Lecture Award (2014) and Outstanding Poster Award (2010). Her current research areas include hearing loss prevention and auditory fitness for duty in diverse populations.
If you have additional co-presenters or co-authors, please tell us how many?	2
Name (Additional Presenter or Co-author #1)	Ashley Parker
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	M.A.
Is this person a co-author, presenting or both a co-author and presenting? (#1)	Co-Author

Name (Additional Presenter or Co-author #2)	Erika Skoe
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	Ph.D.
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author

Presentation & Abstract Information

Paper Title	Agreement Across Different Measures of Noise Exposure in College Students
Preferred Session Type	Poster Presentation
Abstract	Increased interest in noise-induced subclinical changes to the human auditory system has prompted discussions about how to quantify noise exposure in human populations. In our recent studies of the physiological and functional correlates of routine noise exposure, we have used a seven-day dosimetry protocol to characterize the noise exposure of our study participants. However, questions have been raised about whether one week of dosimetry provides a representative snapshot of exposure. This concern motivated the current study, in which 33 college students wore noise dosimeters for three non-consecutive weeks, spread over multiple months. Additionally, participants completed the Noise Exposure Questionnaire (NEQ; Johnson et al., 2017) and the Lifetime Exposure of Noise and Solvents Questionnaire (LENS-Q; Bramhall et al., 2017), which are designed to capture annual and lifetime noise exposure, respectively. Results showed that dosimetric measures were consistent across measurement weeks, suggesting that weeklong personal noise dosimetry may be a reliable tool for capturing current noise exposure patterns in some populations. However, preliminary analyses indicate that noise exposure estimated via dosimetry did not correlate with the NEQ dose nor the LENS-Q score, nor did the NEQ and LENS-Q metrics correlate with each other. Implications for capturing noise exposure history will be discussed.
Learning Objective #1	Distinguish among different ways of estimating noise exposure history
Learning Objective #2	Evaluate the applicability of different measures of noise exposure in a study setting
Learning Objective #3	Evaluate the use of weeklong dosimetry as a tool for estimating current noise exposure patterns
Special Accommodations for presenter(s)/presentation	n/a

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Electronic Signature	Jennifer Tufts

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Browser:	Chrome 79.0.3945.88 / Windows
IP Address:	220.245.168.140
Unique ID:	567993812
Location:	-32.097599029541, 115.8191986084

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Siobhan McGinnity
Lead Author Credentials (i.e., M.D., R.N., etc)	BSc, MClinAud, PhD
Lead Author's Job Title or Role	Research Audiologist
Lead Author's Company/University	The University of Melbourne & The HEARing CRC
Lead Author's Address	550 Swanston St Carlton, VIC 3058 Australia
Lead Author's Phone	61390355333
Lead Author Email	smcginnity@unimelb.edu.au
Lead Author Biography	Dr Siobhan McGinnity is a research audiologist at the University of Melbourne. She lectures, tutors and provides clinical supervision to the Master of Clinical Audiology program students. Her clinical areas of specialty include musicians' hearing care, tinnitus management and aural rehabilitation. Siobhan completed her PhD in 2019, where she investigated preventing hearing injury in the music industry. This included engagement with a wide range of industry stakeholders, from sound engineers to music peak bodies. Siobhan's interest in hearing conservation led to her founding non-for-profit, Musicians 4 Hearing, utilising music events in Australia to fund access to hearing care in the developing world. Siobhan is also a member of several advisory panels, including for Music Victoria and Tinnitus Australia.
If you have additional co-presenters or co-authors, please tell us how many?	3
Name (Additional Presenter or Co-author #1)	Robert Cowan
Additional Presenter or Co-Author #1 Credentials (ie: M.D., R.N., etc)	BSc(Hons), MSc, MBA, PhD, DipAud, FAudA, FICRA, FAAA, GAICD

Is this person a co-author, presenting or both a co-author and presenting? (#1)	Presenter
Name (Additional Presenter or Co-author #2)	Elizabeth Beach
Additional Presenter or Co-author #2 Credentials (ie: M.D., R.N., etc)	BA(Hons), PHD
Is this person a co-author, presenting or both a co-author and presenting? (#2)	Co-Author
Name (Additional Presenter or Co-author #3)	Johannes Mulder
Additional Presenter or Co-author #3 Credentials (ie: M.D., R.N., etc)	FHEA, PhD, MA
Is this person a co-author, presenting or both a co-author and presenting? (#3)	Co-Author

Presentation & Abstract Information

Paper Title	Preventing hearing injury in the music industry
Preferred Session Type	Friday/Saturday Platform
Abstract	Sound levels in the live music industry have been demonstrated to reach levels capable of causing harm to the auditory system. This research investigated approaches to reducing the incidence of hearing injury in the Australian music industry. Methods: Four studies were conducted. Study 1: Audiologists and manufacturers completed surveys investigating the delivery of clinical care for musicians; 2: Musicians rated satisfaction with audiological services as delivered across four treatment conditions; 3: A hearing assessment was completed by 27 live-music sound engineers (LMSEs); and 4: Use of a commercial sound level management (SLM) system in six indoor live-music venues was trialled. Results: there was a high incidence of reporting of hearing loss and tinnitus in musicians. Inconsistencies in clinical procedures were found for both audiological care for musicians, and recommendations made by manufacturers for fitting musicians' hearing protectors. For LMSEs, a substantial proportion reported constant tinnitus and reduced sound tolerance. No reduction in mean sound level (LAeq,T) was found with use of SLM software in live music venues, however the number of nights on which extreme volume levels were recorded was reduced. Conclusions: The results confirm the risks of hearing injury for patrons and staff attending live music venues in Australia.
Learning Objective #1	To identify the risks of hearing injury in the live music industry

Learning Objective #2	To identify ways in which audiological practice may influence hearing conservation for musicians
Learning Objective #3	To better understand sound level management options for live music venues
Special Accommodations for presenter(s)/presentation	Light sensitive (no flash photography, warning if flurescents or spotlights are used so medication can be taken), seating available (preference to stand during presentation, but availability of the option to sit is appreciated).
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Electronic Signature	Siobhan McGinnity

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Submission Time:	August 5, 2019 10:09 pm
Browser:	Safari 12.0.3 / OS X
IP Address:	174.197.17.46
Unique ID:	526650193
Location:	42.015800476074, -87.842300415039

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	S Benjamin Kanters
Lead Author Credentials (i.e., M.D., R.N., etc)	MM
Lead Author's Job Title or Role	Associate Professor
Lead Author's Company/University	Columbia College Chicago
Lead Author's Address	420 S Clinton St Apt 613 Chicago, IL 60607 United States
Lead Author's Phone	(847) 687-9352
Lead Author Email	bkanters@colum.edu
Lead Author Biography	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 during graduate studies at Northwestern University, he developed the course Studies in Hearing in 2000 to teach physiology and conservation to audio students. In 2007, he founded The Hearing Conservation Workshop, and has presented over 100 seminars on hearing physiology and conservation to students and professionals in the audio, music and hearing sciences.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Understanding Audio Through Audiology and Hearing Conservation
Preferred Session Type	Thursday Afternoon Workshop

Abstract	The HearTomorrow "Audio of Hearing Workshop" will explore audio systems theory in the context of hearing physiology, disorders and conservation. Attendees will learn about basic audio systems and principles of sound engineering as well as gain new perspectives on the hearing mechanism. The ear IS and audio system and we are using modern audio technologies in the development of hearing assist and conservation products. The language and mindset of each informs the other. The workshop will cover the following topics pertinent to these areas: microphones & loudspeakers, analog and digital signals and circuits, and signal processing in the spectral and dynamic domains. Wherever possible, audio principles will be explained using the language and theories of hearing physiology, psychoacoustics and cognition.

Learning Objective #1	Attendees will review and integrate the theories and language of hearing, audio and audio systems.
Learning Objective #2	Attendees will broaden their understanding of sound and audio using their knowledge of hearing and the hearing mechanism.
Learning Objective #3	Attendees will explore the basic audio systems of transducers, audio signals, audio measurement and signal processing as they are employed in hearing assist and conservation technologies.
Special Accommodations for presenter(s)/presentation	Projection and stereo sound system. Typical room systems will not be adequate.
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Electronic Signature	S Benjamin Kanters

Form Name:	2020 NHCA Call For Paper Submission
Submission Time:	December 3, 2019 9:49 am
Browser:	Chrome 78.0.3904.97 / Windows
IP Address:	128.255.114.83
Unique ID:	560873547
Location:	41.664001464844, -91.544700622559

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Author Information

Lead Author's Name (all communication regarding presentation will be sent to the lead author only)	Kathryn Crawford
Lead Author Credentials (i.e., M.D., R.N., etc)	MS, COHC
Lead Author's Job Title or Role	PhD candidate
Lead Author's Company/University	University of Iowa
Lead Author's Address	145 N. Riverside Drive S300 Iowa City, IA 52242 United States
Lead Author's Phone	319-384-4389
Lead Author Email	kathryn-leonard@uiowa.edu
Lead Author Biography	Kate Crawford is a PhD candidate in the Department of Occupational and Environmental Health (OEH) at the University of Iowa. Kate received a BA in Literature and a BS in Environmental Health from West Chester University in Pennsylvania. After interning with the Environmental Health and Radiation Safety office at the University of Pennsylvania, she decided to pursue Industrial Hygiene and came to Iowa in 2014. As a trainee in the Heartland Center, a NIOSH ERC located in the University of Iowa's College of Public Health, Kate received her MS in Industrial Hygiene in 2016 and is currently pursuing her PhD in OEH. Her research involves evaluating occupational sound exposures and control strategies for music instructors. Kate is a Certified Occupational Hearing Conservationist and secretary-elect for the American Industrial Hygiene Association's Noise Committee.
If you have additional co-presenters or co-authors, please tell us how many?	NA

Presentation & Abstract Information

Paper Title	Evaluation of Hearing Protection Device Effectiveness for Musicians

Preferred Session Type	Friday/Saturday Platform
Abstract	Hearing protection devices (HPD) may offer protection to musicians, including some designed to provide uniform attenuation across frequencies. Even though these are available, studies find that musicians, especially students and instructors, do not wear them. Additionally, there is evidence indicating that many users do not achieve good fit and adequate sound reduction with HPD, which has led to recommendations for fit-testing in the workplace. Understanding the effectiveness of different HPD in combination with musicians' opinions about wearing them, we can make better recommendations for which types may be the most effective options for reducing excessive sound exposures. Twenty-four musicians were recruited and provided with three HPD: formable foam, non-custom uniform attenuation earplugs (UAE), and custom UAE. Audiometric testing was used to obtain personal attenuation levels at nine frequencies (125-8000 Hz) for each HPD which were compared to manufacturer ratings. The coefficient of variation of attenuation across frequencies was used to determine the uniformity of attenuation. Participants completed surveys over six months regarding HPD use, and perceptions regarding the positive and negatives aspects of wearing HPD.
Learning Objective #1	Understand the importance of fit-testing when recommending HPD for workers.
Learning Objective #2	Identify frequently reported barriers to wearing HPD.
Learning Objective #3	Identify frequently reported benefits to wearing HPD.
I understand that if this abstract is accepted, all presenters will be required to register and pay for attendance at the conference.	I understand and agree to this policy.

Acceptance and Electronic Signature

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Electronic Signature	Kathryn Crawford