



Explore the World of Hearing Loss Prevention

35th Annual Hearing Conservation Conference



Poster Presentation Abstracts 2010 Conference

"Evaluation of feedback noise through fire department 911 dispatcher headsets"

Chandran Achutan, University of Nebraska Medical Center

Chucri (Chuck) Kardous – National Institute of Occupational Safety & Health

This NIOSH study determined if feedback noise that 911 dispatchers hear through their headsets was hazardous to their hearing. We analyzed similar headset models from the manufacturer of the headsets worn by the dispatchers and tested actual feedback noise recordings. The headsets were adequate for intended purposes, although the Plantronics H251N provided the best sound quality. Repeated exposure to peak SPLs found in the recordings may cause dispatchers to develop transient symptoms.

"Evaluation of Noise Exposure at a Metal Conduit Manufacturer"

Scott Brueck, MS, CIH – National Institute for Occupational Safety and Health

Manuel Rodriguez, MS, CIH, CSP, NIOSH

NIOSH investigators conducted a health hazard evaluation to assess noise exposures at a metal conduit manufacturer. Most noise was generated by metal impact and production equipment. Additionally, a pneumatic steam cannon generated impulsive noise exceeding 136 dB. Of the 35 personal noise dosimetry measurements collected during the evaluation, 33 measurements exceeded the NIOSH Recommended Exposure Limit, 29 exceeded the OSHA Action Level, and 6 exceeded the OSHA Permissible Exposure Limit. The company had a hearing conservation program and employees were provided with hearing protection; however, some did not insert earplugs properly and some did not wear any hearing protection. A review of employee audiograms indicated that nearly 10% of the employees had an OSHA-defined standard threshold shift. Recommendations included installing engineering controls to reduce noise, requiring hearing protection when exposures exceed 85 dBA, wearing dual hearing protection near the steam cannon, and using NIOSH criteria to determine hearing threshold shift.

"Field-deployable auditory assessment system for tracking noise-induced hearing loss"

JC Buckey – Dartmouth Medical School

Deanna Meinke, PhD – University of Northern Colorado

R.J. Kine-Schoder – Creare Inc.

O.H. Clavier – Creare Inc.

D.L. Alvarenga – Dartmouth Medical School

This poster will describe a new project of research and hardware development to detect and prevent noise-induced hearing loss. The research effort uses cochlear mapping and repeatability testing to determine the best distortion product otoacoustic emission parameters for detecting and monitoring noise-induced hearing loss. The hardware effort focuses on developing a laptop-based, single-probe, field-deployable auditory assessment system incorporating pure-tone audiometry, otoacoustic

emissions, in-ear noise level measurements, probe position checks and middle-ear assessments using reflectance. Work supported by ONR Grant N00014-09-1-0859

“Occupational noise exposure and work accidents in a Brazilian city”

Adriano Dias - Botucatu Medical School, Dept of Public Health

A hospital-based case-control study was conducted in Brazil to examine the relationship between occupational noise exposure and accident risk. Data were collected from 600 cases and 822 controls (who had a non-occupational accident or had accompanied someone who suffered an accident). Prevalence, attributable fraction, and adjusted odds ratios were calculated across four levels of exposure. After adjustment for occupational and non-occupational factors, logistic regression models showed an association between accident risk and worker noise exposure.

“Daily noise exposures among college-level musicians”

Greg Flamme, PhD – Western Michigan University

Edward Roth – School of Music; Western Michigan University

Amanda Nordgren – Department of Speech Pathology and Audiology; Western Michigan University

Kristy Neiters – Department of Speech Pathology and Audiology; Western Michigan University

Musicians often have exposures to high sound levels, particularly during ensemble rehearsals and performances. Average daily noise exposures (% dose and Leq A24) for 45 undergraduate music majors were assessed using noise dosimetry. Average daily doses ranged from 15% to 2700%, with a mean of 479%. The 5th and 95th centiles of Leq A24 were 75.4 and 93.3 dB, (80.1 - 98.1 dBLeq A8) respectively. Exposure varied by musical instrument and gender, but not by self-reported rehearsal time.

“Hearing thresholds by age, gender, frequency, and ethnicity in non-industrial noise exposed adults”

Greg Flamme, PhD – Western Michigan University

Kristy Deiters – Department of Speech Pathology and Audiology; Western Michigan University

US Public Health Survey data (1960-1962) were used to derive estimates of hearing thresholds by age in an unscreened population in ANSI S3.44 and ISO 1999. We used audiometric data from NHANES (1999-2004) to identify the distributions of hearing thresholds by age, gender, and ethnicity among adults with normal tympanograms and no significant history of occupational noise exposure. Distributions were fitted with asymmetric sigmoid curves to identify trends across frequency and demographic group.

“Evaluating Tinnitus in Industrial Hearing Loss Prevention Programs”

Luciara Giacobe Steinmetz – Universidade Tuiuti do Parana

Bianca Simone Zeigelboim - Universidade Tuiuti do Parana

Jair Marques - Universidade Tuiuti do Parana

Thais Morata –

Adriana Bender M. Lacerda - Universidade Tuiuti do Parana

Noise measurements, a questionnaire, a Brazilian version of the Tinnitus Handicap Inventory (THI), and audiometry were conducted with 52 workers enrolled in a hearing conservation program who suffered from tinnitus. Significant correlations were observed between; periodicity of tinnitus and noise level; degree of tinnitus and chemical exposure; overall THI score and each scale; emotional scale and functional scale scores, THI score and general health. An evaluation of tinnitus in the workplace could benefit tinnitus sufferers.

“Hearing Impairment after Prolonged Exposure to Noise. A Retrospective Study in Pilots”

Aram Hellstadius - Karolinska Institutet Section of Audiology, Dept of Clinical Science, Intervention and Technology

Hearing impairment based on audiometric data was investigated in a retrospective study among 180 military pilots and other flying personnel. Audiometric data was collected from medical records of yearly hearing measurements and noise exposure assessment is based on yearly flight time hours combined with noise measurements in the airplanes. Preliminary results will be presented regarding; a) the prevalence of NIHL among the studied group, b) the progress of audiometric threshold elevation related to noise exposure assessment.

“Spectrotemporal Integration in Normal and Hearing Impaired Listeners”

Evelyn Hoglund, PhD – Ohio State University, Department of Speech and Hearing

Lawrence Feth, PhD – Ohio State University, Department of Speech and Hearing Science

Recent work on spectrotemporal integration by listeners with normal hearing has shown that detection thresholds for brief tonal signals improve as the number of bursts is increased, regardless of time and frequency presentation. The current study measured thresholds for spectral integration, temporal integration, and spectrotemporal integration in listeners with noise induced hearing loss as well as in normal hearing listeners. The effect of noise-induced hearing loss on spectrotemporal integration of brief tone bursts is demonstrated.

“Impact of Hearing Loss on Safety and Task Performance in Aircraft Maintenance Areas”

Edwin Irwin, MSBME – Mercer Engineering Research Center

Speech frequency hearing loss is a common problem in industrial environments. Determining how it impacts productivity and safety is a complex issue due to the differential impact of noise on speech recognition within varied psychoacoustic environments. This research was undertaken to help establish a reasonable approach to qualifying aircraft mechanics with hearing loss to continue working and to help define the types of accommodations that might be expected to work for them on the job.

¿Oyes y Entiendes?: Communication Strategies Between Occupational Hearing Conservationists and Spanish-Speaking Workers

*Emily Wakefield, B.S., University of Northern Colorado, Greeley, CO;
Deanna K. Meinke, Ph.D., University of Northern Colorado, Greeley, CO;
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Mark Guiberson, Ph.D., University of Northern Colorado, Greeley, CO
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The increasing number of minorities working in noisy environments, particularly Spanish-speaking individuals, creates a challenge in terms of providing adequate hearing loss prevention programs (HLPPs). A written survey was distributed to 3000 CAOHC certified OHCs; 300 were completed and returned. The survey investigated interactions between OHCs and Spanish-speaking workers specific to the audiometric testing, hearing protection and training program components of HLPPs. Initial data analysis indicates that there is a significant difference between the services provided by Spanish-speaking and non-Spanish-speaking OHCs. This data suggests that Spanish-speaking workers may not be receiving comparable care to their English-speaking co-workers.

“The effect of recreational noise exposure and hearing loss in youth”

Hannah Kepler - Ghent University/ Faculty of Medicine and Health Sciences/ ENT Department

It is widely accepted that excessive noise exposure can cause noise-induced hearing loss. Besides occupational noise exposure, recreational noise exposure especially during music-related activities is a cause for concern. The results of the current study include: (1) an evaluation of the effect of different types of recreational noise exposure on the auditory system of youth, and (2) an investigation of the effect of attitude regarding noise exposure, as well as use of hearing protector devices.

“Validity of a temporary threshold shift (TTS) detector for use in iPods and other portable audio devices”

*Chantal Laroche – Hearing Research Laboratory, University of Ottawa
Chrystal Vegiard – Hearing Research Laboratory, University of Ottawa
Christian Giguere - Hearing Research Laboratory, University of Ottawa
Les Blomberg - Hearing Research Laboratory, University of Ottawa*

The objective of the study was to validate the use of a tool incorporating TTS measurements as a preventive measure to provide feedback to portable device users. Hearing thresholds were measured prior to and following a one-hour exposure to music from the individual's own portable devices, in a 70-dBA bus noise. Listening levels were adjusted by the participants and exposure levels were measured using a KEMAR manikin coupled to a sound level meter. Two threshold measurement methods were used and compared. Results will be presented.

“Speech-in-noise screening tests by internet; improving test sensitivity for noise-induced hearing loss”

Monique Leensen – Clinical and Experimental Audiology, Academic Medical Centre

The Dutch national hearing association (www.hoorstichting.nl) has developed a hearing-screening test by internet. This test is an automatic adaptive speech-in-noise test using nine different CVC words presented in stationary broadband noise. In a multi-centre study the value of this test in discovering beginning noise-induced hearing loss, is investigated. In addition, the possibility of enhancing the test sensitivity for beginning NIHL using different forms of noise filtering is examined. Therefore,

the stationary broadband noise is spectrally filtered by both high pass and low pass filters (cut-off frequency 1.4 kHz), and temporally filtered by 16 Hz modulation. In the study, 50 normal hearing and 50 subjects with different degrees of NIHL performed the tests. Results suggest that both the low pass filtered noise and the 16 Hz modulated noise are more sufficient to discover NIHL in an early stage. However, further analyses and field research should confirm this.

“Environmental noise level analysis of call center station”

*Teresa Momenshohn – Santos – IEAA – Institute of Hearing Studies
Marielaine Gimenes
Valerie Moura*

The aim of this research was to measure the noise of a Call Center station in order to know the telemarketing operator exposition.. Method: noise was measured with a Bruel & Kjaer (type 2236) sound pressure level meter during one minute, through 69 different points. Results: we found the Leq varied from 67,4 dB(A) to 72,1 dB(A). They were above the level for offices suggested by Brazilian Norms and Techniques Association (30 -60 dBA).

“The use of Personal sound stereo system and the presence of tinnitus”

*Teresa Momenshohn – Santos – IEAA – Institute of Hearing Studies
Mariana Nogueira
Camila Lamas
Marianne Gutierre Molinaro
Thaysa Freitas
Gabriela Bueno*

Aim: to investigate the association between the use of personal sound system (PSS) and the presence of tinnitus. Method: sample was composed by 199 individuals. All of them answered a questionnaire about use of PSS and tinnitus. Results: out of 199, 101 referred the use of PSS, median time of use was 1,9 hours/day. Tinnitus was present in 53 subjects: it was constant in 3 and occasional in 20.

“Tinnitus and auditory complaint in a population that attends noisy exposure”

*Teresa Momenshohn – Santos – IEAA – Institute of Hearing Studies
Larissa Poli Moreira
Mariana Pelegrini Biserra
Andrea Paz
Neury Hayashi*

To investigate the occurrence of tinnitus and auditory complaint in a population that attends noisy environments. Method: 200 people invited to answer a questionnaire about auditory complaint, tinnitus, and attendance to noisy shows and/or workplaces. Results: Out of 200, 29 referred not to hear well, 31 presented tinnitus, 77 attended noisy shows and 57 works in noisy places. Association between tinnitus and noisy shows was 6:77, and tinnitus and noisy workplace was 9:57.

“Auditory sensitivity to individuals with opiate abuse and noise exposure”

*Vishakha Rawool, PhD – Dept. of Speech Pathology & Audiology, West Virginia University
Carrie Dluhy, Aud – Virginia Medical Center*

Auditory thresholds were obtained from 23 men with a history of opiate abuse. Twelve of these individuals reported non-occupational noise exposure, 7 reported occupational noise exposure, and 4 reported no noise exposure. Fifty percent of the individuals without noise exposure, 66% of those with non-occupational noise exposure and 100% of those with occupational noise exposure had auditory thresholds of 25 dB HL or worse at least one test frequency. MANOVA revealed no main effects, but a significant interaction was apparent between the noise exposure type and frequency. Post-hoc analyses with the LSD test revealed that occupational noise exposure resulted in significantly higher auditory thresholds at 0.5, 2, 3, 6 and 8 kHz when compared to no noise exposure. Thresholds of men with occupational noise exposure were also significantly higher at 0.25, 1, 2, 3 and 6 kHz when compared to the thresholds of individuals with hobby-related noise exposure.

“Reduced Susceptibility to Noise in Carriers of German Waltzing Guinea Pig”

Asa Skjonsberg – Dept of Clinical Sciences, Intervention and Technology

We have earlier shown that the carriers of the German waltzing guinea pig strain were less affected to noise trauma compared to control animals from other guinea pig strains. In this blind study, we used littermates as control animals. We

confirmed that the symptom-free heterozygote offspring of German waltzing guinea pig seem to have some auditory protective mechanisms connected to their genetic background.

“Long-term occupational noise and antihypertensive medication: a register-based study”

Z.A. Stokholm – Danish Ramazzini Center, Dept of Occupational Medicine, Aarhus University Hospital

H.A. Kolstad – The Swedish Armed Forces, The Occupational Health Center at the Garrison of Halmstad, Sweden

K.L. Christensen - Department of Internal Medicine and Cardiology, Aarhus University Hospital

J.P. Bonde - Department of Occupational and Environmental Medicine, Copenhagen University, Bispebjerg Hospital

In an ongoing study, we aim to establish whether exposure to occupational noise is a cause of chronic arterial hypertension. This, an 8-year follow-up of 158. 136 employees from 620 companies is currently being conducted. Cumulative noise exposure will be estimated from the employment duration and the degree of the noise exposure. This information will then be related to the number of redeemed prescriptions for antihypertensive drugs during follow-up, as a proxy of hypertension. Prescription data are obtained from a national registry.

“Employee satisfaction with two sound transmission HPDs”

Jennifer Tufts – University of Connecticut; Dept of Communication Sciences

This study compared employee satisfaction with two sound transmission HPDs at a plastic film manufacturing plant in Rhode Island. Both HPDs offered custom earmolds and a volume control for ambient awareness. One of the HPDs integrated radio communication via an in-the-ear microphone and dedicated radio connection. Satisfaction with the employee’s customary passive HPD was also evaluated. Employee ratings along the dimensions of comfort, communication, convenience, and situational awareness will be discussed.

“Unintentional Traumatic injury and hearing acuity among central Ohio cash grain farmers: A Case-Control Study”

Marie Vetter, AuD – Chicago Hearing Services

This case-control study examined the relationship between unintentional injury and hearing threshold levels among male farmers using data from OFFHS. The most marked result was thresholds poorer than 25 dB for 6000Hz in the left ear resulted in a 3.35 increased risk for injury using multivariable logistic regression. Hearing conservation programs and audiometric testing at 6000Hz for this population will help to reduce the incidence of hearing loss, therefore, likely reducing injury risk among agricultural populations.