

CHEMICAL EXPOSURE AS A RISK FACTOR FOR HEARING LOSS: IMPLICATIONS FOR OCCUPATIONAL HEALTH. T. Morata, NIOSH, Cincinnati, OH.

The occupational health community is giving increasing attention to the combined effects of occupational exposure to noise and other factors on hearing. In particular, the interaction between noise and chemicals such as toluene, styrene, and carbon monoxide, poses a new challenge to industrial hygienists and hearing conservationists. NIOSH has conducted epidemiological studies on the effects of solvents on hearing, alone or in combination with noise. In all of the investigations, solvents were found to affect the hearing of workers. In light of the many chemicals that are used in the work place and evidence that they may affect hearing, numerous populations are being underserved with regard to the prevention of hearing loss. Permissible exposure levels for chemicals do not account for the chemicals' effects on hearing loss. Thus, workers who are exposed to noise levels below 85-dBA time-weighted average who are not required to be in included hearing conservation programs may still be at risk of hearing loss due to exposure to these chemicals. Furthermore, methods currently used in hearing conservation (e.g., hearing protectors and noise control) may be ineffective, or even inappropriate, for workers exposed to both chemicals and noise. This presentation will review the current knowledge of chemical ototoxicity and the NIOSH strategy for partnering with industry, academia, and professional organizations interested in preventing occupational hearing loss. Key issues to be addressed in this strategy include: rationale and proposal of consensus list for priority chemicals, methods for evaluating exposures of concern for workers and appropriate biomarkers, methods for assessing auditory effects of chemicals, inclusion criteria in prevention programs and appropriate components of such programs, and finally, the need for information dissemination.

111.

A PILOT SURVEY OF THE AVAILABILITY OF NOISE EMISSION DATA FOR EQUIPMENT AND MACHINERY SOLD IN CANADA. B.

Pathak, Canadian Centre for Occupational Health and Safety, Hamilton, ON, Canada; S. Bly, Health Canada, Ottawa, ON, Canada.

This paper presents the results of a pilot survey on the availability of noise emission data to Canadian purchasers from 100 manufacturers and distributors of machinery and equipment used in Canadian workplaces. The survey included manufacturers or distributors of specific types of machines such as compressors and fans. Also included was a variety of equipment categorized by use in a number of industries such as: auto repair, construction, food processing and packaging, furniture making,

logging, metal manufacturing, mining, pulp and paper, saw mills, and shingle mills. The survey was done by means of telephone interviews using a questionnaire. Information was obtained on whether noise emission data is provided and, if so, the method used. The survey data revealed that 54 of the manufacturers/suppliers responded that they provided noise emission data either voluntarily or on request by the buyer. Twenty-nine of these 54 responses indicated that the data was provided in conformance with a standard.

112.

NOISE LEVELS IN A SKATEBOARD PARK WITH METALLIC RAMPS—AN INDUSTRIAL HYGIENE APPROACH TO QUANTIFY AN EMERGING COMMUNITY NOISE. F. Akbar-Khanzadeh,

S. Spino, Medical College of Ohio, Toledo, OH.

Skateboard ramps constructed of metal (steel) act similarly to drums and are perceived to be noisier than ramps constructed of wood or concrete. This study was performed to examine the extent of noise levels in a skateboard park with metallic ramps. A real-time sound level meter (Quest Technologies, Model 400) was located 1 m from the ramp. Noise sources included 1–4 individuals using skateboards, rollerblades, and/or bikes on or around the ramp. The highest peak noise level (dBA), ranging from 88.5–146.7 with a mean (SD) of 100.1 (13.1) and median of 101.7, was recorded when two rollerbladers played at the same time. In 604 measurements of 10-s intervals, the maximum noise levels ranged from 46.7–107.9 dBA with a SD of 70.9 (14.1) and median 69.6. The results of this study indicate there is real potential for hearing damage from noise in skateboard parks with metallic ramps.

113.

SAMPLING RATE EFFECT ON WELDER NOISE EXPOSURE. J. Thomas, U.S. Air Force, Brooks-City Base, TX; K. Blehm, D.

Sandfort, S. Reynolds, M. Andersen, R. Ackley, Colorado State University, Fort Collins, CO.

Recent United States Air Force (USAF) studies hypothesized current measurement techniques are not adequately measuring welder noise exposures, and that welders are losing their hearing at a higher rate than expected based on attributable risk. The objective of this study was to assess noise measurement sampling rates and averaging times to determine potential differences in the amount of total energy characterized during routine exposure assessments.

Seven types of welding (shielded metal arc welding, gas metal arc welding, gas tungsten arc welding, flux core arc welding, oxy-fuel gas cutting, plasma arc cutting, and air carbon arc gouging) were evaluated. Data were collected via a two-channel system using a microphone, pre-amplifier, and front-end unit for

each channel. The signals were saved to digital audiotape or a digital oscilloscope and then analyzed with a real time analyzer and the digital oscilloscope. Sampling rates up to 25 MHz were used to collect exposure data.

Increasing sampling rate did not increase the amount of energy measured and hence the dose did not increase. The results of this study point to investigating additional avenues to explain the hearing loss of the welders. Other possible explanations include: ototoxins, non-occupational exposure, other noise sources, inadequate use of hearing protection, or data anomalies in the audiograms.

114.

FIELD TESTING HEARING PROTECTOR PERFORMANCE. N. Barone, ExxonMobil Biomedical Sciences, Clinton, NJ.

Real world field tests of hearing protector (HP) attenuation have shown discrepancies with the mandatory experimenter-fit laboratory noise reduction rating testing performed by manufacturers for the purposes of labeling. Based on these findings, OSHA inspectors normally derate HP attenuation by 50% to determine their adequacy of protection. This study describes field testing of HP attenuation conducted to determine the actual adequacy of protection provided at two petrochemical facilities. Workers wearing HP were approached in the field and asked to participate in the study. The hearing threshold levels with HP and without HP was the real-ear-attenuation-at-threshold (REAT). REAT measurements were collected using circumaural headphones and a Compaq Ipaq Pocket PC running Pocket Hearo software. The results of this field testing suggest that this method offers an opportunity to match hearing protectors with individual variability (e.g., size, shape of ear canal) so that the best protector can be selected, fitted, and verified for each worker participating in a hearing conservation program.

Podium 116. Industrial Hygiene General Practice 1

Papers 115–126

115.

RESPONDING TO A HEXAVALENT CHROMIUM LEAK AT A NUCLEAR POWER PLANT. A. Syverson, Duke Energy,

Houston, TX; A. Almaguer, Duke Energy, York, SC.

Situation: Reactor coolant containing hexavalent chromium leaked in the reactor building. Such leaks typically go to sumps and system volume is replenished. The leaks pose no radiological hazards. However, the coolant leaked directly onto the 650°F nuclear reactor, flashed to steam, resulting in dusts containing hexavalent chromium. The dusts were spread by the ventilation system causing concerns of overexposures.

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