

construction industry. Study materials and training products will be displayed and discussed.

The University of Washington (UW) has been assessing noise exposure levels, hearing loss, and hearing protection use among construction workers in Washington for more than five years. Workers from eleven different trades have been examined as part of this research. In this part of our presentation on "hearing conservation in the construction industry," Rick will discuss some of the noise exposures measured for the various trades, tasks, and tools that have been evaluated by UW, as well as self-reported use of hearing protection among the construction workers who have participated in the research. In addition, newly developed hearing conservation outreach materials designed by UW for use by both safety and health professionals and workers in the construction industry will be presented. Recent research on hearing protection performance and cross-shift changes in hearing levels of construction workers will also be discussed.

#### **Point/Counterpoint: Components in NIHL—Can Their Relative Effects be Fairly and Equitably Discerned?**

*Robert Dobie, University of California at Davis, Sacramento, California, David Lipscomb, Correct Service Inc., Stanwood, Washington and Mary Wilson, Assistant Attorney General, State of Washington, Seattle, Washington*

This section has been organized to update attendees on the concept of allocation between etiologies (causation). In all of hearing conservation, few topics have posed a greater challenge to professionals in this avenue of service than the "allocation" concept. To the uninitiated, the audiometric allocation between causative factors might seem to be a simple and straightforward task. Yet, discussions concerning this process have ranged far and wide. There is little or no controversy concerning the need for such a process. The disagreements occur when methods are proposed, considered and evaluated by professional and/or legal entities.

The intent of our presentations will be to bring our understanding of allocation to the new century. While it is acknowledged that there are still disagreements, more recent thinking and legal decisions may not be well known. Thus, we offer this review and update.

#### **Allocation in Cases of NIHL**

*Robert A. Dobie, M.D., University of California at Davis and Dobie Associates*

Many worker's compensation programs require adjustment of awards for hearing loss when more than one cause is present, and distribute liability among employers when more than one employer has exposed a worker to a hazard such as noise. Allocation between noise and aging is accomplished in some states by basing awards on age-corrected audiograms (making many workers ineligible for awards), or by reducing the award by the ratio of the median expected age-related thresholds to the actual thresholds. Other states require a clinical determination of what a claimant's impairment would likely have been absent occupational noise exposure, then base the award on the difference between this estimate and the actual impairment. Whether in worker's compensation or in litigation, allocation estimates are most reliable when there is a detailed audiometric and exposure history. Audiometric shape and trajectory, combined with an understanding of the epidemiology of NIHL, provide the best evidence in most cases."

#### **Point/Counterpoint**

*David Lipscomb, Correct Service, Inc., Stanwood, Washington*

This presentation will cite two underlying assumptions and raise questions about those assumptions: 1. The validity of pure tone test data without benefit of serial hearing testing; and 2. The accuracy of hearing handicap calculations. The discussion will conclude with a summary of the interactive factors in the function of the auditory mechanism and its neural components. The intent of the summarization will be to remind the attendants of the complexity of function our auditory system possesses, complexity that gives audition its outstanding capabilities, yet, complexity that defies simplistic notions for retrospectively calculating the relative contributions of multiple etiologies.

#### **Hearing Conservation for the Very Small Business**

*Carol Merry-Stephenson, CDC/NIOSH, Loveland, Ohio*

NIOSH has a particular interest in meeting the health and safety needs of small businesses, i.e., less than 50 employees, but also many "mom and pop shops" with 10 or fewer employees. Typically, these enterprises fall through the cracks and have little or no resources to address OSHA issues. This past year, NIOSH has been working with small business owners in the pallet-making industry. The industry has a disproportionate share of illness and injury—including major problems with noise-induced hearing loss. This presentation will present findings and recommendations from a year of field work in this industry. Generalization of issues, approaches, and solutions for other small cottage industries will be made. A prototype training manual for the owners of these small businesses is under development, and the hearing loss section will be showcased.

#### **The Keokuk County Rural Health Study: Prevalence and risk factors for hearing impairment in rural Iowa**

*Gregory A. Flamme, University of Iowa, Iowa City, Iowa*

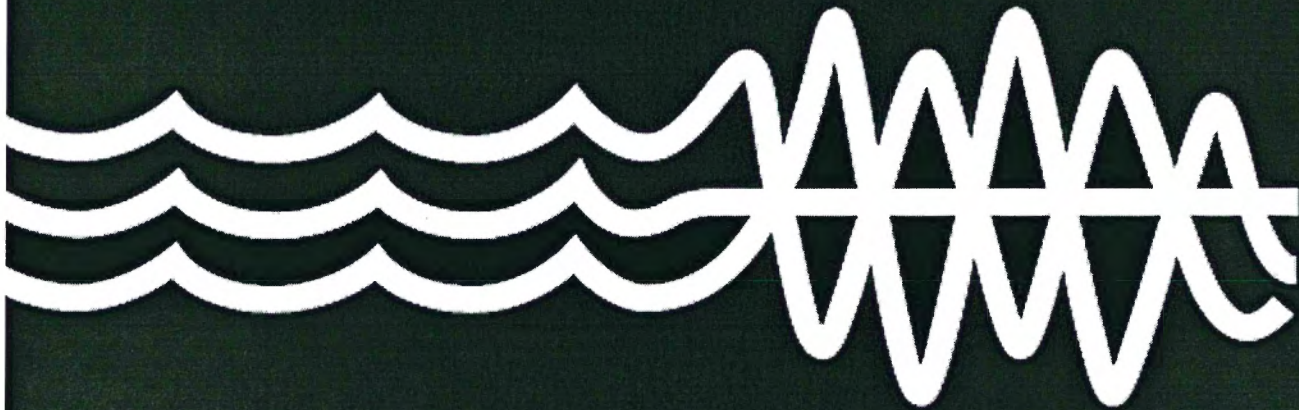
Selected results of a population-based study of health outcomes in rural areas will be presented. Prevalence of hearing impairment will be reported using multiple definitions, ranging between mild hearing damage to interference with loud speech. Relationships between hearing status and noise and non-noise risk factors, including exposures, smoking, and health history, will be discussed. A high prevalence of impairment and significant relationships with multiple risk factors were found. Project supported by NIOSH.

#### **Noise Exposure Levels for Wood Industry Workers**

*Michael Stewart, Kari Koltes, and Mark Lehman, Central Michigan University, and Jim Bennie, Jim Dougovito, Joe Pryal, Angelo St. Juliana, and Jayne Zzukalowski, M-TEC at Bay College*

Individual dosimetry was used to determine noise exposure levels for workers in 94 different wood industry jobs. Results revealed over 40% of the wood industry jobs exhibited 8-hour TWAs over 90 dBA, 33% of the jobs had TWAs between 85-89 dBA, while less than 25% of the jobs had 8-hour TWAs below 85 dBA. Eight-hour TWAs for the loudest jobs were over 100 dBA. Eight-hour time-weighted averages (TWAs) and daily noise doses obtained using the currently mandated Occupational Health and Safety Administration (OSHA) measurement criteria were also compared to those obtained using the American Conference of Government Industrial Hygienists (ACGIH) recommended criteria. The ACGIH method yielded significantly higher 8-hour TWAs and daily noise doses than the OSHA method. The effect of variables such as saw size, season, and wood type were also examined. Implications of this study will be discussed.

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## 29<sup>th</sup> Annual NHCA Hearing Conservation Conference

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