Now Hear This . . .

Volume 5, No. 1 **Spring 2002**

This is the third issue in a 3-part series, based on the March 2001 Michigan Speech, Language and Hearing Association's (MSHA) Short Course that was sponsored by the Michigan State University Occupational and Environmental Medicine Program. The Summer 2001 and Fall 2001 Issues of Now Hear This highlighted the presentations that were given at this conference by Lee D. Hager and Dr. Lisa Murray-Johnson. This third issue highlights Dr. Mark Stephenson's contribution to the Short Course.

Showcase on Preventing Occupational Noise-Induced Hearing Loss (NIHL): National Institute for Occupational Safety and Health (NIOSH) Best Practices for Hearing Loss Prevention: Issues and Criteria

Dr. Mark Stephenson has served as a Research Audiologist at NIOSH since 1993. He currently directs a NIOSH project that is developing hearing loss prevention programs for the construction industry. Dr. Stephenson joined NIOSH after having completed a 20-year career in the United States Air Force. Dr. Stephenson spent most of his Air Force career at the Aerospace Medical Research Laboratory where he investigated the hazards of noise exposure, hearing protector performance and voice communication during noise. Dr. Stephenson is active in numerous professional organizations. He has served as a President of the Air Force Audiology Association, and Vice President of the National Hearing Conservation Association. He also currently serves as the Chair of the American Academy of Audiology Task Force on Hearing Conservation. Dr. Stephenson is an adjunct professor at the Ohio State University and Miami University where he teaches industrial audiology.

Dr. Stephenson's presentation highlighted critical elements of the NIOSH Criteria Document on Preventing Occupational Hearing Loss. Dr. Stephenson began by discussing the hierarchy of control methods to prevent hearing loss. The first step is to remove the hazard, in this case noise. Removing the worker from the hazard is the next best choice if the noise cannot be satisfactorily reduced. Finally, protecting the worker by issuing hearing protection devices such as plugs or muffs would be the last choice a company could choose in a hearing loss prevention strategy. These control methods apply to factories as well as construction sites.

Sometimes an argument that people use about hearing loss is that individuals are destined to lose their hearing as they age. However, while hearing ability can decrease over time, it will not decrease as dramatically as it will in individuals who are exposed to high levels of noise. High levels of noise primarily affect hearing in the high frequencies. Dr. Stephenson presented two graphs (figures 1 and 2); one of normal hearing decrements over time, and the second illustrating hearing function decreases in noise-exposed individuals.

Another issue that Dr. Stephenson pointed out relates to the costs associated with hearing loss. Hearing loss prevention in the form of the controls mentioned above is much more cost effective than providing hearing aids to individuals who develop hearing loss severe enough to warrant the wearing of hearing as-

Figure 1. Even by age 60, the average healthy person does not have impaired hearing!!

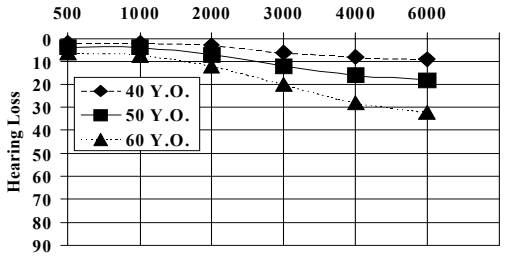
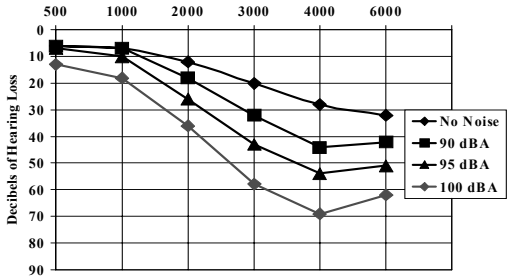


Figure 2. Hearing Levels in 60 Year Old Males as a Function of Noise Exposure



sisting devices. Beyond monetary costs, of course, are the social and psychosocial costs to the individual who has trouble hearing.

Education also plays an important role in preventing hearing loss. As Dr. Stephenson noted, "Without proper training, any hearing protector that can be worn wrong, will be worn wrong!" Some of the reasons people do not wear hearing protection include comfort, convenience, cost, and the perception that important sounds will not be heard if the devices are worn. Improperly fitting or improperly worn hearing protection devices reduce the amount of protection the device will provide as shown in figure 3.

Training workers about the importance of wearing hearing protection must be done in a way that the worker can identify and "buy into." Without knowing what workers' concerns and beliefs are, a hearing conservation program that truly protects workers' hearing cannot be developed and carried out. In other words, talking to the workers is critical to understanding what type of program will work. Dr. Stephenson gave an example of a project (the same one Dr. Murray-Johnson discussed in her part of the presentation) to encourage underground coal miners to wear hearing protection. When asked, the workers cited the following reasons for not wearing hearing protection: comfort (worried about "poking out eardrums"); communication; convenience (the ear cups are too big on the muffs); and roof talk (protection devices mask the warning sounds that the miners need to be able to hear).

Removing barriers and developing self-efficacy are two things that must be addressed to influence hearing protector use among workers. See figure 4.

The development of an effective program to conserve hearing is a repeated or iterative process which begins with conducting a focus group. The focus group consists of the individuals for whom the hearing conservation program is being developed.

The goal of a focus group is to hear first hand the types of concerns and thoughts about how the workers view hearing loss. In addition, a company needs to document noise levels throughout the facility in order to determine what workers or areas are in the highest noise levels. Training programs can then be developed to conserve hearing. Next, it is important to observe if the principles of the program are being adopted by the workers affected by noise. Hearing ability should also be tested to see if anyone continues to lose their hearing. Based on this information, the program may need to be modified or refined periodically.

In essence, holding focus group sessions to identify the perceived barriers to using hearing protection, measuring sound pressure levels and hearing threshold levels, analyzing the audiometric data and observing behaviors are all key parts of developing a program to protect workers' hearing.

If you would like to know more about what NIOSH is doing to promote hearing conservation, check out their "Noise and Hearing Loss Prevention" web page at: www.cdc.gov/niosh/noise/noisepg.html

Figure 3. Available protection vs. the amount of protection obtained by untrained workers.

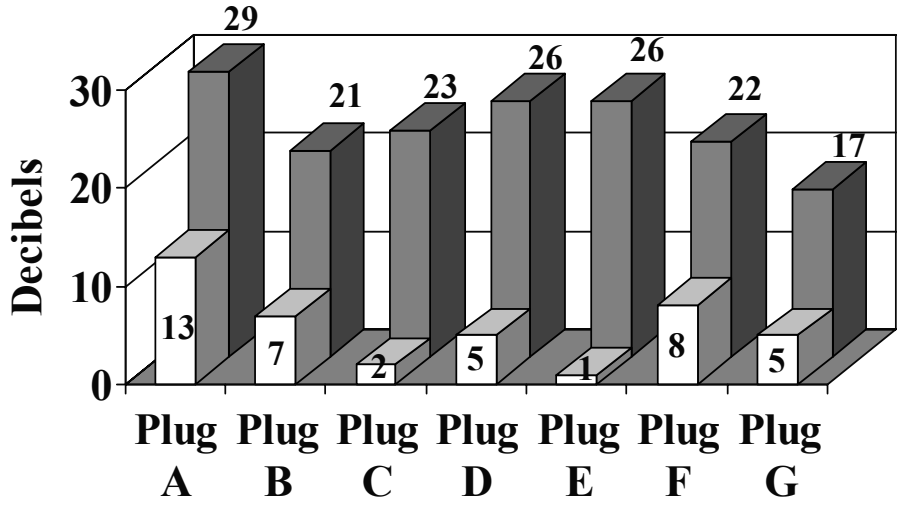
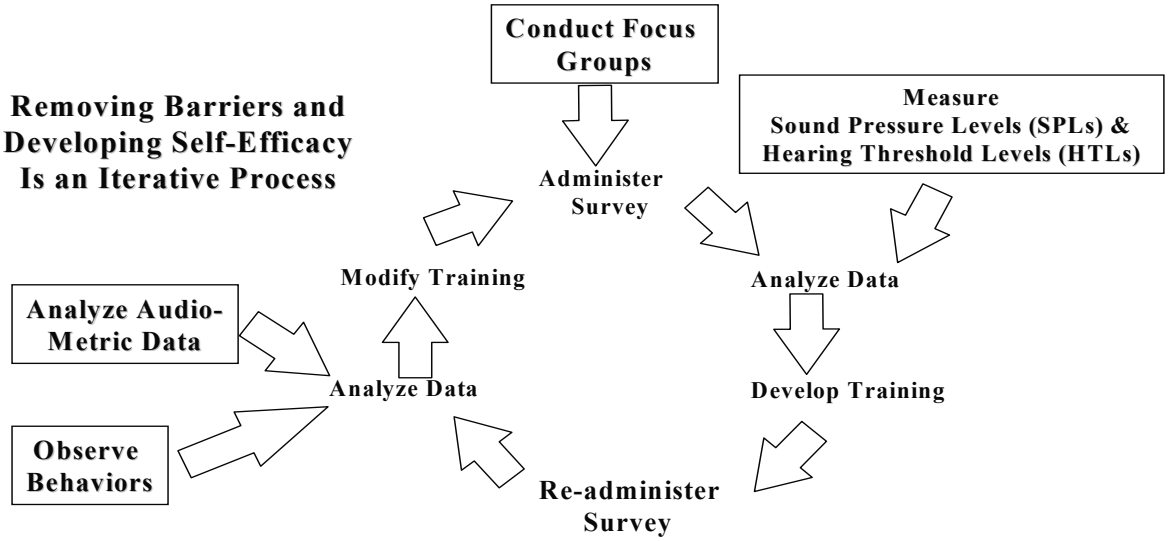


Figure 4. How Do You Remove Barriers and Develop Workers' Self-Efficacy?



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In this issue:
Third in Three Part Series:
Showcase on preventing NIHL

Printed on recycled paper.

Now Hear This is published quarterly by Michigan State University-College of Human Medicine with funding from the Michigan Department of Consumer and Industry Services and is available at no cost. Suggestions and comments are welcome.

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Michigan Law Requires the Reporting of Known or Suspected Occupational NIHL

Reporting can be done by:
FAX (517) 432-3606
Telephone 1-800-446-7805
E-Mail ODREPORT@ht.msu.edu
Web www.chm.msu.edu/oem
Mail MDCIS Div. of Occ. Health
P.O. Box 30649
Lansing, MI 48909-8149

Suggested Criteria for Reporting Occupational NIHL

1. A history of significant exposure to noise at works; AND
2. A STS of 10dB or more in either ear at an average of 2000, 3000 & 4000 Hz. OR
3. A fixed loss.*

*Suggested definitions: a 25 dB or greater loss in either ear at an average of: 500, 1000 & 2000 Hz; or 1000, 2000 & 3000 Hz; or 3000, 4000 & 6000 Hz; or a 15 dB or greater loss in either ear at an average of 3000 & 4000 Hz.