

Implementing effective hearing-conservation training
in structural steel fabrication starts with
listening to your workers.

Have you HEARD?

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OCCUPATIONAL NOISE-INDUCED HEARING LOSS (NIHL) has been a major concern ever since the beginning of the industrial revolution.

And it's still a major concern for the steel fabrication workforce and management; noise levels of typical equipment such as band saws can exceed 100 decibels. Exposure to noise has also been associated with increased blood pressure, muscle tension, sleeplessness and fatigue. These can combine to potentially cause workers to skip procedures, take shortcuts and create safety hazards other than hearing loss, not to mention contribute to an overall lower quality of life.

One of the key elements of protecting worker hearing is implementing a hearing conservation training program. The question is, how can employers best implement this training to maximize its effectiveness and encourage long-term healthy hearing-related behavior?

Tackling Training

Because exposure to noise can be unpredictable and intermittent, it is important that workers are able to recognize hazardous exposures and know how to protect themselves. This is particularly crucial for young people just entering the trades. Most NIHL occurs in the first 10 to 20 years of exposure; any subsequent loss is mostly due to aging. So it is critical that hearing loss prevention, including proper training, starts right at the beginning of the worker's career—before it is too late.

However, effective hearing conservation training and use of hearing protection devices (HPDs) is often nonexistent at the

workplaces that need them most. When training does occur, it often just covers the basic information required by OSHA 29 CFR 1910.95, *Occupational Noise Exposure*:

- Effects of noise on hearing
- Advantages/disadvantage of HPDs
- Basic use and care of HPDs

While these topics are certainly important, training on them doesn't address the critical topic of motivating workers to change their behavior for the better (i.e., wearing HPDs). It is important to develop a framework that delivers the information in a way that acknowledges the workers' needs and concerns. Research in the construction industry indicates that a person's decision to take action is determined by the expected outcome of that decision and their evaluation of those outcomes. Several studies have identified five cognitive/perceptual factors that appear to influence HPD use. These include:

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- Self-efficacy: confidence in one's ability to perform a task—in this case to properly wear HPDs. Even if the benefits outweigh the barriers, the person may not take action unless they believe they can successfully carry that action out
- Barriers: expected negative aspects of the behavior
- Benefits: expected positive effects of the behavior
- Control of health: a person's perception of his/her ability to maintain personal health
- Value of use: the perceived importance of the outcome of using HPDs

Studies indicate that self-efficacy strongly influences a person's response to exposure to noise and wearing HPDs. These studies indicate that training should devote a significant amount of time to hands-on activities and demonstrations to help develop a high level of skill mastery in properly donning HPDs. Training should be done one-on-one or in small groups to allow interaction between the worker and the trainer. In addition, the trainer should be familiar enough with the work site so they can relate actual on-site exposures during training.

When it comes to barriers, these can include:

- Wearing HPDs may be uncomfortable
- Wearing HPDs may make it harder to hear speech or warning signals
- Using earplugs is perceived as being too complicated
- Worker underestimation of the danger of their particular noise exposure

Barriers should be identified and addressed in ways that are specific to the audience. For example, workers may think the band saw noise is insignificant as it occurs only intermittently during the day. Training may include a discussion of noise levels produced by each saw used, approximate duration of daily use and comparisons to recommended exposure duration limits for the noise levels noted.

Other training useful techniques include:

1. Use the most appropriate delivery format. In studies that compared video and manufacturer's printed instructions, one-on-one training was found to be far more effective in increasing the *effectiveness* of donning HPDs. Subjects with no experience using HPDs received one of the above training methods and then donned the HPD. The subjects were then tested to determine achieved noise reduction using the HPD. The video and printed materials training showed similar performance in noise reduction achieved after putting the HPDs on. However, the individually trained subjects showed an average of 5 db to 8 db increase in *achieved* attenuation versus the other two training method subjects. Similarly, small group training was compared to one-on-one training and to only reviewing manufacturer's written instructions. They found a similar increase in achieved at-

tenuation over written instructions for both small group and one-on-one training. There was no significant difference between the small group and one-on-one options. It appears that small group training would be sufficient, with one-on-one training being the better option if a worker subsequently demonstrates a significant hearing threshold shift. Both studies indicate that the chosen training method can be a factor between achieving adequate and marginal protection.

2. "Gain frame" the behavior. This means emphasizing the gain to be realized by performing the desired action. In the case of hearing-prevention training, gain framing would communicate that wearing hearing protection *prevents* hearing loss, *maintains* health and allows the worker continue to *enjoy* the sounds of family and friends. Contrast that with "loss framing"—e.g., by not wearing hearing protection, you are likely to *lose* your hearing and you *won't be able* to hear your family and friends.
3. Make the training location-specific. Discuss noise levels of the equipment that the workers actually use.
4. Keep any handouts to a simple reading and comprehension level. Use pictures instead of text in printed materials. If pictures are used, they must show the *exact* HPD and procedure to be used.
5. Emphasize management support for effective hearing conservation training and the importance of preventing NIHL. Company leaders must be highly visible in wearing HPDs and personally encouraging workers to do the same.
6. Use noise indicators. Noise indicators are small devices workers wear on their clothing. They typically flash red when noise levels exceed a preset level such as 85 dBA. This notifies the wearer that they are in a high-noise area. One study, implementing both baseline training, reinforcement talks and noise indicators, showed a marked increase in use of HPDs compared to implementing training alone. The noise indicator provided real-time information on noise levels and also acted as a reminder to wear HPDs.
7. Test HDPs for proper fit. Hearing protection can now be fit-tested to help the user understand how to wear it properly and help select HPDs with the appropriate protection level and maximum comfort.

Noise exposure and hearing loss is not a new topic, but it is an ongoing issue. You can help increase effective HPD use by hearing your training programs from the workers' side of the classroom. Listening to what motivates workers and using the most effective ways to communicate valuable knowledge and skills can help you improve your hearing conservation training and ensure that your workers don't endanger their hearing while they're on the job. ■