

Hearing loss among miners and measures to protect hearing

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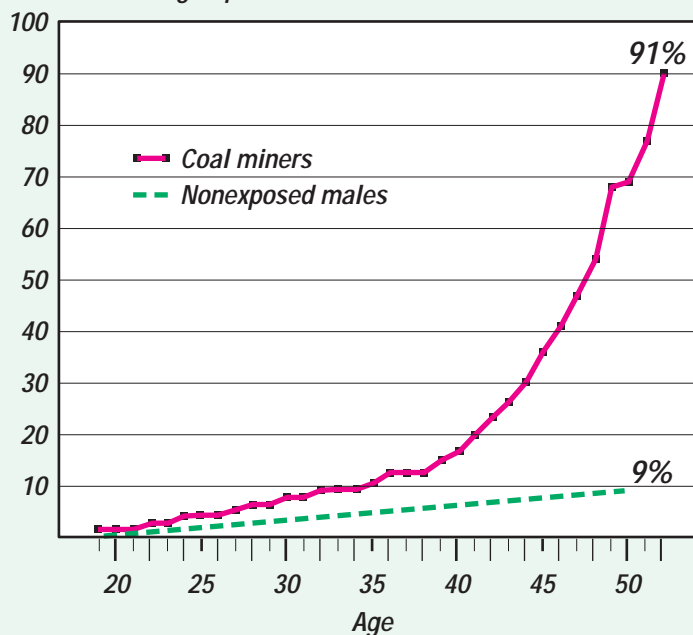
Everyone knows that mining is a noisy job, but did you know that you are nine times more likely to lose your hearing than someone who works in a quieter job? If unprotected from noise on the job, by age 50, you will probably need hearing aids. Obviously, the best solution is to engineer out the noise, but that isn't always immediately possible. Until mines are quieter, one way you can help save your vital sense of hearing is to use hearing protectors whenever the noise around you is hazardous. Even if you already have some hearing loss, you can use hearing protectors to prevent your hearing from getting worse. **When loud noise is present, proper use of hearing protectors will help miners prevent most or all noise-induced hearing loss.**

The tools and machines that miners use are noisy enough to cause most miners to lose some or much of their hearing. NIOSH analyzed hearing tests from a large sample of coal miners. This chart shows that by age 30, coal miners have about as much permanent hearing loss as a healthy, non-noise exposed male worker will have at age 50. This chart also shows that coal miners' hearing loss continues to get worse. If current trends continue, by the time the average coal miner retires, 9 out of 10 will have a serious hearing handicap. Other types of mining (surface, metal/nonmetal, etc.) require noisy tasks that are equally hazardous to hearing.

Both employers and miners, working together, can take steps to reduce the risk of permanent hearing loss.

Figure 1.—Percent of males with hearing impairment: male coal miners vs. general population of non-noise exposed males

Percent with hearing impairment



Engineering controls should be the number one priority in the battle to eliminate hazardous noise.

When replacing or upgrading equipment, mine owners and operators should “buy quiet” whenever possible. In many situations, sound barriers, sound dampening material, enclosed cabs, or other noise controls can reduce miners’ exposure to noise. But, if engineering controls have not eliminated the noise hazard, then employers should provide hearing protectors that meet the special needs of miners for: (1) comfort, (2) convenience, and (3) usability in a mining environment. Employers should provide training to miners on how to select and wear a variety of hearing protectors, and miners

should make a conscientious effort to use the devices effectively.

Miners need to know that hearing protectors can safely be worn in a mine along with other safety equipment. In fact, sometimes hearing protectors can actually help miners hear warning signals, alarms, and speech by muffling the level of continuous background noise. Miners should also be assured that properly worn earplugs will not damage their ear canals or eardrums. If the job requires miners to talk with one another, hearing protectors with built-in communication circuits are available. New protectors with active circuits that muffle background noise while amplifying nearby speech are available. These may be especially useful in a mining environment where the

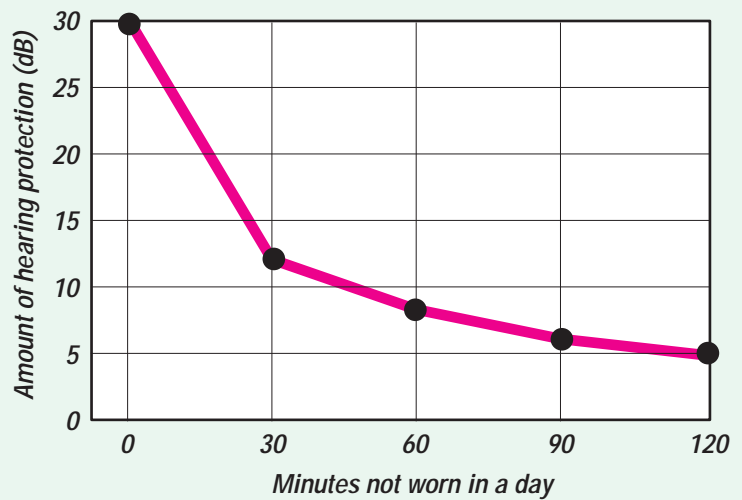
4

noise is intermittent. Some of these electronic devices may not yet be approved for underground mining, but are already in use for above ground mining and heavy construction.

Picking a hearing protector is like trying on shoes: no single device will suit everyone. NIOSH has published a booklet that lists over 50 manufacturers and nearly 250 different hearing protectors including many types of earplugs, earmuffs, and banded canal inserts. Employers can help by making a variety of these devices available. Miners need to keep trying hearing protectors until they find one that they are willing to wear. The single leading cause of hearing loss among miners exposed to hazardous noise is failure to wear hearing protection **every time** and **all of the time** that they are working in hazardous noise.

Figure 1 shows the surprising drop in the amount of *effective* protection you will get from your hearing protector if you don't wear it 100% of the time you are in hazardous noise. For this example, let's assume you work in hazardous noise for an entire 8 hour shift. Let's say you take your hearing protector off a few minutes here, and a few minutes there so that you actually wear your hearing protector 7 hours out of the noisy 8-hour day. Because of

Figure 2.—Effect of **NOT** wearing your hearing protector in noise



the way your ear interacts with noise, this would result in a loss of **almost 75%** of the hearing protector's *effective* protection! In this example, a person who was exposed to a time-weighted average noise level of 95 decibels might think that an earplug with a Noise Reduction Rating (NRR) of 30 would provide plenty of protection. But, because the earplug was not worn 100% of the time the worker was in hazardous noise, its *effective* NRR was only about 8 decibels. As a result, this person's noise exposure will be much worse than they thought: 87 decibels,

instead of 65 decibels. Exposure to 87 decibels doesn't sound like a lot, but research has shown that over time, even this much noise exposure can cause permanent hearing loss in many people. Remember—you might think that by wearing an earplug *most* of the time, you will be fully protected from hazardous noise. But as Figure 2 shows, you need to wear hearing protection consistently **whenever** the noise is hazardous. This is actually not very different from the need to wear welders' goggles whenever welding, and not just "most of the time".

What about hearing roof noises?

Many underground miners share a concern about being able to hear noises that indicate a roof fall may be about to occur. Miners may assume that if they are wearing hearing protectors, they will not be able to hear these roof noises. Because of the importance of this issue, it has been carefully studied both in the United States as well as in Australia. We now know that:

(1) The machinery used in mining operations is loud enough to cover up the sounds made by the roof working ... "roof-talk".

(2) Wearing hearing protectors while noisy machinery is in use does **NOT** affect whether or not a miner hears roof noises.

In other words, miners can't hear roof noises during mining operations because the machinery "drowns out" the roof noises, not because hearing protectors "block out" roof noises. When loud noise is not present, naturally, there is no need to wear hearing protection.

If miners want to be able to hear the roof working, it is very important for them to wear their hearing protectors every time they are in hazardous noise. This will prevent

miners from developing both temporary and permanent hearing loss. Either of these types of hearing losses will interfere with miners ability to hear **ALL** kinds of sounds—including roof noises.

Miners who have not protected their hearing may have enough temporary or permanent hearing loss to interfere with their ability to hear roof noises—even in quiet. Miners who **have protected their hearing** will have the advantage! They will be most able to hear roof noises and take appropriate [evasive] action

How can you tell when noise is loud enough to hurt you?

There are two rules of thumb:

#1. If you have to shout to be heard from three feet away, and



#2. If your ears are ringing or feel stuffed up after you leave a noisy area,



Then, the noise is hazardous and hearing protectors should be worn.

REMEMBER:
Almost all miners would keep almost all their hearing...

IF
they wore almost ANY hearing protector EVERY time they were in hazardous noise.

How can you learn more about noise control, hearing protectors, and preventing occupational hearing loss?

There are many sources of information from government agencies (particularly MSHA and NIOSH), universities that study mining issues,

and private industry. Two NIOSH documents may be particularly useful:

*NIOSH has published a booklet, **The NIOSH Compendium of Hearing Protection Devices** (DHHS, NIOSH publication No. 95-105) that lists nearly every manufacturer and type of hearing protector sold in the United States. Information is provided about 78 earmuffs, 30 hard-hat-mounted earmuffs, 86 earplugs and 17 semi-aural devices (sometimes referred to as ear canal caps or semi-inserts).*

*NIOSH has also developed a general guide for workers and employers that describes how to start an effective hearing loss prevention program, **Preventing Occupational Hearing Loss—A Practical Guide**, (DHHS, NIOSH publication No. 96-110). This guide also includes information about training materials and sources of further information.*

*For a free copy of either of these documents, or to talk to someone about protecting hearing please call toll free: **1-800-35-NIOSH***

*When free copies are exhausted, additional copies of these documents can be purchased by contacting the **National Technical Information Service (NTIS)**, 5285 Port Royal Road, Springfield, VA 22161 phone: (703) 487-4650*

The authors wish to acknowledge Dr. John Franks for the figure comparing hearing impairment between coal miners and non-noise exposed males, and Dr. Fredrik Lindgren for providing the data for the figure used to describe the effect of not wearing your hearing protector.

FIND A PROTECTOR YOU LIKE AND WEAR IT!

Miners memorial to be dedicated at Twin Falls

A memorial honoring coal miners was dedicated at the Twin Falls Resort State Park Lodge.

Coal miners who have been killed in mining accidents and those who have died from work related diseases or as a result of work-related activities will be honored.

The memorial is a joint effort of the United Mine Workers of America, Wyoming County Commission, and the state of West Virginia.

Guests included UMW President Cecil Roberts, Rep. Nick Rahall, UMW District 17 President Robert Phalen, state Sens. Billy Wayne Bailey Jr. and

Bill Wooton, and Dels. Joe Sparks and Rick Staton, according to spokesman Harold Hayden.

Twin Falls is located on state Route 97 between Pineville and Mullens.

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