MODULE 1-14 HEARING CONSERVATION AND SAFETY

Over 15 Million Americans Have Hearing Losses

We take good hearing for granted. Yet over 10 million Americans have measurable hearing losses.

Without our hearing, we can miss much of what goes on in the world. A bird's song... a child's laughter... a shouted warning.

Problems with our hearing can also affect our ability to do our jobs. If we can't hear instructions... or take part in important discussions... we will have a difficult time being effective.

One of the problems in dealing with hearing loss is that it is often a gradual thing. This is one of the reasons that we often don't notice hearing problems when they first occur.

Many things can damage our hearing. Because it is so valuable, we need to protect ourselves from excessive noise and other hazards. In short, we need to learn as much as possible about hearing conservation and safety.

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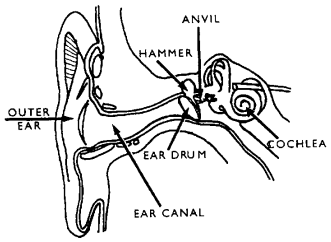
The Ear Is A Complex Mechanism

The ear is a complex and fragile organ. It is easy for something to go wrong. To understand how our hearing can be damaged, we need to know how our ears work.

Sound sends out vibrations, or "pressure waves". The outer ear funnels these waves to the ear canal, which moves them on to the ear drum.

The ear drum vibrates when sound waves hit it. This vibration is passed on to three small bones in the middle ear, which in turn pass the vibrations on to fluid in the cochlea.

Thousands of tiny hair-like cells then change the waves into electrical impulses, which are then sent to the brain to be interpreted.



The most frequent hearing losses involve damage to the hair-like cells. This damage can occur for several reasons:

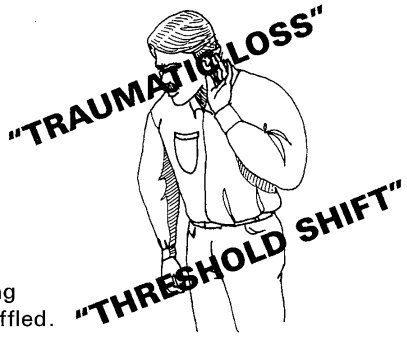
- Physical injury.
- Sickness.
- Loud noise.

Noise Can Affect Our Hearing In Several Ways

There are several ways loud noise can be harmful. One of the most common is by causing "threshold shift". Threshold shift normally is a result of being exposed to harmful noise levels over a prolonged period of time.

Threshold shift manifests itself in several ways:

- Losing the ability to hear soft sounds.
- Losing the ability to hear sounds in all frequencies.
- Sounds seeming "distant" or muffled.



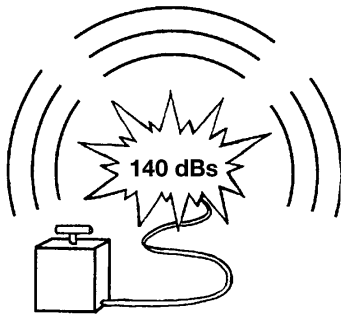
Threshold shift can be temporary or permanent. If it is temporary, normal hearing usually will return within several hours.

A single exposure to extreme noise can also be extremely harmful. This can result in what is called "traumatic" hearing loss.

With traumatic loss, the characteristics of the harmful sound (loudness, frequency and duration) will determine the extent of the damage that you suffer.

Loudness, Frequency And "Duration" Can All Be Harmful

A sound's loudness, frequency or duration can each be harmful to our hearing.



For instance, the longer your exposure (duration) to a harmful sound, the greater the chance for hearing damage.

A sound's frequency (also known as "pitch") can also cause significant hearing damage. In this case, the higher the pitch, the greater potential there is for damage.

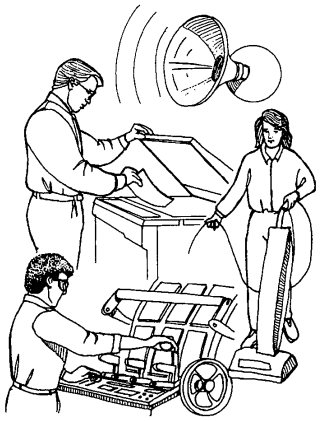
Loudness, also called "intensity", is measured in decibels or dB's. The higher the decibels, the more hazardous the sound.

An eight hour average of 90 decibels requires hearing protection. Some people may have an even lower tolerance to a sound's loudness and should use protective equipment at a much lower dB level.

Our Environment Is Noisier Than We Think

Because we are surrounded by lots of different sounds every day, it's easy to get used to a noisy environment. Often the noise psychologically becomes "background sound" that we don't even "hear".

As a result, we really don't think that the noise is hurting us. But decibel levels can be higher than you think.



Surveys show that there are average noise levels of:

- 40 dB's in office areas.
- 55 dB's at home.
- 75 dB's in busy traffic.
- 90dB's when riding in a convertible.
- Between 105 and 115 dB's at a rock concert.
- 140 dB's for a jet airplane.

It is easy to see that even environments we think of as being relatively quiet generate a great deal of noise... and that many of our work environments exceed the 90 dB level that requires hearing protection.

Your Work Environment May Need To Be Tested

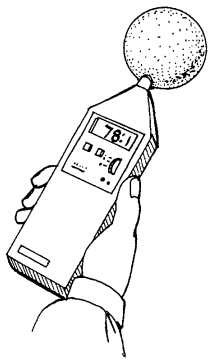
To make sure that your work environment isn't exposing you to harmful noise levels, your facility may conduct "tests" to determine the decibel levels in various areas.

Based on the results of these tests, you and your supervisor can determine whether hearing protection is needed for any of the tasks you perform.

Your facility may also conduct "hearing tests" for those employees who work in areas where high levels of noise may occur. These tests will determine not only how loud a noise has to be before you can hear it, but if you can hear "high" or "low" pitched sounds as well.

You can also apply some rough tests of your own. Ask yourself:

- Is it difficult to hear a normal conversation that is two feet away?
- Do you have "ringing" in your ears when you leave work?
- Is it hard for you to hear your T.V. when it is set on normal volume?



If the answer to any of these questions is yes, you may be being exposed to harmful noise.

Most Hearing Loss Is Only Temporary

Most hearing loss is only temporary. In these cases, the symptoms disappear after a few hours.

But loud noise can have other detrimental effects as well. It can distract your from your work, or cause you to miss important information that one of your coworkers is trying to give you.

The irritation caused by constant noise in your work area can cause real mental stress. You may find yourself jittery and tense, without any reason you can think of.

Fortunately, there are steps you can take to protect yourself against hearing loss and noise's other adverse effects:

- Have your hearing checked annually.
- Recognize situations that can generate harmful noise.
- Learn how to minimize noise hazards once you find them.

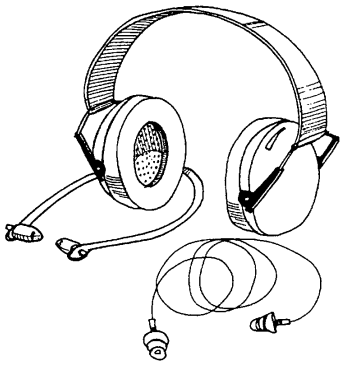
If it is determined that there are noise hazards in your work area that can't be eliminated, your employer will provide you with personal protective equipment that will reduce the noise that reaches your ears.

There Are Several Types Of Hearing Protection

There are several types of hearing protection that you can use. The most popular fall into two categories:

- Ear plugs.
- Earmuffs.

There are a number of reasons that you may want to choose one or the other of these alternatives, depending on your work situation.



Most experts feel that earmuffs are able to reduce decibel levels more than plugs. But muffs can be bulky and uncomfortable at times. Plugs, on the other hand, can be quickly and easily inserted into the ear.

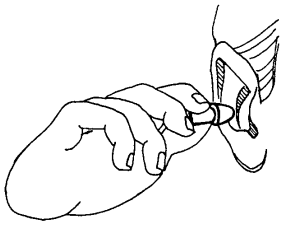
Ear plugs come in two forms... disposable and reusable. Disposable plugs are favored by many workers, since they have no external attachments and can be discarded after use, (this eliminates any clean-up considerations). Reusable plugs have their advantages, too.

You will probably want to try several different forms of ear protection to see which you like best. What you select may vary, depending upon the type of job you are doing at the time.

Disposable Plugs Form To Your Ear's Shape

The reason that disposable plugs are many people's favorite is that they are "formable". You knead them into shape before you insert them. This helps them fit snugly into the ear canal.

Disposable plugs are especially good when you need temporary protection from noise, dirt and grease. If you decide to use disposable plugs, it is important that you know the proper techniques for inserting them into your ears. You should follow these steps:



- Make sure your hands are clean.
- Roll the plug into a tight cylinder shape.
- Pull back the outer part of your ear.
- Insert the plug well into your ear.
- Hold your ear open with your fingers (this gives the plug time to expand).

Once you have inserted plugs in both ears, you should test their effectiveness. You can do this by placing one hand flat over each ear.

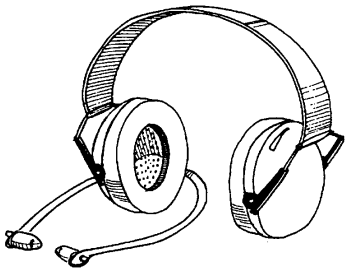
If the plugs are working correctly, the hands should not reduce the noise that you hear to any significant extent.

Reusable Protective Equipment Comes In Several Varieties

There are several varieties of reusable ear protection. Reusable plugs can either be custom molded to your ears' particular shape, or formed to fit the "average" person.

Many reusable plugs have strings or headbands connecting them. This helps to keep them from getting lost, and also indicates to coworkers and supervisors that you have your hearing protection in place.

"Canal caps" are one popular type of reusable plugs. They are connected with a spring-like headband, which creates uniform pressure on each plug. This keeps the plugs firmly in your ears.



"Earmuffs" are also very effective. In fact, many people feel that they are the best hearing protection available. Muffs cover your ears with cushions filled with foam, liquid or air.

Earmuffs are particularly good where there is a danger of dust or dirt working their way into your ears. They are also good for short-term protection, since they are easily taken on and off.

Very Noisy Environments May Require Combining PPE

For very noisy environments you may have to use both ear plugs and earmuffs.

This dual protection is especially needed at noise levels over 100 dB's.

In these cases, disposable ear plugs are usually best, since they have no outside attachments that would make wearing earmuffs difficult.

This is also a consideration when you have to combine other personal protective equipment with earmuffs. For instance, if your job requires wearing safety glasses, you need to make sure that the temples will not break the seal of the earmuffs' cushions.

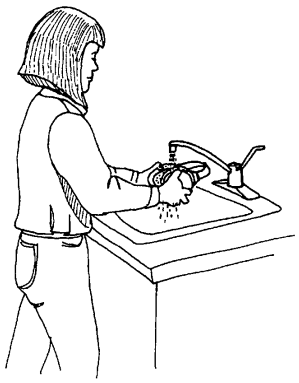
You need to be sure you select the hearing protection that is most appropriate for your work environment. Most equipment is rated according to how many decibels it can block out.

This is called the "Noise Reduction Rating" (NRR). But it's important to realize that these ratings may not be entirely accurate for your work environment. To calculate the amount of protection that you need, consult with your supervisor.

Maintaining Your PPE Is Also Important

Maintaining your protective equipment is also important:

- Always follow the manufacturer's guidelines.
- Wash reusable plugs with a toothbrush in a mild detergent.
- Rinse well, and allow plugs to completely dry on a clean surface.
- Store plugs in their own plastic container.
- Replace plugs with torn flanges or other signs of wear.



Earmuffs are fairly expensive, so you don't want to discard them unless it is absolutely necessary. You should also clean them frequently, following the manufacturer's instructions. Many manufacturers offer replacement cushions if the originals get dirty or discolored and need to be disposed of.

Taking care of your ears themselves is also important. Don't put anything into your ear canal. If your ears get dirty, use a washcloth to clean the outer ear.

Remember . . .

- Hearing damage occurs more frequently than we may think. Over 10,000,000 Americans have measurable hearing losses.
- Noise can harm our hearing in a number of ways... including intensity, frequency and duration.
- Much hearing damage is short-term and can be reversed.
- Our environment is noisier than we think. Many areas have average noise levels that require hearing protection.
- Popular hearing protection includes ear plugs and "earmuffs." Know which is best for you.
- Maintaining your hearing protection equipment can be as important as selecting it.

Your ears are complex and fragile organs... and can be easily harmed. But by learning to recognize noise hazards, and using the proper protective equipment... you can keep them safe and healthy!

QUIZ

1. How many Americans have measurable hearing losses?
   - 100,000
   - 1,000,000
   - 10,000,000

2. Which of the following can cause hearing loss?
   - Disease
   - Loud noise
   - Physical injury

3. True or False... One of the effects of "threshold shift" is losing the ability to hear sounds at all frequencies?
   _____ True _____ False

4. You should wear hearing protection if you are exposed to noise levels that average over how many decibels in an 8 hour day?
   - 65 dB's
   - 90 dB's
   - 105 dB's

5. Which type of equipment is generally thought to provide the best hearing protection?
   - Disposable ear plugs
   - Canal caps
   - Earmuffs

6. Surveys show that the average noise level of traffic on a busy street is:
   - 45 dB's
   - 75 dB's
   - 95 dB's

7. True or False... Many times hearing loss is temporary, and will return in a few hours?
   _____ True _____ False