One Hour Safety Presentation

The main goal of the Division of Safety & Hygiene is the reduction of accidents and illnesses in the workplace. Toward this goal, the One Hour Safety presentation is designed to support the delivery of a presentation to co-workers in your workplace to help them understand and promote safer and healthier work environments. It is recommended that you take the DSH Training Center course as a background for using One Hour Safety Presentation to train others at your workplace. Call 1-800-OHIOBWC, option 2, 2, 2 for class dates and locations.

The One Hour Safety Presentation contains:

- Transparency Masters from which films can be made to use on an overhead projector,
- Instructor Notes which gives the instructor suggestions and script notations to use during the presentation, and
- Student Handouts which can be copied for those attending the presentation.

Materials are included for a one-hour presentation on each of these topics:

- ✓ Accident Analysis
- ✓ Bloodborne Pathogens
- ✓ Effective Safety Teams
- ✓ Enhancing Safety through a Drug-Free Workplace
- ✓ Ergonomics Basic Principles
- ✓ Ergonomics Developing an Effective Process
- ✓ Hazard Communication
- ✓ Lockout/Tagout and Safety-related Work Practices
- ✓ Machine Guarding Basics
- ✓ Measuring Safety Performance
- ✓ Powered Industrial Trucks Training Program
- ✓ Respiratory Protection
- ✓ Violence in the Workplace

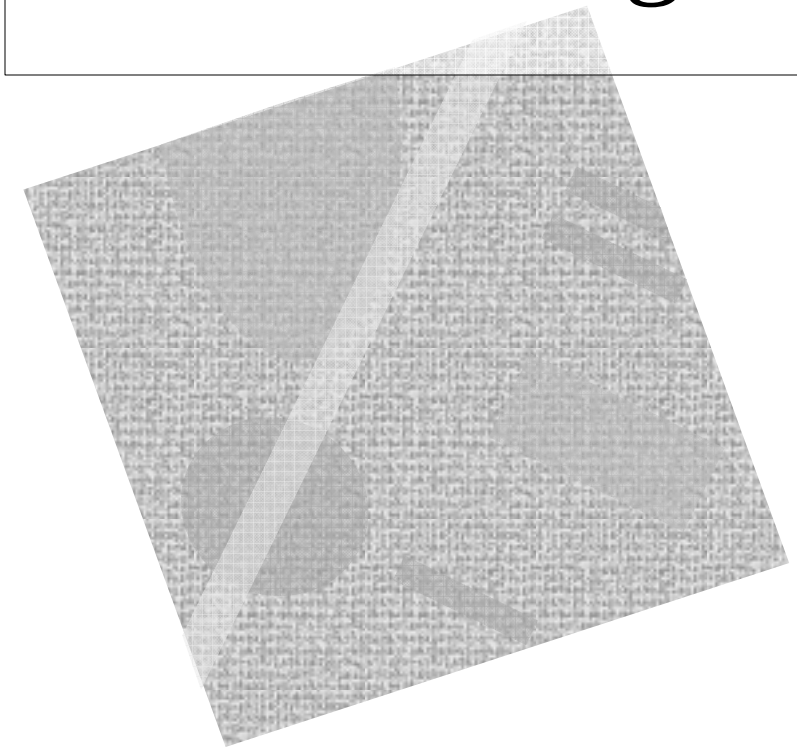
Applications used:

1) Text documents (ending in .txt) can be opened with any word processing program.
2) Microsoft PowerPoint slides (ending in .ppt) can be opened with the Microsoft PowerPoint program. If you do not have PowerPoint and you do have Windows 95, 98, 2000 or Windows NT operating system, you can view the PowerPoint slides by downloading a free PowerPoint Viewer from the following website: http://office.microsoft.com/downloads/default.aspx?Product=PowerPoint&Version=95|97|98|2000|2002&Type=Converter|Viewer
3) Adobe Reader document (ending in .pdf) contains the One Hour Safety Presentation in read-only format. It can be opened when you download Adobe Reader, which is available free of charge at the following website: http://www.adobe.com/products/acrobat/readstep2.html

If you have comments or questions about these materials for One Hour Safety Presentation, please e-mail us: OCOSHTrng@bwc.state.oh.us

Transparency Masters

Hearing Conservation



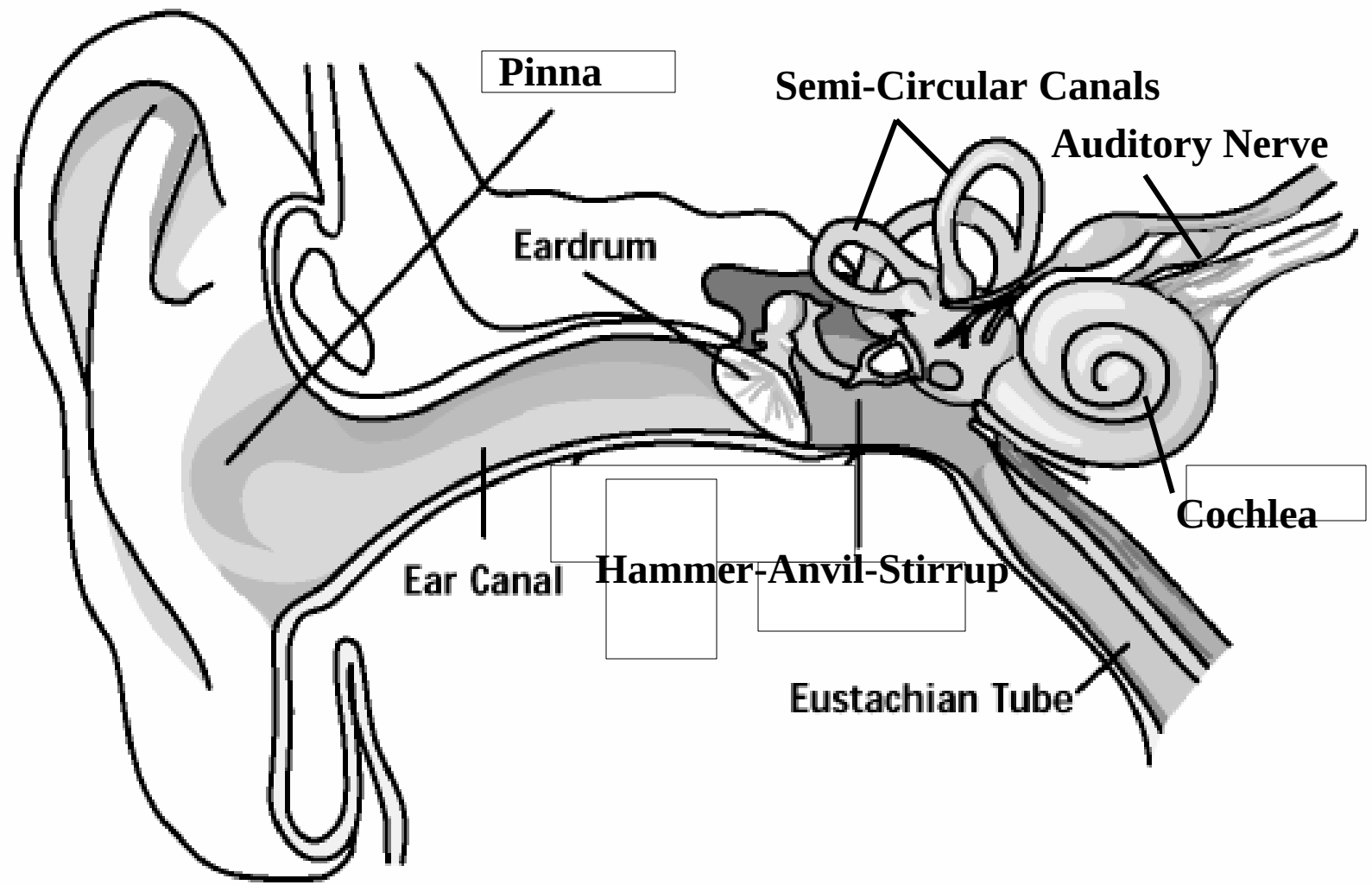
and

Noise Control

WHY??????

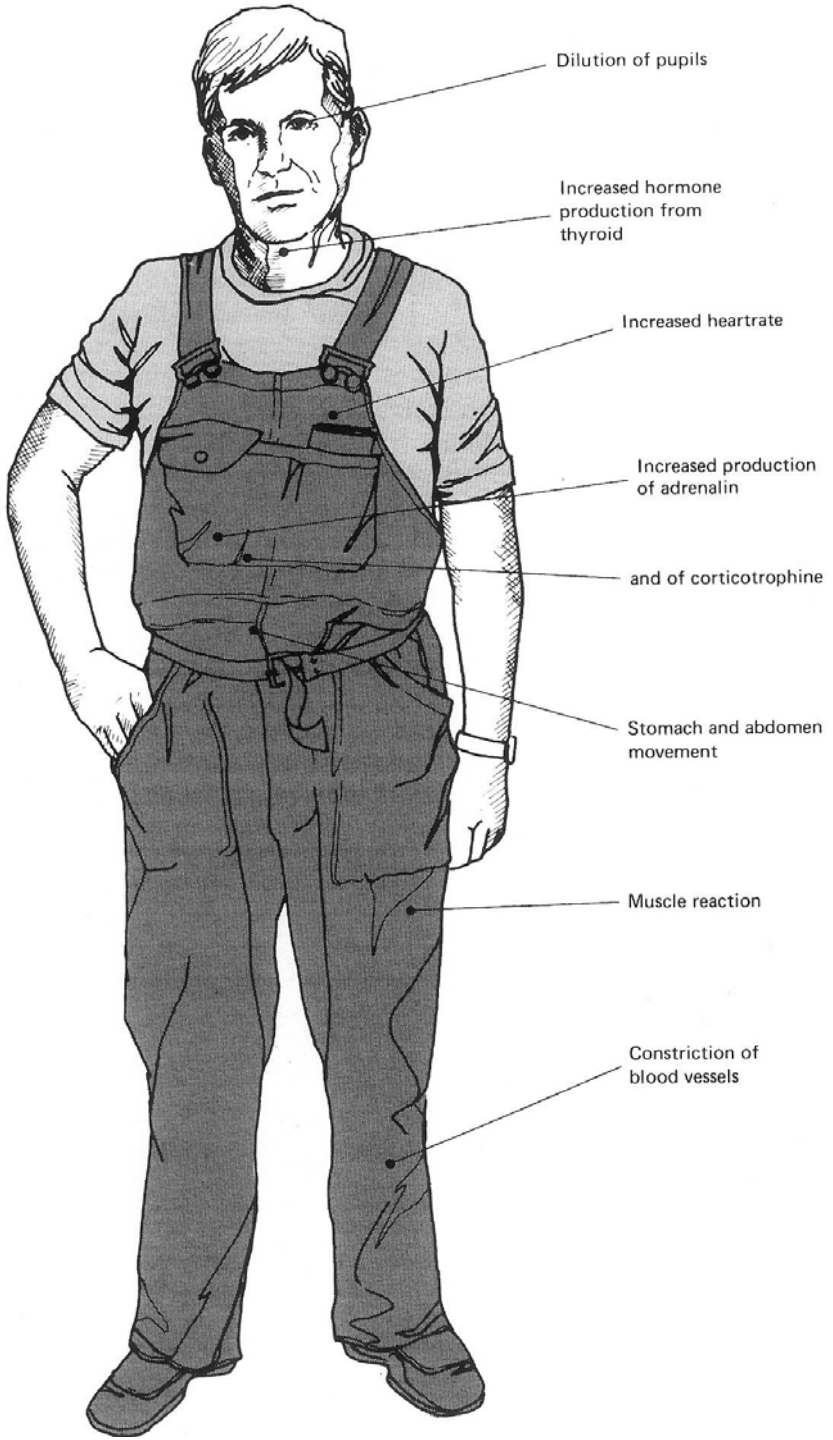
- It’s the LAW
- Quality of Life
- Gradual / Painless

Anatomy of the Ear



Types of Hearing Loss

- Conductive
- Central
- Sensorineural


Dilution of pupils
Increased hormone production from thyroid
Increased heartrate
Increased production of adrenalin
and of corticotrophine
Stomach and abdomen movement
Muscle reaction
Constriction of blood vessels

Degree of Risk

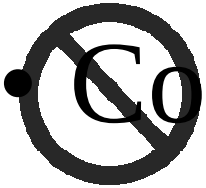
- Frequency
- Intensity
- Duration
- Individual Variability

How Loud is Loud?

- Jet engine 140 db
- Threshold of Pain 125 db
- Pneumatic hammer 110 db
- Compressed Air 105+ db
- Punch Press 95 db
- Lawn Mower 90 db
- Conversation 65 db

Personal Protective Equipment

advantages / disadvantages

- 
  Cotton Balls
- Canal Blockers
- Ear Muffs
- Ear Plugs
- NRRs (example on next page)

NRRs

- EPA protocol
- For “A” scale measurements NRR – 7

Noise exposure 92 dBA

Manufacturer’s NRR 32

32 – 7 = 25 (effective noise exposure reduction)

92 – 25 = 67 dBA

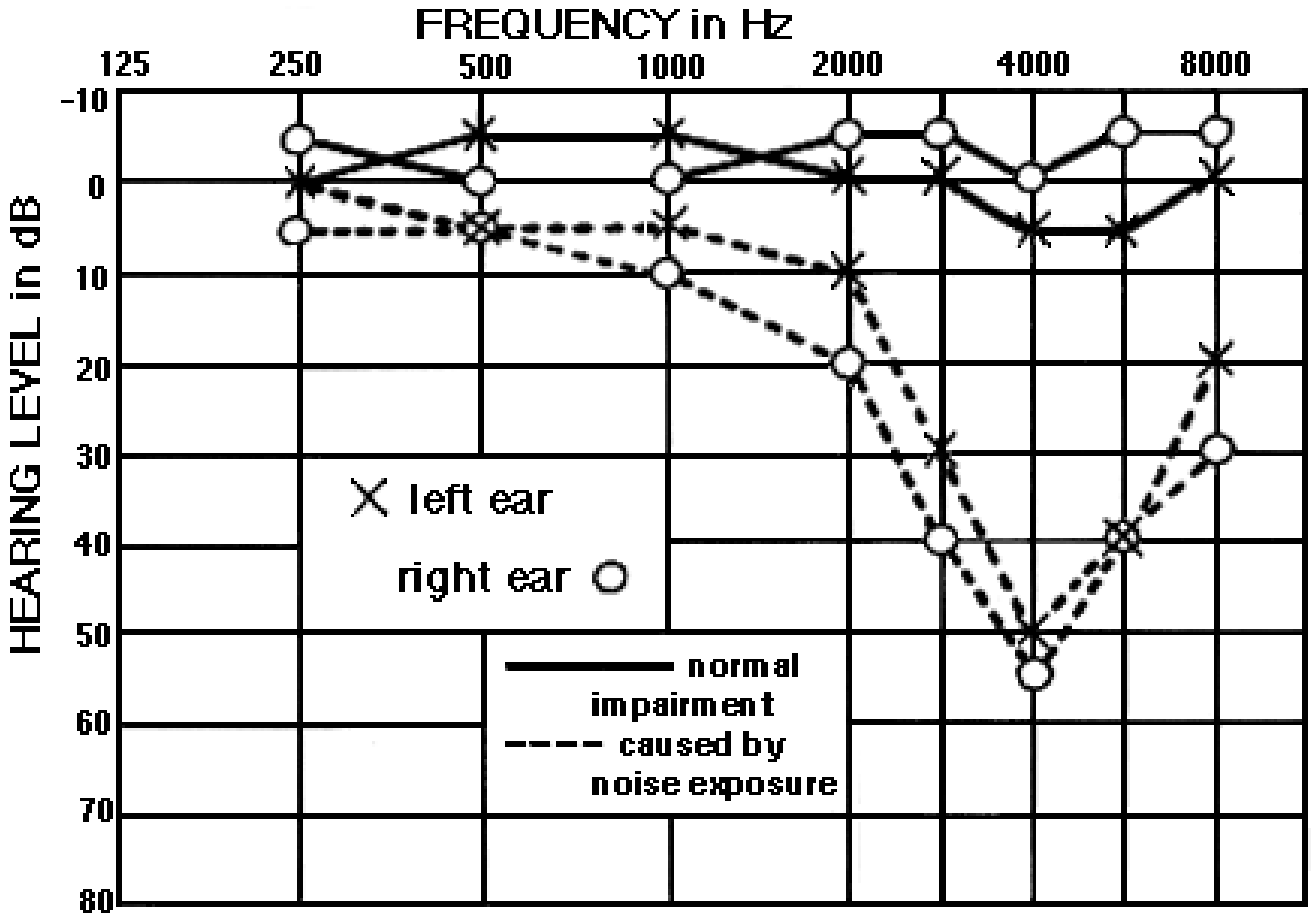
Exposure Limits

- ACGIH — 85 dBA
- NIOSH — 85 dBA
- OSHA — 84🡻 dBA
  85 - 89 dBA
  90 dBA

Noise Monitoring

- Required by the OSHA standard to identify all noise above 80 dBA
- Monitoring must be performed whenever there is an increase in production or equipment is added that could increase the noise level

Audiograms


FREQUENCY in Hz
125
250
500
1000
2000
4000
8000
HEARING LEVEL in dB
-10
0
10
20
30
40
50
60
70
80
left ear
right ear
normal
impairment
caused by
noise exposure

Training requirements

- Annual Training
- Hearing Conservation Elements
- Hearing Protectors

Recordkeeping

- Monitoring records
- Audiometric testing records

Noise Control

- Engineering
- Administrative
- Personal Protective Equipment

What we're doing to control noise

- Fill in here what you're company is doing to reduce exposure to noise……..

Instructor Notes

Thank you for your interest in teaching the basics of Noise and Hearing Conservation to your employees and for promoting self-sufficiency on behalf of the Division of Safety & Hygiene.

A few points to keep in mind while teaching this class to your employees.

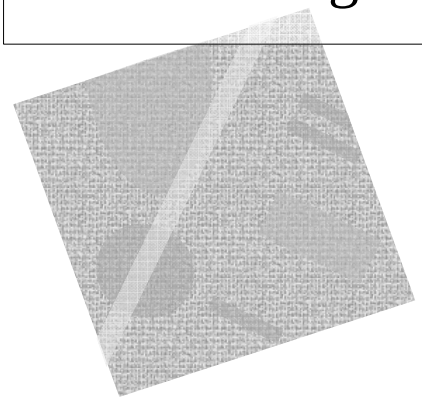
Try to do everything you can to get your students "involved" with the information that you will be presenting. This means using actual work place examples wherever possible. Try to use your own work area noises, your own hearing conservation program, your own types of hearing protection and certainly refer to your company specific procedures when at all possible.

If possible, incorporate some exercises into your training. These exercises might be as simple as reviewing how to properly insert earplugs, or as involved as having people actually measuring noise levels. The key is to get your class involved so that they are not just listening to you lecture.

Encourage questions and repeat questions for clarity to be sure that everyone has heard and understood. Even if you know the answer, a good technique is to ask the class if anyone can answer the question. On questions where you're not sure of the answer or there is disagreement within the class, tell the class that you'll check on it during a break or as soon after the class as possible. Follow-up and make sure everyone gets the information.

Remember, your goal is to teach your employees to be safe and to provide accurate information about noise and hearing conservation and your specific hearing conservation program.

Hearing Conservation



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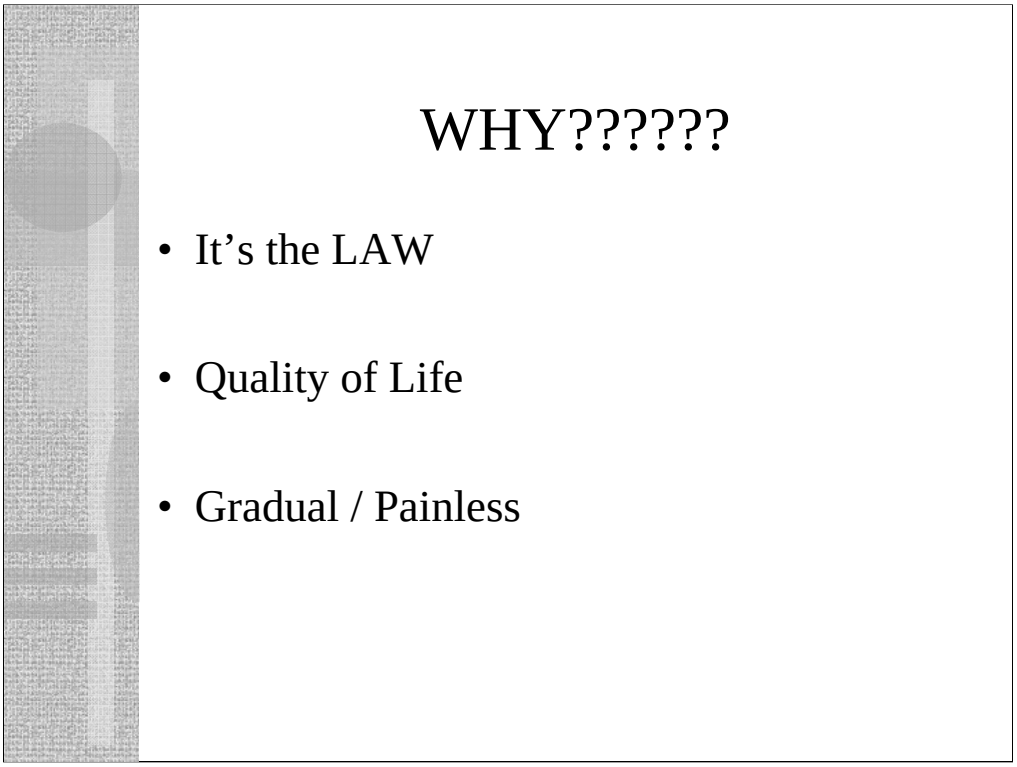
Noise Control

Exposure to noise in the workplace where the noise level, expressed in decibels, exceeds 85 dBA requires the implementation of an effective hearing conservation program. If the noise level is above 90 dBA then requirements to reduce the noise level with noise control devices **must** be performed.

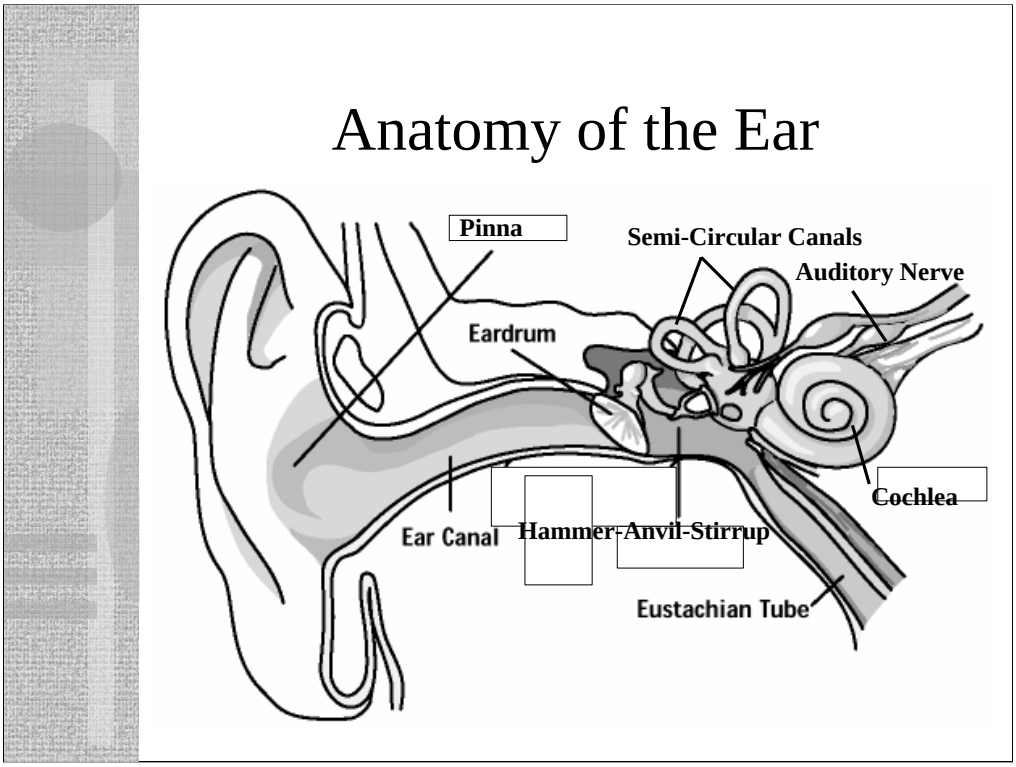


Why have a hearing conservation program?

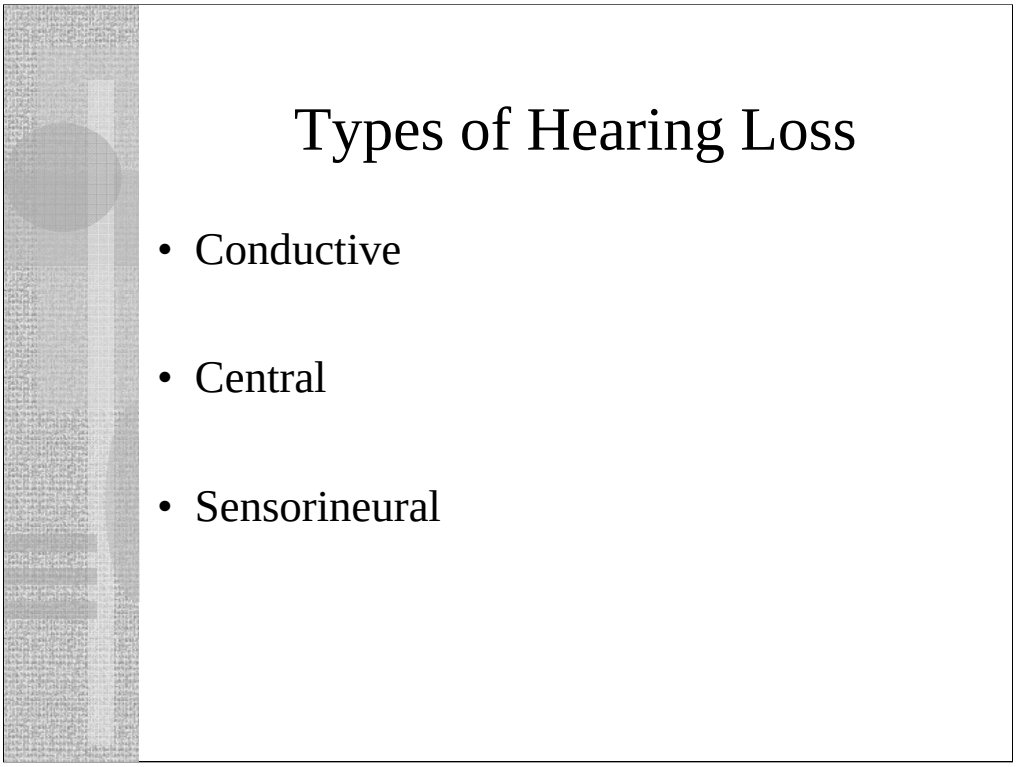
It is required by OSHA regulation 1910.95

Quality of life issues

Most sensroineural hearing loss occurs very gradually and is painless.



The eardrum consists of 3 parts known as the outer ear, the middle ear, and the inner ear. The outer ear consists of the pinna and the ear canal. This part of the ear directs noise into the ear. The middle ear includes the eardrum and occicles (bones of the middle ear). This part of the ear converts the transverse wave into mechanical vibrations. The vibrations are then transferred to the inner ear where the cochlea interprets the mechanical vibrations, converts it to electrical impulses, and sends the message through the auditory nerve to the brain.

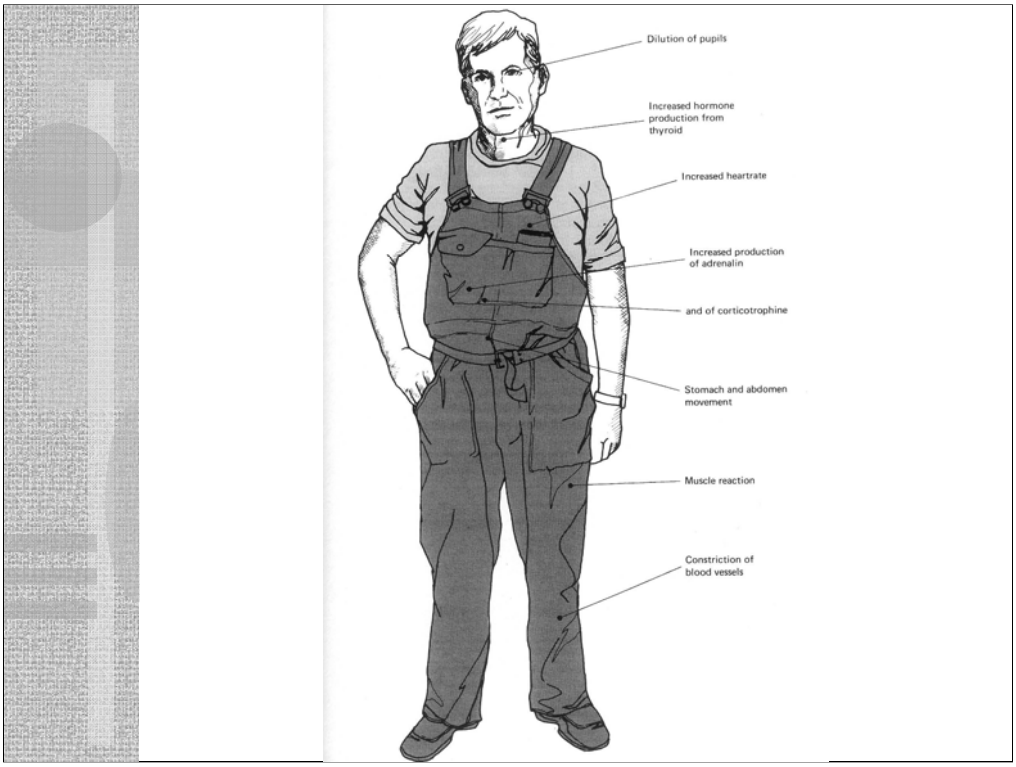


Types of hearing loss;

Conductive occurs in the ear canal, ear drum, ossicles. These can generally be corrected surgically.

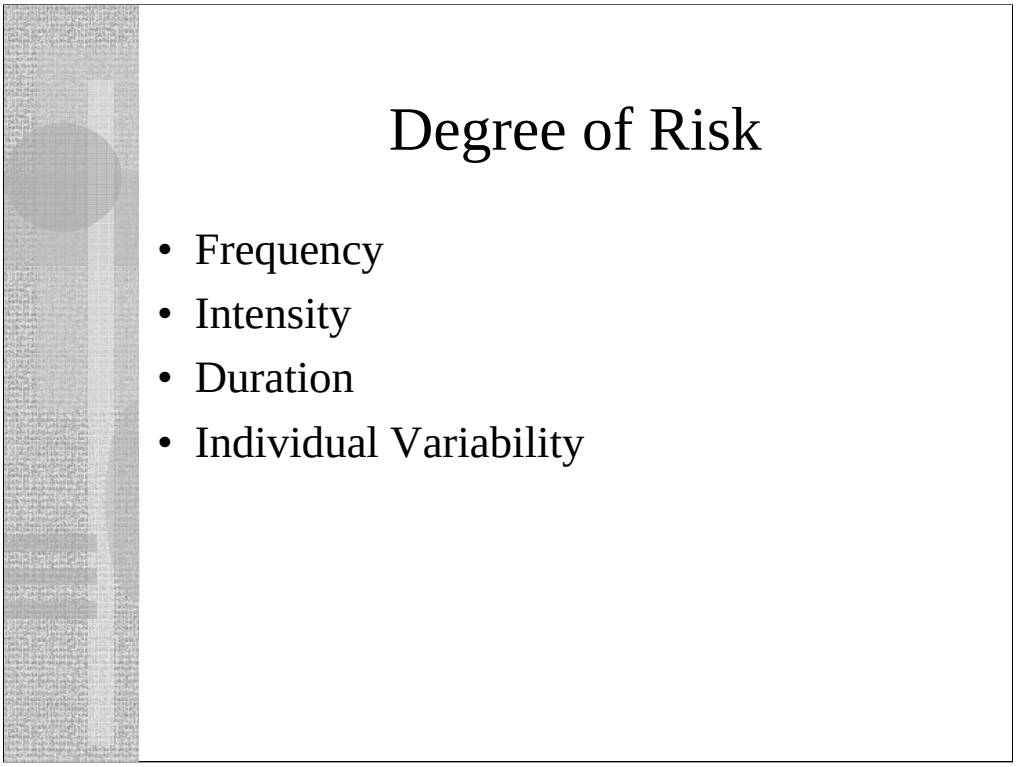
Central hearing loss is damage to auditory nerve.

Sensorineural is NERVE damage that occurs in the cochlea.



Health effects other than hearing loss.

In addition to noise induced hearing loss, noise causes dilution of the pupils, increase in hormone and adrenalin production, increased heart rate, causes the muscles to react, and causes construction of the blood vessels.



Factors influencing hearing loss:

Frequency = how often are workers exposed

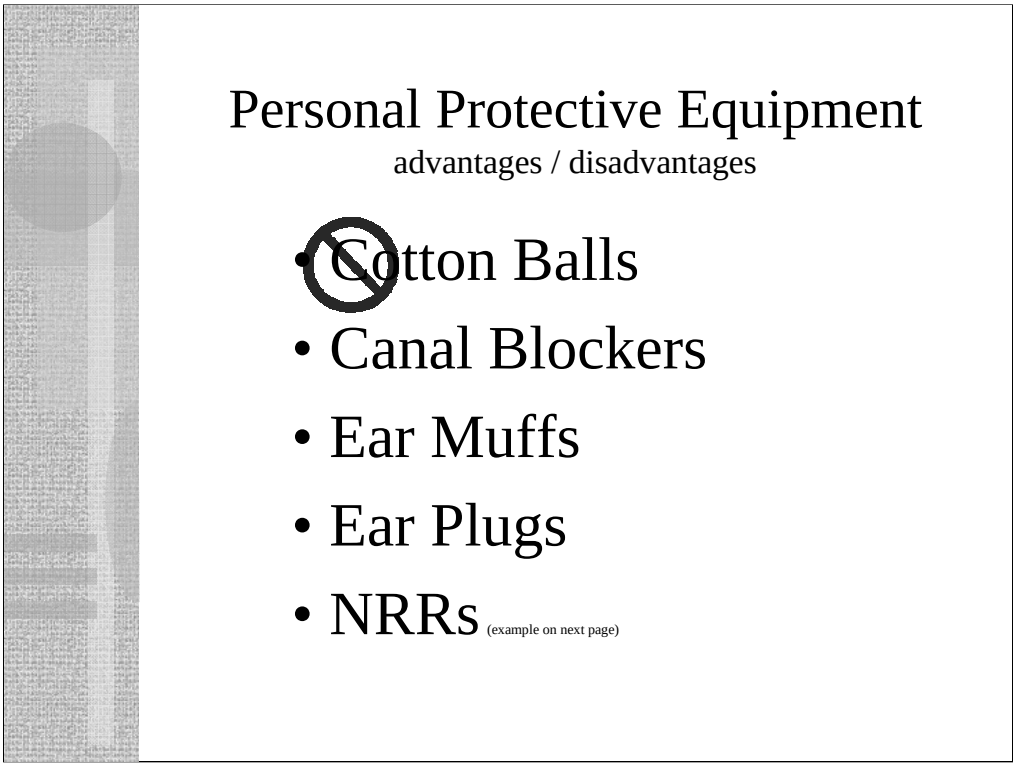
Intensity = how loud is the noise

Duration = how long are workers exposed

Individual Variability = differences in individuals “resistance”

How Loud is Loud?

- Jet engine 140 db
- Threshold of Pain 125 db
- Pneumatic hammer 110 db
- Compressed Air 105+ db
- Punch Press 95 db
- Lawn Mower 90 db
- Conversation 65 db



Types of hearing protectors

Cotton Balls provide NO protection.

Canal Blockers are basically caps like mushroom caps that only cover the opening of the ear canal

Ear muffs

Ear plugs

NRR = Noise Reduction Rating. Must subtract 7 from the manufacturer's NRR if noise is measured on the A scale.

no need to subtract 7 if the noise is measured on the C scale.

The business about dividing by two after subtracting 7 is for two purposes.

1. to yield an indication of "real world" protection factor
2. for engineering control purposes.

NRRs

- EPA protocol
- For “A” scale measurements NRR – 7

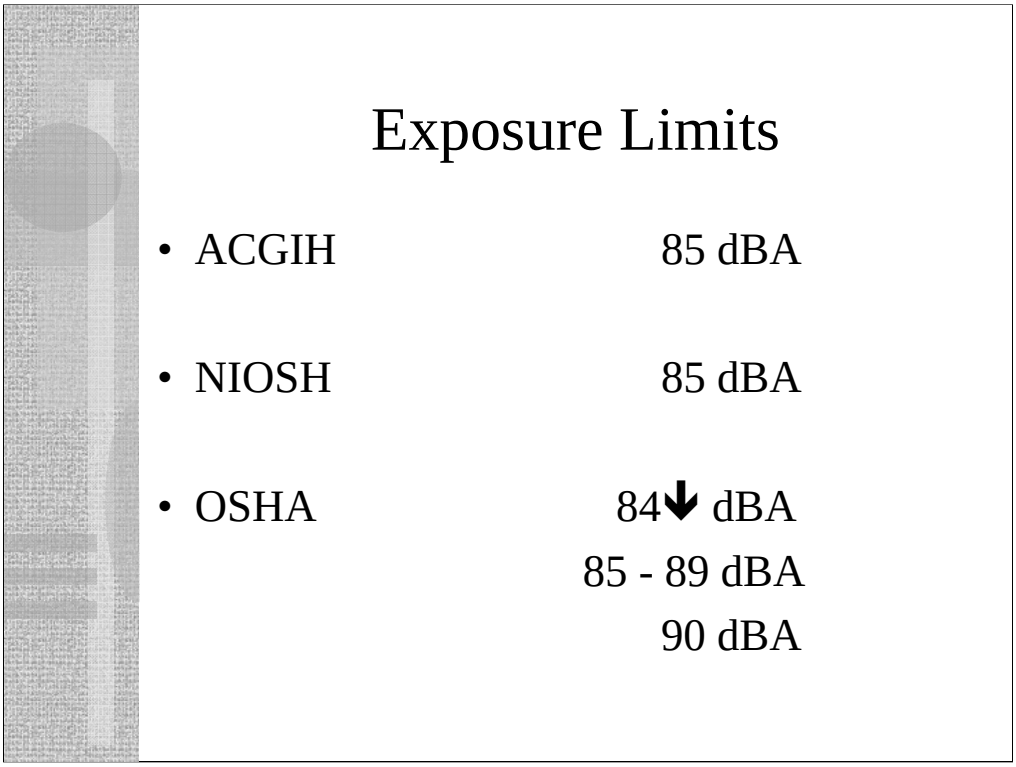
Noise exposure 92 dBA

Manufacturer’s NRR 32

32 – 7 = 25 (effective noise exposure reduction)

92 – 25 = 67 dBA

Briefly work through the example



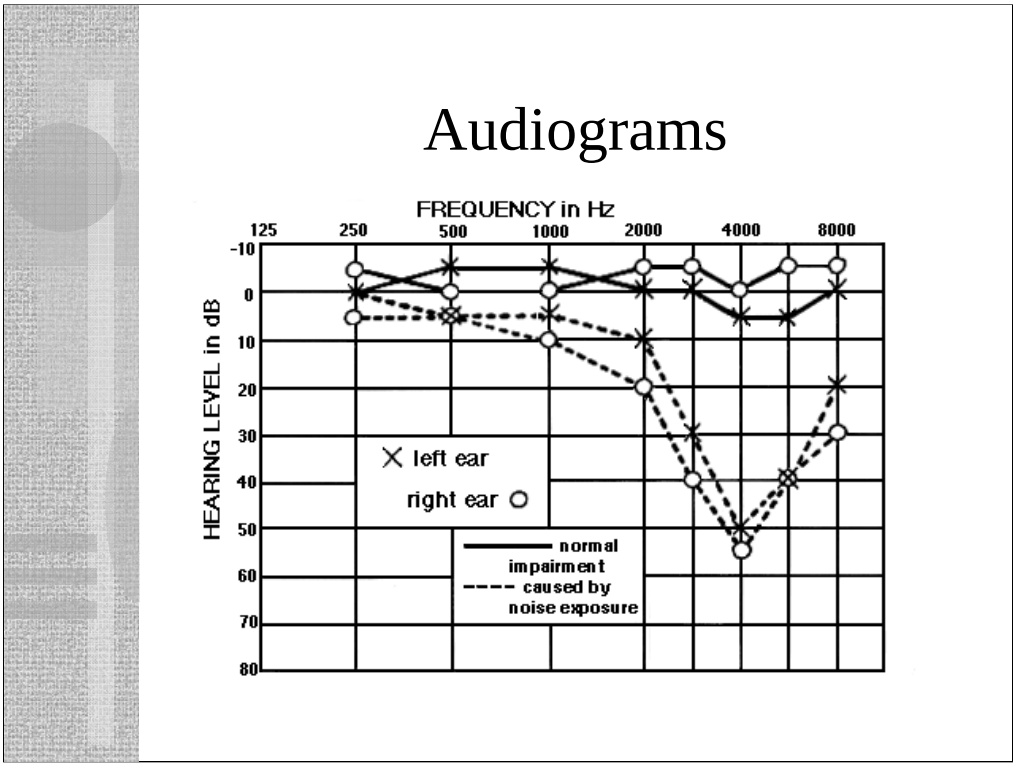
OSHA's Permissible Exposure Limit (PEL) is 90dBA and they added the hearing conservation amendment in 1983 that created an action level at 85 dBA which requires the five basic elements of the hearing conservation program.

The five elements are: monitoring, audiometric testing, hearing protectors, training, and recordkeeping.

NIOSH and ACGIH have updated their respective noise recommended exposure levels and threshold limit values (TLVs) to be more protective of an individual's hearing and their limits are 85 dBA.

Noise Monitoring

- Required by the OSHA standard to identify all noise above 80 dBA
- Monitoring must be performed whenever there is an increase in production or equipment is added that could increase the noise level

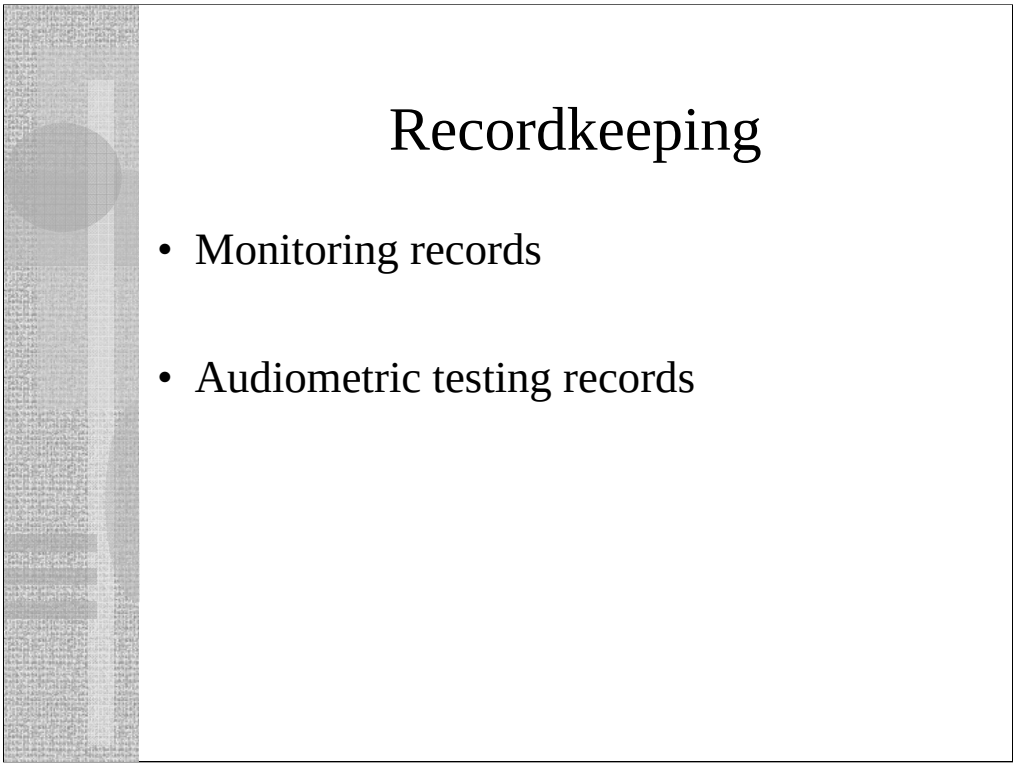


Audiograms are required every year to identify if there has been a loss of hearing. The audiogram above shows two audiograms. The solid line shows a normal result with no hearing loss. The dotted line represents a typical noise induced hearing loss (NIHL). The 4000 Hz notch is readily apparent on all NIHL.

The five elements include, monitoring, audiometric testing, training, hearing protectors, and recordkeeping.

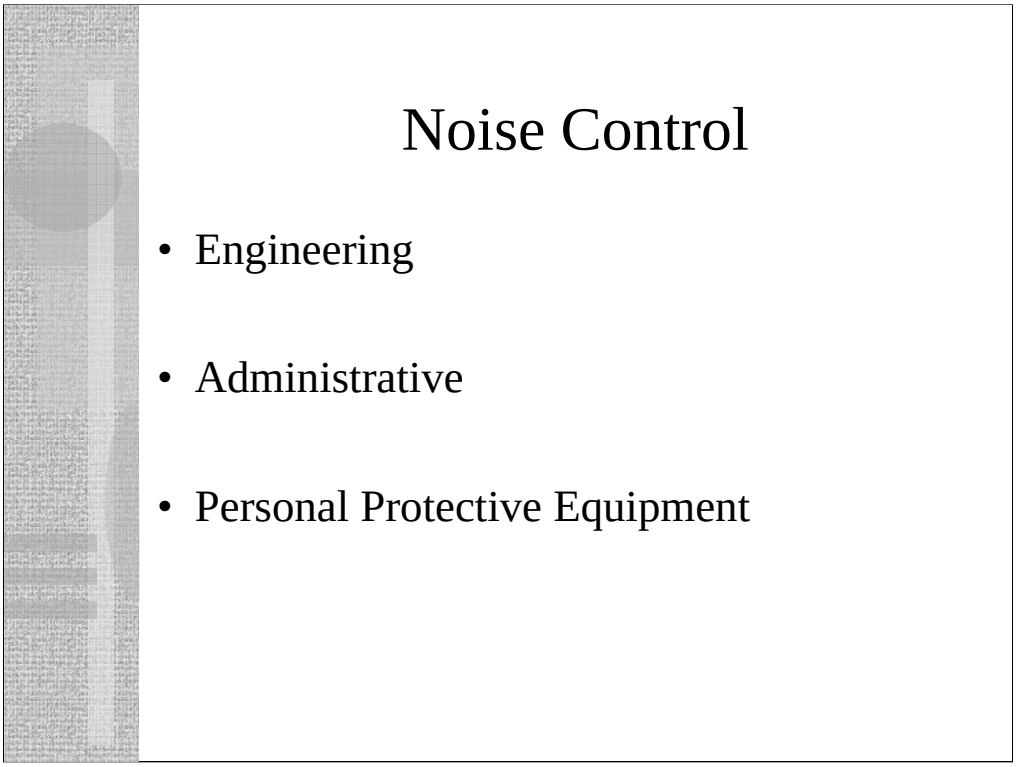
Employees need to understand noise, its effect on your body, and the requirements of the hearing conservation amendment and the protection that it provides to the employees.

Hearing protectors can be insert type, canal caps, or ear muffs. Each of these basic types have several choices as an example insert type includes, foam inserts, plastic inserts, or custom fitted protection. Each has advantages and disadvantages including comfort, fit factor, cleanliness, and cost.



Monitoring records must be kept for two years by the OSHA standard, however, records that indicate actual exposures in the workplace should be maintained and made available as needed (OSHA inspection, change in safety, HR, or administrative personnel).

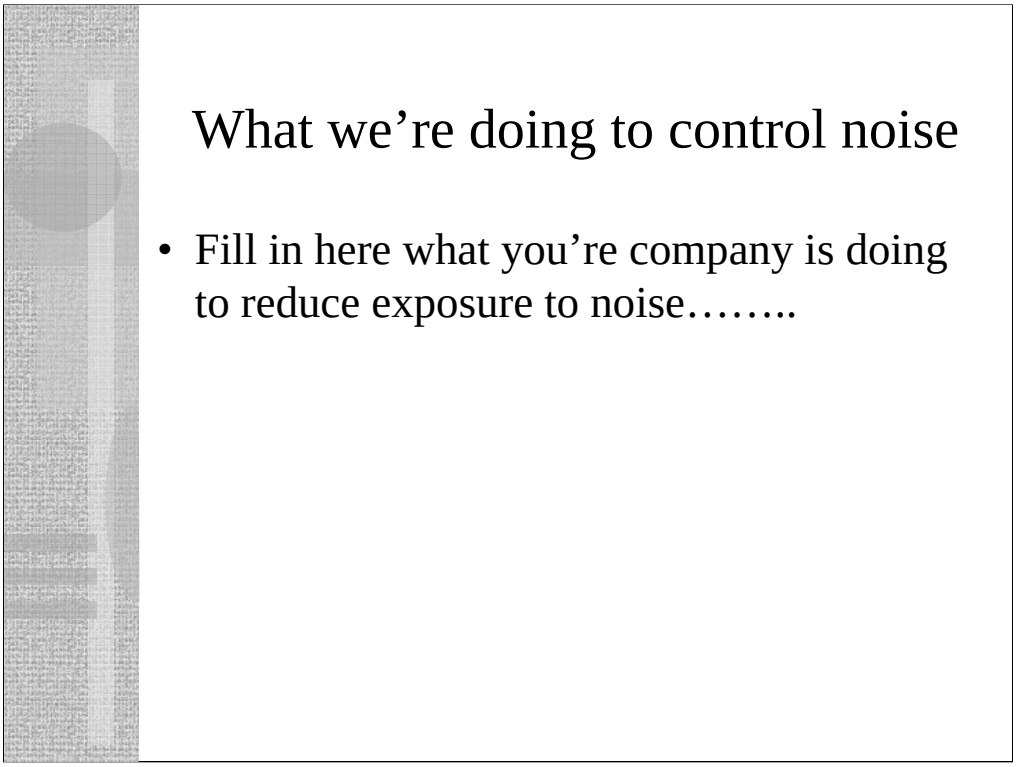
Audiometric testing results must be kept for the period of employment.



If noise levels are above 90dBA, OSHA requires engineering controls to reduce the noise in the workplace. Interpretation of this requirement over the years has identified that if it's economically and technically feasible, noise control needs to be implemented between 90 and 100 dBA. Above 100 dBA, if it's technically feasible then noise control **must** be implemented regardless of cost.

Administrative controls while an option, are not typically used to control noise exposures.

PPE is the control method that is typically used.



Generate discussion about your company’s efforts to reduce noise levels.

Noise and Hearing Conservation
Frequently Asked Questions

Q. What is hearing conservation?

A. Hearing conservation is the concerted effort by employers, medical providers, and state and federal governments to minimize occupational noise-induced hearing loss and the costs associated with it. A comprehensive hearing conservation program includes monitoring, audiometric testing, employee training, hearing protection and record-keeping.

Q. Why is hearing conservation important to my company?

A. Approximately 30 million people in the United States are exposed to hazardous noise in occupational settings. About 10 million people have noise-induced hearing loss, nearly all of which was caused by occupational exposures. Fortunately, the incidence of occupational noise-induced hearing loss can be reduced or eliminated through the successful application of engineering controls and hearing conservation programs.

Q. Am I required by OSHA to have a hearing conservation program?

A. OSHA's hearing conservation program is designed to protect workers with significant occupational noise exposure from suffering material hearing impairment. Employers are required to implement a program for employees who are exposed to noise at or above 85 decibels (dB) averaged over eight working hours, or an eight-hour time weighted average (TWA). That is, employers must monitor all employees whose noise exposure is equivalent to or greater than a noise exposure received in eight hours where the noise level is constantly 85dB.

Q. What is the difference between a baseline and an annual audiogram?

A. The baseline audiogram is the reference audiogram against which future audiograms are compared. Baseline audiograms must be provided within six months of an employee's first exposure at or above an eight-hour time weighted average (TWA) of 85dB.

The annual audiogram identifies deterioration in hearing ability so that protective follow-up measures can be initiated before hearing loss progresses. Annual audiograms must be routinely compared to baseline audiograms to determine whether the audiogram is valid and to determine whether the employee has lost hearing ability. Annual audiograms must be conducted within one year of the baseline.

Q. Who is required to wear hearing protection?

A. Hearing protectors must be available to all workers exposed to eight-hour time weighted average (TWA) noise levels of 85dB or above. With the help of a person who is trained in fitting hearing protectors, employers should determine what size and type of protector is most suitable for their working environment. Employers must re-evaluate the suitability of the employee's current protector whenever there is a change in working conditions that may cause the hearing protector to be inadequate or if a standard threshold shift (STS) has occurred in the worker's hearing.

Q. How long am I required to maintain records?

A. OSHA requires noise exposure measurement records be kept for two years and staff audiometric test results maintained for the duration of employment. NIOSH recommends that noise exposure measurement records and audiometric test results be maintained for the duration of employment plus 30 years.

Q. What is CAOHC?

A. CAOHC, or the Council for Accreditation in Occupational Hearing Conservation, is dedicated to the establishment and maintenance of training standards for those who safeguard hearing in the workplace. CAOHC certification is required for all individuals who provide audiometric testing and offers credibility and also serves as verification that medical providers have been trained to the highest standards.

Q. What is noise?

A. Any disturbing, harmful, or unwanted sound.

Q. What are the different types of noise?

A. Noise can be continuous or steady. Examples include power tools, vehicles, and aircraft. Noise can also be impulsive (banging) such as certain industrial machinery.

Q. Will noise toughen your ears?

A. No! Noise destroys your ability to hear and to understand speech.

Q. When and where can noise impair your hearing?

A. Noise can damage your hearing at work, at home, and during recreational activities. Noise in combination with some chemical exposures can increase hearing damage. For example toluene, lead, carbon monoxide, etc.

Student Handouts

Hearing Conservation

and
Noise Control

WHY??????

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- Quality of Life
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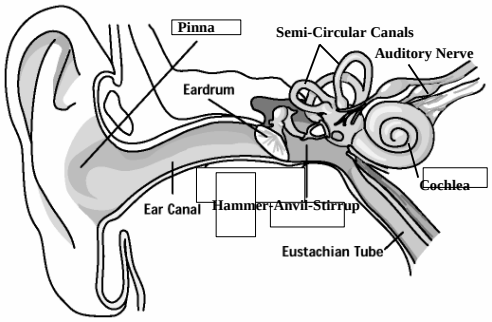

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Personal Protective Equipment

advantages / disadvantages

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- Canal Blockers
- Ear Muffs
- Ear Plugs
- NRRs (example on next page)

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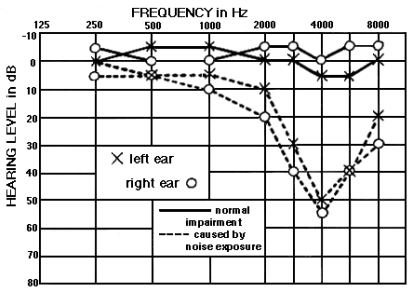

Training requirements

- Annual Training
- Hearing Conservation Elements
- Hearing Protectors

Recordkeeping

- Monitoring records
- Audiometric testing records

Noise Control

- Engineering
- Administrative
- Personal Protective Equipment

What we're doing to control noise

- Fill in here what you're company is doing to reduce exposure to noise……..

Glossary Of Common Terms

ACGIH – The American Conference of Governmental Industrial Hygienists.

Action level – The OSHA action level is an 8-hour time-weighted average of 85 decibels measured on the A-scale, slow response, or equivalently, a dose of fifty percent.

Audiogram - A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

Audiologist - A professional, specializing in the study and rehabilitation of hearing, who is certified by the American Speech-Language-Hearing Association or licensed by a state board of examiners.

Baseline audiogram - The audiogram against which future audiograms are compared.

Criterion sound level - A sound level of 90 decibels per the OSHA standard and 85 decibels is recommended by ACGIH.

Decibel (dB) - Unit of measurement of sound level.

Hertz (Hz) - Unit of measurement of frequency, numerically equal to cycles per second.

Noise dose - The numerical expression of exposure where 100% would be equal to an average exposure of 90 dBA.

Noise dosimeter - An instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a noise dose.

Otolaryngologist - A physician specializing in diagnosis and treatment of disorders of the ear, nose and throat.

Permissible Exposure Limit (PEL) – OSHA's PEL is presently 90 dBA. A time weighted average exposure that must not be exceeded during any 8-hour work shift of a 40-hour work week.

Representative exposure - Measurements of an employee's noise dose or 8-hour time-weighted average sound level that the employers deem to be representative of the exposures of other employees in the workplace.

Sound level – A measured sound pressure level as it relates to a reference pressure level expressed in decibels.

Sound level meter - An instrument for the measurement of sound level.

Standard Threshold Shift (STS) – OSHA uses the term to describe a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear. OSHA uses an STS to trigger additional audiometric testing and follow-up.

Significant Threshold Shift – Used by the National Institute of Occupational Safety and Health (NIOSH) to describe a change of 15 dB or more at any frequency, 500 through 6000 Hz, from baseline levels that is present on an immediate retest in the same ear and at the same frequency.

Threshold limit value (TLV) – A guideline provided by the American Conference of Governmental Industrial Hygienists (ACGIH) to denote the exposure, which when reached or exceeded, may be hazardous. For noise the TLV is 85 dBA.

Time-weighted average (TWA) sound level - That sound level, which if constant over an 8-hour exposure, would result in the same noise dose as is measured.