Calcasieu Mechanical Contractors

HEARING CONSERVATION TRAINING

Six Main Causes Of Hearing Loss

- Heredity
- Infections
- Acoustic Trauma
- Prescription Drugs
- Presbycusis
- Hazardous Noise

So What's The Problem?

1. Noise...too much of it !
2. Noise and sound terms are used interchangeably.
3. Noise, in terms of occupational health is any sound intense enough to damage hearing.

"One person's music can be another's racket".

Noise is a **BIG** problem

- One of the most pervasive occupational health exposures.
- #1 cause of nonfatal health problems in the USA.
- Over 30 million affected with partial or total hearing loss.
- 10 million have suffered irreversible noise induced hearing loss.
- Rate of hearing loss in increasing in US.
- "Sneaky villain"...each repeated over-exposure to hazardous noise sources such as heavy construction equipment, air compressors, chainsaws, skid-steer loaders, water pumps, and the like add to the damage.
- Nerve cells in your ears attempt to repair however repeated exposures will create permanent hearing loss.

What Is Noise?

What is Noise?

- Noise is a physical energy that moves through the air like ripples in a pond
  - noise is directional
  - noise will bounce off walls and other objects

Two Components Of Noise

- Frequency
  - perceived as "pitch"
  - measured in hertz (Hz)
  - human ear most sensitive in the 1,000 to 4,000 range
    - speech frequency ranges
- Intensity
  - perceived as "loudness"
  - measured in decibels (dB)
  - "A" scale mimics the human ear
    - used for noise surveys

Tinnitus

- Hearing loss may not be silent ….
  - Persistent (often or all the time)
    - Ringing, roaring, clicking or hissing sound
  - 12 million Americans have Tinnitus
  - should be evaluated by a Dr.
  - smoking, alcohol & loud noise can make it worse
  - use earplugs whenever exposed to noise

In Addition To Hearing Loss Hazardous Noise Exposure Can...

- Cause increased fatigue
- headaches
- increase the heart rate and blood pressure
- cause muscles to become tense
- cause indigestion
- can lead to impaired balance
- make it more difficult to hear audible warning devices

Noise Induced Hearing Loss…

- Entirely preventable
  - *"People would pay more attention to hearing loss if it caused a lot of physical pain"*

Noisy Hobbies...

- Guns
  - 130 – 140 dBA
- riding motorcycles
  - 90 dBA
- snowmobiles
  - 120 dBA
- Woodworking
  - electric drill = 95 dBA
  - power saw = 110 dBA
  - air tools = 120 dBA
  - belt sander = 93 dBA
- walkman headsets
  - 90 dBA
- rock concerts
  - 140 dBA

Typical Noise Levels...

- pneumatic hand held grinder 101 dBA
- air hammer 105 - 130 dBA
- pavement breaker 114 dBA
- power actuated nail gun 94 - 117 dBA
- portable saw 105 dBA
- air wrench 107 dBA
- Hydraulic post driver 123 dBA
- arc welder 116 dBA
- traffic line grinder 91-101 dBA
- loader - 88 - 91 dBA
- paver 86 - 96 dBA
- snowplow 87 - 97 dBA
- 10 yard truck 76 - 85 dBA

How Do You Know You Are Exposed To Hazardous Noise?

- Feel the need to shout in order to be heard 3 feet away
  - sound levels probably approaching 85 dBA
- If immediately after a period of high noise exposure
  - ringing, buzzing or whistling is noticed
- Equipment is tagged or marked as noise hazardous

How Much Hazardous Noise Can You Be Exposed To?

- OSHA rules
  - 90 dBA averaged over an 8 hr shift
    - requires the use of controls first and then the use of PPE to reduce your exposure
      - earplugs must be used whenever noise is 90 dB +
  - 85 dBA averaged over an 8 hr shift
    - requires your employer to enroll you in a hearing conservation program
      - training
      - hearing tests & follow up
      - Make available and recommend the use of HPDs

What Is A TWA ?
(TWA = time weighted average)

- This is a daily "dose" of noise not a single exposure to a noisy piece of equipment
- Your daily dose of noise (TWA) is a function of:
  - how loud the equipment is (intensity)
  - how close you are to the noise
  - how long you are exposed to the noise

Fundamental Characteristics of Sound

Sound has two fundamental characteristics:

1. Loudness or Intensity – measured in "decibels".
2. Frequency – measured in "Hertz" or cycles per second.

Sound Is Measured In Three Different Ways:

1. Frequency (cycles per second or hertz)
2. Intensity (dbA or dbC)
3. Duration (hours and minutes)

How Is Noise Measured?

- Sound level meter
- Noise dosimeter
- Decibel dB
  Logarithmic scale
  - a 6 decibel increase is double the loudness
- Examples of Noise
  - 20 dBA whispered voice
  - 74 dBA average TV
  - 110 dBA leafblower

Determining Noise Exposures...

There are ***two measuring devices*** used to test amounts of sound in any given situation:

1. Sound Level Meter

- Provides a snapshot
- Provides immediate results
- Measures the noise levels in the immediate area
- Measures loudness in decibels

2. Dosimeter

- Worn by the individual during the day
- Measures the sound near the entrance to the ear
- Measures the amount of noise encountered continuously as the individual goes about the day's work

How Much Is Too Much?

Once sound levels are determined, the figures must be adjusted to arrive at a ***Time-Weighted Average (TWA)**** exposure.

The amount of sound you receive each day depends on three factors:

1. Loudness measured in dBA's;
2. Length (duration) of exposure;
3. Distribution of exposure (the range of noise levels and frequencies);

Prolonged exposure to sound levels greater than

85 decibels

will result in hearing loss.

You don't "get used to" noise...

Noise does not have to be uncomfortably loud to be damaging.

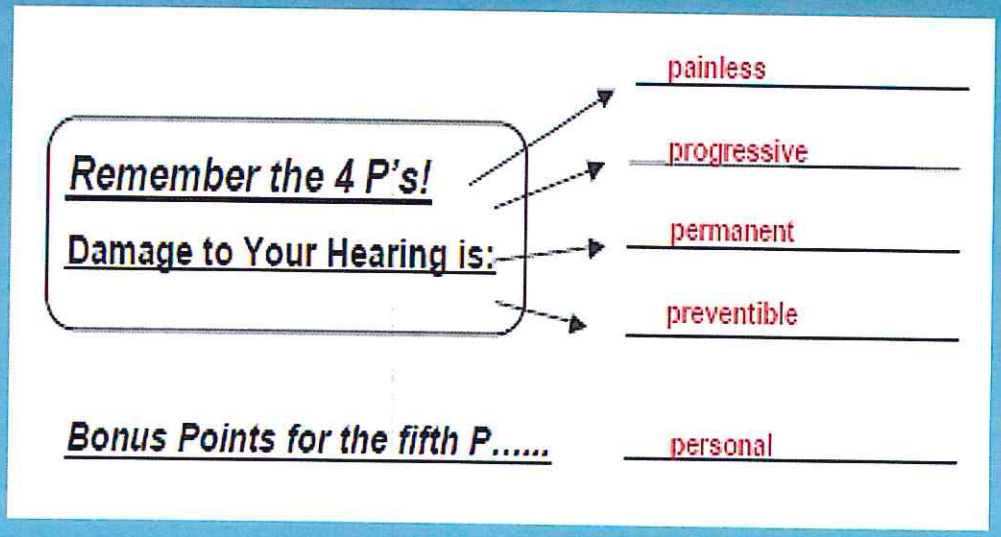
You may even think your ears are "used to" the noise, but what has probably happened is that hearing loss has already begun.

Taking Action For Hearing Health

Why It's important To Act NOW...

Because every day you are exposed to noise, whether it's work-related or a part of your home and recreational environment, some damage is done to your ear's hair cells. It may be gradual, *painless*, and invisible, but.....

the damage is very real, it is *progressive*, and it is ***permanent***.

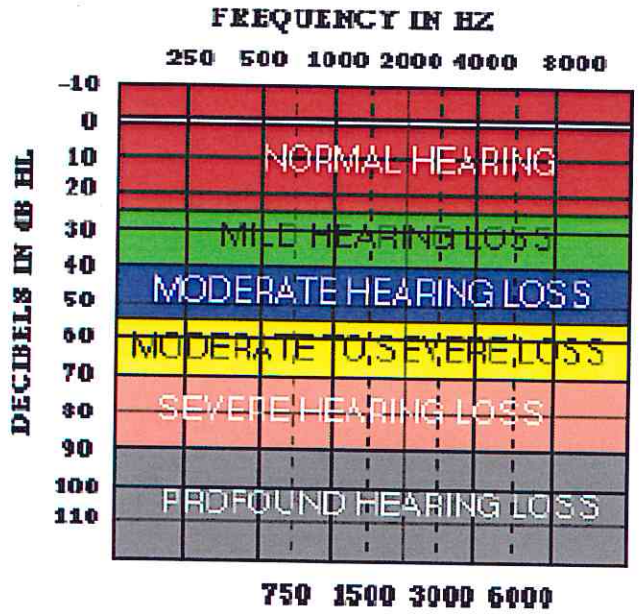


Hearing Conservation

1. Monitor noise levels.
2. Perform audiometric testing.
3. Apply engineering and administrative controls. Utilize personal protective equipment (PPE) as last option.
4. Educate and train affected employees.

Degrees Of Hearing Loss

- Normal 10 - 25 dB
- Mild 30 - 45 dB
- Moderate 50 - 65 dB
- Severe 70 - 85 dB
- Profound 90 dB



Managing Noise Exposure

A. Engineering Controls

a) Generally preferred as a first choice. However, these are a challenge in that there are seldom ready-to-order solutions. They must be tailored to the situation.

b) In many instances it is difficult to achieve even 10dB of noise reduction in a retrofit noise control application.

c) Many such controls require maintenance and periodic adjustment or replacement to remain effective.

d) Works best when coupled with carefully selected **Hearing Protection Devices (HPD's)** and adequate emphasis on training, motivation, supervision and enforcement.

B. Administrative Controls

a) Job Rotation

b) Selective operation of equipment only when needed in the production process

c) Ensuring employees maintain the equipment in good running order

C. Personal Protective Equipment (HPD's)

Employers are required to provide hearing protectors to all employees who meet what requirement? Exposed at or above action level *

Hearing Protector Attenuation *

An employer must evaluate a selected hearing protection device for its ability to **attenuate** or reduce the amount of noise that actually reaches the eardrum. The employee must be provided with whatever combination of protection is required to achieve the following levels:

a) Attenuation to an exposure level of 90dB or less over an 8-hour TWA.

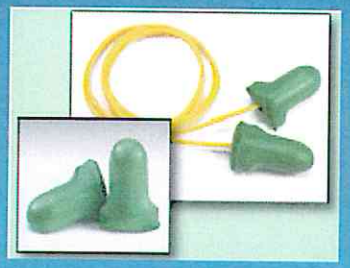
b) For employees with an STS, exposure must be attenuated to an 8-hour TWA of 85dB or less.

Managing Noise Exposure

Some thoughts on selection of "correct" HPD

- A wide variety of plugs, caps and muffs are available to choose from.
- All come with an ***NRR*** rating, what the manufacturer says is this product's

  "Noise Reduction Rating". Don't you believe it!
- In general, you want to select an option with a higher NRR rating but more importantly, one which the employee will ***use.*** If a selected HPD is uncomfortable or difficult to use, an employee will be less likely to use it.



How To Prevent Further Hearing Loss…

- *Identify noise hazardous equipment*
- Put distance between you and the noise source
- *Limit the amount of time you are exposed*
- Modify the noise source so it is quieter
- *Use hearing protection when around loud noise*