Noise-Induced Hearing Loss and Hearing Conservation Session

Introduction to noise-induced hearing loss

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Mining Hearing Loss Prevention Workshop
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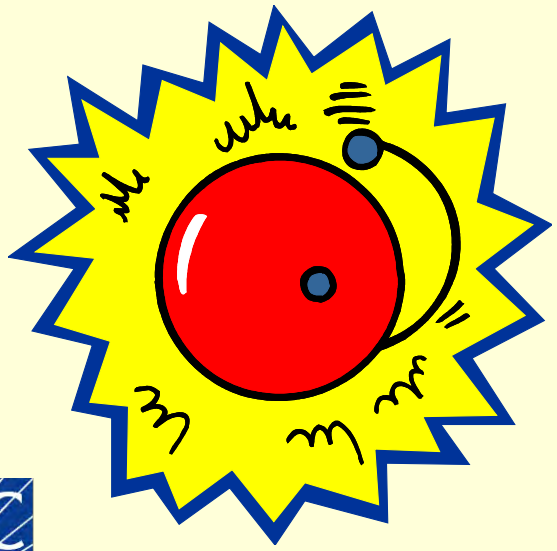
Pittsburgh Research Laboratory

Why Noise is Bad for You

- It causes *permanent* hearing loss



- It makes your ears **ring** all the time

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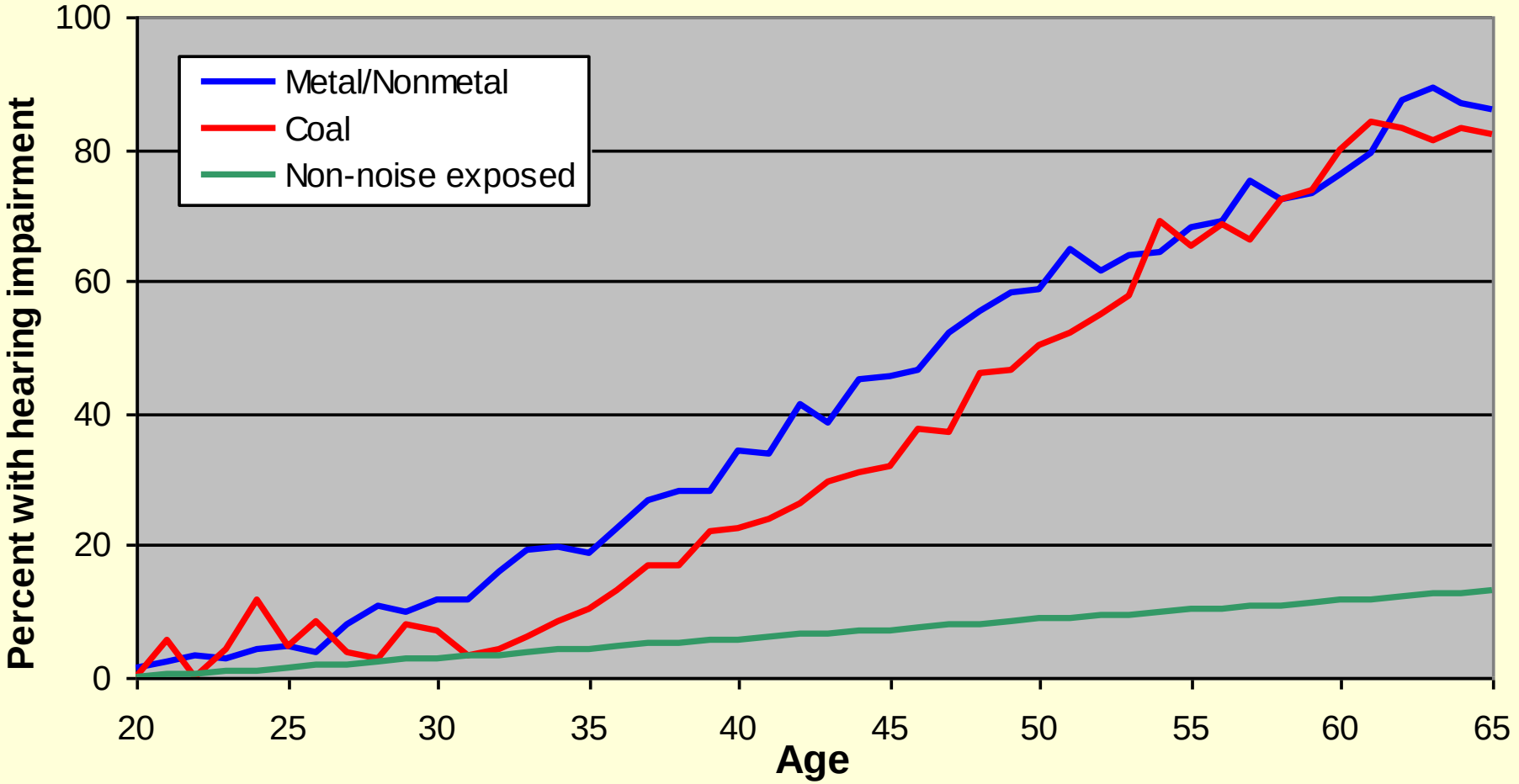
Miners Suffer Higher Rates of Hearing Impairment than Non-exposed Males



Impairment: > 25 decibel hearing loss (averaged over 4 frequencies in each ear)

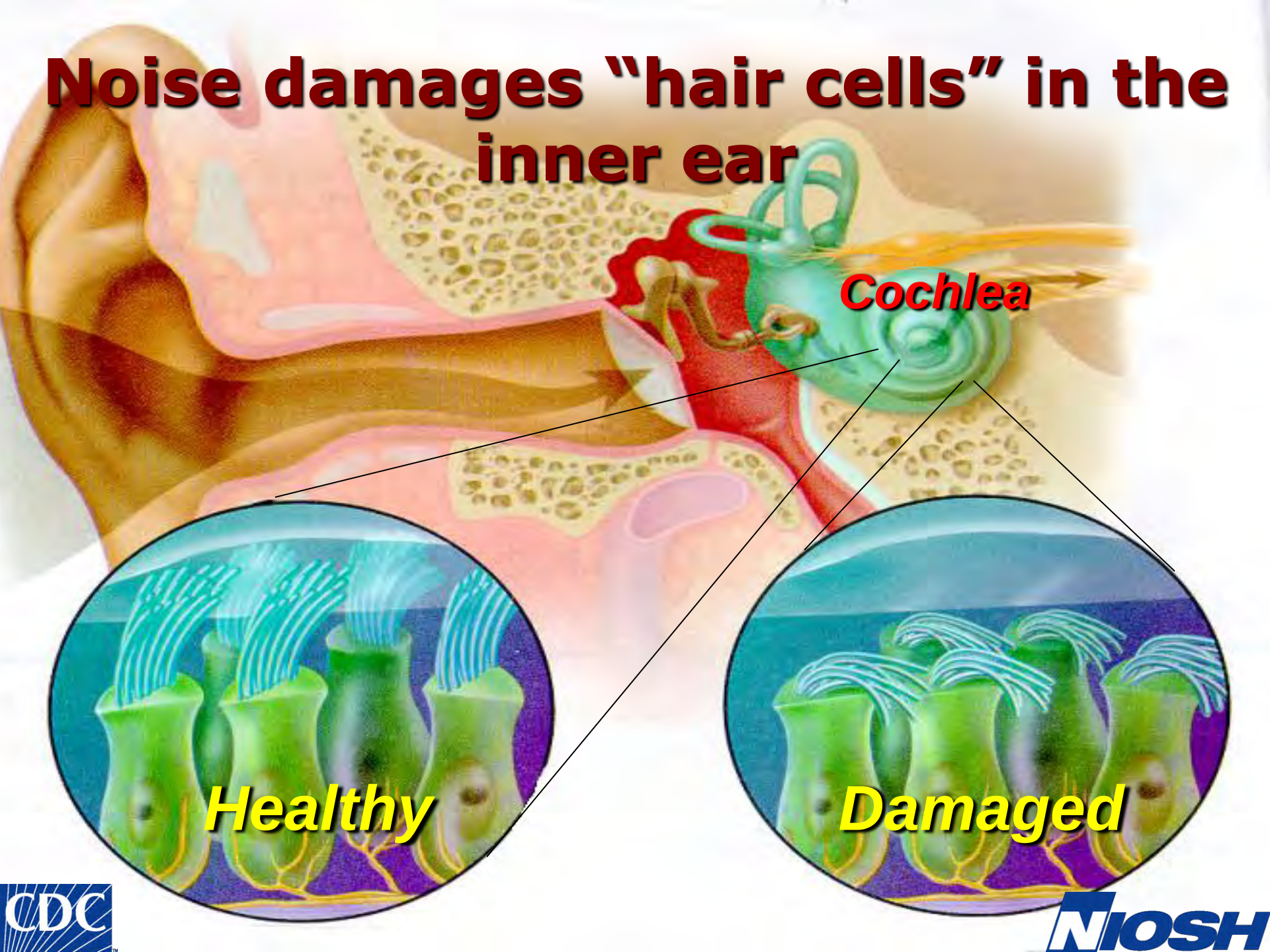
Source: John Franks, NIOSH

Hearing Loss Types

- **Conductive**
  - Outer and Middle Ear
  - Usually low frequency, correctable
  - Ex: earwax, hole in eardrum, head cold

- **Sensori-neural**
  - Inner Ear
  - Usually high frequency, not correctable
  - Ex: aging, diseases, medications, **noise**

Noise damages "hair cells" in the inner ear



This Is Your Ear…

This Is Your Ear on Noise…

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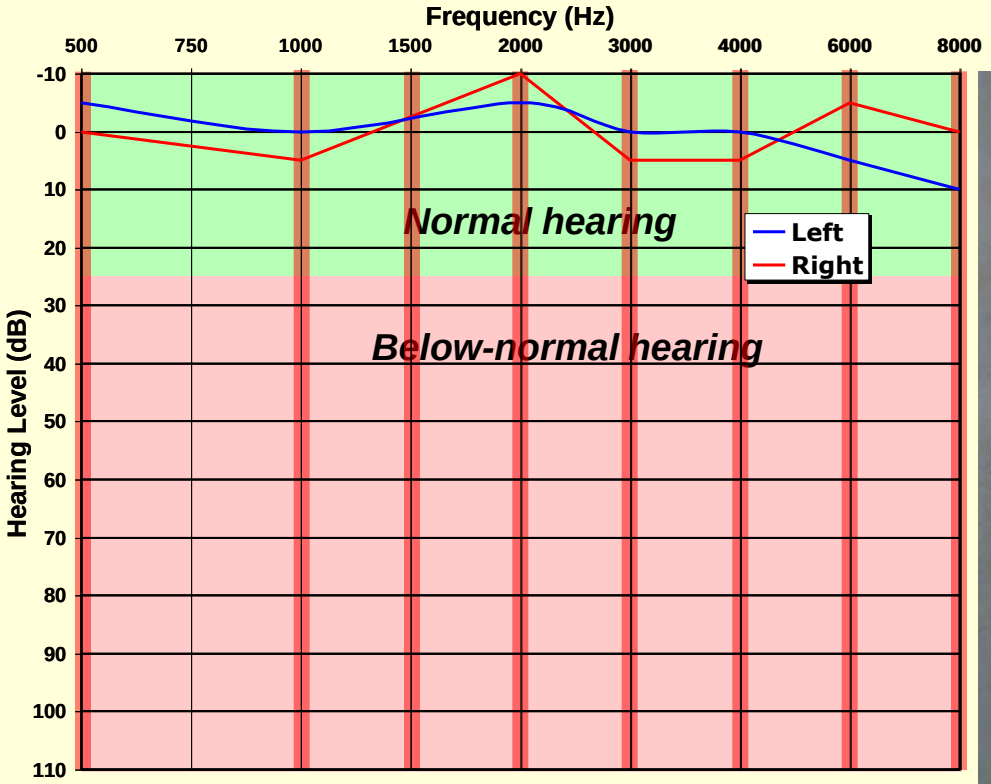
Hearing is measured with an *audiogram*



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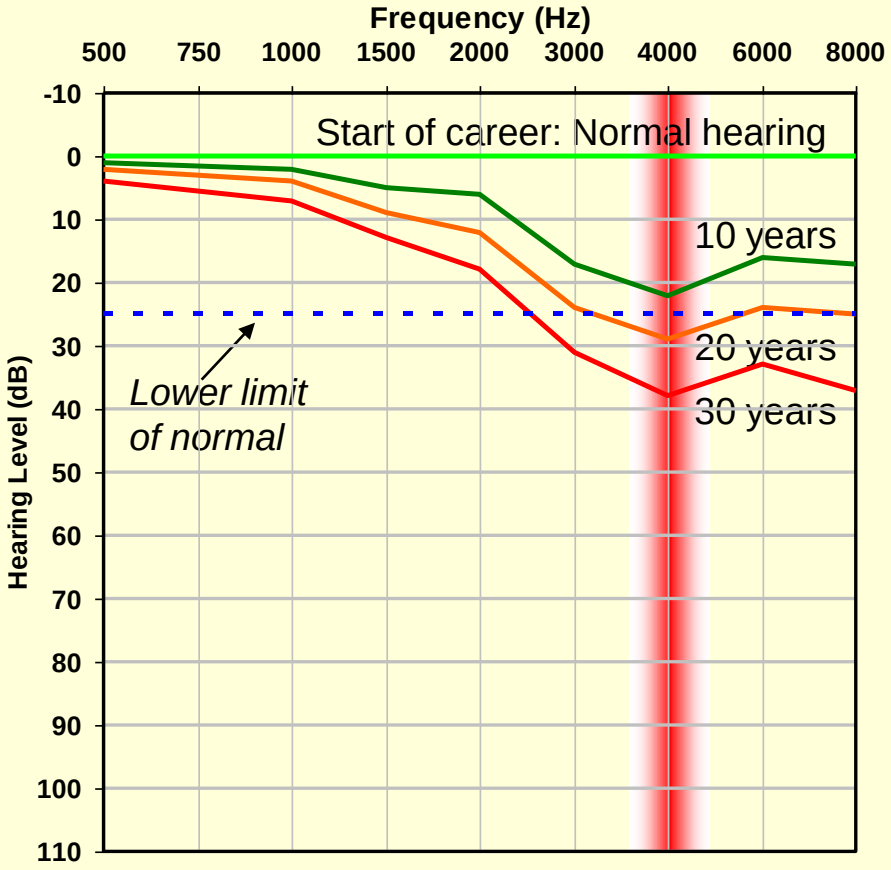
Effect of loud [95dB(A)] noise over a career*

- Noise-induced loss greatest at 4000 Hz
- *Some* of this hearing loss is due to aging, but ***most*** is due to ***noise***



*(estimated based on ANSI S3.44 standard)

What workers tell us:

"My dad worked at [company] for thirty-something years and I hope I don't end up like him. You got to scream for him to hear you."

"It's almost like you're mad at yourself because why can he hear? He works in the same atmosphere; why can he hear and I can't?"

"…machine backing up, beeping the safety alarm or something, you might not hear"

"…you can't hear that little whistling noise, something that's a little bit out of the ordinary, it could be very dangerous."

"It seems like new people…they're the ones that might get hurt"

"Loss of hearing could put you or maybe your buddy in jeopardy if you don't see something or hear something"

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Where Hazardous Noise Comes From

- High-powered motorized equipment
- Striking, drilling, digging
- Air-powered tools

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When is Loud TOO LOUD?

- Risk of damage starts at **85 decibels** (dB(A)) or higher
- Longer exposure times increases your risk
- Measure with instruments or….
- Look for warning signs
  - Too loud for conversation 3’ away
  - Everything sounds “dull”
  - Ears “ring”

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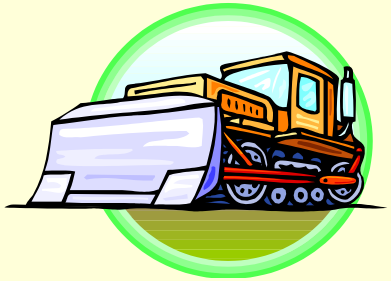
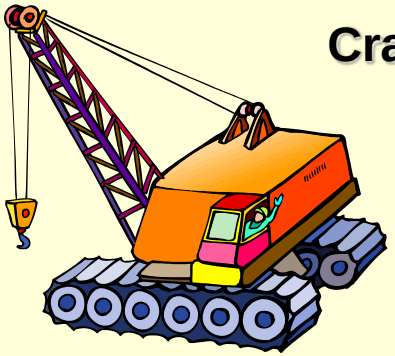
Typical Noise Levels



Heavy duty dozer
99 dB(A)
Light duty: ***96dB(A)***

Continuous mining machine
102 dB(A)

Air rotary drill rig (no cab)
99 dB(A)



Crawler crane

Over 35 ton, non-insulated cab: ***97 dB(A)***

Under 35 ton, non-insulated cab: ***94 dB(A)***

insulated cab: ***84 dB(A)***

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What Can You Do About It?

More than you may think!

- ***First:*** Get rid of the noise (Engineering controls)
- ***Second:*** Stay away from the noise (administrative controls)
- ***Third:*** Protect yourself from the noise (personal protective equipment)

First: Get rid of the noise

- *"Engineering controls"*
- Keep doors SHUT
  - *Reduces noise by 10-20 dB(A)*
- Maintain cab seals
- Take care of mufflers and other controls
- Report worn or broken noise controls

Then: Stay away from noise

- Have a hearing conservation program? *Ask for list of "administrative controls".*
- Noisy and you don't have to be there? *Leave!*
- Have a noisy task? *Break it up!*

Finally: Protect your ears:

- Noise high, but hearing protection low: For instance: only **48%** of sand & gravel miners *ever* use it! *(Deborah Landen, 2004)*
- Find comfortable hearing protection
  - Muffs, plugs, canal caps
- Learn to wear them correctly
- Practice listening through protection
  - Hard, but easier than listening through damaged ears!
- ***Don't go into noise without it!***

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For more information

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