Hearing Loss, Noise Exposure and Prevention

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Normal Anatomy

- http://www.youtube.com/anatomy
Why is it important?

- Over 30 million people are at risk of suffering from noise-induced hearing loss in the work place, recreational activities, and at home.
- It is the number one hazard found in the work place in the United States.
- Noise-induced hearing loss can be prevented with the proper knowledge.

NIHL (Noise-Induced Hearing Loss)

Hearing loss as a result of prolonged or sudden exposure to loud noise.

When our ears are exposed to levels of noise over 85 dB, the tiny hair cells in our cochlea can become disorganized and damaged from too much and too harsh of vibrations.

Once the hair cells break, they will NEVER grow back, this causes hearing loss.

Signs of Damage

- A plugged sensation in your ears
- Ringing in your ears (tinnitus)
- May experience a temporary hearing loss (temporary threshold shift).
  - If this occurs a person's hearing should return with in 16 to 48 hours.
What happens when you are exposed to noise?

• Continuous exposure:
  • A gradual hearing loss is the most likely to occur.
  • Permanent tinnitus may result.
  • The effects of noise exposure are cumulative

Damage

Signs of hearing loss

• Difficulty hearing in background noise
• Difficulty hearing speech from a distance
• Misunderstanding what is said
• Thinking others are mumbling
• Others complaining that TV is too loud
• Women and children’s voices are often the most difficult to hear

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What does hearing loss sound like?

Hearing loss from noise exposure effects the higher frequencies first, making it difficult to hear sounds that are important for understanding speech.

What does hearing loss sound like?

- [http://www.youtube.com/watch?v=1ElI4gpJHci] M

How Loud is too Loud?

![Noise Thermometer]

115 Decibels: Airplane taking off
115 Decibels: Rock Concert
125 Decibels: Home Power Tool
130 Decibels: Gunfire
135 Decibels: Jet Plane taking off
140 Decibels: Thunder
# How loud?  

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Sound Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oboe</td>
<td>8</td>
</tr>
<tr>
<td>Clarinet</td>
<td>6</td>
</tr>
<tr>
<td>Timpani and bass drum rolls</td>
<td>6</td>
</tr>
<tr>
<td>Flute</td>
<td>5</td>
</tr>
<tr>
<td>Trombone</td>
<td>2</td>
</tr>
<tr>
<td>Symphonic music peak on stage</td>
<td>1</td>
</tr>
<tr>
<td>Rock music peak</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Noise Per Day</th>
<th>NIOSH</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 dB(A)</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>85 dB(A)</td>
<td>0.5</td>
<td>8</td>
</tr>
<tr>
<td>90 dB(A)</td>
<td>0.15</td>
<td>8</td>
</tr>
<tr>
<td>105 dB(A)</td>
<td>0.25</td>
<td>2</td>
</tr>
<tr>
<td>105 dB(A) (TWA)</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>130 dB(A)</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>120 dB(A)</td>
<td>0.15</td>
<td>1</td>
</tr>
</tbody>
</table>

*NIOSH National Institute for Occupational Safety and Health  
OSHA Occupational Safety and Health Administration*

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# Prevention

- Earplugs and earmuffs
- Soft hearing protection

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# Video

- [http://www.youtube.com/watch?v=8f3Aykl0_E&feature=share](http://www.youtube.com/watch?v=8f3Aykl0_E&feature=share)
Prevention

- For every 3dB reduction in noise = twice the exposure time

<table>
<thead>
<tr>
<th>Noise Level</th>
<th>Dose 1</th>
<th>Dose 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Medium</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Low</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Extremely Low</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>