

# Now Hear This . . .



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## Exposure to Work-Related Noise In Teenagers

The prevalence of hearing loss increases with age, ranging from 6% in 18-25 year olds, 7% in 25-34 year olds, 11% in 35-44 year olds, 17% in 45-54 year olds, 22% in 55-64 year olds, 33% in 65-74 year olds and 44% among those older than 74. Two recent studies found that 24-30% of that hearing loss can be attributed to noise exposure at work (1,2).

Patients seen in the office today reflect the adverse effect of noise exposure over many years. A significant proportion of workplace noise exposure among older patients may have taken place prior to the adoption of the noise standard in 1981 or even the establishment of OSHA in 1972. Hopefully, with more workplace controls and increased awareness about the adverse effects of noise, the prevalence of hearing loss will decrease as the current youth become older.

Is there evidence that teenagers who work

today are exposed to less noise or are more likely to use hearing protection than their parents or grandparents? A cross-sectional telephone survey of a nationally representative sample of U.S. working teenagers, 14-17 years of age, published in October 2008, would suggest that our working youth are no better protected from hearing loss than their parents or grandparents and that we will continue to see significant occurrence of noise-induced hearing loss in the future (3).

Respondents for this survey held a paying job for at least 2 months within the prior 12 months. Analysis was performed by age categories 14-15 and 16-17 to reflect the age categories that child labor laws use for different work restrictions.

Table I shows that over 60% of working teenagers responded they are “exposed to continuous loud noises.”

**Table I. Weighted Percent (95% CI) of U.S. Youth Working in the Retail or Service Industry Reporting Selected Continuous Noise Exposures, by Sex and Age, 2003**

Weighted Percent (95% Confidence Interval) Reporting Continuous Noise Exposure				
Male		Female		Total
14-15 years	16-17 years	14-15 years	16-17 years	All
64.1%	73.1%	57.8%	63.0%	67.0%
(95% CI 47.2, 81.1)	(95% CI 66.0, 80.2)	(95% CI 38.5, 77.0)	(95% CI 55.2, 70.9)	(95% CI 62.1, 71.9)

(Adapted from reference 3)

**Table II. Weighted Percent (95% CI) of U.S. Youth Working in the Retail or Service Industry Reporting Hearing Protection Equipment Use Among Those Reporting Continuous Loud Noise Exposure, by Sex and Age, 2003**

Weighted Percent (95% Confidence Interval) Reporting Hearing Protection Use				
Male		Female		Total
14-15 years	16-17 years	14-15 years	16-17 years	All
2.8 % (95% CI 1.2, 4.4)	0.5 % (95% CI 0.0, 1.0)	0.0 % (95% CI 0.0, 0.0)	1.9 % (95% CI 0.9, 2.8)	1.7 % (95% CI 0.8, 2.5)

(Adapted from reference 3)

Despite reported high exposures to noise, the use of hearing protection was almost non-existent (Table II). Even though a “yes” response for hearing protection was based on “ever used” rather than usually or frequently used, less than 3% of those exposed to continuous loud noise answered “yes” to using hearing protection.

The strength of this study is its nationally representative sample, which allows the results to be extrapolated to the whole population of U.S. working teenagers. Its major limitation is that the results are based on self-reporting; it is possible that teenagers over-estimated their noise exposure. However, there is not a plausible reason to suggest why they would have understated their use of hearing protection.

Concern about hearing loss in youth has centered on loud music and the use of personal listening devices as illustrated in articles in *Ear and Hearing*, such as: Torre, P. Young Adults Use and Output Level Settings of Personal Music Systems. *Ear & Hearing* 2008; 29: 791-799 and Fli-gor BJ, Cox LC. Output Levels of Commercially Available Portable Compact Disc Players and the Potential Risk to Hearing. *Ear and Hearing* 2004; 25: 513-527. Results from the Torre study show that medium or comfortable volume settings corresponds to an average decibel level of 71.6 dB SPL while loud corresponded to 87.7 dB SPL and very loud averaged at 97.8 dB SPL. Given the survey of working teens, concern must also be addressed to noise exposure and use of hearing protection

where teens work.

What resources are available to educate teenagers about the hazards of noise? WISE EARS!® is the national public education campaign of the National Institute on Deafness and Other Communication Disorders (NIDCD) to prevent noise-induced hearing loss. Educational material can be obtained on their web site: <http://www.nidcd.nih.gov/health/wise/>. The material for youth is targeted for grades three through six. The NIDCD website indicates that in 2008 they will be expanding their noise-induced hearing loss campaign efforts to reach youth ages 8 to 12 and their parents.

The National Institute for Occupational Safety and Health has educational material for adults on their web site: <http://www.cdc.gov/niosh/topics/noise/default.html>.

The National Hearing Conservation Association has educational brochures including one for parents about their children: [http://www.hearingconservation.org/rs\\_pracGuides.html](http://www.hearingconservation.org/rs_pracGuides.html).

The American Academy of Audiology also has a brochure on noise and hearing loss for children: <http://www.audiology.org/publications/books/>.

We are not aware of any organization that has material specially targeted for teenagers.

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Health professionals who see teenagers need to emphasize the importance of hearing protection from high levels of noise from both work and recreational activity exposures. As always, we are interested in reports from hearing professionals of patients employed at work places with exposure to high noise levels.

## REFERENCES

- (1) Tak SW, Calvert GM. Hearing Difficulty Attributable to Employment by Industry and Occupation. An Analysis of the National Health Interview Survey – United States, 1997-2003. *Journal of Occupational and Environmental Medicine* 2008; 50:46-56.
- (2) Stanbury M, Rafferty AP, Rosenman KD. Prevalence of Hearing Loss and Work-Related Noise-Induced Hearing Loss in Michigan. *Journal of Occupational and Environmental Medicine* 2008; 50:72-79.
- (3) Runyan CW, Vladutiu CJ, Rauscher KJ, Schulman M. Teen Workers' Exposures to Occupational Hazards and Use of Personal Protective Equipment. *American Journal of Industrial Medicine* 2008; 51:735-740.



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- **The National Hearing Conservation Association**
  - [http://www.hearingconservation.org/rs\\_pracGuides.html](http://www.hearingconservation.org/rs_pracGuides.html)
  - Provides educational brochures including one for parents about how to prevent noise damage among children.
  - 
  - **The American Academy of Audiology**
  - <http://www.audiology.org/publications/books/>
  - Provides a brochure on noise and hearing loss for children.
- .....



Now Hear This...

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In this issue:  
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1. A history of significant exposure to noise at work; AND
2. A STS of 10 dB or more in either ear at an average of 2000, 3000 & 4000 Hz. And average of 2000, 3000 & 4000 Hz. OR
3. A fixed loss.\* Suggested definitions: a 25 dB or greater loss in either ear at an average of: 500, 1000 & 2000 Hz; or 1000, 2000 & 3000 Hz; or 3000, 4000 & 6000 Hz; or a 15 dB or greater loss in either ear at an average of 3000 & 4000 Hz.

**Suggested Criteria for Reporting Occupational NIHL**

Internet  
www.oem.msu.edu  
E-Mail  
ODREPORT@ht.msu.edu  
FAX  
517-432-3606  
Telephone  
1-800-446-7805  
Mail  
MIOSHA-MTS Division  
P.O. Box 30649  
Lansing, MI 48909-8149

Michigan Law Requires the Reporting of Known or Suspected Occupational NIHL  
Reporting can be done by:

**Project SENSOR Staff**  
*(MIOSHA)*  
**Safety & Health Administration**  
**At the Michigan Occupational**  
**Health Association**

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