

(Approved by the Board of Directors of the Educational Audiology Association March 2014)

The need for creating public awareness of the harmful effects of noise and the prevention of noise induced hearing loss (NIHL) among school-aged children is great. Hearing loss is permanent and worsens with continued noise exposure. It also creates problems in listening, language, and learning, leading to academic and social concerns. Children are often exposed to excessive levels of noise from many different sources, such as music, equipment, or recreational vehicles. Several studies have indicated that the prevalence of NIHL among children and young adults is increasing (Chermak & Peters-McCarthy, 1991; Montgomery & Fujikawa, 1992; Niskar et al, 2001). The prevalence of high-frequency hearing loss has increased among U.S. adolescents from 12.8% in 1988-1994 to 16.4% in 2005-2006 (Shargorodsky, 2010). Noise-induced hearing loss in particular is preventable, warranting a reliable school hearing screening protocol that detects high-frequency hearing loss (Sekhar, 2012).

For many years, health care policy agencies and numerous experts in hearing science have recommended teaching hearing loss prevention practices to children in school as a way to reduce the prevalence of NIHL. The Individuals with Disabilities Act (2004) Part B and Part C Definitions of Audiology include “the creation, administration, and provision of services for the prevention of hearing loss.” Additionally, the Healthy People 2020 statement, published by the U.S. Department of Health and Human Services in 2010, lists the following objectives for hearing loss prevention in adolescents:

Objective ENT-VSL 6.2: Increase the proportion of adolescents 12–19 years who have ever used hearing protection devices (earplug, earmuffs) when exposed to loud sounds or noise.

Objective ENT-VSL 7: Reduce the proportion of adolescents who have elevated hearing thresholds, or audiometric notches, in high frequencies (3, 4, or 6 kHz) in both ears, signifying noise-induced hearing loss.

While efforts have been made to teach hearing loss prevention practices to school-aged children, a review of curricula and materials available for this purpose found that many educational resources exist, but that the widespread dissemination of this information in our nation’s schools is lacking (Folmer, Griest, & Martin, 2002). Collaboration with school nurses, who are in a primary position to identify children at risk of hearing loss, is critical for developing effective educational programs in conjunction with routine hearing screening protocols (Hendershoot et al, 2011). Consequences of NIHL in children include communication difficulties, lower academic performance, reduced productivity, social isolation, depression, and tinnitus (Dobie, 1995, as cited in Folmer, Griest, & Martin, 2002). **School age children and young adults do not appreciate the long term impact of noise induced hearing loss and may find that they are denied entry into a chosen occupation, e.g. military service, law enforcement, flight school.** Therefore, the purpose of this document is to provide the resources needed to develop and implement a hearing conservation educational program for school-aged children, with the goal that these educational efforts can eventually help to reduce the prevalence of NIHL. The audiologist working in the school can facilitate the success of these programs.

References:

- Chermak, G., & Peters-McCarthy, E. (1991). The effectiveness of an educational hearing conservation program for elementary school children. *Language, Speech and Hearing Services in Schools, 22*, 308-312.
- Folmer, R., Griest, S., & Martin, W. (2002). Hearing conservation education programs for children: A review. *Journal of School Health, 72*(2), 51-57.
- Hendershoot, C., Pakulski, L., & Dowling, J. (2011). School nurses’ role in identifying and referring children at risk of noise-induced hearing loss. *The Journal of School Nursing, 27*(5), 380-389.
- Individuals with Disabilities Education Improvement Act of 2004 (IDEA 2004), Public Law 108-446, 20 U.S.C. 1400 et seq.
- Montgomery, J., & Fujikawa, S. (1992). Hearing thresholds of students in the second, eighth, and twelfth grades. *Language Speech Hearing Services in the Schools, 23*, 61-63.
- Niskar, A., Kieszal, S., Holmes, A., Esteban, E., Rubin, C., Brody, D. (2001). Estimated prevalence of noise-induced hearing threshold shifts among children 6 to 19 years of age: The Third National Health and Nutrition Examination Survey, 1988-1994, United States. *Pediatrics, 108*(1), 40-43.
- Shargorodsky, J., Curham, S., Curham, G., & Eavy, R. (2010). Change in prevalence of hearing loss in US adolescents. *Journal of the American Medical Association, 304*(7), 772-778.
- Sekhar, D., Rhoades, J., Longenecker, A., Beiler, J., King, T., Widome, M., & Paul, I. (2012). Improving detection of adolescent hearing loss. *Archives of Pediatrics & Adolescent Medicine, 165*(12), 1094-1100.
- United States Department of Health and Human Services. Office of Disease Prevention and Health Promotion. Healthy People 2020. (2010). Washington, DC. Available at <http://www.healthypeople.gov>.

HEARING LOSS PREVENTION MATERIALS¹

Preschool Level

Listen to the raindrops, by A. Bronsaft. www.noisefree.org/children.html

Dangerous Decibels (kindergarten level). Order online through www.dangerousdecibels.org or Oregon Museum of Science and Industry (OMSI) Outreach catalogue www.omsi.edu

Elementary Level

Sertoma SAFEEARS! Order through local Sertoma Club or from Sertoma Foundation, 1912 East Meyer Boulevard, Kansas City, MO 64132. www.sertoma.org

Dangerous Decibels (see above for ordering information)

Know noise. Order from Sight & Hearing Association, 1246 University Ave. Suite 226, St. Paul, MN 55104-4125. 1-800-992-0424. Charge for program, plus shipping fee. Free 30-day trial (money refunded if not satisfied). www.sightandhearing.org

I love what I hear! Order from NIDCD Clearinghouse, PO Box 37777, Washington, DC 20013-7777. Materials are free and can be duplicated. www.nidcd.nih.gov/health/education/

Listen to Your Buds. Outreach materials available free from American Speech-Language-Hearing Association (ASHA), 2200 Research Boulevard, Rockville, MD 20850-3289, 301-296-5700 800-638-8255. www.listentoyourbuds.org

It's a Noisy Planet. Website with online interactive information and activities for tweens and their parents developed by NIDCD. Order online www.noisyplanet.nidcd.nih.gov

The Ear and Hearing (Series 1). Order from National Information Center on Deafness, Gallaudet University, 800 Florida Avenue NE, Washington DC 20002-3695 https://www.gallaudet.edu/clerc_center/information_and_resources/info_to_go.html

Middle School Level

Dangerous Decibels (see preschool info)

How your brain understands what your ear hears. Order from NIDCD www.nidcd.nih.gov/health/education

It's how you listen that counts. House Ear Institute, 2100 W. Third Street, 5th Floor, Los Angeles, CA 90057. Charge for full program (demo video available free). www.earbud.org

Say what...? Order from American Academy of Audiology, 11730 Plaza America Drive, Suite 300, Reston, VA 20190. 800-AAA-2336 www.audiology.org/pages/store.aspx Minimal charge for AAA members; cost slightly higher for non-members.

It's a Noisy Planet (see elementary info)

Listen to Your Buds (See elementary info)

Turn It To the Left. Rap CD and t-shirt (proceeds go to the AAA Foundation), with free downloadable materials. www.turnittotheleft.com

¹ From: Johnson & Seaton (2012). *Educational Audiology Handbook* (2nd ed), Delmar Cengage Learning, p. 443-444.

Listen smart: Safely handling the power of sound. Order from Educational Audiology Association, 12011 Tejon St., Suite 700, Westminster, CO 80234 www.edaud.org

The Ear and Hearing (Series 2). Order from Clerc Center at Gallaudet (see Elem. Level)

High School Level

Can't hear you knocking. Produced by Hearing Education and Awareness for Rockers (H.E.A.R.), PO Box 460847, San Francisco, CA 94146. Minimal cost for program if ordered through Sertoma Club. www.hearrecords.com

An earful of sound advice about hearing protection. Free on request from EAR, 7911 Zionsville Road, Indianapolis, IN 46268.

Hip to hear survival guide. Free eight-page pdf download targeting musicians and music fans. www.hearnet.com

National Hearing Conservation Association materials (slides, posters, brochures). Order from NHCA, 12011 Tejon St., Suite 700, Westminster CO 80234 (303) 224-9022 www.hearingconservation.org
Charges based on quantities ordered, plus minimal s/h fee.

Turn It to the Left (see Middle school info)

Sound-level meters, tuning forks, ear plugs and other hearing protection devices, plus links to articles on current noise regulations www.earplugsonline.com www.allsafetyproducts.biz www.allhearingprotection.com www.elvex.com/hearing-protection.htm www.aearo.com
www.honeywellsafety.com/USA/Product_Catalog/Hearing.aspx
www.moldex.com
www.northsafety.com
www.sonomax.com
www.tascocorp.com
www.3m.com/occsafety
www.earmold.com.au
www.protectear.com

Also Google product or search online for current manufacturers and prices.

Additional online resources:

<http://www-personal.umich.edu/~lusk/sallynihl.html> Brief overview of noise-induced hearing loss with Quick Time video of hair cell damage.

<http://www.phonak-communications.com/en/products/hearing-protection/> Hearing loss simulation for various stimuli and environments.

<http://www.nasa.gov/centers/johnson/slsd/about/divisions/spacemed/facilities/hearing-conservation.html> Free CDs demonstrating the impact of hearing loss on everyday listening situations.

www.rockefeller.edu/labheads/hudspeth/graphicalSimulations.php Video graphically demonstrating musical stimulation of the cochlea.

<http://www.asha.org/buds/> Site for brochures, posters, articles, and tip-sheets on noise and hearing loss.

www.chcheating.org/noise-center-home Links to information and articles for all age levels from the Center for Hearing and Communication (formerly NY League for the Hard of Hearing).