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Prevention of NIHL and Tinnitus is Possible: Dangerous Decibels® Update

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Numbers are interesting and at times they can be surprising. As audiologists in training, we learned about many numbers including those that represent loudness and those that represent time. We learned the exquisite relationship between intensity and time and the potentially devastating effect it can have on the auditory system. We learned that too much loudness for too long was not a good thing. Too much can cause irreversible damage and possibly tinnitus. Both can have a profound effect on peripheral and central auditory neural function, especially when the onset is during childhood or young adulthood.[1]

Here are some interesting numbers for you to consider:

- 16.7% of 12–18 year olds had noise-induced threshold shift.[2]
- Over 94% of adolescents use personal music players and over 28% are estimated to do so at levels putting them at risk for hearing loss.[3]
- Tinnitus, which is most commonly caused by sound exposure, has been reported in up to 59% of children with 19.6% indicating it as severe.[4]

Protecting the hearing of our youngest patients is an important part of our role as audiologists. We can play a positive role in our community by helping children, teens, and young adults learn healthy listening habits. We have the potential to protect them from noise-induced hearing loss and tinnitus.

Researchers have shown us that hearing-loss education can effectively improve knowledge, attitudes, and intended behaviours regarding exposure to dangerous sounds and appropriate use of hearing protective strategies when presented to elementary school children.[6]

One such program is Dangerous Decibels® which continues to expand around the globe, educating thousands of children around the world.

Dangerous Decibels®: Evidence-Based Intervention

For those of you who may not be aware, Dangerous Decibels is an evidence-based public health partnership that works to reduce with the incidence of noise-induced hearing loss and related tinnitus.[7] Educational activities address the sources of dangerous sounds and ways to be protected from dangerous sounds.

The Dangerous Decibels® classroom program has been demonstrated to improve knowledge, attitudes, and intended behaviours regarding sound exposure and the use of hearing protection.[8]

This classroom program is a 45-minute, interactive presentation with demonstrations and images. Every student participates in one or more hands-on activities. The content includes the physics of sound, normal auditory function, pathophysiology, and consequences of noise exposure, recommended exposure limits, hearing protection strategies, and addresses peer-pressure issues related to the use of hearing protection.

Dangerous Decibels® is now in 50 states and in 37 countries (including Canada!) and is growing. Future plans include regional educator training workshops in Southeast Asia (most likely Singapore). Malaysia, Philippines, China, India, and Indonesia have also expressed an interest in bringing the program to their young people. The Brazilian Academy of Audiology is planning to bring Dangerous Decibels® to their members. Additionally, Israel and Germany have also expressed an interest in the program

It has been exciting for the Dangerous Decibels® research team to share their latest research findings related to their randomized-controlled trial of their own NIHL interventions. Their program has been shown to improve the knowledge, attitudes and intended behaviours regarding exposure to dangerous sounds and the use of hearing protection. Immediately following the delivery of the classroom program, there was an improvement of 25–29% in questionnaire scores; three months following the delivery of the classroom program there was an 18–21% improvement. The control group (which received no education) showed only a 2% improvement.

Community Education: Getting in on the Act

Health education is critical to helping children understand the importance of healthy listening habits. Interactive classroom programs can be effective in producing sustained improvement in knowledge, attitudes, and intended behaviours regarding exposure to dangerous sound and use of appropriate hearing protection strategies.[9] The advantages of an interactive classroom program include the rapport you establish with the students, the role modelling you offer, and the hands-on nature of the educational approach.

But are we doing all we can to help children their knowledge and change their attitudes and behaviour? The research team of Dangerous Decibels® is currently looking into the impact a community may have on hearing health education. Early findings suggest there may be strength in recruiting community members (family, friends, and community leaders) to leverage the health promotion message (Martin W., personal communication, 2014). Because each of us is part of our own local community, we can offer our expertise to help prevent noise-induced hearing loss and tinnitus.

Here are 5 ways you can bring NIHL and tinnitus prevention to your community:

1. Update your business website to include information about noise-induced hearing loss and tinnitus. You can highlight the importance of prevention and the three easy ways it can be done: “Turn it down, walk away, and wear hearing protection.” Be sure to include information about various types of hearing protection and actively promote custom earplugs for workers and musicians.
2. Write a general interest article for your local newspaper or parenting magazine about hearing and noise-induced hearing loss prevention.
3. Create handouts with relevant information about the hazards of loud sounds/music. These can be distributed whenever you are out in your community actively promoting noise-induced hearing loss and tinnitus prevention. Be sure to include your business contact information so you can be contacted if there are further questions.
4. Host a “Hearing Appreciation” seminar at your local library or community centre aimed at the

age group of your choice. Provide information about how the ear works, how damage can occur, and ways to protect the hearing from damaging sounds. Include information about tinnitus which is often a consequence of noise-induced hearing loss.

5. Contact the local media and let them know the health education activities you are offering in your community. Invite them to attend and write about your activities in the local paper. Health education is always a great type of article for them to offer to their readers.

Share your hard work! Post links in the “News” section of your website. Laminate a copy of the good press you have received and place it on display in your office. Your patients will be interested to know you are involved in the community as an advocate for the prevention of unnecessary hearing loss and tinnitus due to unsafe sound exposure.

Here is a number I will leave you with: 1.

Yes, you are only one person, just like me. But, as audiologists, this means we can all make a positive and lasting difference in our communities.

The rewards are infinite.

References

1. Lin H, Furman A, Kujawa S and Liberman M. Primary neural degeneration in the guinea pig cochlea after reversible noise-induced threshold shift. JARO 2011;12:605–16.
2. Henderson E, Testa M.A, Hartnick C. Prevalence of noise-induced hearing-threshold shifts hearing loss among US youths. Pediatrics 2011;127:e39–e46.
3. Kim MG, Hong SM, Shim HJ, et al. Hearing threshold of Korean adolescents associated with the use of personal music players. Jonsei Med J 2009;50:771–76.
4. Coelho CB, Sanchez TG, Tyler RS. 2007. Tinnitus in children and associated risk factors. In B Langguth and AR Møller (eds.) Progress in brain research: New York: Elsevier; 2007.
5. Neufeld A, Westerberg BD, Nabi S, et al. Prospective, randomized controlled assessment of the short- and long-term efficacy of a hearing conservation education program in Canadian elementary school children. Laryngoscope 2011;121:176–81.
6. Martin WH 2008. Dangerous Decibels: Partnership for preventing noise- induced hearing loss and tinnitus in children. Semin Hear 2008;29:102–110.
7. Martin WH, Sobel J, Griest SE, et al. Noise induced hearing loss in children: Preventing the silent epidemic. J Otol 2006;1:11–21.
8. Griest SE, Folmer RL, and Martin WH. Effectiveness of “Dangerous Decibels,” a school-based hearing loss prevention program. Am J Audiol 2007;16:S165–81.
9. Martin WH, Martin GY, Griest SE, and Lambert WE. How loud is your music? Beliefs and regarding use of personal stereo systems. 9th International Congress on Noise as a Public Health Problem (ICBEN); 2008.