OSC | 11
Ohio Safety Congress & Expo

#334 Whole life, working life and hearing loss prevention

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Ohio | Bureau of Workers' Compensation

Whole Life, Working Life and Hearing Loss Prevention

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The findings and conclusions in this presentation are those of the author and do not necessarily represent the views of the National Institute for Occupational Safety and Health.

CDC Workplace Safety and Health

NIOSH

- *Whole life* Hearing Loss Prevention (HLP)
- Benefits of noise control beyond HLP
- What works in HLP

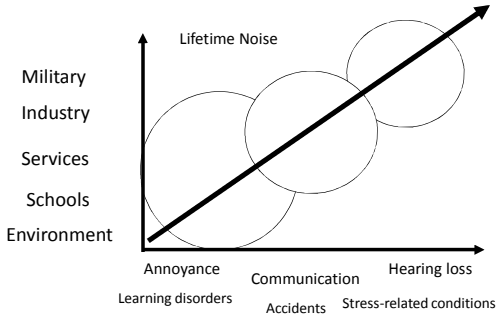
and…

- Communicating what we know in HLP

Hearing ⟺ Whole life

Benefits of noise control beyond HLP

Noise and Work



Esko Toppila, 2010 NHCA

Hearing loss research

Endogenous factors
Agent

- General health
- Age
- Gender
- Genetics
- Skin pigmentation
- Stress sensitivity

Exogenous factors

- Socio-economic factors
- Work
- Lifestyle
- Diet
- Education
- Smoking & drinking

Early in Life

- General Health
- Socio-Economic Status (Ecob et al., 2008; Cruickshanks et al; 2009)
- Exposures (Kujawa & Liberman 2006)
- Play (toys, fireworks, music, sports)
- School (Stansfeld et al., Lancet 2005)

Noise in the Classroom

February 4, 2009, During the signing ceremony on a law expanding the State Children's Health Insurance Program President Barak Obama stated that:

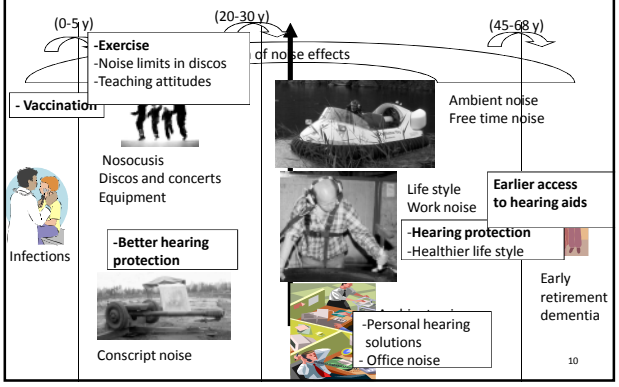
> *"No child in America should be receiving her primary care in the emergency room in the middle of the night.* ***No child should be falling behind at school because he can't hear the teacher or see the blackboard****. I refuse to accept that millions of our kids fail to reach their full potential because we fail to meet their basic needs."*

Later in Life

- General Health (diet, Shargorodsky et al., 2010; smoking, etc.)
- Lifestyle
- Education
- Socio-Economic factors
- **Exposures at work**
- Exposures in the military
- Play (music, sports, hobbies; Neitzel et al., 2004)

Esko Toppila, 2010 NHCA

Life cycle of noise



Somewhat current issues on occupational risks

- Safe levels of noise exposure/global harmonization
- Buy quiet/Noise control/ Noise labeling
- Impulsive/impact noise measurement & damage risk criteria
- Fit check of protective devices
- Industries beyond manufacturing (construction, services, entertainment, etc.)
- Exposures other than noise

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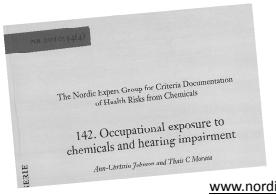
Ototoxicity of environmental chemical exposures

Metals
Solvents
Asphyxiants
Pesticides
PCBs

Mostly:
- ✓ Relatively few studies
- ✓ Effects not restricted to the cochlea
- ✓ Use poorly monitored, i.e., poor knowledge of exposure history
- ✓ Confounded by noise

Approaches:
- ✓Substitution/control of exposure
- ✓Antioxidants

Key authors: Sliwinska-Kowalska, Morata, Fuente, Campo, Fechter, Johnson



www.nordicexpertgroup.org

European Agency for Safety and Health at Work

http://osha.europa.eu/en/publications/literature_reviews/combined-exposure-to-noise-and-ototoxic-substances

Occupational exposure to chemicals

- Environmental/occupational chemicals CAN increase the risk for hearing loss
- Occupational Exposure Limits for chemicals do not account for ototoxicity
- Consideration to be given for the inclusion of workers exposed to ototoxic chemicals in Hearing Loss Prevention Programs

Laws and Standards

The European Community directive on noise **(2003/10 EC noise)** requires that the interaction between noise and work-related ototoxic substances, and noise and vibration be taken into account in the risk assessment of exposed populations (Article 4 of Section II)
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:042:0038:0044:EN:PDF

Countries (Australia, New Zealand, Brazil) started to accept link between chemical exposure and hearing loss in compensation cases.

Brazil
Decree no. 3048/ May 6, 1999
Australia/New South Wales
http://www.workcover.nsw.gov.au/Pages/default.aspx
Australia-New Zealand AS/NZS 1269:2005 Occupational Noise Management/Informative Appendix on Ototoxic Agents requiring hearing tests for those exposed to ototoxic agents.

Laws and Standards

French Institut National de Recherche et de Sécurité (INRS) proposed lowering the occupational exposure limit for styrene from 50 to 30 ppm in addition to the compulsory use of hearing protectors for 8-hour noise exposure to 80 dB(A) .

German Social Accident Insurance (DGUV) Committee for Occupational Medicine: Several measures to evaluate and reduce risk from ototoxicants.

Spanish National Institute for Occupational Safety and Hygiene (INSHT) has published guidance on include workers in hearing loss prevention programs independently of the level of noise exposure.

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Traditionally…

Resources and focus on health & hearing research:

- identification of risks, its magnitude and impact (Nelson et al., 2005; EUOSHA, Noise in Figures 2005; ListenHear, Access Economics, Australia, 2006).

- best approach to risk assessment
- best approach to detect and evaluate outcome
- development of interventions

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Need to take next step

Improve communication with safety and health professionals and the general public to reduce the gap between what we know and what we do regarding our hearing health.

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Gaps

Neil Pakenham-Walsh, 2004:
"*We* who?"

Gap exists between what a profession as a whole knows and what individual professionals know to be relevant to their practice.

✓ In the traditional realms of information exchange, we excel (conferences, publications, etc.)

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Need to take next step

We need to explore new avenues to broadly inform, communicate, and educate both ourselves and those we serve (Wikipedia, Facebook, Twitter, smart phone apps, and whatever "next new thing" comes along).

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If "blogging" and "tweeting" are what it takes to minimize the "know-do gap," then we must blog and tweet:

- to ensure that everyone has the same opportunity to keep informed,
- to benefit from continuing professional development and education, and
- to communicate this information to our target populations.

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2007
The National Institute for Occupational Safety and Health (NIOSH) was the 1st of the CDC institutes to start an external Blog (web log) to facilitate direct discussion between NIOSH researchers and the public.

2010
The NIOSH Science Blog has been visited more than 120,000 times and has more than 25,000 subscribers.

2011
60% of study participants (n=75) planned to continue using the blog. Significant proportions (20-50) of readers reported that they would make one or more changes in the workplace based on information obtained from the Science Blog.*

*Sublet V, Spring C, Howard J; National Institute for Occupational Safety and Health. Does social media improve communication? Evaluating the NIOSH science blog. Am J Ind Med. 2011 Jan 18.

http://www.cdc.gov/niosh/blog/nsb012511_music.html
http://www.cdc.gov/niosh/blog/nsb081610_stockcarnoise.html
http://www.cdc.gov/niosh/blog/nsb061710_worldcupnoise.html
http://www.cdc.gov/niosh/blog/nsb112409_hearingloss.html
http://www.cdc.gov/niosh/blog/nsb051208_quickfit.html

☆ Recipient of the 2011 National Hearing Conservation Media Award

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Gaps

Gaps exist:

- between what individual professional know and the population he/she serves knows and
- between people's awareness of health risks and their actual behavior (health promotion). Examples: HPDs, Music players

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Industries beyond manufacturing (construction, services, entertainment, etc.)

Hearing loss prevention approaches need to be customized, since "classic" conservation initiatives – those geared towards manufacturing - do not always apply to other industries or non-occupational scenarios.

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Industries beyond manufacturing (construction, services, entertainment, etc.)

What can be done?

Targeted communication campaigns are needed to highlight:

- the value of hearing. Hearing matters!
- the risks associated with continuous exposure to loud noise and or/music and more importantly,
- the availability of services and products that preserve sound quality and/or communication and are suited to the needs of different populations.

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What works in work-related hearing loss prevention?

- Very limited number of studies on intervention effectiveness (Dobie, 1995; Borchgrevink, 2003, Daniell et al., 2006; Davies et al., 2008, Heyer et al., 2010).
- 2 Cochrane reviews (El Dib et al., 2006, updated 2009; Verbeek et al., 2009).

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Cochrane Reviews

"Cochrane Reviews investigate the effects of interventions for prevention, treatment and rehabilitation. They are designed to facilitate the choices that doctors, patients, policy makers and others face in health care. Most Cochrane Reviews are based on randomized controlled trials, but other types of evidence may also be taken into account, if appropriate."

http://www.cochrane.org/reviews/clibintro.htm#library

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What works in work-related hearing loss prevention

- Legislation can reduce noise levels in workplaces
- Current focus of HCP is in Hearing Protective Devices
- Contradictory evidence that prevention programs are effective in the long-term
- Long-lasting school based interventions may increase the use of hearing protection substantially

http://www.cochrane.org/podcasts/issue-3-july-2009/interventions-prevent-occupational-noise-induced-hearing-loss

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http://www.safeinsound.us/

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Reason for optimism?

Rabinowitz et al., 2006. Trends in the prevalence of hearing loss among young adults entering an industrial workforce 1985 to 2004:

- the prevalence of hearing loss among a group of young US adults has not significantly increased over the past two decades.

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Zhan, Cruickshanks et al, 2010. Generational differences in the prevalence of hearing impairment in older adults:

- older adults may be retaining good hearing longer than previous generations and
- modifiable factors contribute to hearing impairment in adults.

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Reason for optimism?

Overcoming barriers to effective noise control and hearing loss prevention
Safe Work Australia
Dept. of Health and Ageing

http://www.safeworkaustralia.gov.au/NR/rdonlyres/2A0AE4CF-3895-4C33-BEC4-B5959C3AE61C/0/Occupational_Noiseinduced_Hearing_Loss_Australia_2010.pdf

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Challenge

Public Health: "An organized community effort to prevent disease and promote health" (Institute of Medicine, 1988)

Safety professionals have the knowledge, tools, opportunity and are in strategic positions to facilitate or advocate for hearing loss surveillance and prevention.

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Challenge

There might be reasons for optimism, but, *we* need to do better.

We, professionals in the clinic, healthcare providers, researchers, educators, preventionists, publishers, information professionals, policy-makers, need to reach *all* and *listen* as well.

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Important to remember!

- What part of the information story is most important to tell or emphasize? Or …What are the main messages?
- What part of the information/story best identifies the need or urgency for prevention or care?
- Involves values & judgment

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In conclusion…

We need:

- to teach,
- to keep learning , and
- *we* need to apply what we learn to achieve shared goals in hearing loss prevention.

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