



## Injury Prevention Information Centre

Formerly IPRC Information and Resource Unit

# Noise-induced hearing loss:

## a review of management and prevention best practice

While there is an extensive literature on the causes of noise-induced hearing loss (NIHL), research on practical means of preventing NIHL is more limited. Because there is no one study or experience to provide a solution, the report<sup>1</sup> on which this Research Bulletin is based, catalogues and evaluates all available information on the prevention of NIHL and from that synthesis, extracts clear trends and factors that should lead to reductions in the incidence and extent of NIHL.

This Research Bulletin highlights the findings of a review of the literature and associated research conducted by Dr Peter Thorne and others at the School of Population Health, University of Auckland for the Accident Compensation Corporation.

### What is Noise-Induced Hearing Loss?

Noise-induced hearing loss is the deafness that occurs when the ears are exposed to sounds in excess of what they can handle. NIHL results in a loss of hearing in the high frequencies and the loss of the ability to separate speech sounds, and may also result in an intolerance of loud sounds. NIHL often results in ringing in the ears (tinnitus) which people may find the most distressing symptom. Hearing loss can have significant social and interpersonal consequences. The negative consequences of uncorrected hearing are reviewed by Arlinger<sup>2</sup>.

### Estimates of Prevalence and Incidence in New Zealand

It is difficult to identify exactly how many people are affected by noise-induced hearing loss, and how many are at risk.

NIHL is the second most voluntarily reported occupational disease in New Zealand, after occupational overuse syndrome/osteoarthritis.

**On average, 11 more New Zealanders receive compensation for noise induced hearing loss every day. Compensation and rehabilitation directly cost New Zealand almost \$43 million in 2004/05.**

Around a quarter of the New Zealand workforce of 1.47 million workers are affected to some degree by harmful noise at work.

**The national standard for occupational noise exposure is an eight-hour equivalent continuous sound pressure level of 85dB(A).**

### Legislation

New Zealand regulations<sup>3</sup> set levels for maximum noise exposure and the Health and Safety in Employment Act<sup>4</sup> requires employers to identify and eliminate noise

hazards, or isolate noise hazards if this is not possible. However in practice there is a reliance on protective equipment, such as hearing protectors, rather than modifying the machinery, the environment or work processes to lower noise output.

<sup>1</sup> Thorne, P. (2006). Noise induced hearing loss: final report. Auckland: Uniservices. Online at: [http://www.acc.co.nz/DIS\\_EXT\\_CSMP/groups/external\\_ip/documents/internet/wim2\\_065096.pdf](http://www.acc.co.nz/DIS_EXT_CSMP/groups/external_ip/documents/internet/wim2_065096.pdf)

<sup>2</sup> Arlinger, S. (2003). Negative consequences of uncorrected hearing loss – a review. *International Journal of Audiology*, 42: 2517-20.

<sup>3</sup> Health and Safety in Employment Regulations, 1995, Regulation 11

<sup>4</sup> Health and Safety in Employment Act, 1992, s.7-10

## Review of Interventions

### Hearing Conservation Programmes

Hearing conservation programmes can only be effective if there is strong management support and commitment, consistent high quality noise and audiology monitoring and strict adherence to the use of hearing protectors. However, due to compliance and behavioural factors, any reliance on the use of hearing protectors as a primary means of protection against noise-induced hearing loss in industry is unlikely to deliver the expected protection.

**Hearing conservation programmes require strong commitment from management to be effective.**

### Personal Hearing Protection

Effective interventions to increase the use of hearing protection in industry should include effective training and accessible information on the selection and proper use of hearing protection, and the implementation of a regular maintenance and inspection programme. Training and information regarding excessive noise exposure as a risk to hearing, health and lifestyle is required as is functional training to identify what kinds and amounts of noise exposure constitute a risk to hearing.

**Hearing protectors are not  
"one size fits all".  
They need to be individually  
selected to ensure an effective fit.**

### Noise Management Programmes

Noise management is achieved by a strong focus on the elimination and isolation of noise, preventing noise exposure occurring in the first place through a variety of engineering and organisational methods. The reliance on personal hearing protection is greatly reduced with a focus on reducing noise at the source, while the concept of hearing protection as a suitable sole solution to noise exposure is discredited.

**A shift from a hearing conservation approach to a hearing loss prevention approach or noise management programme has been touted as a potentially more effective method of reducing the incidence of noise-induced hearing loss in industry.**

### Future Research

Key areas for future research into the prevention of NIHL in New Zealand need to address:

- ways to improve the shortcomings of the incidence and prevalence data of NIHL.
- the efficacy of current practices and implementing a new preventative model.
- public understanding of noise and hearing loss and the establishment of a sound safety culture.

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