

# NOISE INDUCED HEARING LOSS

## RAISING AWARENESS FOR GREENKEEPERS

By Herbert Barker

Over the next few months Greenkeeper International will be working in conjunction with vibration testing services Fivesquared to discuss the implications of Hand Arm Vibration (HAVS), Whole Body Vibration (WBV) and Noise. Number two in the series is Noise Awareness, discussing the measures that greenkeepers can put in place to prevent a loss of hearing.

### OVERVIEW

As with last month's article, Hand-Arm vibration, the European Commission introduced legislation 'harmonising' noise levels in the workplace for all member states, and gave each state three years to effect this. The UK 'version' became law in the form of the 'Control of Noise at Work Regulations (2005)'.

Many clubs have implemented noise management for greenkeepers, while others have done little, or decided that it doesn't affect them and have 'shelved' any action.

This article is designed to give a brief overview of the problems of Noise Induced Hearing Loss and the solutions.

### NOISE LEVELS FOR GREENKEEPERS

Our research has shown that some, but by no means the majority of golf clubs, have implemented best practice management systems for controlling noise exposure in their golf clubs and more specifically their greenkeepers exposure levels.

Noise can be a difficult subject to grasp, with numerous different types of hearing protection available what is the best for your greenkeepers and which type will offer the correct level of protection. During our recent research we found that some golf clubs offer their staff different types of protection, some golf clubs leave it to the greenkeepers themselves to choose which type they prefer to use, but, more importantly, is the hearing protection offered or chosen the correct type and suitable for the job?

### WHAT IS IT?

Hearing loss caused by prolonged or regular exposure to loud noise is a widespread recognised problem affecting many workers.

Hearing loss can be temporary or permanent. Temporary deafness is often experienced after leaving noisy places, such as a club, or party. Although hearing recovers within a few hours, this

shouldn't be ignored. It is a sign that continued exposure to noise could cause permanent damage.

Permanent damage can be caused immediately by sudden, extremely loud, explosive noises.

The majority of hearing loss, however, is usually gradual, due to prolonged exposure to noise. It is only when damage caused by noise over the years combined with normal hearing loss - due to ageing - that people realise how deaf they have become. Hearing loss from prolonged exposure is usually incurable.

Many tools, machines, and processes used in industry can produce noise levels likely to cause hearing damage to anyone within the vicinity of the noise source and in some cases, those some distance away, by reflected noise.

It is safest to regard regular prolonged use of any tool or machine causing loud noise as suspect.

As a general rule, noise may damage your hearing if you have to shout over background noise to make yourself heard, the noise hurts your ears, makes your ears ring, or you are slightly deaf for several hours after exposure to the noise.

Hearing loss can be caused by factors other than noise, but noise induced hearing loss is different in one important way - it can be reduced or prevented altogether.

Loud noise can damage the hearing of young people as easily as the not so young.

### HOW DO I RECOGNISE IT?

Prolonged loud noise exposure affects the tiny hair cells in the inner ear which send electrical signals to the brain. Once damaged, these cells no longer respond to sound and so hearing decreases.

#### *Loss of hearing at higher frequencies.*

When hearing impairment begins, the higher frequencies are often lost first, which is why people with hearing loss often have difficulty in hearing the high pitched voices of women and children.

#### *Difficulty in understanding speech.*

Loss of high frequency hearing can also distort sound, so that speech is difficult to understand, even though it can be heard. Hearing impaired people often have difficulty detecting differences between certain words that sound alike, especially words that contain S, F, SH, CH, H, or soft C sounds because these sounds are in a higher frequency range than vowels or other consonants.

#### *Tinnitus*

Hearing loss is not the only problem. Tinnitus (ringing, whistling, buzzing, or humming in the ears) may also occur. This condition can also lead to disturbed sleep.

Sufferers from any symptoms of hearing loss should initially report their symptoms to their supervisor, so that if required, appropriate health surveillance can be initiated.

### WHO IS AT RISK?

Those whose jobs require regular frequent use of noise producing tools and equipment (hand-held or ride on), or in the vicinity of these machines, are most at risk.

These occur in industries, including:

- Road and railway construction/maintenance
- Construction
- Forestry/Gardening/Greenkeeping
- Foundries
- Light and heavy engineering
- Mining and quarrying
- Stone masonry
- Wood working

### WHAT CAN I DO ABOUT IT?

The 'Control of Noise at Work Regulations (2005)' puts obligations on employers to assess, control, and manage noise exposure in the workplace.

The challenge is to determine which information is correct and current. This can be confusing. To protect successfully your workforce from Noise Induced Hearing Loss it is vital that employers have an effective Noise Management System to - Assess, Measure, Monitor, Control, and Manage any noise risks.



Employers are obliged to provide information and training for employees to ensure knowledge of health risks, health surveillance, noise management systems, safe use of equipment, and awareness of noise problems in the workplace.

### Assess

The first stage is assessment – “Do I have a problem?”

This can be achieved with a simple questionnaire asking the present workforce whether they are suffering from any symptoms of hearing loss.

The responses to the questionnaire will determine the next stage which is Health Surveillance, involving audiometric testing.

Potential employees should be questioned on previous work which may have entailed noise from power tools; and leisure activities which may involve high noise levels.

### Health Surveillance

Employers are obliged to provide Health Surveillance for any of their workforce using equipment producing noise of 85 dB or over to prevent symptoms appearing or existing symptoms from becoming worse. Noise Induced Hearing Loss is incurable and if no precautions are taken then symptoms will usually get worse with time.

Specialist health surveillance may be necessary for employees with hearing loss symptoms, so they can be assessed as to the severity of hearing loss.

### Noise Levels of Equipment

Sources from which employers can obtain noise data for tools, or machines are:

- Manufacturer's Literature
- Equipment Suppliers
- Internet databases
- Research Organisations
- Trade Associations
- HSE
- Vibration Consultants
- Measurements in the workplace

Of these, the most accurate tends to be Measurement in the workplace, which gives noise levels for YOUR tools or equipment operating under YOUR working conditions.

Having obtained noise levels under working conditions, employers should determine the highest noise producing tools, machines, or processes and attempt to re-design the job or process to eliminate the use of these tools in the processes. This may not always be possible, but should be the long term objective.

### Noise Measurement & Definitions

#### Decibels (dB)

Intensity of sound is measured in decibels (dB). The scale runs from the faintest sound that the

human ear can detect, which is 0 dB, to over 180dB, the noise at a rocket pad during launch.

Decibels are measured logarithmically. This means that decibel intensity increases by units of 10, so each increase is 10 times the lower figure. Thus, 20dB is 10 times the intensity of 10 dB, and 30dB is 100 times as intense as 10 dB. As a rough guide, an increase of 3dB doubles the intensity.

#### Frequency Weighting (A) & (C)

To address the way that the human ear responds to sounds of different frequencies, measurement of noise is given a weighting to correct for this. This weighting is known as an 'A' weighting and measurements are expressed as dB(A). Impulse, or high intensity short duration sound, is measured similarly and classed as 'Peak' levels. Peak levels are also 'weighted' and expressed as dB(C).

The legislation set lower values for noise levels when it was implemented in April 2006.

#### Daily Exposure Lower Action Level 80 dB(A)

In practice, this means that workers exposed to noise at this level, up to the Upper Action level, who determine that hearing protection would be beneficial, can request such protection; must be issued with it, but it is not mandatory to wear it.

A Lower Action Peak Level of 135 dB(C) was also introduced.

#### Daily Exposure Upper Action Level 85 dB(A)

In practice this means that employers must issue suitable hearing protection to their workforce and this protection must be worn at, (or above) this level.

It should, however, be noted that issuing hearing protection for users should be considered in line with the Regulations, to prevent hearing damage – but should not be regarded as a permanent solution but only as an interim measure whilst other procedures to reduce noise are considered and implemented.

An Upper Action Peak Level of 137 dB(C) was also introduced.

#### Daily Exposure Limit Level 87 dB(A)

In practice this means that whatever type of hearing protection is issued, the noise reaching the wearer's ears (underneath the protection) must not exceed this level.

A Limit Peak Level of 140 dB(C) was also introduced.

#### Hearing Protection

The main types of hearing protection are:

- ear muffs – which completely cover the ear.
- ear plugs – which are inserted in the ear canal
- semi-inserts – which cover the entrance to the ear canal

There are many types of hearing protection on the market, and employers should ensure that the protection supplied is suitable for the highest noise level that may be present for the particular job, and employees are trained in fitting the particular type used.

#### Selecting hearing Protection

Ideally select a protector so that daily exposure is reduced to between 80 dB and 75 dB at the ear. Avoid protectors resulting in less than 70 dB at the ear - this is 'over-protection' and can cause 'isolation' of the operator.

Hearing protection is now available marked with an 'SNR' number (Single Number Rating) to indicate the degree of attenuation provided by the protector.

### MONITOR, CONTROL AND MANAGE

#### Daily Noise Exposure Level

It is not only intensity of noise that can produce hearing loss, but also the length of time exposed to that noise. During noise measurements, an average noise level (Leq) is produced and this is used with the time exposed to that noise, to produce a Daily Noise Exposure Level, (L EPd).

If this noise level is the only noise that workers are exposed to, then monitoring and control of noise levels becomes relatively simple and this will be the workers' Daily Level. If, however, workers are exposed to several different noise levels, then each of these (along with time exposed) must be calculated. Using suitable formulae, these individual totals are combined to give a Total Daily Noise Exposure Level which is compared against the Action and Limit Levels, to determine if workers are at risk and what appropriate action to take, if necessary.

There are several methods in use to manage noise exposure, but the simplest is a system whereby noise values can be converted into 'points' (using suitable formulae) and the tool or equipment is 'tagged' with this information.

The operator simply has to note the number of points on the tag, and multiply by the time used (while noise is produced) to determine how many points have been used on each separate use of tools or equipment.

There is a 'daily' maximum number of points, and as long as this is not exceeded, then the operator will not exceed his daily noise level.

This is an effective, real time, management system, in use by many of Fivesquared's clients – including local authorities, public utility companies, large construction companies, and several golf greenkeeping departments.

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