Noise Exposure in Turf Maintenance
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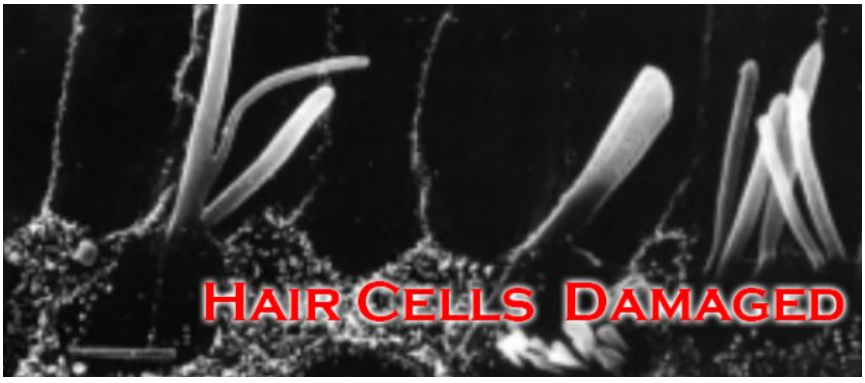
We ask a lot of our ears, and generally they do what they are designed to, transmitting variations in sound pressure to our brain where it is interpreted as sound. Damage to your ears restricts the ears' ability to hear some or all sounds, this has implications on your capacity to function normally in society whilst increasing your vulnerability.

Your ears are not simply a funnel, they are a complex structure through which sound waves move. Those waves are transmitted along the ear canal setting the tympanic membrane (ear drum) in motion, the motion is transmitted to the middle ear via the incus, malleus and stapes (hammer anvil and stirrup) which amplify the waves. This causes the fluid in the cochlea (inner ear) to move in response. Deep within the cochlea are hair cells which sense the movement, it sets off nerve impulses which are carried to the brain via the cochlear nerve. This complicated process is very finely balanced and is susceptible to damage in numerous ways.

Within the workplace, one of the ways your hearing can be affected is excessive noise, when this happens it is called Noise Induced Hearing Loss, the exposure to which, the employer has a duty to manage, hearing loss occurs in the following forms;

- **Temporary Threshold Shift,** Short periods of excessive noise producing varying degrees of inner ear damage that is initially reversible. Recovery time can be anything from minutes to days;
- **Permanent Threshold Shift**, Permanent damage, known as Noise Induced Hearing Loss This includes a condition that results in a permanent sound (ringing or whining) in the ear known as Tinnitus.



The duty to manage noise is set out in the Control of Noise at Work Regulations 2005, these apply the concept of a noise dose – that being the amount of noise you can be exposed to within an eight-hour period (the working day).

Noise levels are measureable, and as we all know it is measured in decibels (dB) therefore, a noise dose is the amount of decibels you can be exposed to over that period. The regulations allow for variations, "if noise exposure varies over the day, you can measure a weekly exposure". It is important to understand that every 3 dB is a doubling of audible sound, meaning 84dB is only half the exposure of 87dB. The regulations establish three very clear points called action levels, these levels are points at which different duties are imposed on the employer, these are;

LEAV – Lower Exposure Action Value 80 dB

Action is required if this level is exceeded (it is the noise level at which the regulations become active)

UEAV – Upper Exposure Action Value 85 dB

Employers have a duty not to expose employees to noise above this level, the employer must reduce exposure to as low as reasonably practicable by establishing or implementing a programme of organisational and technical procedures

ELV – Exposure Limit Value 87 dB

Employers must ensure this limit is not exceeded and if it is, reduce the level immediately, investigate and modify measures to prevent recurrence

If the noise an employee is exposed to exceeds the ELV (87dB), the employer must make a suitable and sufficient risk assessment, that risk assessment should include duration of exposure, and determine the procedures in place to reduce exposure to a level less than 80dB.

Right now I can hear managers reading this and thinking, we are often using equipment that is running at greater than 100dB how can ELV be managed?

The answer is that CNWR 05 allow for that situation.

CNWR2005 (4) Exposure Limit Values and Action Values

When exposure is unavoidable you can supply PPE and consider the protection it offers at the ear in calculating a noise dose. Using the PPE to reduce noise levels to below 80dB at the ear.

MHSWR1999 (4) The Principles of Prevention

If noise can be enclosed, or if people can reasonably practically be screened or distanced from the noise source, they should be, eliminating the need for PPE.

This is difficult to do with turf maintenance machinery; however, we could consider dB output in the purchasing process! One of the objectives of the principles of prevention is that all PPE is only considered as a last resort.

CNWR2005 (7) Hearing Protection

Any equipment louder than 85dB should be declared a mandatory hearing protection zone! have a safety sign in a prominent position declaring it so, staff should be trained in what the sign means.

Employees Duties

HASAWA1974 (8) General Duties of the Employee

If hearing protection is supplied, it must not be interfered with, i.e. by wearing music speakers on the inside.

Some measured noise levels in maintenance equipment

Hover Mower – 90 dB(a)

Back Pack Blower – 106 dB(a)

Chainsaws (large) – 115 dB(a)

Chainsaws (small) – 106 dB(a)

Strimmer – Brushcutter – 100 dB(a)

Pedestrian Cylinder Mowers – 87 dB(a)

Grinders – 88 dB(a)

Tractor mounted blower with tractor, outside cab – 100 dB(a)

Tractor mounted blower with tractor, inside cab all windows closed – 87 dB(a)

Fairway mower (5 units) – 92 dB(a)

Greens Mower (3 units) – 87dB(a)

Rough Mower (5 decks) – 105 dB(a)

(Note; these levels could vary significantly from premise to premise dependent upon the manufacturer, age of the equipment, the maintenance of the equipment, the frequency of use and other site specific factors, they are published for demonstration purposes only. All measurements were made with a class 1 noise meter)

Noise Action Levels and Noise Dose

Nose dose is calculated over an 8 hour period, with every 3 decibels doubling sound, The employer can be exposed to 80 dB(a) for 8 hours without protection, or 83 dB(a) for 4 hours without protection. All noise exposure after that point must be below 80 dB(a)

dB(a) Level	Regulation duty	Dose
80	Make hearing protection available if requested	8 hrs No PPE
85	Make hearing protection mandatory, declare mandatory hearing protection zones	2.5 hrs or calculate PPE / SNR
87	Consider the protection (Attenuation, SNR) offered by PPE in calculating noise dose	1.5 hrs or calculate PPE / SNR
89		1 hrs or calculate PPE / SNR
92		30 mins or calculate PPE / SNR
95		15 mins or calculate PPE / SNR
98		7.5 mins or calculate PPE / SNR
101		3.25 mins or calculate PPE / SNR