



Independent Hearing Care Services

Hearability information sheet NOISE DAMAGE

Exposure to excessive levels of noise can damage the tiny hair-like cells in the liquid-filled cochlea, or inner ear. Hearing loss from such exposure is always permanent. Individuals may vary in sensitivity to noise, and this determines the amount of damage they may sustain. The degree of damage is also dependent on the level of noise to which a person is exposed, and the length of time over which this exposure occurs.

The intensity of sound is measured in decibels (abbreviated dB). The decibel scale is a little odd because the human ear is incredibly sensitive. Your ears can hear everything from your fingertip brushing lightly over your skin to a loud jet aircraft. In terms of power, the sound of the jet engine is about 1,000,000,000,000 times more powerful than the smallest audible sound. That's a big difference!

On the decibel scale, the smallest audible sound (near total silence) is 0dB. Every 6dB increase in volume requires a doubling of energy and a 10dB increase in volume is perceived as double volume (normal hearing). Here are some common sounds and their decibel ratings:

Approximate descriptions of levels of sound

0 dB	Threshold of hearing
10 dB	Rustling of leaves
20 dB	Whisper
30 dB	Quiet conversation
40 dB	Average home
50 dB	Normal conversation
60 dB	Busy shop
70 dB	City street
80 dB	Busy workplace
90 dB	Underground railway
100 dB	Pneumatic drill 10ft away
110 dB	Propeller aircraft taking off
120 dB	Jet aircraft taking off

From our own experience, we know that distance affects the intensity of sound. If you are far away, the power is greatly diminished. Sound propagation is subject to an inverse square law. That means that if you double the distance from the sound source then you halve the volume. All of the ratings above are taken while standing near the sound. Any sound above 85dB can cause hearing loss, and the loss is related both to the power of the sound as well as the length of exposure. You know that you are listening to an 85dB sound if you have to raise your voice to be heard by somebody else. Eight hours of 90dB sound can cause damage to your ears; any exposure to 140dB sound causes immediate damage (and causes actual pain).

Noise in the workplace

The Noise at Work Regulations came into effect in 1990 and are monitored by the Health & Safety Executive. These regulations define levels of exposure and impose duties upon employers and employees. However, the danger is only likely to be controlled effectively if you and your employer co-operate to make sure noise levels are assessed and that control measures work properly.

What do employers have to do about noise?

Your employer must have the noise assessed wherever your exposure might reach one of the 'Action Levels' of the Noise at Work Regulations. If you have to shout or raise your voice to be heard by someone two metres away or if your ears are ringing when you finish work, you should find out if this has been done. The levels of exposure to noise at which action is to be taken are:

- First Action Level a daily personal noise exposure of 85 dB (A)
- Second Action Level a daily personal noise exposure of 90 dB (A)
- Peak Action Level a peak sound pressure of 200 Pascal's (140dB)

If your exposure reaches the Action Levels, your employer should take a number of steps immediately including:

- Tell you where noise levels are high and warn you about the risk to your hearing.
- Control noise.
- Provide you with ear protection - earmuffs or earplugs - suitable for your job.
- Mark any 'Ear Protection Zones'.
- Provide adequate information and training on how to use noise control equipment, where and when to use ear protectors, how to look after them, and what to do if you find anything wrong with the equipment.

The duties of employers are:

- 1 To have a competent person assess the level of noise exposure where this is likely to exceed the First Action Level, and to review this in the light of circumstances which may alter the noise level.
- 2 To keep a record of the assessment and of subsequent reviews.
- 3 To minimise noise exposure where this exceeds the First Action Level so that it reduces the risk of hearing damage.
- 4 To suppress noise where it exceeds the Second Action Level.
- 5 That at a level above the First Action Level ear protectors should be available to employees on request.
- 6 That above the Second Action Level or where exposure reaches Peak Action Level, suitable ear protectors should be provided which reduce the risk of hearing damage to a level below these two benchmarks.
- 7 That signposts should be provided through notices in areas where ear protectors should be worn.
- 8 That information should be provided to employers on:
 - (a) The level of noise to which they are exposed.
 - (b) The action necessary by the employee to minimise exposure.
 - (c) Access to ear protection.
 - (d) The general obligations of the employees under the regulations.

What should you do?

- Use the noise control equipment provided. If you work at a machine that is meant to have silencers or enclosures, make sure they are always in place and working properly.
- Use ear protectors all the time you are exposed to loud noise. Wherever there is a serious risk of hearing damage your employer **must** provide you with ear protectors and you **must** wear them. This will include all marked 'Ear Protection Zones'. In areas where the risk is not so high, your employer has to offer you ear protectors. It is in your interests to use them.
- Look after your ear protectors, learn how to use them properly and keep them clean. Damaged, dirty protectors won't work properly and could cause an ear infection.
- Don't ignore faulty equipment. If you find something wrong with your ear protectors or the noise control equipment, or you have problems with them, tell someone who can get them put right.
- Don't neglect your hearing. If you think there is something wrong with your hearing see your own doctor or works medical department if you have one. Remember to tell them you work in a noisy area.

If you think you have been deafened as a result of exposure to noise in the course of your work, you may have a case for an Industrial Injuries Compensation claim. Each case is individually assessed, and much depends on whether the exposure took place before the relevant legislation came into effect, and whether or not your employer was negligent. Your local DSS office will be able to advise you on how to make a claim.

Loud music

Music from a personal stereo at 95dB average volume can be tolerated for about six hours per week in total. Exposure for less than six hours means that damage to hearing is slight, but if this limit is exceeded there is a significant risk of hearing damage in the long term. Furthermore, if you are subject to high levels of noise elsewhere, the risk of hearing loss becomes greater still. Many nightclubs play music at over 120dB, some even louder. For those clubbers regularly exposed to loud music, the cumulative effect could be very damaging. Someone who goes clubbing once a week could potentially be putting their hearing at risk, even if they only spend a few minutes on the dance floor on each occasion.

To prevent hearing damage from loud music, you should be alert to alarm signals such as a temporary deafness or a roaring sound in the ears. This signifies too great a level of exposure to noise. Bear in mind that your continued enjoyment of music depends not only on the quality and volume of the sound reproduction but also on your hearing capacity.

What can I do?

- Protect yourself by taking regular breaks from loud music.
- Wear earplugs if regularly exposed.
- Make a conscious effort not to stand by loudspeakers.
- Turn the volume down in your personal stereo (or buy one with a noise-limited circuit).

Ask your local club to:

- Provide chill out space where noise levels don't exceed 80dB (A).
- Publish noise levels for the dance floor, the bar and the chill out area, where they can be seen by staff and the public and display consumer-friendly signs advising about hearing protection
- Provide earplugs for free or available to buy.

As part of its 'Don't Lose the Music campaign', RNID has produced a poster that nightclubs can display to inform their customers of the average noise levels on the dance floor, by the bar and in the chill out room. In addition, the poster tells clubbers how to protect their hearing and where to go for further information. The poster is available to download from the 'Don't Lose the Music' website at www.dontlosethemusic.com

Breakdown of hearing loss

20–40dB loss	Mild hearing loss - Difficulty with some speech made worse in the presence of noise
41–70dB loss	Moderate hearing loss - Frequent difficulty with speech, talking in groups and following speech in the presence of noise
71–95dB loss	Severe hearing loss - Can understand only amplified speech
+95 dB loss	Profound hearing loss - Sometimes cannot understand even amplified speech

Further information

Health and Safety Executive

Helpline: 08701 545500
HSE Books
PO Box 1999
Suffolk CO10 2AW
www.hse.gov.uk

The National Society for Clean Air and Environmental Protection

44 Grand Parade
Brighton BN2 9QA
Tel: 01273 878770
Fax: 01273 606626
www.nasca.org.uk

This organisation gives out information about simple remedies that can minimise the impact of noise and noise nuisance.

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