Registered in England & Wales
Company Number: 7497312

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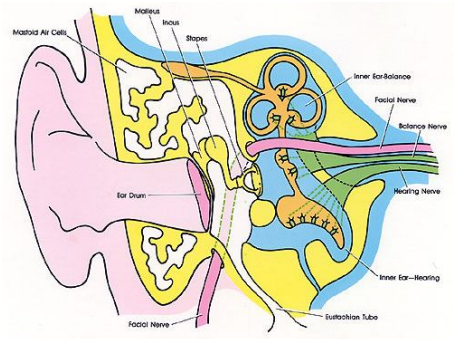
Sound and the Ear

Sound consists of vibrations of air in the form of waves. The ear is able to pick up these vibrations and convert them into electrical signals that are sent to the brain. In the brain, these signals are translated into meaningful information, such as language or music with qualities like volume and pitch. The volume of sound is measured in decibels (dB).

Cross section of the ear:



Causes of hearing loss

There are many possible causes of hearing loss. These can be divided into two basic types, called conductive and sensorineural hearing loss.

Conductive hearing loss is caused by anything that interferes with the transmission of sound from the outer to the inner ear. Possible causes include:

- Middle ear infections (ottis media)
- Collection of fluid in the middle ear ("glue ear" in children)
- Blockage of the outer ear (by wax) ETC

Sensorinerual hearing loss is due to damage to the pathway for sound impulses from the hair cells of the inner ear to the auditory nerve and the brain. Possible causes include:

- Age related hearing loss – the decline in hearing that many people experience as they get older
- Acoustic trauma (injury caused by loud noise) to the hair cells

Employees working with equipment that produces noise levels in excess of HSE designated levels are provided with annual hearing checks.

Audiometry (Hearing Tests)

The Control of Noise at Work Regulations 2005 requires employers to prevent or reduce risk to health and safety from exposure to noise at work. One of the regulations requires you as an employer to carry out health surveillance where there is a risk to health.

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Audiometric health surveillance should be provided for workers who are regularly exposed to noise levels above the upper exposure values (85 db). Between the lower and upper value exposure value levels (80-85 db) audiometry should also be done for people who are sensitive to noise induced hearing loss, It should be performed as a baseline at pre-employment, then annually for 2 years.

Audiometry is an established screening technique which detects earlydamage to hearing possibly resulting from exposure to noise.

Audiometry tests are performed to provide a baseline, assess an employee'shearing ability in relation to their fitness for work and at routine intervals, which will depend on the outcome of the results when tested.

Research estimates that over 2 million people are exposed to potential harmful noise levels in the UK.

The employee's audiometric test result is encompassed within four HSE Categories:

Category	Result	Calculation	Action
1	**Acceptable hearing ability** – within normal limits.	Sum of hearing levels at 1, 2, 3, 4 and 6 kHz.	None
2	**Mild hearing impairment** - Hearing within 20th percentile, i.e. hearing level normally experienced by 1 person in 5. May indicate developing NIHL.	Sum of hearing levels at 1, 2, 3, 4 and 6 kHz. Compare value with figure given for appropriate age band and gender in Table 14.	Warning
3	**Poor hearing** – Hearing within 5th percentile, i.e. hearing level normallyexperienced by 1 person in 20. Suggests significant NIHL.	Sum of hearing levels at 1, 2, 3, 4 and 6 kHz. Compare value with figure given for appropriate age band and gender in Table 14.	Referral
4	**Rapid hearing loss** – Reduction in hearing level of 30 dB or more, within 3 years or less. Such a change could be caused by noise exposure or disease.	Sum of hearing levels at 3, 4 and 6 kHz.	Referral