# Noise - advice for young workers


## Summary

One of the most significant risks that you face as a young worker is noise. Many workplaces expose you to high levels of noise for prolonged periods, which can cause permanent damage to your hearing, make you feel stressed and anxious, increase your risk of having an accident, and give you a range of other health problems such as high blood pressure. Hearing loss is one of the most common occupational disorders, and you are particularly vulnerable as a young person. But there are things that can be done to control these hazards and risks effectively. By law, your employer must assess the risks that you face as a young worker, particularly in relation to noise and vibration. Your employer must put in place measures to protect you, including supplying protective equipment, providing training and supervision, and working out which jobs it is safe for you to do. You can also help to keep yourself safe, by following safety rules, using equipment as you have been trained to do, knowing the warning signs to look out for, and finding out more about the risks you face and how to overcome them.


## Definitions

Noise and vibration are both fluctuations in the pressure of air (or other media) which affect the human body. Vibrations which are detected by the human ear are classified as sound. We use the term 'noise' to indicate unwanted sound.

Noise and vibration can harm workers when they occur at high levels, or continue for a long time.

## How does the ear work?

The sound vibrations hit the ear drum, and then travel to the middle and inner ear. In the middle ear three small bones called the malleus (or hammer), the incus (or anvil), and the stapes (or stirrup) help to transmit and amplify the vibrations generated by the sound. The inner ear contains a snail-like structure called the cochlea, filled with fluid and lined with cells with very fine hairs. These microscopic hairs transform sound waves into nerve impulses

Although everybody loses these tiny hair cells throughout life, which accounts for the fact that old people's hearing is not as good as young people's, constant exposure to loud noise destroys them. In fact if you are not careful, your hearing at 25 might be that of a 60-year-old.

## Noise levels at work

Noise is measured in decibels(dB) - the higher the number, the more intense the sound. There are various techniques for measuring sound that are normally identified by adding a letter after dB, for example dB(A).

The longer you are exposed to loud noise, the more likely it is that you will suffer hearing loss. For this reason, noise measurement and noise limits in the workplace are usually given in relation to the amount of time during which you are exposed to noise.

Workplace noise limits are normally given as a time-weighted average – the average noise level over a time period, for example 87 dB(A) averaged over 8 hours. If you work in an area where the noise is louder than 87 dB(A), then the length of time you can work here before the limit is exceeded becomes shorter.

European law sets a daily limit for exposure to loud noise. A worker must not be exposed to over 87dB(A) averaged over an 8-hour period.

There are also peak noise level limits that can be measured as pressure (Pa) rather than as sound (dB).

Different EU Member States may have different noise levels, so you need to check which apply to your workplace. Generally, if you have difficulty being heard clearly by someone about two metres away, then you may have a noise problem at work.

### A Rough Guide to Noise Levels

| dB (sound pressure level) | Source |
|---|---|
| 0 | Threshold of human hearing (with healthy ears) |
| 10 | Human breathing at 3m |
| 20 | Whispering |
| 60 | Typical office level |
| 70 | Busy traffic at 5m |
| 80 | Vacuum cleaner at 1m |
| 90 | Heavy truck at 1m |
| 110 | Chainsaw at 1m |
| 130 | Threshold of pain |
| 150 | Jet engine at 30m |

## Many young workers are exposed to high noise levels

In Denmark, since 1990, exposures were highest for workers aged 18–29. In 2000, 34 % reported regularly being exposed to noise at work.

In Finland, there has been little difference between age groups regarding noise exposure, although the 25–39 age group has slightly higher exposure levels than the others. Based on the data, noise exposure has increased in all age groups from 1997–2003.

In France, according to the working conditions survey in 1998, the younger the workers were, the higher were the exposure rates to very loud or very high-pitched sounds (40 % of workers under 20 as compared to 25 % for workers over 55). Moreover, the younger the workers, the more the rates increased over time, although the total number of workers in these age groups decreased (from 1,997,000 to 1,115,000).

In the Netherlands, it can be said in general that the higher the age the less frequently employees have to deal with noise at work.

The exposure of very young workers is difficult to assess, however. According to EU legislation, young workers should not be exposed to loud noise. (Data taken from European Agency, Noise in Figures, p. 38).

- 60 million people across Europe are exposed to noisy conditions for more than a quarter of their working time;
- noise-induced hearing loss is still one of the most common occupational disorders in Europe, accounting for around one third of all work-related illness;
- noise accounts for the second largest single amount of yearly expenditure on disability pensions and rehabilitation costs - 160 million euros.

Noise is not only bad for your hearing

- exposure to noise has an effect on the cardio-vascular system, resulting in the release of adrenaline that is associated with stress and an increase in blood pressure;
- chronic noise exposure is associated with a mild- to moderately increased risk of heart attack;
- if noise is prolonged, you may experience stress, anxiety, irritability and tension;
- noise can interact with dangerous chemical substances, increasing their impact on health;
- Noise can be dangerous for the unborn child of a pregnant women
- less severe noise can be a safety hazard, as it can interfere with verbal communication, and affect performance.

## The law on noise at work

Regulations in Europe mean that employers must ensure that young people under the age of 18 do not carry out tasks in which there is a risk to health from extreme cold or heat, or from noise or vibration. (These regulations are based on European Union Council Directive 94/33/EC of 22 June 1994, on the protection of young people at work).

Regulations that apply to all workers mean that employers must prevent risks to hearing, arising or likely to arise from exposure to noise at work. (These regulations are based on European Union Directive 86/188/EEC of 12 May 1986 on the protection of workers from the risks related to exposure to noise at work ).

## Steps your employer should take to protect you:

- assess and identify measures to eliminate or reduce risks from exposure to noise. Where the risks are low, the actions they take may be simple and inexpensive, but where the risks are high, they should be managed using a prioritised noise-control action plan.
- Where required, ensure that:
    - hearing protection is provided and used;
    - any other controls are properly applied;
    - you are provided with information, training and health monitoring.

Some terms explained:

- a hazard means anything that can cause you harm, such as loud noise
- a risk is the chance, high or low, that you will be harmed; by the hazard, such having their hearing damaged by exposure to loud noise
- risk control involves taking steps to reduce the chance, and/or the consequences, of a hazard causing you harm, such as using quieter machines, or stopping people going into noisy work areas

## How do I know if I am affected?

Listen to the warning signals from your body. When you experience any of these symptoms, leave the noisy environment immediately and give your ears some rest (this advice also applies to listening to music or going to concerts in your free time):

- ringing, whining or buzzing noises ins your ears;
- pain in your ears;
- the feeling of having cotton wool in your ears;
- difficulties hearing after the noise has stopped.

If you answer yes to any of the following questions, you should see a doctor:

- do you have problems following a conversation with friends?
- do you have to turn the volume up on your television or MP3 player?
- at parties, do the sounds melt together, meaning that you cannot understand people properly?
- do you have difficulty hearing people shouting from another room?
- do you like standing face to face with the people you talk to?
- Do you sometimes guess what people say?
- do you often ask people to repeat themselves?

Various studies around the world show that as many as 1 in 5 teenagers suffer from noise-induced hearing threshold shifts (NITS). NITS is a change in hearing sensitivity that may be experienced as temporary hearing dullness, from which the person recovers, or as a permanent condition. Continuous exposure to high noise levels may worsen the threshold shift and reduce hearing sensitivity.

## Further Information and references

### If you want to know more:

- **Resources on young people at work and safety:**
- http://ew2006.osha.europa.eu/
- **Information about noise at work and its prevention:**
- http://osha.europa.eu/topics/noise
- **Factsheets for young people:**
    - Looking out for work hazards: http://osha.europa.eu/publications/factsheets/66
    - Your rights to safe and healthy work: http://osha.europa.eu/publications/factsheets/65

### More information on noise and young workers:

- http://osha.europa.eu/good_practice/risks/noise/index_topic?topicpath=/good_practice/risks/noise/special_groups/
- http://osha.europa.eu/good_practice/person/young_people/index_topic?topicpath=/good_practice/person/young_people/noise
- WISE EARS!® http://www.nidcd.nih.gov/health/wise/

**Try the noise quiz:** http://ew2006.osha.europa.eu/risq/quizzes/1/

## References and bibliography

1. Reducing the risks from occupational noise
http://osha.europa.eu/publications/reports/6805535/full_publication_en.pdf
2. Prevention of risks from occupational noise in practice
http://osha.europa.eu/publications/reports/6905812/full_publication_en.pdf
3. Noise in figures
http://osha.europa.eu/publications/reports/6905723/full_publication_en.pdf
4. Anne Renaut. Europe slipping on health and safety
http://www.ilo.org/public/english/dialogue/actrav/publ/126/renaut.pdf
5. Louis Hagler, MD, Adverse Health Effects of Noise
Cox et al (2000). Research on Work Related Stress, p. 64
Jones, (1983) Beyond damage to the ear and hearing impairment.
Melamed et al. (1999). Industrial Noise Exposure and Risk Factors for Cardiovascular Disease: Findings from the CORDIS Study
6. Le bruit:
http://www.inrs.fr/inrs-pub/inrs01.nsf/IntranetObject-accesParIntranetID/OM:Document:03AC7C5CD7B5F2C5C125701400338DCD/$FILE/Visu.html
7. Bruit et agents ototoxiques (Noise and ototoxic agents) :
http://www.inrs.fr/inrs-pub/inrs01.nsf/IntranetObject-accesParReference/ED%205028/$File/ed5028.pdf