

Noise

Loud noise can damage your health

What are the danger signals?

- Do you have to shout to be heard at work?
- Is your hearing dulled after work?
- Do you have ringing in the ears?
- Do you have trouble following a conversation in a crowded place?
- Have your friends or family complained that you have the TV or radio turned up too loudly?

If your answer is *yes* to some of these questions, then noise in your workplace could be dangerously high.

What is noise?

Noise is a vibration in the air transmitted by the eardrum and bones of the middle ear to the inner ear. The inner ear is full of liquid which is set in motion by the noise. This motion is picked up by thousands of tiny hair cells. The hair cells, when they are bent by the motion of the liquid, send nerve messages to the brain and we hear sound.

The cells bend and sway in the sound waves like trees in the wind. If wind blows too hard or for too long a tree may lose its resilience and become permanently bent or broken. In the same way hair cells in the ear can be damaged. At first, given quiet periods, like trees, they rebound and recover. But repeated noise will damage them permanently. The damaged cells cannot transmit messages to the brain. The result is deafness to a greater or lesser degree.

Higher pitched sounds are the first to be affected and so a person is deafened to sounds such as frying bacon and the higher pitched sounds of speech, such as 'S', 'T', 'K' and 'C'. This partial deafness leads to misunderstandings when listening to others speak.

Even relatively low levels of noise can cause problems under certain circumstances. There is evidence that "irritating" background noise (such as is often found in offices) causes stress, resulting in an increased metabolic

rate and lowering an individual's resistance to noise; this can lead to noise induced hearing loss. The Standards Association of Australia recommends 40-45 dBA for General Office areas.

Health effects of excessive noise

- Excessive noise can cause ringing in the ears. This is temporary at first but can become permanent. This ringing can be very distracting and cause severe difficulties in concentration or sleep.
- Noise can affect sense of balance and cause dizziness.
- Noise is a source of stress, which can lead to tiredness, irritability and headaches.
- Noise can raise blood pressure, putting strain on the heart.
- Noise affects the eyes, causing loss of clarity, colour perception and night vision. Fine close work becomes difficult as noise causes the pupils of the eyes to dilate, forcing the eyes to constantly refocus.
- Noise increases the risk of accidents by masking sounds of approaching danger or warnings. Noise also increases the risk of accidents through its effect on balance and concentration.
- Noise interacts with other workplace hazards. Workers exposed to noise together with some other workplace hazards may have an increased risk of hearing loss. These hazards include: carbon monoxide, trichlorethylene, vibration and heat.

Measuring noise

Noise is measured by a device called a sound level meter, which gives a reading in decibels. Noise loud enough to cause pain in the ears is about ten million times as intense as the quietest sound that can be heard. To measure such a wide range in sound intensity, a special logarithmic scale is used.

On a logarithmic scale a sound increase of 10 dBA means that the sound intensity has been multiplied by ten.

Roughly every increase of 3db on the scale means a doubling of sound intensity.

The chart shows the noise levels produced by various noise sources. The units on the scale are called decibels (dBA).

Reducing noise

There are four ways to reduce noise.

1. Reduce the noise at its source

- Replace outdated and noisy machinery
- Use quieter materials and equipment. For example replace metal gears with quieter helical fibre or nylon gears.
- Reduce the distance that objects fall, and cushion their landings. Noise levels can be significantly reduced by fitting collection bins with rubber flaps to break the fall of items such as pressed or machined metal parts.

2. Block the noise transmission path

The best way of protecting against noise, if it is not possible to control the noise, is to prevent the transmission of noise throughout the workplace by:

- Moving noisy machinery or noisy processes to remote areas of the factory away from workers.
- Fitting sound absorbent materials to ceiling and walls.

3. Prevent workers' exposure to noise

- Provide a soundproof enclosure for the operator. For example control booths in industrial plants.
- The time spent by workers in a noisy environment can be reduced by job rotation or rest periods. Some unions have set a noise level of 80 dBA as a safe standard to work. Work in noise twice that level (83 dBA) should not go on for more than four hours. Work in noise ten times that level (90 dBA) should only go on for 45 minutes.

4. Provide hearing protection

Protection such as ear plugs and ear muffs are the last resort, where other methods controlling noise have not been applied or are not practical.

Remember that personal hearing protection is not very effective against very high noise exposure levels. Nor is it effective against high level impulse or impact noise.

The law and noise

The national standard for exposure to noise during a working day of eight-hours is 85 dBA and 140 dBA (lin) for a peak noise level. The law also states that noise above 85 dBA must be reduced by control design, isolation, en-

Effect on People	Sound Level (in dBA)	Sound Source
High	140	Jet engine
Injurious	130	Rivet hammer
	120	Pain threshold
Injurious	110	Chain Saw
Irritating	85	Sheet-metal workshop
	80	Aust. General Standard for 8 hrs
	70	Heavy traffic
	60	Normal conversation
	50	Low conversation
	40	Quiet radio music
	30	Whispering
	20	Quiet urban room
	10	Rustling leaves
	0	Hearing threshold

closure and replacement procedures. However, the standard of 85 dBA is not a guarantee freedom from health problems arising from noise. Individuals have different susceptibilities to hearing damage. For some, hearing damage occurs at 75 dBA.

What you can do

1. Look for the danger signals

If you think that there is a noise problem at work, then you need to find out the level of noise in your workplace.

2. Measure the level of noise

The NSW WorkCover *Code of Practice for Noise Management and Protection of Hearing at Work* states that a noise assessment should be done in all workplaces where employees may be exposed to noise exceeding the standards set by the regulatory authorities. As an informal guide, it is advisable to carry out a noise assessment if it is necessary to use a raised voice to communicate with a person about one metre distant.

A noise assessment can be done by management, WorkCover inspectors or by an external consultant. If a noise survey has not yet been done in your workplace, you can request management to conduct such a survey through your safety committee. Some unions also have their own noise measuring equipment and will conduct surveys. The Workers Health Centre can also measure noise levels in your workplace.

If you can, observe how the survey is conducted and then ask for a copy of the results.

3. Get your hearing checked

Hearing checks are conducted with a machine called an audiometer. The audiometer measures your loss of hearing at various frequencies. This test can show whether your deafness is caused by noise or by some other problem.

The Workers Health Centre can perform screening audiometry (short hearing tests) as part of a hearing conservation program. Also, at the Centre, a qualified audiometrist performs audiological testing for hearing loss complying with Australian Standards. Where industrial deafness is diagnosed, a precise calculation of percentage hearing loss can be determined.

4. Compensation

Current legislation determines that 6% or more industrial noise induced hearing loss is compensable. If an audiogram shows that you have hearing loss caused by workplace noise, then go to your union compensation officer who can assist you with an *Industrial Deafness Notice of Injury* form.

Your union will send you to their solicitor who will ask your doctor for a report. When the solicitor receives the report he or she will claim compensation for you from your employers insurance company.

Some suggestions for action

- Through your workplace Health and Safety Committee conduct a survey of all workers to find out if they have the warning symptoms of noise induced deaf-

ness or other problems related to noise. Accidents are sometimes caused by noise; for example, by making workers dizzy and affecting their balance.

- Check whether consultants employed by management to measure and investigate noise problems are investigating the problem thoroughly. The Workers Health Centre can provide information on what steps the Committee should take and assist you in assessing and interpreting reports.
- Investigate and insist on engineering controls for noise problems.
- Find out what new machinery is to be introduced in the workplace and check whether it is designed and installed in a way that will reduce noise.

Useful references

National Occupational Health and Safety Commission (phone 132 447):

Occupational Noise - National Standard for Occupational Noise and National Code of Practice for Noise Management and Protection of Hearing at Work, 1993

Core Training Elements for the National Standard for Occupational Noise, 1995.

NSW WorkCover (phone 131 050):

Code of Practice for Noise Management and Protection of Hearing at Work, May 1996

For further information and advice contact the Workers Health Centre



The Workers Health Centre provides a range of quality services in occupational health and safety including

- Occupational medicine
- Medical screenings
- Hearing tests
- Workplace assessments
- OHS training
- Rehabilitation
- Related services in psychology, acupuncture and massage therapy

For further information and advice ring us on 02 9749 7666

Workers Health Centre