

Workplace Health and Safety Bulletin



Audiometric Testing: Information for Employers and Workers

This publication is intended to assist employers meet the requirements of the audiometric testing component of the noise management as required in Part 16 by the Occupational Health & Safety (OHS) Code.

Occupational hearing loss is one of the leading causes of work-related disorders. Audiometric testing of workers' hearing is important to the success of a noise management program since it is the only way to actually determine if occupational hearing loss is being prevented by the noise management control measures. Because occupational hearing loss happens gradually over time, workers often fail to notice changes in their hearing ability until a relatively large change occurs. By comparing audiometric tests from year to year, early changes can be detected and appropriate protective measures implemented to prevent further damage.

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Legislated Requirements

If a noise exposure assessment confirms that workers are exposed to excess noise at the work site, the employer must develop and implement a noise management program. The noise management program must include audiometric testing and an annual review of the effectiveness the noise management program in preventing hearing loss. "Excess noise" is defined in the OHS Code as "noise that exceeds 85 dBA L_{ex} and the exposure limits listed in Schedule 3, Table 1.



The employer is responsible for identifying workers exposed to excess noise, educating workers in hazards of noise exposure, training workers in the use of control measures, and ensuring that noise exposed workers have hearing tests conducted by an audiometric technician. As well, the employer must designate a physician, audiologist or occupational health nurse to work with the audiometric technician; keep a record of whether the hearing test was done (but not a copy of the actual hearing test), and pay the costs associated with a hearing test. The employer must also ensure a log book is kept containing audiometer calibration data and review policies and procedures annually to determine the effectiveness of the training and education related to noise management. Where the employer contracts out the audiometric testing, the employer must ensure the audiometric contractor understands their roles, obligations and responsibilities under the OHS Code.

A worker who is or may be exposed to excess noise must cooperate with the employer in implementing the noise management program including having audiometric testing. Seasonal and temporary workers who are exposed to excess noise also must receive audiometric testing. The employer must bear the costs of testing including time from work, if that is required.

When a worker is or may be exposed to excess noise, the worker must have a baseline audiogram as soon as practicable, but no later than six months after the start of employment. This requirement also applies if a worker is exposed to noise due to a change in activities (the introduction of new equipment or processes) or duties (reassigned to a new job or a new, noisier area within the workplace).

The baseline audiogram is conducted in a noise free environment when the worker has been away from noise for 14 hours, including noise exposure away from work. For workers who have audiometric testing conducted during their work shift, hearing protection may be used to meet the no noise requirement.

Additional tests are required 12 months after the baseline test and every two years thereafter. These subsequent tests should be scheduled at the end of or well into the work shift so that temporary changes in hearing can be noted. The results can then be compared with the baseline audiogram to check for changes in hearing sensitivity, identify a temporary hearing loss before it becomes permanent, and allow corrective control measures to be implemented.

The Audiometric Test

The audiometric test consists of pure tone air conduction threshold testing of each ear at 500, 1000, 2000, 3000, 4000, 6000, and 8000 Hz. At each frequency, the threshold recorded for the ear is the audiometer's lowest signal output level at which the individual responds. Noise exposure increases hearing thresholds, resulting in threshold shifts toward higher values (poorer hearing).

Exposure to noise usually causes gradual development of hearing loss over time. During each overexposure to noise, the ear develops a temporary reduction in sensitivity, called a temporary threshold shift. This shift reverses over a period of hours or days if the ear is allowed to recover in a quieter environment. If the exposure is to a high enough level of noise, for a long enough time, the temporary threshold shift may not reverse completely and a permanent threshold shift begins to develop.

Who does the audiometric testing?

The employer is responsible for ensuring that audiometric tests are conducted by a qualified audiometric technician who works in consultation with a physician, audiologist or occupational health nurse. The person doing the tests must be qualified and recognized by the Director of Medical Services, Employment and Immigration (E&I), as holding a certificate in audiometric testing and must re-qualify every 5 years. The list of approved audiometric technician training agencies and approved audiometric technician courses are available on the Workplace Health and Safety website at: www.worksafely.org.

Hearing tests must be done by a qualified audiometric technician.

The *OHS Regulation*, Section 13, requires that workers be competent or work under the supervision of a competent worker. A person conducting audiometric testing must be “adequately qualified, suitably trained and with sufficient experience” to perform all the tasks outlined in the OHS Code, Section 223 (2). When hiring a contractor to conduct audiometric testing, this requirement must be met.

Testing equipment – audiometers

Audiometric testing must be conducted using an audiometer that meets the specifications of an audiometer described in the ANSI Standard S3.6-2004, *Specifications for Audiometers* or equivalent. The Canadian Standards Association, CAN3-Z107.4-M86 (R2001), *Pure tone air conduction audiometers for hearing conservation and for screening*, can also be used as a resource.

Calibration of audiometers and related equipment is critical for reliable test results and must be calibrated following the CSA Standard CAN3-Z107.4-M86 (R2001). Audiometers must have a laboratory calibration at least annually or according to the manufacturer’s specifications.

Audiometer must be calibrated.

Test environment

The purpose of conducting background noise level measurements is to ensure that background noise does not interfere with the audiometric testing and give false results. The testing environment must meet the requirements of the OHS Code, Schedule 3, Table 3 for background noise.

The background noise levels must be measured and recorded and kept with the calibration records. When audiometric test equipment is moved to a different location, background noise levels must be measured again.

Audiometric test results

The audiometric technician classifies the tests as normal, abnormal, or abnormal shift. The definitions of abnormal, or abnormal shift are found in the OHS Code, Part 1, Definitions.

An “abnormal audiogram” means an audiogram that indicates

- (a) the threshold in either ear is more than 25 dB at 500, 1000 or 2000 Hz
- (b) the threshold in either ear is more than 60 dB at 3000, 4000 or 6000 Hz
- (c) there is one-sided hearing loss with the difference in hearing threshold level between the better and the poorer ear exceeding the average of 30 dB at 3000, 4000 and 6000 Hz.

“Abnormal shift” means a threshold shift, in either ear, of 15 dB at two consecutive test frequencies from 1000 Hz up to and including 6000 Hz when compared to the baseline test.

Where results of the audiogram are abnormal or abnormal shift, the audiometric technician must inform the worker of the test result and ask the worker to provide a health history related to hearing. The audiometric technician must send the results of a new abnormal audiogram or an audiogram showing an abnormal shift, the baseline audiogram, and the health history to the physician or audiologist designated by the employer to review audiograms.

The audiometric technician must give the worker a copy of the results of the audiogram. The worker is encouraged to keep a record of audiometric test results in case a hearing loss develops. Because employers are only required to keep audiometric test results for 10 years, the worker needs to keep records of his or her audiometric test results over the course their working life.

Responsibility of Designated Physician/Audiologist

The physician or audiologist must be a health care professional knowledgeable in occupational noise and workplace exposure. They will review the audiogram, related health information and confirm that the audiogram is an abnormal or abnormal shift audiogram. The physician or audiologist may require repeat testing or refer the worker to an appropriate health care professional for follow-up.

Where the physician or audiologist, confirms that the audiogram is abnormal or an abnormal shift, the worker must be advised of this within 30 days. The physician or audiologist must provide a copy of the audiometric test results to the worker’s physician with the worker’s permission.

As the physician or audiologist will have knowledge of non-occupational exposure of the worker, the worker can be advised how this may be a contributing factor where the audiogram is abnormal.

The physician or audiologist must also advise the employer as to the effectiveness of the noise management program in place at the work site as it relates to worker hearing. When doing so, a record (not the

actual audiogram) with the names of the workers and the dates when they were tested should be given to the employer. As well as a summary of the number of tests, results should be categorized and an explanation of the group results given to the employer. This should include the total number of noise exposed workers, total number of audiograms, number of baseline tests, number of periodic abnormal audiograms, and number of abnormal shift audiograms.

The employer should consider this information when evaluating the effectiveness of workplace education and training programs for noise and the effectiveness of noise control measures. The employer should also designate a knowledgeable person at the work site to consult with the physician or audiologist to provide specific details of the noise management program, such as hearing protection worn, work site noise levels, and personal dosimetry results. This person could be the audiometric technician or health and safety personnel. Where there are abnormal audiograms the employer must determine the work-related cause of the exposure and either eliminate or control the noise source.

Record keeping

The audiometric technician must record the results of the hearing test and keep the records for at least 10 years from the date the test was done.

Audiograms are confidential medical records and cannot be given to the employer. The employer must ensure that the audiogram and the worker's medical history are under the sole control of a health professional designated under OHS Code, subsection 223 (2) (a). Audiograms can only be released with the worker's written consent.

Audiograms are
confidential medial
records.

The audiometric technician must keep a log book that contains the audiometer's calibration records. The log book and calibration records must be kept with the audiometer throughout its useful lifetime. The audiometer must be calibrated yearly or at intervals specified by the manufacturer.

Follow-up

The physician or audiologist designated by the employer must notify the Director of Medical Services, Workplace Health and Safety Policy and Legislation, EII of noise-induced hearing loss as required by the *Occupational Health and Safety Act*, Section 22 and *OHS Regulation*, Section 6.

Noise-induced hearing loss is a notifiable disease.

Who pays for the testing?

The employer must pay for the audiometric testing and the interpretation of the results. Every effort should be made to have the audiometric testing conducted during normal working hours. If the testing takes place during the worker's hours of work, the worker's wages, salary or benefits cannot be deducted while the worker is being tested.

The employer must pay for audiometric testing.

If it is impractical for the worker to have the audiogram conducted during his or her normal working hours, the employer must pay the worker for the time that is spent having the test conducted. If travel to or from the audiometric testing happens during working hours, the worker's wages, salary or benefits cannot be deducted for this period.

Annual report for noise exposed workers

Occupational Health and Safety Officers from E&I may ask for documentation of the noise management program including the annual review. The form "Annual Report for Noise Exposed Workers", Appendix A of this bulletin, when completed can be used to fulfill the requirement of reviewing the noise management program annually.

Annual Report for Noise Exposed Workers

18. How is audiometric testing done at this worksite?

- a) In-house company technicians Yes No
- b) Private contractor Yes No _____
If yes, name of private contractor
- c) Both, a and b Yes No _____
If yes, name of private contractor
- d) Other _____
Specify

19. Where is the audiometric testing done?

- a) Sound booth Yes No
- b) Mobile van Yes No
- c) Quiet room on site Yes No
- d) Other _____
Specify

20. Type of muffs or plugs used for testing: _____

21. Which of the following components are included in your noise management program?

- a) Education about Alberta OH&S Code, Part 16 Noise Yes No
- b) Engineering and administrative controls for noise Yes No
- c) Worker education about noise Yes No
- d) Sound level surveys Yes No
- e) Personal noise dosimetry Yes No
- f) Selection, instruction and use of hearing protection Yes No
- g) Audiometric testing Yes No
- h) Program evaluation Yes No
- i) Other _____
Specify

22. Is the following hearing protection provided to workers?

- a) Plugs Yes No If yes, brand name(s) _____
- b) Ear muffs Yes No If yes, brand name(s) _____

Name of person who completed form: _____


SIGNATURE: _____

DATE: _____

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Workplace Health and Safety



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