



UNIVERSITY OF
NORTHERN COLORADO

Environmental Health and Safety

Hearing Conservation Program

September 2022



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Hearing Conservation Program

I. Purpose

The University of Northern Colorado Hearing Conservation Program (HCP) is designed for the conservation and protection of the hearing abilities of University personnel who are exposed to occupational noise during work related duties. Federal regulation criteria recommends that occupational noise exposure at an average of 85 decibels (dBA), when decibels are measured on the “A” scale of a standard sound level meter at slow response settings, over an 8 hour time-weighted average (TWA) is the highest average sound level at which a worker can be exposed to and this trigger level shall constitute the promulgation of the HCP. This program will provide guidance to personnel that are exposed to an occupational noise exposure at certain levels.

II. Responsibilities

A. Departments

- Ensure that Department employees who have noise exposures of 85 dBA or greater at an 8-hour TWA are entered into this program.
- Schedule employees for baseline audiogram prior to working in noise hazard areas where applicable.
- Schedule and send workers for annual audiometric testing where applicable.
- Schedule annual training with EHS for those entered into this program.
- Purchase and issue effective hearing protective devices.
- Assure that hearing protection is readily available to employees at all times.
- Require the employees to use the personal protective and noise control equipment that is provided for them.
- Inform the employee when hearing protection is mandatory.
- Inform EHS when changes in personnel, procedures and/or processes may significantly change noise exposures.
- Erect signs to delineate hearing conservation areas and high noise areas.
- Evaluate high noise areas and assist in the development of administrative and engineering controls.
- Request specifications for noise emission data as well as controls offered by the machine and equipment supplier.
- Provide EHS with noise specifications at the design stage of project development.

- Contact EHS to schedule noise monitoring of an area, individual, supervisors, or employee.

B. Employee

- Report for annual audiometric test when scheduled.
- Attend and participate in hearing conservation training when scheduled.
- Use hearing protection in high noise areas.
- Properly use and maintain the hearing protection devices and noise control equipment provided by to them.
- Encourage co-workers and visitors to utilize hearing protection as designated or required.
- Notify supervisors if hearing protection is not readily available

C. Audiometric Testing and Analysis (Medical Provider)

- Administer audiometric testing in compliance with regulatory standards.
- Perform otoscopic (ear) examinations prior to the audiometric portion.
- Maintain audiometric database and analyze test results for changes in hearing and need for personal or occupational medical referrals.
- When a standard threshold shift has occurred as specified in the regulatory standard, inform the employee in writing within twenty-one days of determination.
- Inform EHS of individuals that have standard threshold shifts.
- Provide employee notifications of changes in hearing or medical referral recommendations.
- Provide EHS with recommendations regarding potential occupationally-related medical referrals.
- Maintain and calibrate audiometric testing equipment.
- Collaborate on noise sampling data collection.

D. Environmental Health and Safety

- Maintain and update the Hearing Conservation Program
- Set up hearing conservation program specifications.
- Provide employee hearing loss prevention training and/or training resources, including the proper fitting, care, use, and cleaning of hearing protection devices and aural hygiene.
- Develop noise sampling strategies.
- Conduct initial noise level monitoring to identify any high level areas that are greater than or equal to 85 dBA for an eight-hour TWA.
- Inform Departments and employees of locations that are identified as a high noise and hearing conservation area.
- Conduct or coordinate monitoring in high noise areas for the purpose of investigating engineering controls and verifying the effectiveness of said controls.
- Conduct monitoring, following changes in procedures and/or processes that may significantly change noise exposures.

- Assist in the identification and recommendation for hearing protection devices to be made available to employees.
- Schedule and audit the audiometric testing program.
- Periodically audit the use of hearing protection.
- Assist in the development of administrative and/or engineering controls.
- Maintain and calibrate noise sampling equipment.
- Maintain training records.

E. Human Resources

- Maintain medical records for employees.
- Provide medical follow up appointments, if needed.

III. Program Directives

The regulatory standard provides for employee protection against the effects of noise when employees are exposed above *Permissible Noise Exposures (PNE)*. Personal noise exposures are a function of the noise level and the duration of exposure. An equivalent exposure may be of shorter duration but at a higher noise level, i.e., 95 dBA at 4 hours or 100 dBA at two hours.

Listed below are the regulatory permissible noise exposures for specific exposure times.

Duration (hr)	Sound level (dBA)
8	90
6	92
4	95
3	97
2	100
1	105
.5	110
.25	115

Per the regulatory standard, the employer is required to identify high noise sources and to establish a Hearing Conservation Program for employees whose noise exposure equals or exceeds the *Action Level*. The action level for entrance into the HCP has been set at 85 dBA (regulatory standard per HCP) for any duration during the course of a work day.

Personnel whose exposure equal or exceed the Action Level must be enrolled in the Hearing Conservation Program.

This program is devised to prevent the loss of hearing and will be provided to all qualified employees whose noise exposures equal or exceed the Recommended Exposure Limit (REL). The program has three phases once an area is designated as a Hearing Conservation Area or employees are identified to be enrolled in the HCP.

Phase I consists of monitoring areas that have the potential to be at or above the threshold of 85 dBA or have already been identified as such. Phase II consists of getting those employees who have been identified in for baseline audiometric testing and subsequent annual testing thereafter to ensure hearing loss is not occurring or is halted. Phase III encompasses training with an emphasis on control methods, more specifically Personal Protective Equipment (PPE) in the form of hearing protection.

A. Noise Exposure Monitoring

The goal of the Hearing Conservation Program is to reduce employee exposure to occupational noise that meets or exceeds the regulatory standard. EHS will monitor and evaluate potentially loud operations and equipment. In areas where the noise level exceeds the REL of 85 dBA TWA, EHS will conduct a personal noise exposure sampling and a sound level survey of the work areas in an effort to identify any high noise hazard areas or equipment so that appropriate actions can be taken.

1. *Area noise monitoring/surveys* will be conducted to identify locations where average noise levels meet or exceed the 85 dBA threshold. In areas where the 85 dBA criteria is met or exceeded, hearing protective will be required.
2. *Noise Dosimetry* will be used for individual noise monitoring to measure personal exposure over typical work shift duration. All noise dosimetry samples will be normalized to an 8-hour TWA.

Employees and supervisors are encouraged to observe noise monitoring procedures.

B. Audiometric Testing

Audiometric testing is made available to all employees who qualify for the HCP under specific stipulations. An audiologist, audiology graduate student under the supervision of an audiologist or a certified audiometric technician, will perform the audiometry. The exams will be provided at no cost to the employee and covered by the employee's department.

1. Baseline Testing

Ideally a baseline audiogram should be administered for any new employee prior to beginning work that may be exposed to a noise hazard area, but no later than 30-days after enrollment in the HCP. The test determines an individual's "hearing threshold". The baseline test should be preceded by 12-14 hours without exposure to noise from the workplace.

2. Annual Test

Employees enrolled in the HCP will be scheduled for an annual audiogram. The annual audiogram results will be compared to the baseline data to identify changes in hearing or medical referrals recommended. The annual exam may be performed at any time during the work shift and a “quiet” period before the audiogram is not required. The test will indicate if there has been a Standard Threshold Shift (STS) that may be suggestive of noise-induced hearing loss. A STS is a change in hearing threshold relative to the baseline audiogram of an average of 10 dBA or more at 2000, 3000, and 4000 hertz in either ear. If an STS has been detected, the employee will be scheduled for a retest within 30 days to confirm the change in hearing.

- 30-day Retest

Employees with an STS on the annual audiogram will be retested within 30-days after avoiding hazardous noise for 12-14 hours prior to the exam. The determination of an STS will either be “confirmed” or “unconfirmed” depending on the test results.

3. Test Evaluation

If the annual audiogram has proved an employee to have suffered a confirmed STS, an audiologist or physician must review the results and determine whether there is need for further evaluation. The employee should be notified in writing within 21 days of a STS determination.

If a physician or audiologist determines that the standard threshold shift is work related the employer is responsible for the following:

- Employees found not using hearing protection shall be fitted with hearing protectors, trained in their use and care, and required to use them.
- Employees already using hearing protection shall be refitted and retrained in the use of hearing protectors and provided with hearing protection offering greater attenuation if necessary.
- The employee shall be referred for a clinical audiological evaluation if additional testing is necessary or if the employer suspects that a medical pathology of the ear is caused or aggravated by the wearing of hearing protectors.

Additionally, the audiologist will review all audiograms and identify any “personal” medical referrals that may be indicated for the employee. For instance, an employee with a pre-existing hearing loss may need medical follow-up. EHS and Audiology are responsible for notifying the employee of these recommendations.

C. Control Methods

The employer is responsible for instituting controls to reduce employee noise exposure over an 8-hour day. These controls may include the following:

1. Administrative controls

- Decrease worker's scheduled hours when working in high noise areas.
- Post signs for the recommended or required use of hearing protective devices in areas with noise hazards.
- Enforce the use of hearing protectors (ear plugs, ear muffs) in designated areas to minimize noise exposure.
- Make hearing protectors easily accessible to employees.

2. Engineering controls

- Use the *Best Available Technology* to reduce noise levels.
- Keep machinery in good condition to reduce noise levels (i.e. use of noise mufflers, change or repair equipment as necessary).
- Enclose areas of high noise levels by building partial or total barriers.

3. Personal Protective Equipment (PPE) – Hearing Protection

- PPE such as earmuffs, earplugs or ear canal caps should be worn in all high noise level areas.
- All workers using hearing protective devices should be trained on the proper selection, fitting, use, care, handling, and operation of the devices.

a. Hearing Protection

Hearing protective devices are required to be worn when working in high noise areas or operating equipment designated as sources of high noise. This requirement applies to all UNC employees, visitors or any other persons in the noise hazard area.

Employers must make hearing protective devices available to all employees at or above the REL. Devices should be provided at no cost to the employee. There should be a variety of hearing protective devices for an employee to choose from such as earplugs and earmuffs. EHS and the Audiology department can help determine proper hearing protection specific to the employee's work area, communication needs and other safety equipment in use.

- Hearing protective devices must be worn in all designated areas and be replaced as necessary.
- Hearing protection use is mandatory for any employee who has not received their baseline audiogram.

D. Training

The training program requires participation for all employees who meet or exceed the recommended exposure level. The training will be held on an annual basis for all employees who qualify for the HCP.

The training will provide employees with the following information:

- The effects of noise on hearing
- Hazardous noise sources at the worksite
- The purpose of hearing protectors, the advantages, disadvantages, attenuation of various types, and instructions on selection, fitting, use, and care. This should include supervised hands-on practice in the proper fitting of hearing protection.
- The purpose of audiometric testing, and an explanation of the test procedures.
- A description of the university hearing loss prevention program and applicable administrative or engineering controls.

IV. Record Keeping

Human Resources will maintain employee exposure measurements. EHS will maintain noise level survey data. The noise level survey data will be maintained for a minimum of two years. Ideally, all exposure records should be maintained for the duration of employment plus 30 years for risk management purposes.