OSHA mandates that students spend a specific amount of time in each module of this course. In order to comply with OSHA’s requirement, additional resources related to this module’s content are provided below. You should also consider reviewing the Fact Sheet for this module, which is located at the end of this resource list.

When the minimum required time for this module has elapsed, you will be allowed to proceed to the next module.

**CAUTION:** When closing resource links, take care to not close your course browser window, as that will stop the module timer.

### Module 7: Health Hazards in Construction

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## Module 7: Health Hazards in Construction

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Module 7: Health Hazards in Construction

In this module, we cover information that will enable workers to recognize health hazards in construction and methods for abating those hazards.

Module Objectives

Terminal Objective
Given current OSHA and industry information regarding construction worksite illnesses, injuries, and/or fatalities, the student will be able to recognize best practices for abating health hazards found in construction industry workplaces.

Enabling Objectives
Specifically, the student will be able to:

1. Identify information that employers must make available to employees through a Hazard Communication Program.
2. Identify common health hazards encountered on construction worksites.
3. Identify the different types of hearing protection that might be used on a construction worksite.
4. Identify the different type of respiratory protection that might be used on a construction worksite.

What Information Must Employers Make Available Through A Hazard Communication Program?

If employees are exposed to hazardous chemicals at their workplace, they have the right to know and need to be trained about them.

According to OSHA, “all workplaces where employers are exposed to hazardous chemicals must have a written plan.” This plan must describe how the Hazard Communication Standard is implemented at worksite. The written plan must include the following information:

- Chemicals present at the worksite
- Indication of who is responsible for various aspects of the program at that worksite
- Indication of where written materials will be available to employees
- Labeling and Safety Data Sheets (SDS)

OSHA updated the Hazard Communication Standard (March 2012) to incorporate the Global Harmonized System (GHS) elements for labeling and safety data sheet.

Labeling requirements for chemicals include:

- Pictogram
- Signal word
- Hazard and precautionary statements
- Product identifier
- Supplier identification

Employers must have an MSDS for each hazardous chemical they use. A uniform format should be used that includes the following section numbers, headings, and associated information:

- **Section 1, Identification** – includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.
- **Section 2, Hazard(s) Identification** - includes all hazards regarding the chemical; required label elements.
- **Section 3, Composition/Information on Ingredients** - includes information on chemical ingredients; trade secret claims.
- **Section 4, First-Aid Measures** - includes important symptoms/ effects, acute, delayed; required treatment.
- **Section 5, Fire-Fighting Measures** - lists suitable extinguishing techniques, equipment; chemical hazards from fire.
- **Section 6, Accidental Release Measures** - lists emergency procedures; protective equipment; proper methods of containment and cleanup.
- **Section 7, Handling and Storage** - lists precautions for safe handling and storage, including incompatibilities.
• **Section 8, Exposure Controls/Personal Protection** - lists OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).

• **Section 9, Physical and Chemical Properties** - lists the chemical's characteristics.

• **Section 10, Stability and Reactivity** - lists chemical stability and possibility of hazardous reactions.

• **Section 11, Toxicological Information** - includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

• **Section 12, Ecological Information**

• **Section 13, Disposal Considerations**

• **Section 14, Transport Information**

• **Section 15, Regulatory Information**

• **Section 16, Other Information** - includes the date of preparation or last revision.

*Note: Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15 [29 CFR 1910.1200(g)(2)].

**What Are Common Health Hazards On Construction Worksites?**

Health hazards in construction fall into one of four categories: chemical, biological, ergonomic, or physical.

**Chemical Hazards**

Exposure to chemicals may put workers at risk of developing health problems, such as heart ailments, central nervous system damage, kidney and lung damage, sterility, cancer, burns, or rashes. Some chemicals may pose risks of fire and explosion hazards.

Chemicals enter the body through the following means:

- **Inhalation** - the most common means of chemical entry into the body; exposure may be prevented or lessened by substitution of volatile chemicals for less volatile chemicals, ventilation, or PPE.
- **Ingestion** – least common route of entry, but could easily occur if contaminated hands are not washed prior to eating, smoking, or inserting into the mouth.
- **Absorption** – chemicals can be absorbed through the skin, eyes, respiratory tract, or digestive tract.

Workers can potentially be exposed to chemicals in various ways. The following are some common ways workers encounter chemicals on a construction worksite:

- **Confined spaces** can potentially expose workers to chemicals (or a lack of oxygen). Confined spaces should be tested and ventilated before entry. Ensure proper ventilation and PPE is used during work in confined spaces. Take proper precautions before rescuing co-workers in confined spaces.

• **Lead** exposure may occur during demolition, salvage, removal, encapsulation, renovation, and clean-up activities due to the use of lead in lead-based paints, lead solder, electrical fittings and conduits, tank linings, plumbing fixtures, and many metal alloys.

Methods of protecting against lead exposure include:

- Use proper PPE.
- Wash hands and face after work and before eating, drinking, or smoking.
- Never enter eating areas wearing PPE.
- Never wear clothes and shoes that were worn during lead exposure away from work.
- Launder clothing daily; use proper cleaning methods.
- Be alert to symptoms of lead exposure (severe abdominal pain, headaches, loss of motor coordination).

• **Asbestos** exposure tends to occur in the construction industry and in ship repair, particularly during the removal of asbestos materials during renovation, repairs, or demolition. Asbestos has been used in products such as insulation for pipes, floor tiles, building materials, and in vehicle brakes and clutches. Methods of protecting against asbestos exposure include:

  - Monitor personal exposure to assess the risk.
  - Provide hazard awareness training for operations where there is potential exposure to asbestos.
  - Wear appropriate PPE.
  - Provide medical monitoring of workers.
  - Establish regulated work areas.

• **Crystalline silica** is abundant in earth’s crust and occurs in several forms, including the most common form as quartz. Exposure to silica through inhalation of small crystalline silica particles in the air occurs in with common workplace operations such as cutting, sawing, and drilling. Quartz is found in many construction materials such as brick and mortar, concrete, slate, granite, sandstone, stone aggregate, tile, and sand. Crystalline silica is also found in asphalt filler, roofing granules, plastic composites, soils, wallboard joint compounds, paint, plaster, caulking, and putty.

Methods of protecting against silica exposure include:

- Replace silica materials with safer substitutes whenever possible.
Provide local exhaust ventilation and blasting cabinets.
Use PPE and other work practices to control dust exposures.
Wear only a N95 NIOSH-certified respirator.
Do not eat, drink, or smoke where silica dust is present.
Wash hands and face outside of dusty areas.
Participate in training, exposure to monitoring, and health screenings.

**Biological Hazards**
Exposure to biological hazards can occur during demolition, renovation, sewer work, and other types of construction work from contact with contaminated or disease-carrying soil, water, insects, droppings, and animals. Biological hazards include:

- Exposure to pathogens that cause diseases and illnesses, such as:
  - Tetanus
  - H1N1 or Swine flu
  - Avian flu
  - West Nile virus
  - Lime disease
- Exposure to poisonous or harmful plants, such as:
  - Poison ivy, poison oak, or poison sumac
  - Thorn-bearing plants
- Exposure to animals, such as:
  - Mosquitoes and other biting insects, spiders, scorpions, ticks
  - Stray or wild animals
  - Snakes

Methods for protecting against exposure to biological hazards include:

- Use insect repellent and wear long pants, socks, and long-sleeved shirts to ward off pathogen-carrying insects.
- Be on alert for animals that may be hiding under materials or debris piles.
- Keep current on vaccine shots, such as tetanus.

**Ergonomic Hazards**
Ergonomic hazards can cause painful and disabling injuries and illnesses to the joints and muscles and are associated with a range of tasks, including, but not limited to, lifting, holding, pushing, walking, and reaching. Examples of ergonomic hazards include:

- Heavy, frequent, or awkward lifting
- Awkward grips
- Poorly designed tools
- Repetitive and intensive work

Methods for protecting against ergonomic hazards include:

- Use proper lifting technique.
- Ask for help when handling heavy, bulky materials.
- Use tools ergonomically designed for job.

**Physical Hazards**
Physical hazards include exposure to extreme temperatures, impacts or vibrations, radiation, or excessive noise.

Workers may be exposed to extreme hot or cold temperatures in both indoor and outdoor environments due to climate or working conditions. Factors that affect temperature extremes include humidity level, wind speed, radiant heat, physical contact with hot or cold objects, and strenuous physical activity.

The following methods may be used to protect against exposure to cold environments:

- Wear appropriate clothing for cold, wet, windy conditions.
- Use engineering controls, such as heaters and wind shields, to make the work environment warmer.
- Adjust work schedules and practices to combat effects of exceedingly cold weather.

The following methods may be used to protect against exposure to hot environments:

- Use engineering controls, such as air-conditioning and ventilation to make the work environment cooler.
- Adjust work practices that allow workers to use work/rest cycles, drink water often, and build up a level of tolerance to working in the heat.
- Know the symptoms and look out for heat-related illnesses in yourself and others.

Impact or vibrating tools can cause fatigue and strains during use. Employers should implement appropriate engineering controls and work practices to prevent vibration and impact hazards and issue PPE if hazards cannot be controlled.

Radiation can be found in a wide range of occupational settings, and if not properly controlled, can lead to potential health hazards. The following are examples of various types of radiation exposure to which workers may be exposed:
• Extremely Low Frequency Radiation (ELF) – produced by power lines, electrical wiring, and electrical equipment; sources of intense exposure include ELF induction furnaces and high-voltage power lines.
• Radiofrequency (RF) and Microwave Radiation (MW) – sources include radio emitters and cell phones.
• Infrared Radiation (IR) – sources include furnaces, heat lamps, and IR lasers.
• Visible Light Radiation – different visible frequencies of the electromagnetic spectrum; lighting.
• Ultraviolet Radiation (UV) – sources include the sun, black lights, welding arcs, and UV lasers. UV radiation is the most common source of exposure for construction workers.
• Lazar Hazards – emit optical radiations (UV, visible light, IR).

The following methods may be used to protect against exposure to radiation:
• Utilize engineering and administrative controls.
• Wear appropriate PPE.

Noise exposure is also considered a physical hazard. OSHA sets limits on noise exposure in the workplace based on a worker’s Time-Weighted Average (TWA) over an 8-day period. OSHA’s Permissible Exposure Limit (PEL) is 90 dBA TWA for an 8-hour day. However, NIOSH recommends exposure levels of 85 dBA or less for an 8-hour TWA.

What Types Of Hearing Protection Might Be Used On Construction Worksites?
Noise control, aimed at reducing the hazardous exposure to the point of eliminating or minimizing the risk, is the first line of defense against excessive noise exposure.

The following engineering controls can reduce worker exposure to noise:
• Choose low-noise tools and machinery.
• Maintain and lubricate machinery and equipment.
• Place a barrier between the noise source and employee(s).
• Enclose or isolate the noise source.

The following administrative controls can reduce or eliminate worker exposure to noise:
• Operate noisy machines during shifts when fewer people are exposed.
• Limit the amount of time a person spends at a noise source.
• Provide quiet areas where workers can gain relief from hazardous noise sources.
• Restrict worker presence to a suitable distance away from noisy equipment.

If it is not possible to eliminate or reduce noise exposure by using engineering and administrative controls, hearing protection must be provided by employers and employees must use it.

Workers should be alert to hazardous noises, and request medical examinations and hearing tests if they think they are in danger of permanent hearing loss.

What Types Of Respiratory Protection Might Be Used On Construction Worksites?
Respirators protect workers against insufficient oxygen and against harmful dusts, vapors, and sprays. Your employer must provide you with respirator training that includes how to properly clean and disinfect a respirator, how to store and inspect a respirator, and how to determine if a respirator needs to be repaired.

The two basic types of respirators are:
• Air-Purifying Respirators (APR) – remove contaminants, such as particles and vapors. Include the following styles:
  o Disposable mask - covers nose, mouth, and chin
  o Quarter-mask – uses cartridges or filters and covers nose and mouth
  o Half-mask – uses cartridges and covers nose, mouth, and chin
  o Full-face respirator – uses cartridges; protects the entire face
• Supplied Air Respirators – provide a clean source of breathable air. Include the following styles:
  o Self-Contained Breathing Apparatus (SCBA) – uses a portable air tank
  o Air line respirator – air is supplied from a distance away through a hose