



# Health Hazards in Construction

OSHA 10-Hour Construction Industry Course

Required Online Topic Time: 30m



# Learning Objectives



## Duration

30 minutes

## Terminal Learning Objective

Given current OSHA and industry information regarding worksite illnesses, injuries, and/or fatalities, the student will be able recognize how to protect themselves from common health hazards found in construction industry workplaces.

## Enabling Learning Objectives

- Identify common health hazards (e.g., chemical, heat stress, noise, biological, ergonomic-related).
- Describe types of common health hazards.
- Apply health hazard protection methods.
- Recognize employer requirements to protect workers from health hazards in construction, including hazards communication program.



# Introduction



**Construction workers face a number of health and safety hazards on work sites every day, which can result in injury, illness, disability, or even death.**

There are many factors that increase the health risks of construction workers, including:

- *Constantly changing job sites*
- *Multiple contractors*
- *High turnover*
- *High number of unskilled labors*
- *Ever-changing relationships with other work groups*
- *Variety of work activities occurring simultaneously*
- *Exposure to health hazards*

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# Introduction



Construction-related health hazards can be divided into four basic categories.

**Chemical hazards** can be present in dust, fumes, liquids, solids, mists, vapors, or gases of products used at a site or released during a construction job. They can be absorbed by touch, inhaled, or ingested.



**Physical hazards** are the most commonly thought of hazards for construction. This hazard includes radiation, extreme temperatures, noise, and vibration.



**Biological hazards** include microorganisms, such as bacteria, fungus, mold, or viruses that can cause illness and may be present in soil, water, animal waste, insects, and structures.



**Ergonomic hazards** may cause the most injuries in the construction field. These hazards can lead to injuries to the joints or muscles by way of heavy, frequent lifting, repetitive tasks, irregular gripping and postures, intense work, and using tools improperly.



# Chemical Hazards



Most chemicals used in the workplace have some hazard potential. This includes both **process chemicals** and **cleaning chemicals**.

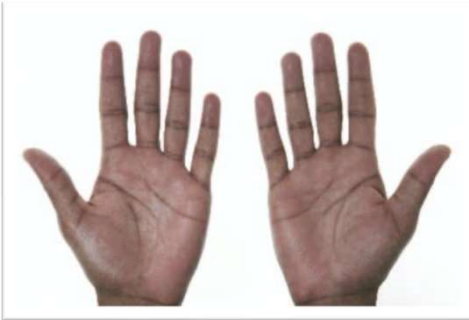
Employees have a need and legal right to know the hazards and identities of the chemicals to which they are exposed, while employers have a responsibility to:

- *Identify the potential hazards of chemicals*
- *Train their employees*
- *Provide proper personal protective equipment*





# Chemical Hazards continued...



**Chemicals** exist in many products workers use at construction sites and are generated during construction activities. Some common chemical hazards in construction include:

- *Asbestos*
- *Lead*
- *Silica*
- *Cadmium*
- *Carbon monoxide*
- *Welding fumes*
- *Spray paints*
- *Cutting oil mists*
- *Solvents*
- *Hexavalent chromium*

Chemicals can be swallowed, inhaled, absorbed through the body through skin or eyes, or through penetration, such as needles.

Chemicals at work sites can cause headaches, eye irritation, dizziness, faintness, drowsiness, and affect judgment and coordination. They can also lead to severe health disorders, such as poisoning, asphyxiation, and cancer.

# Chemical Hazards continued...



**To help ensure the safety and health of workers around asbestos, employers must:**

- *Assess all asbestos operations for the potential to generate airborne fibers*
- *Use exposure monitoring data to assess employee exposures*
- *Designate a competent person to identify asbestos hazards in the workplace and correct them when found*

**Employers should follow the hierarchy of hazard control:**

1. Eliminate hazards from work environment.
2. Substitute hazards with safer alternatives if they cannot be removed.
3. Implement engineering controls to isolate hazards if workers are still at risk.
4. Implement administrative protection to reduce worker exposure if workers are still at risk.
5. Select and implement personal protective equipment if workers are still exposed.



# Chemical Hazards continued...



## Knowledge Key

Most chemicals used in the workplace have some hazard potential. Construction workers can be at risk from solvent and flammable chemicals as well as confined spaces and the materials on certain worksites, such as asbestos, silica, and lead.

Workers can be protected from chemical hazards when their employers follow the hierarchy of hazard control, train them on the correct safety procedures, and actively monitor for chemical hazards on affected worksites. Workers should always use the appropriate PPE when there are chemical hazards present.



# Physical Hazards



## Noise

Prolonged exposure to noise levels above 85 decibels can cause noise-induced **temporary** and **permanent hearing loss**. Workers not using or operating equipment are often exposed to excessive noise as much as the operators.

To reduce workers' exposure to noise, employers can use a **silencer, mufflers, enclosures, sound barriers**, or increase the **distance** between themselves and the source of the noise. If there is no way to sufficiently avoid noise exposure, workers should use appropriate **Personal Protective Equipment (PPE)**.



## Vibration

Whole-body vibration occurs from operating large mobile equipment, and hand-arm vibration can result from using hand-held power tools. Hand-arm vibration may cause carpal tunnel syndrome, a disease that affects the fingers and hands. In the long term, **permanent damages** to the nerves result in a loss of the sense of touch and dexterity.

Employers can reduce workers' exposure to vibration by using **vibration reduction equipment** or providing workers with **appropriate training and job rotations**. Workers can also use **anti-vibration gloves** as PPE.



# Physical Hazards continued...



## Temperature Extremes

Changes in body temperature due to extreme work conditions can lead to **stress** or **illness** from heat or cold. If left untreated, stress from heat or cold can lead to **life-threatening situations**, such as dehydration, sudden collapse, unconsciousness, irregular breathing, or hypothermia.

Employers should **eliminate** or **substitute** a temperature extremes hazard whenever possible, but they can also provide workers with **heaters, air conditioning, ventilation, water, rest periods, shade,** and **PPE** if necessary.



## Radiation Exposure

Prolonged exposure to ionizing radiation from X-rays and gamma rays from different construction equipment can lead to an increased risk of developing **cancer** and **genetic diseases**. Exposure to non-ionizing radiation, such as ultraviolet light, infrared radiation, radio waves, and lasers, can result in **skin cancer, eye damage,** premature **skin aging,** and **burns**.



# Physical Hazards continued...



## Knowledge Key

Physical hazards are dangers present on construction worksites and include extreme temperatures, impact or vibration hazards, radiation, and noise. Be aware of which physical hazards you could encounter, as they can change based on the equipment and tools you use or even the weather.

# Biological Hazards

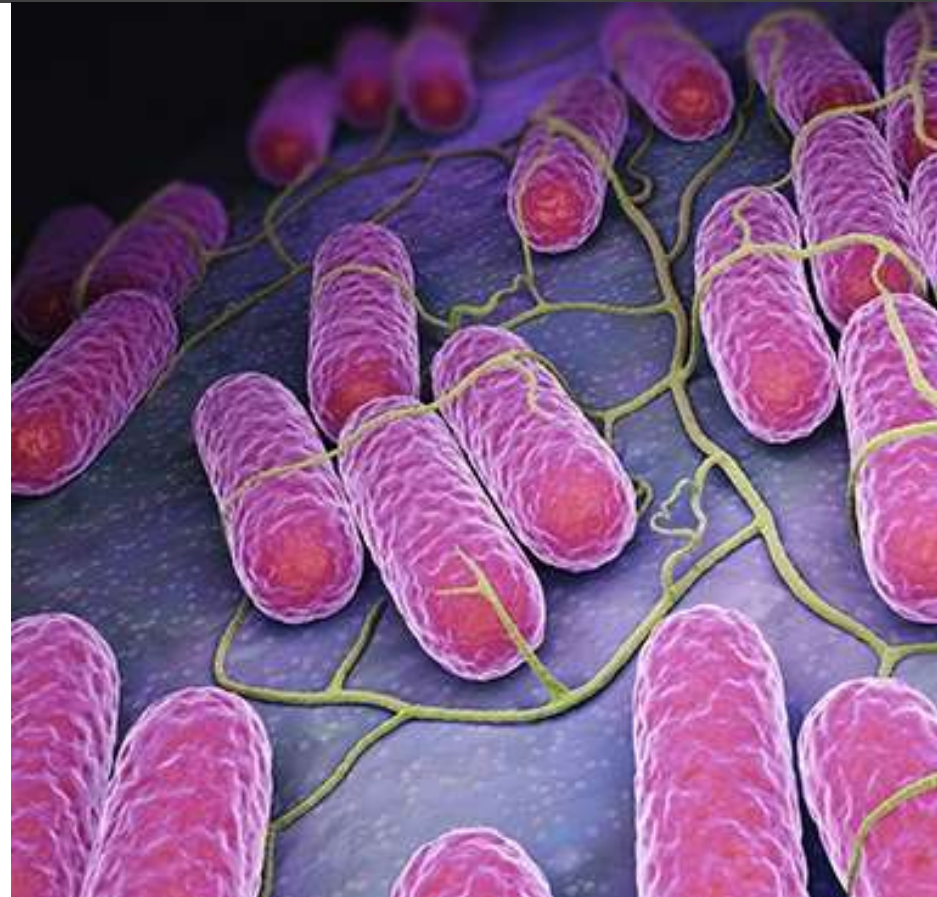


Biological hazards are **disease-causing organisms** and **substances** produced by organisms. Examples:

- *Salmonella bacteria*
- *HIV*
- *Ebola virus*
- *SARS*
- *Tetanus*
- *West Nile Virus*
- *Swine Flu*
- *Lyme Disease*
- *Avian Flu*
- *Hepatitis B or C*

**Examples of substances that include biohazards:**

- *Rat droppings with the Hanta virus*
- *Humans with Hepatitis C*
- *Bird droppings*
- *Sewage contamination*
- *Stagnant water*



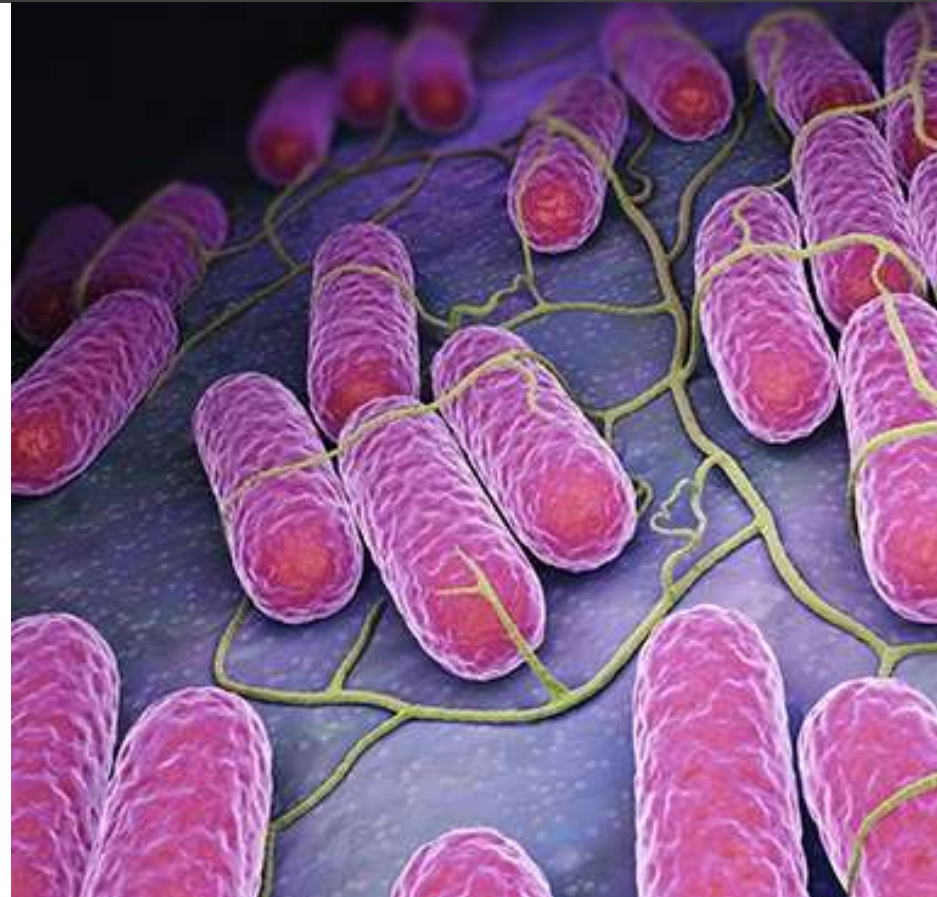
# Biological Hazards continued...



Various biological hazards may be present on a construction site, any of which can lead to disease if precautions are not taken to reduce the risks. Some of these diseases can be serious or fatal. Not all sites have biological hazards. However, those where **groundwork**, **refurbishment**, or **demolition** work is taking place are more likely to be affected.

## Protect yourself from biological hazards:

- Take every precaution with blood, bodily fluids, animals, and insects.
- Practice personal hygiene, perform proper first aid on cuts and scratches, and use the correct PPE for your job.
- Avail yourself of available vaccines for diseases such as Hepatitis B and follow the universal precautions for bloodborne pathogens.





# Biological Hazards continued...



## Knowledge Key

There are different biological hazards which can be present on construction sites. Be sure to look for these hazards, including bird droppings, syringes, rats, sewage contamination, and stagnant water. Take every precaution to keep yourself safe from these biological agents.

# Ergonomic Hazards



**Ergonomics** is the science of fitting workplace conditions and job demands to the capabilities of the working population.

Ergonomic hazards are the most frequently occurring health hazards in construction and the cause of most injuries. Common examples of ergonomic risk factors are found in jobs that require:

- *Repetitive, forceful, or prolonged exertions of the hands*
- *Frequent or heavy lifting, pushing, pulling, or carrying of heavy objects*
- *Prolonged awkward postures*
- *Exposure to vibration and cold which may add risk to these work conditions*

Exposure to ergonomic hazards can result in a variety of musculoskeletal disorders (MSDs). Early indications of an MSD include persistent **pain**, **restriction of joint movement**, and soft tissue **swelling**.

Protect yourself by using ergonomically-designed **tools**, using **correct work practices**, asking for **help**, and wearing appropriate **PPE**.

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# Ergonomic Hazards continued...



## Knowledge Key

Ergonomic hazards are the most frequently occurring health hazards in construction and the cause of the most injuries. If you're exposed to ergonomic hazards, you can develop any number of musculoskeletal disorders (MSDs), so you should be sure to protect yourself by using ergonomically-designed tools, using correct work practices, asking for help with large or heavy loads, and using the proper PPE.

# Employer Requirements



OSHA sets enforceable PELs to protect workers like you against the health effects of exposure to hazardous substances. PELs are **regulatory limits** on the amount or concentration of a substance in the air. They may also contain a skin designation.

If you or a co-worker are potentially exposed to a substance with a specific standard, such as lead or asbestos, you must be **monitored** and **protected** in accordance with that specific standard.

Employers must also have a hazard communication program available for you to access, which gives you, the worker, the **right to know** about any hazards in your workplace.



# Employer Requirements continued...



## Knowledge Key

If you're exposed to hazards at your workplace which are covered by OSHA standards, your employer is required to monitor those hazards and intervene to provide a safe and healthful workplace. You have the right to know about any hazards in your workplace, and your employer is responsible for providing you with information and training on those hazards.



# Practice Questions



1. Who should monitor for chemical hazards on affected worksites?

- a. Employer
- b. Employee

2. At what point in the hierarchy of hazard control should PPE be selected and implemented in the work environment?

- a. If you can't substitute a safer substance for a chemical hazard
- b. If the engineering controls don't protect workers completely from a chemical hazard
- c. If administrative protection doesn't protect workers completely from a chemical hazard

3. Which of the following answer options are physical hazards? **Select all that apply.**

- a. Asbestos
- b. Extreme Temperatures
- c. Radiation
- d. Silica
- e. Poor posture
- f. Noise
- g. Vibration

# Practice Questions



4. Which of the following answer options are ways to keep yourself safe from biological hazards? **Select all that apply.**

- a. Practice personal hygiene
- b. Take breaks
- c. Use the correct PPE
- d. Perform proper first aid on cuts and scratches
- e. Work in the shade
- f. Get any available vaccines

5. Which of the following is a requirement for employers? **Select all that apply.**

- a. Provide a hazard communication program.
- b. Monitor employees.
- c. Comply with OSHA's standards.

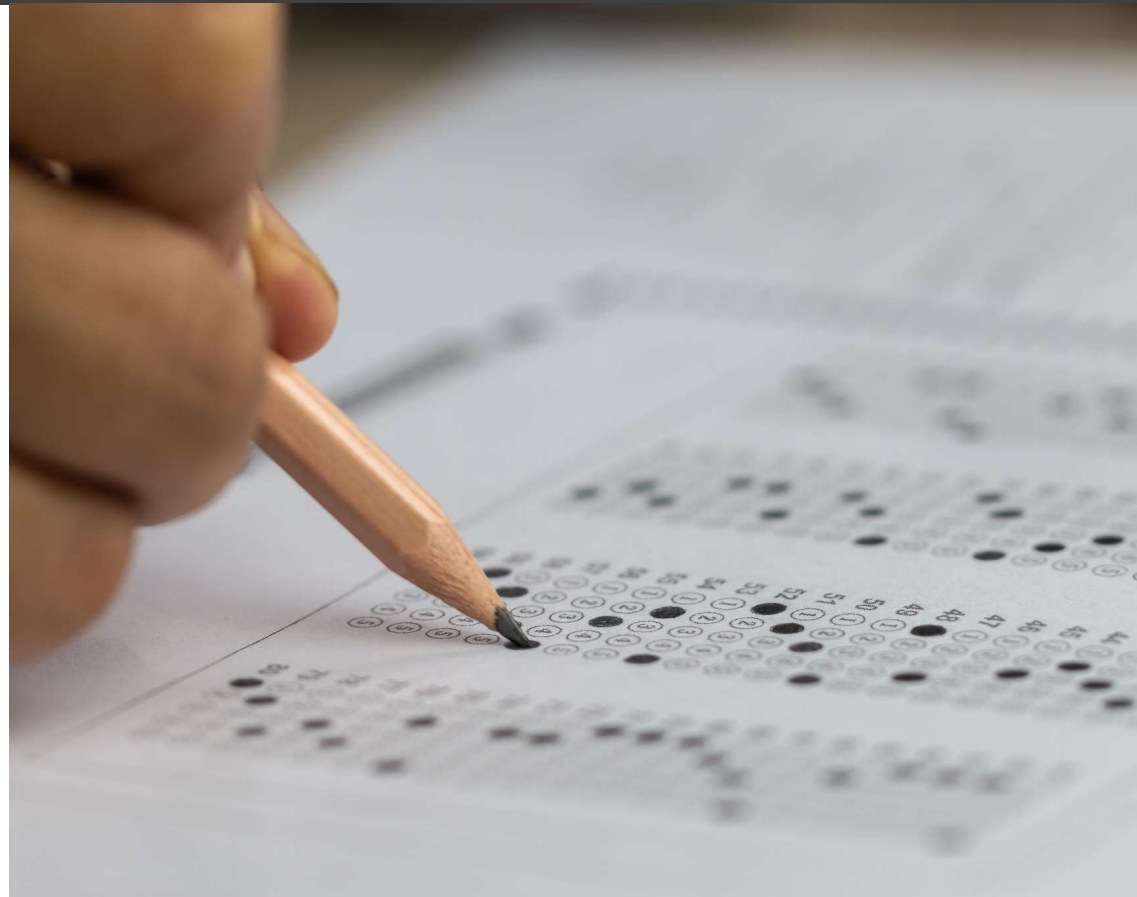
6. Which of the following answer options are ways you can protect yourself from ergonomic hazards? **Select all that apply.**

- a. Wear the proper PPE
- b. Drink water
- c. Use ergonomically-designed tools
- d. Use proper first aid on cuts
- e. Use correct work practices
- f. Ask for help with heavy loads

# Practice Questions Answer Key



1. A
2. C
3. B, C, F, G
4. A, C, D, F
5. A, B, C
6. A, C, E, F



# Conclusion



## Good Job!

You successfully completed the Identifying Construction Health Hazards topic.

