

Health Hazards in Construction

10-Hour Construction Outreach

Health Hazards

Potential exposures to health hazards:

- Worker on the job
- Worker's family



Source: OSHA

Objectives

1. Identify common health hazards.
2. Describe types of common health hazards.
3. Apply health hazard protection methods.
4. Recognize employer requirements to protect workers from health hazards in construction, including hazards communication program.

Common Health Hazards

Chemical



Source: OSHA

Physical



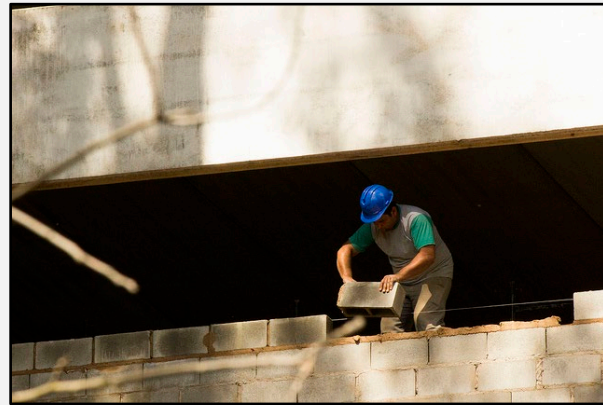
Source: OSHA

Biological



Source: OSHA

Ergonomic



Source: Arlosvaldo Gonzáfoles (Flickr.com)

Common Ways Workers Encounter Chemical Hazards

- Solids
- Liquids
- Gases and vapors
- Aerosols
 - Dust, Mist, Fumes

Welding Fumes



Source: U.S. Navy

Asbestos



Source: OSHA

Spraying Chemicals



Source: OSHA

Silica



Source: OSHA

Lead



Source: OSHA

Effects of Chemical Exposure

May put workers at risk of developing health problems:

Health Problems		
Heart Ailments	Lung Damage	Sterility
CNS Damage	Kidney Damage	Burns
Cancer	Liver Damage	Rashes

May pose risk of fire and explosion hazards:

Fire



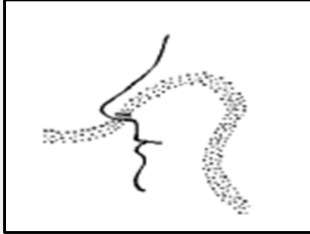
Source: Virginie Moerenhout (Flickr.com)

Explosion



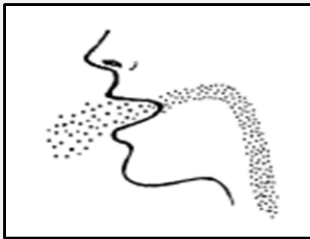
Source: Jonathan Perera (Flickr.com)

Routes of Entry



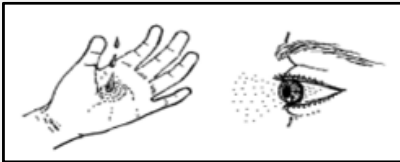
Source: OSHA

Inhalation: Breathed in (Most common route)



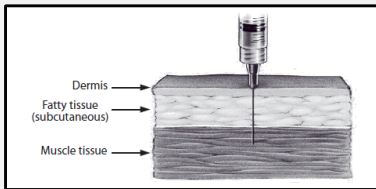
Source: OSHA

Ingestion: Swallowing via eating or drinking



Source: OSHA

Absorption: Drawn through skin or eye surface



Source: CDC

Injection: Punctures through skin

Health Effects

Exposure Condition		Exposure	Example
ACUTE	Immediate	Short-term, high concentration	H ₂ S exposure within a confined space
CHRONIC	Delayed; generally for years	Continuous; for long periods of time	Asbestosis

Acute



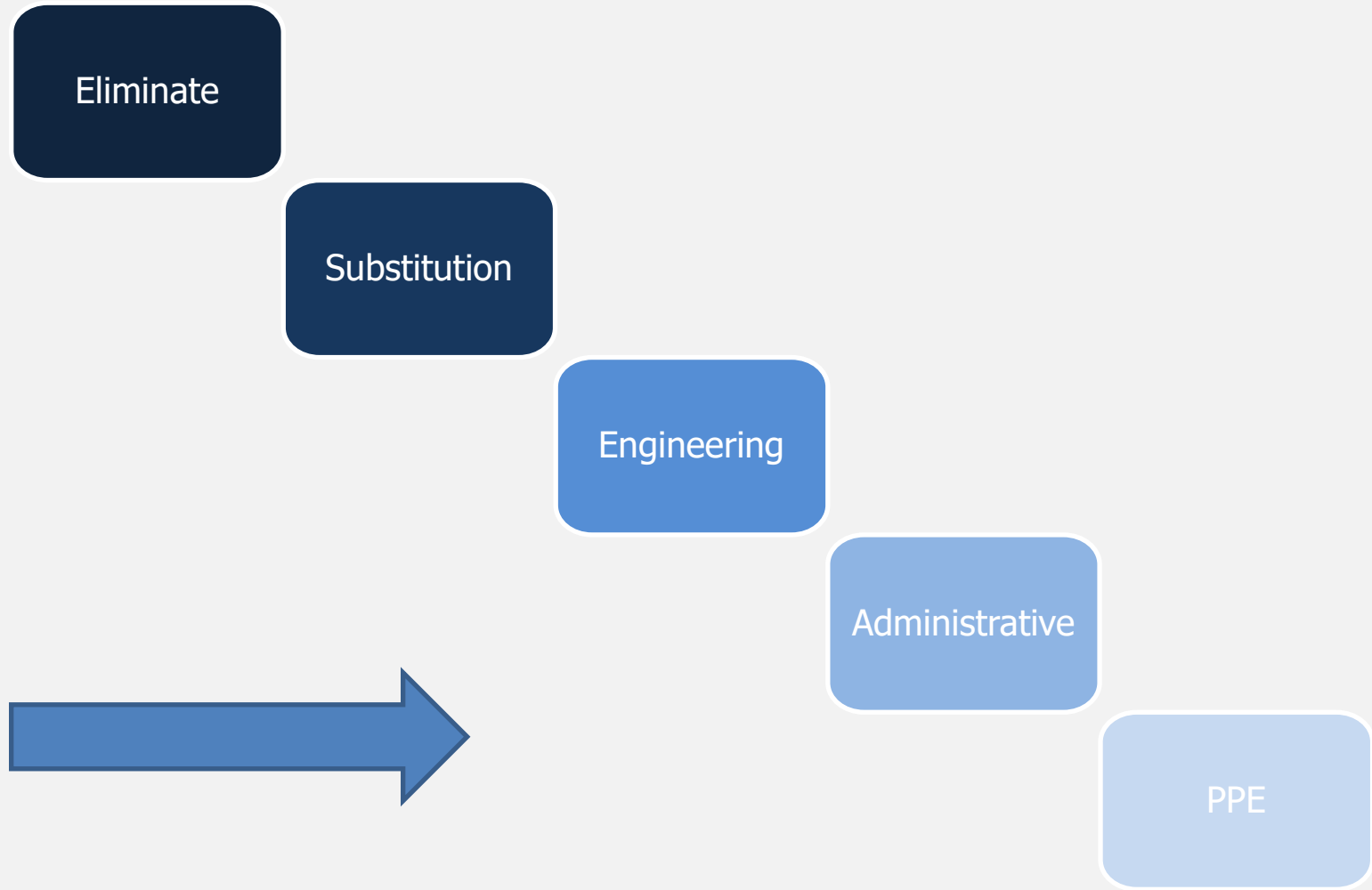
Source: U.S. Army Corps of Engineers

Chronic



Source: OSHA

Chemical Hazard Protection



Chemical Hazard Protection

- **Engineering**
 - Ventilation (local/general)
 - Process and equipment modification
 - Isolation/automation
- **Administrative**
 - Monitor/measure exposure levels
 - Inspections and maintenance
 - Develop SOPs
- **PPE**
 - Respirators
 - Gloves
 - Safety glasses
 - Protective clothing

Local Exhaust Ventilation



Source: OSHA

Physical Hazards in Construction

- Noise
- Temperature extremes
- Vibration
- Radiation

Temperature



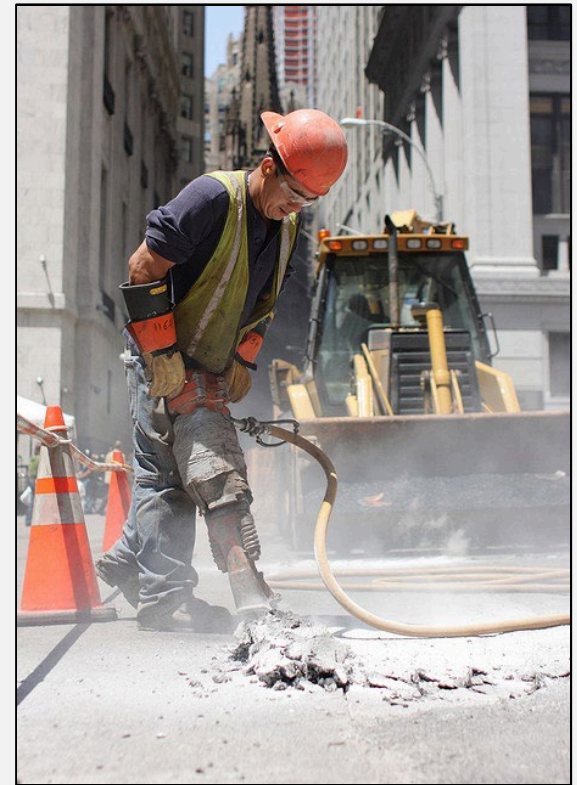
Source: OSHA

Radiation



Source: Alper Çuğun (Flickr.com)

Noise and Vibration



Source: Nick Allen (Flickr.com)

Effects of Exposure to Physical Hazards

Temperature	Radiation	Vibration	Noise
Rash; Cramps	Burns	Fatigue	Interferences
Exhaustion	Sickness	Strains	Stress
Stroke	Aging	Carpal tunnel	Tinnitus
Hypothermia	Cancer	HAVS	Headaches
Frostbite	DNA mutations	Raynaud's	Hearing loss

Noise

Common Construction Noise Sources	
Equipment	Noise (dB)
Backhoe	85
Bulldozer	87
Router	90
Front end loader	90
Chop saw	92
Welding equipment	92
Nail gun	97
Jackhammer	102
Grader/scrapper	107

Source: U.W. Dept. of Environmental & Occupational Health Services – Rick Neitzel July, 2005

Prolonged exposures to 85 dB can lead to hearing loss

Protection Against Physical Hazards

Hazard	Engineering Controls	Administrative Controls	PPE
Temperature	Heaters; AC; windshields; ventilation	<u>Water; Rest; Shade</u>	Hoods; cooling vests; hard hat liners
Vibration	Vibration reduction equipment	Train not to grip too tightly; Job rotation	Anti-vibration gloves
Noise	Silencers; mufflers; enclosures; sound barriers	Increase distance between source and worker	Ear plugs; muffs



Eliminate or substitute hazard, whenever feasible

Biological Hazards in Construction

Insects



Source: James Jordan (Flickr.com)

Animals



Source: Jean-Jacques Boujot (Flickr.com)

Mold



Source: OSHA

Plants



Source: OSHA

Water/Sewage



Source: Matt Brown (Flickr.com)

Blood

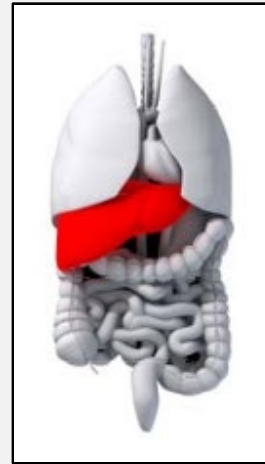


Source: Monsieur Gordon (Flickr.com)

Effects of Exposure to Biological Hazards

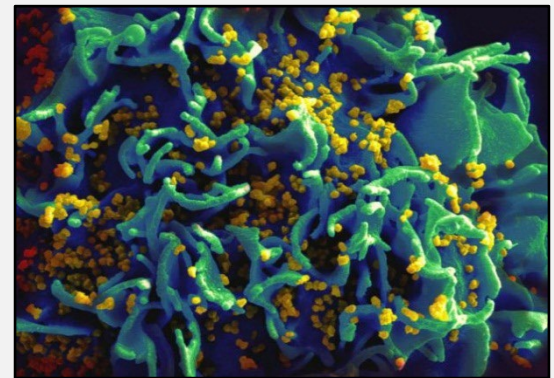
- **Mild**
 - Allergic reaction
- **Serious**
 - Tetanus
 - Swine Flu
 - SARS
 - Avian Flu
 - West Nile
 - Lyme Disease
- **Chronic/Terminal**
 - HIV
 - Hepatitis B & C

Hepatitis C



Source: OSHA

HIV-infected H9 T cell



Source: NIAID

Protection Against Biological Hazards

- Practice precaution with:
 - Blood
 - Bodily fluids
 - Animals
 - Insects
- Personal hygiene
- Proper first aid
 - Cuts/Scratches
- Proper PPE
- Vaccinations – schedule



Source: U.S. Army Corps of Engineers

Ergonomic Hazards in Construction

- Lifting and pushing
 - Heavy
 - Awkward
 - Repetitive
- Awkward grips and postures
- Reaching
- Using wrong tool or using tool improperly
- Using excessive force
 - Overexertion



Source: OSHA

Effects of Exposure to Ergonomic Hazards

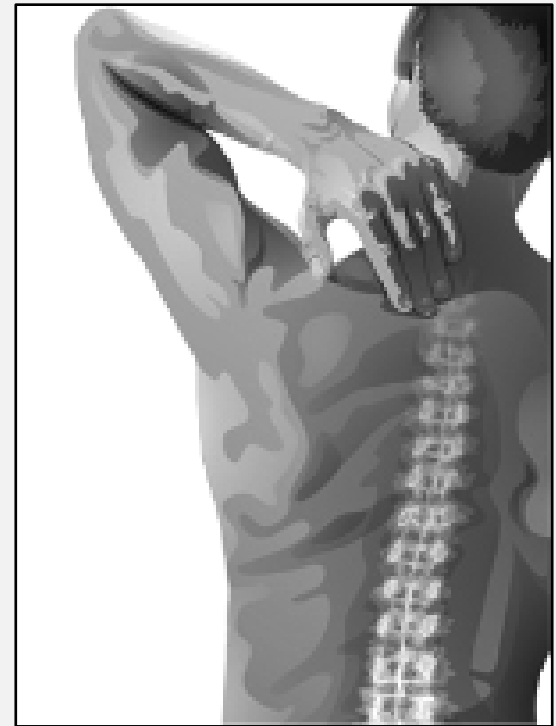
Musculoskeletal Disorders (MSDs)

- **Mild**

- Joint pain
- Swelling
- Sciatica
- Acute lower back pain

- **Serious**

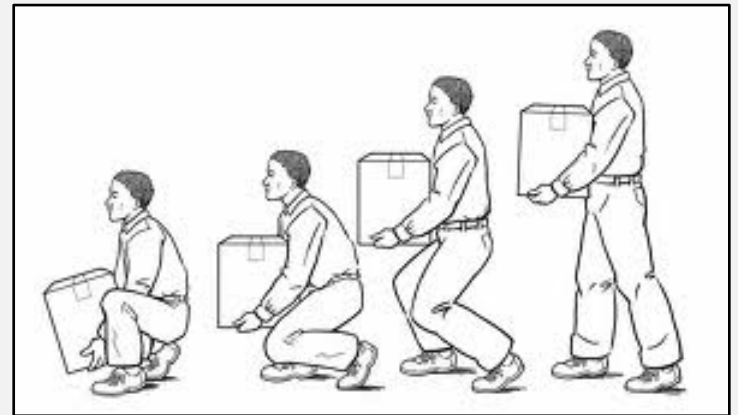
- Epicondylitis (Tennis Elbow)
- Raynaud's Phenomenon (White finger)
- Thoracic Outlet Syndrome
- Carpal Tunnel Syndrome
- Chronic lower back pain
- Tears (Rotator cuff is common)



Source: OSHA

Protection Against Ergonomic Hazards

- Use ergonomically designed tools
- Use correct work practices
 - Proper lifting techniques
 - Work station setup
- Ask for help when handling:
 - Heavy loads
 - Bulky/Awkward materials
- Proper PPE



Source: Boston University (bu.edu/wellness/workplace/ergonomic)

Employer Requirements

- Abide by OSHA regulations
 - Permissible Exposure Limits (PELs) for all chemicals
 - Monitoring and protection programs
 - Hazard Communication Program (HAZCOM)
 - Worker right to know
 - Hazardous chemical training
 - Written plan (Who, What, Where)
 - Proper chemical labeling
 - SDS



Source: OSHA

Multiple health hazards

In some cases, workers can be exposed to several health hazards at the same time or on the same worksite over time.



Source: OSHA

This worker is simultaneously exposed to noise, silica dust, vibration, and ergonomic hazards.

Knowledge Check

1. Which of the following is a common type of health hazard:
 - a. Chemical hazards
 - b. Economic hazards
 - c. Electrical hazards
 - d. Fall hazards

a. Chemical hazards

Knowledge Check

2. Which of the following is an example of a physical health hazard:

- a. Asbestos
- b. Noise
- c. Silica
- d. Lead

b. Noise

Knowledge Check

3. Which is an appropriate engineering control for protection against noise exposures:
- a. Audiograms
 - b. Earplugs
 - c. Increasing distance between source
 - d. Constructing sound barriers

d. Constructing sound barriers

Knowledge Check

4. Which is a requirement of the employer:
- a. Determine if workers' exposures exceed OSHA PELs
 - b. Perform medical evaluations on all employees
 - c. Develop silica training programs for all employees
 - d. Provide all workers with safety toe protective footwear

a. Determine if workers exposures exceed OSHA PELs

Health Hazards in Construction Questions?