Department of LABOR AND INDUSTRIES

Health Hazards in Construction

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What this presentation covers

This module gives a general overview of the various health hazards to which construction workers may be exposed:

- Chemical Hazards
- Physical Hazards
- Biological Hazards
- Ergonomic Hazards

Introduction

Construction workers are at risk of exposure to various health hazards that can result in injury, illness, permanent disability, or even death.

Damaged asbestos pipe insulation

Introduction

Construction work is dynamic, diverse, and constantly changing.

This poses a great challenge in protecting the health and safety of workers.

Risk Factors in Construction

Factors increasing the health risk of construction workers include:

- constantly changing job site environments and conditions
- multiple contractors and subcontractors
- high turnover; unskilled laborers
- constantly changing relationships with other work groups
- diversity of work activities occurring simultaneously
- exposures to health hazards resulting from own work as well as from nearby activities ("bystander exposure")

Some Examples of Construction Workers and Health Hazards

Occupations	Health Hazards
Brickmasons	Cement dermatitis, awkward postures, heavy loads
Drywall installers	Plaster dust, heavy loads, awkward postures
Electricians	Heavy metals in solder fumes, awkward posture, heavy loads, asbestos dust
Painters	Solvent vapors, toxic metals in pigments, paint additives
Pipefitters	Lead fumes and particles, welding fumes, asbestos dust
Carpet layers	Knee trauma, awkward postures, glue and glue vapor
Insulation workers	Asbestos, synthetic fibers, awkward postures
Roofers	Roofing tar, heat
Solderers	Metal fumes, lead, cadmium
Drillers, earth, rock	Silica dust, whole-body vibration, noise
Excavating and loading machine operators	Silica dust, histoplasmosis, whole-body vibration, heat stress, noise
Hazardous waste workers	Heat, stress

Types of Health Hazards

Health hazards are generally grouped as:

- Chemical
- Physical
- Biological
- Ergonomic

Silica exposure from cutting concrete in road construction

Ergonomic hazards are the most frequent health hazard.

Chemical Hazards

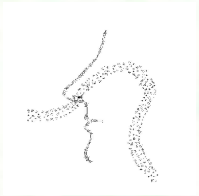
Chemicals can exist in the form of

- dusts, fumes, fibers (solids)
- liquids, mists
- gases, vapors

Examples of chemical hazards found in construction work:	• asbestos • lead • silica • cadmium • carbon monoxide	• welding fumes • spray paints • cutting oil mists • xylene vapor • solvents

Chemical Hazards

Chemicals can enter the body via



- inhalation – breathed in

Inhalation is typically the most common way chemicals can enter the body in a work situation.

- ingestion – accidental swallowing through eating, drinking, or smoking

- absorption – absorbed through contact with skin or eyes

Injection, in which a chemical enters the body when the skin is punctured, occurs rarely (e.g., paint from a high-pressure spray gun).

Chemical Hazards

Types of Health Effects from Exposure to Chemical Hazards

HEALTH EFFECTS		EXPOSURE	EXAMPLE
ACUTE	Appear immediately or within short time following exposure, (minutes or hours); death possible from some hazardous substances	Typically sudden, short-term, high concentration (acute exposure)	Dizziness and confusion from high levels of carbon monoxide
CHRONIC	Usually develop slowly, as long as 15-20 years and longer	Continued or repeated for a prolonged period, usually years (chronic exposure)	Chronic kidney disease from lead exposure

Some hazards have both acute and chronic effects, e.g., carbon monoxide.

Chemical Hazards

A health hazard can affect the entire body or many organs, or affect only specific tissues, organs, or parts of the body.

Examples of health conditions and illnesses from exposure to chemical hazards:

- Headaches
- Confusion
- Loss of consciousness
- Dermatitis
- Lung irritation
- Asbestosis
- Silicosis
- Cancer
- Liver damage
- Sterility

Physical Hazards

Physical hazards are different types of energy which may be hazardous to workers.

- Noise
- Vibration
- Temperature extremes
- Radiation

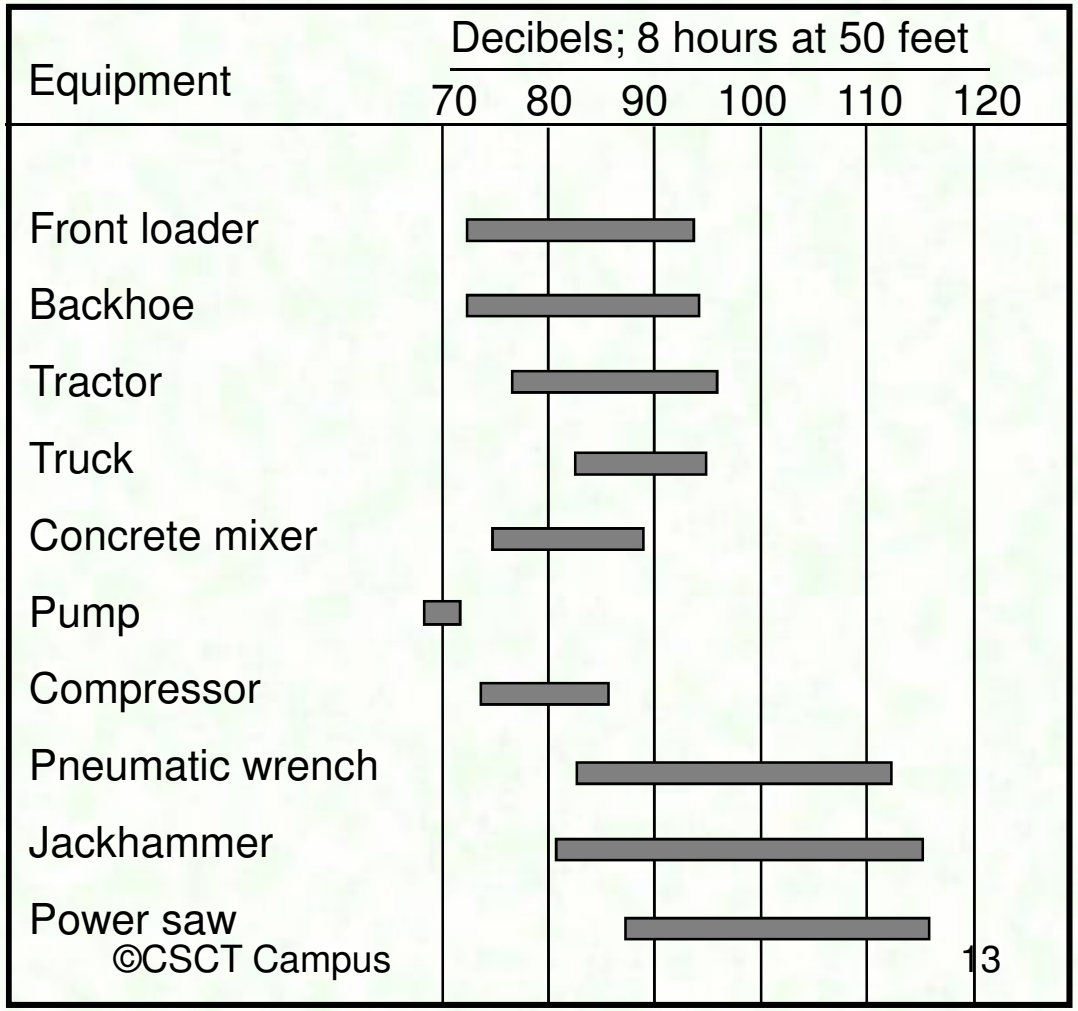
Physical Hazards – Noise

Prolonged exposure to excessive noise levels can cause noise-induced hearing loss.

When you are exposed to excessive noise levels, the first stage is temporary hearing loss.

Over time, the hearing loss becomes <u>permanent</u>.

Noise levels of some common construction equipment



Physical Hazards – Noise

Several factors influence the noise levels to which workers are exposed:

- Type of equipment being operated
- Condition/maintenance of the equipment
- Other equipment running at the same time
- Enclosed or partially enclosed spaces

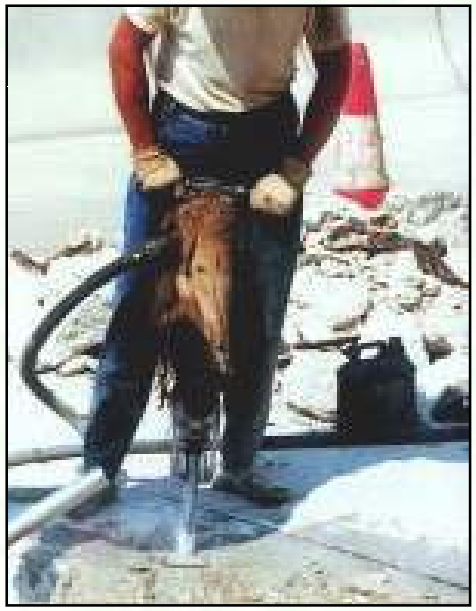
Physical Hazards – Vibration

Workers can be exposed to vibration affecting the entire body or only to the hand and arm.

Whole-body vibration can occur from operating large mobile equipment, such as drillers, air hammers, pile drivers, tractors, graders, excavators, earth-moving equipment, and other large machinery.

Physical Hazards – Vibration

Hand-arm vibration can result from using hand-held power tools, such as pneumatic drills and hammers, and disc grinders.



Hand-arm vibration may cause carpal tunnel syndrome, a disease that affects the fingers and hands. In the long run, permanent damages to the nerves will result in a loss of the sense of touch and dexterity.

Working in a cold and damp environment can aggravate the harmful effects of hand-arm vibration.

Physical Hazards – Temperature Extremes

A change in body temperature due to extreme work environmental conditions can lead to stress or illness from heat or cold. If not treated in time, both heat and cold stress/illness can develop into life-threatening situations.

Heavy work in high temperatures (e.g., roof work) can cause muscle cramps, dehydration, sudden collapse, and unconsciousness.

Freezing temps can lead to fatigue, irregular breathing, confusion, and loss of consciousness.

Heat illnesses:

- Heat rash
- Fainting
- Heat cramps
- Heat exhaustion
- Heat stroke

Cold illnesses and injuries:

- Frost nip
- Immersion injury (trench foot)
- Frost bite
- Hypothermia

Physical Hazards – Heat

Hot conditions can occur from

- prolonged work under direct sunlight in summer (e.g., asphalt paving or roofing in summer)
- wearing impermeable protective clothing when doing heavy work

- working in an enclosed area with a strong heat source, poor ventilation, and high humidity (e.g., heavy equipment operators in an enclosed cab with without sufficient ventilation)

Physical Hazards – Cold

Cold conditions:

- cold air temperatures
- rain, snow, sleet, or other wet weather conditions
- windy conditions
- underground construction work
- working over water and falling in

Physical Hazards – Radiation

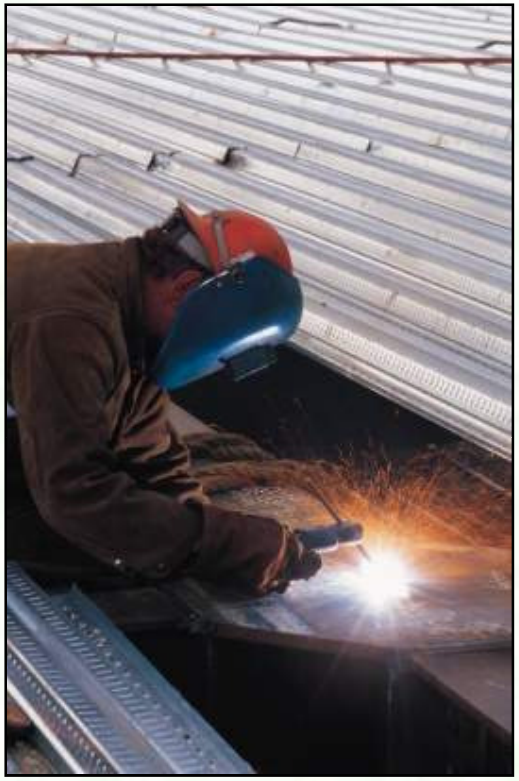
Ionizing radiation

- X-rays, gamma rays from equipment used to gauge the density and thickness of pipes, to inspect welds, for detecting weakness of metal structures on a construction site
- radioactive isotopes from flow meters
- Health effects: increased risk of developing cancer and genetic disease

Trefoil sign

Indicates the presence of ionizing radiation.

Physical Hazards – Radiation



Non-ionizing Radiation

- ultraviolet light from sunlight
- infrared radiation from torch welding and cutting
- radio waves from radio towers
- lasers used for aligning, ranging, and surveying are usually low-powered but can cause eye injuries if directly viewed for extended time
- microwaves

Health effects:

- skin cancer
- eye damage
- premature skin aging
- weakening of immune system

Biological Hazards

Diseases or illnesses can occur from biological sources:

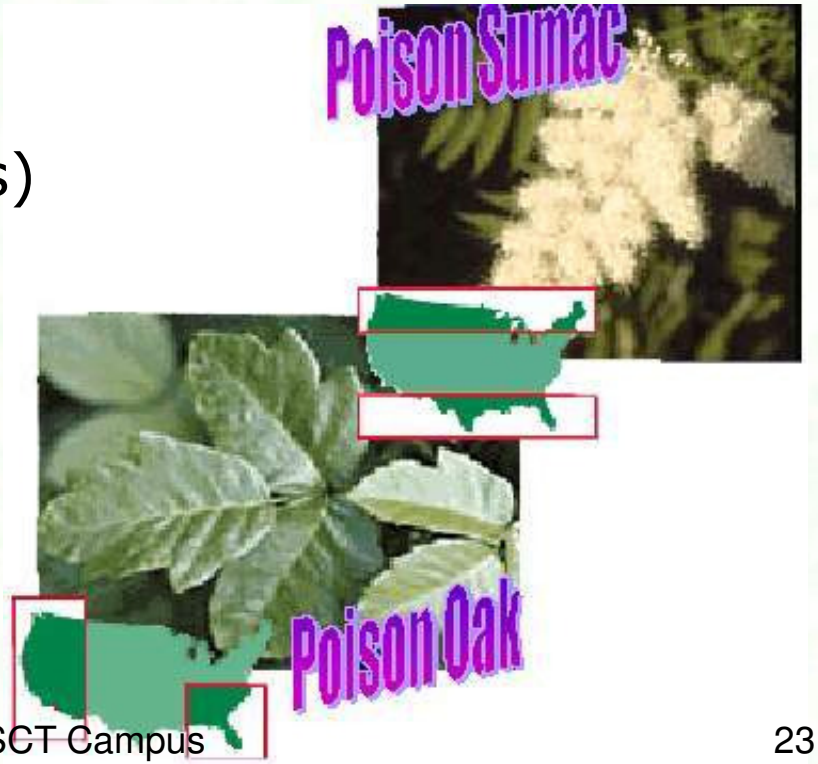
	Examples:
• Microorganisms (e.g., bacteria, viruses, fungi, molds)	– Leptospirosis – *Malaria* – *Fungal infections* – Rabies virus
• Plant toxins, oils	– Toxic plants

In many cases, the route of entry is cuts in the skin or breathing. Some diseases are minor infections; others can be serious or deadly.

Biological Hazards

Exposure may occur during demolition, renovation, sewer work, work on air handling systems, or other construction work from contact with contaminated or disease-carrying

- soil
- water
- insects (mosquitoes, ticks)
- bird, bat droppings
- animals
- structures



Ergonomic Hazards

Ergonomic hazards can cause painful and disabling injuries.

- heavy, frequent, or awkward lifting
- repetitive tasks
- awkward grips, postures
- using excessive force, overexertion
- using wrong tools for the job or using tools improperly
- using improperly maintained tools
- hand-intensive work

Manual handling is common in construction work and is one of the most common causes of injury at work.

Ergonomic Hazards

Musculoskeletal Disorders (MSDs) and injuries:

- strains and sprains –
  one of the most common injuries among construction workers
- tendonitis
- carpal tunnel syndrome
- low back pain
- fatigue

Ergonomic hazards can cause a lifetime of pain and disability.

Resources

- Workplace Safety and Health
  http://www.lni.wa.gov/Safety/default.asp
- Look for more in-depth modules on many of the topics covered in this module at
  http://www.lni.wa.gov/Safety/TrainTools/Online/Courses/default.asp
- OSHA
  http://www.osha.gov
- NIOSH
  http://www.cdc.gov/niosh/homepage.html
- Construction Association of Ontario
  http://www.csao.org

Consultation Services

Safety & Health program review and worksite evaluation

- By employer invitation only
- Free
- Confidential
- No citations or penalties
- Letter explains findings
- Follow-up all serious hazards

For additional assistance, you can call one of our consultants. Click below for local L & I office locations:
http://www.lni.wa.gov/wisha/consultation/regional_consultants.htm