

LECTURES IN COMMUNITY MEDICINE

OCCUPATIONAL MEDICINE

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PHYSICAL HAZARDS

(1)-HEAT AND COLD:

The common physical hazard in most industries is heat. The direct effects of heat exposure are burns, heat exhaustion, heat stroke and heat cramps; the indirect effects are decreased efficiency, increased fatigue and enhanced accidents rate.

Many industries have local 'hot spots'- ovens and furnaces, which radiate heat.

Radiant heat:

Is the main problem in foundry, glass and steel industries.

Heat stagnation:

Is the principle problem in jute and cotton textile industry.

Important hazards associated with cold work are chilblains, erythrocyanosis, immersion foot, and frostbite as a result of cutaneous vasoconstriction.

(2)-LIGHT:

Workers may be exposed to the risk of poor illumination or excessive brightness. The acute effects of poor illumination are

A - eye strain

B- headache

C- eye pain

D-lacrimation.

E-corneal congestion

f-eye fatigue

(3)-NOISE:

A-*AUDITORY*: this may cause temporary or permanent hearing loss.

B-*NON AUDITORY*; causes nervousness, fatigue, interference with communication by speech, decreased efficiency and annoyance.

The degree of injury from exposure depends upon:

1-Intensity and frequency range.

2-duration of exposure.

3-individual susceptibility.

(4)-VIBRATION:

especially between 10- 500 Hz, may be encountered at work with pneumatic tools such as drills and hammers. Vibration usually affects the hands and arms. After some months or years of exposure , the fine blood vessels of the fingers may become increasingly sensitive to spasm (white fingers) Exposure to vibration may also produce injuries of the joints of the hands, elbows and shoulders.

(5)-ULTRAVIOLET RADIATION:

Occurs in arc welding. Such radiation affects mainly the eyes, causing intense conjunctivitis and keratitis (welder's flash).

Symptoms are redness of the eyes and pain.

(6)-IONIZING RADIATION:

Includes x-rays and radioactive isotopes. Important radio- isotopes are cobalt 60 and phosphorus 32. Certain tissues like bone marrow are more sensitive than others and from a genetic standpoint there are special hazards when the gonads are exposed. This includes genetic changes, malformations , cancer , leukemia, depilation, ulceration, sterility and in extreme cases death. The International Commission of Radiological Protection has set the maximum permissible level of occupational exposure at 5 rem per year to the whole body.

EYE AND EAR – OCCUPATIONAL HAZARDS

Thousands of people are blinded each year from work-related eye injuries. According to the Bureau of Labor Statistics (BLS), nearly three out of five workers are injured while failing to wear eye and face protection.

Common causes of occupational eye injury include blunt trauma, chemical burns, corneal abrasions, and biological contamination (infections).

Trade workers in the automotive, construction, and agriculture industries, among others, are at risk. Even office workers are at risk, as staring at a computer monitor for an extended period of time can cause eyestrain.

OSHA Standards

Training and Qualifications

Employees shall be trained to know at least the following:

When PPE is necessary

What PPE is necessary

How to properly wear PPE

The limitations of the PPE

The proper care, maintenance, useful life, and disposal of the PPE
Changes in the workplace
Changes in the types of PPE to be used
Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill

Protectors must:

Provide adequate protection against the particular hazards for which they are designed

Be of safe design and construction for the work to be performed

Be reasonably comfortable

Be durable

Be capable of being disinfected

Be easily cleanable

Employers must ensure that employees who wear prescription (Rx) lenses or contacts use PPE that incorporates the prescription or use eye protection that can be worn over prescription lenses.

Employees must be provided with eye and face protection equipment when machines or operations present potential eye or face injury from physical, chemical, or radiation agents.

PPE devices alone should not be relied on to provide protection against hazards, but should be used in conjunction with guards, engineering controls, and sound manufacturing practices.

Safety spectacles

are intended to shield the wearer's eyes from impact hazards such as flying fragments, objects, large chips, and particles.

Workers are required to use eye safety spectacles with side shields when there is a hazard from flying objects.

Safety goggles are used as primary protection to shield the eyes from heat hazards. Goggles form a protective seal around the eyes, preventing objects or liquids from entering under or around the goggles. This is especially important when working with or around molten metals that may splash.

Face shields are intended to protect the entire face from a variety of chemical hazards.

All face shields are considered secondary protection and must be used *in addition* to safety goggles to provide adequate protection.

Wearing protection with the correct filter shade number is required to protect workers' eyes from optical radiation. When selecting PPE, consider the type and degree of radiant energy in the workplace.

Welding helmets are secondary protectors intended to shield the eyes and face from optical radiation, heat, and impact.

Use welding helmets *in addition* to primary protection such as safety spectacles or goggles to provide adequate protection.

Workers with exposure to laser beams must be furnished suitable laser safety goggles which will:

Protect for the specific wavelength of the laser

Be of optical density adequate for the energy involved

When employees are trained to work safely they should be able to anticipate and avoid injury from job-related hazards

Occupational Deafness is a loss or reduction of hearing ability which has been caused by working in a place where there are or were excessive noise levels. It is a recognised industrial disease under the Industrial Injuries Scheme and is the second most common form of acquired deafness, after ageing

What is a “critical” (i.e. dangerous) amount of noise will vary from one person to another depending on the person’s age, previous noise exposure or hearing damage and genetic susceptibility

Workers who use noisy machinery, such as in:

Textiles

Printing

Wood cutting

Transportation

Agriculture

Road workers

Measures to reduce occupational deafness include:

1-Enclosing or segregating noisy machinery so that not all employees are subject to high noise levels.

2-Fitting silencers or changing the way machinery is mounted to make it quieter.

3-Providing ear muffs and/or ear plugs



Hazard Assessment

Hazard Type	Hazard Type	Common related tasks
<u>Impact</u>	Flying objects such as large chips, fragments, particles, sand, and dirt.	Chipping, grinding, machining, masonry work, wood working, sawing, drilling, sanding, etc.
<u>Heat</u>	Anything emitting extreme heat.	Furnace operations, pouring, casting, hot dipping, welding, etc.
<u>Chemicals</u>	Splash, fumes, vapors, and irritating mists.	Acid and chemical handling, degreasing, plating, and working with blood.
<u>Dust</u>	Harmful dust.	Woodworking, buffing, and general dusty conditions.
<u>Optical Radiation</u>	Radiant energy, glare, and intense light	Welding, torch-cutting, -brazing, -and laser work.