



INDUSTRIAL HYGIENE CONTROL (Environmental Health)

LOSS CONTROL PROGRAM

assists a company in developing ways to protect
from special hazards like



INDUSTRIAL HYGIENE

- 1 The science of protecting and enhancing the health and safety of people at work.
- 2 Health and safety hazards cover a wide range of chemical, physical, biological and ergonomic stressors.
- 3 Involves anticipating, recognizing, evaluating and controlling hazards.
- 4 Professionals dedicated to this are called industrial hygienists.



BENEFITS

Improves workers health

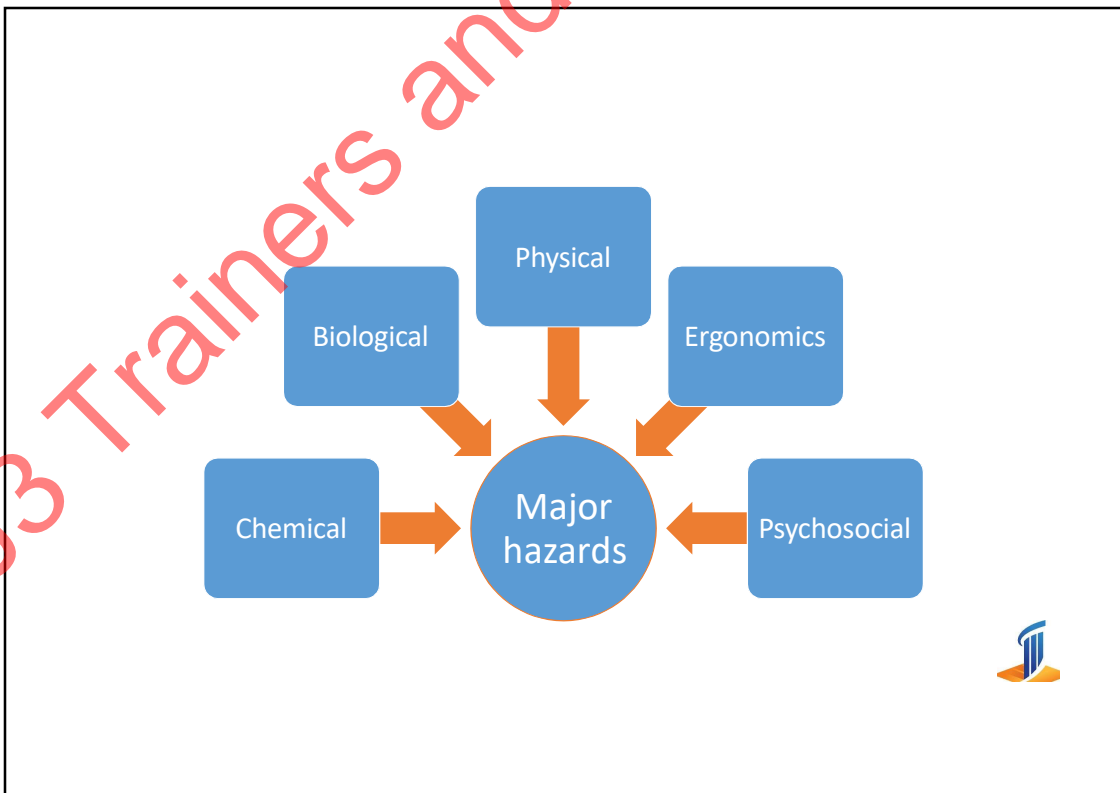
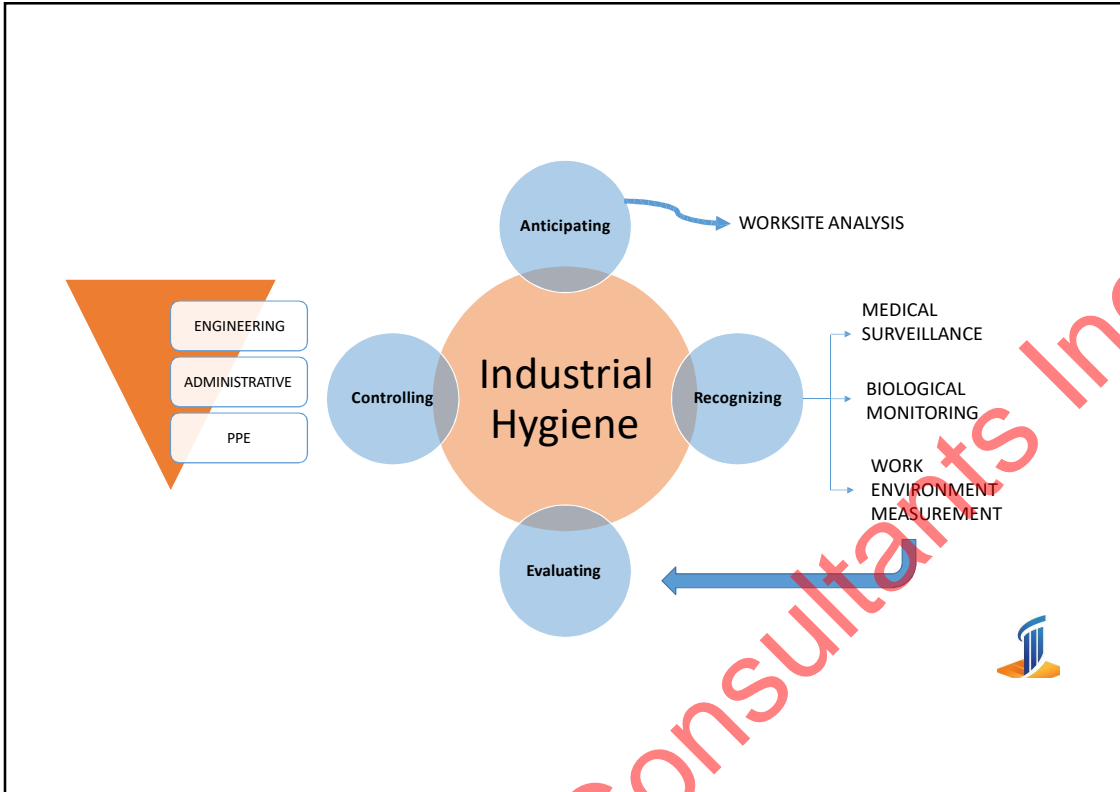
Increases life expectancy

Reduce absenteeism

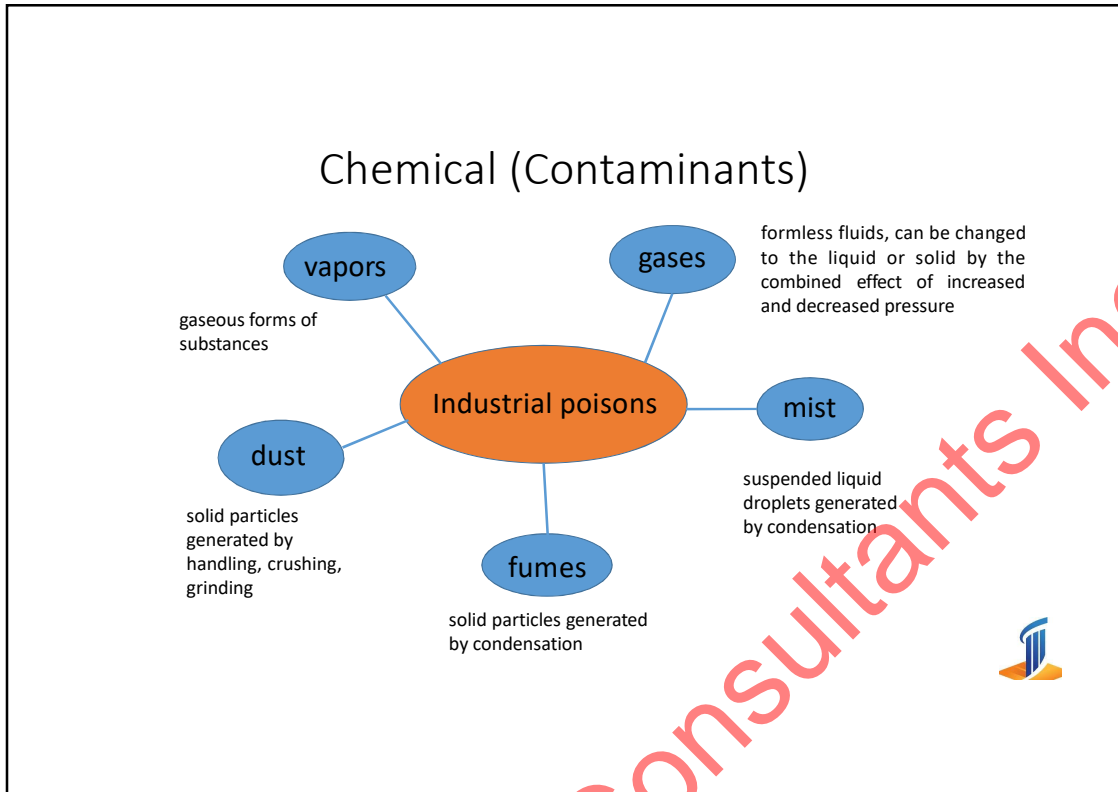
Improves productivity

Lowers health care cost





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






Toxic substances, effects on health of workers

1. Irritants

inflame the surfaces of the parts of the body

affect the skin, upper respiratory tract, upper respiratory tract

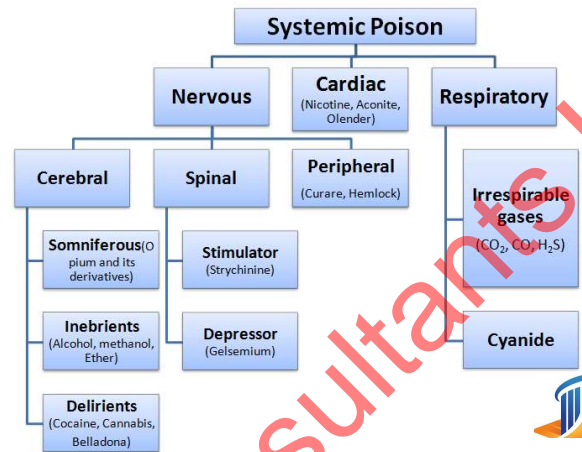
	Oxidising		Harmful
	Highly Flammable		Corrosive
	Toxic		Irritant

Toxic substances, effects on health of workers

2. Systemic Poisons

more insidious than
the irritants

attack the vital organs
or systems of organs



Toxic substances, effects on health of workers

2. Systemic Poisons



lead



attacks the blood, digestive system,
and the central nervous system, brain

methanol

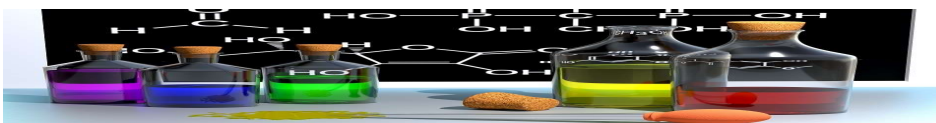


central nervous system

chlorinated
hydrocarbons



blamed for liver damage



Acute and Chronic Poisoning

Types of Poisoning

1. Acute Poisoning

- q Excessive single dose, or several smaller doses of a poison taken over a short interval of time

2. Chronic Poisoning

- q Smaller doses over a period of time, resulting in gradual worsening eg. Arsenic, Phosphorus, Antimony, etc...



Toxic substances, effects on health of workers

3. Depressants

affects the central nervous system

most common:

ethyl alcohol

benzene



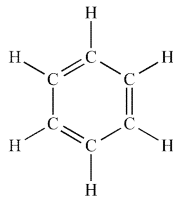
Toxic substances, effects on health of workers

4. Asphyxiants

prevent oxygen from reaching the body cells
Most common: Carbon dioxide (CO₂)



5. Carcinogens



substances that are known to cause cancer
Most common: benzene and vinyl chloride



Toxic substances, effects on health of workers

6. Teratogens

Affect the fetus, so their toxic is indirect. They do their damage after conception but before birth.

7. Mutagens

Substances that attack the chromosomes and thus the species, instead of the individual. They do their damage before conception, and they affect the chromosomes of either the potential father or the potential mother.



Expressions for concentrations of substances in air

parts of the contaminant per million parts of air (ppm)

milligrams (mg) of the contaminant per liter (l) of air

percentage by volume of the contaminant in air

milligrams of the contaminant per cubic meter of air, more common for
indicating the concentration of solids (e.g., dusts) in air



Expressions for concentrations of substances in air

Example:

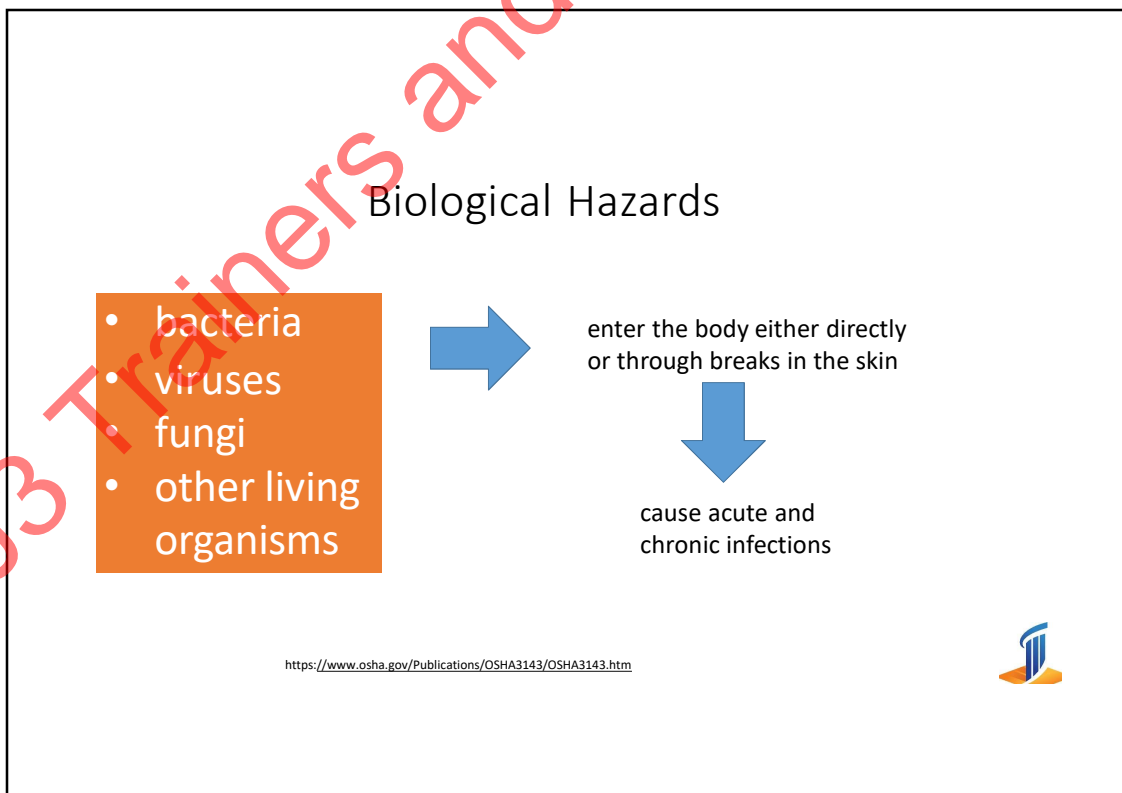
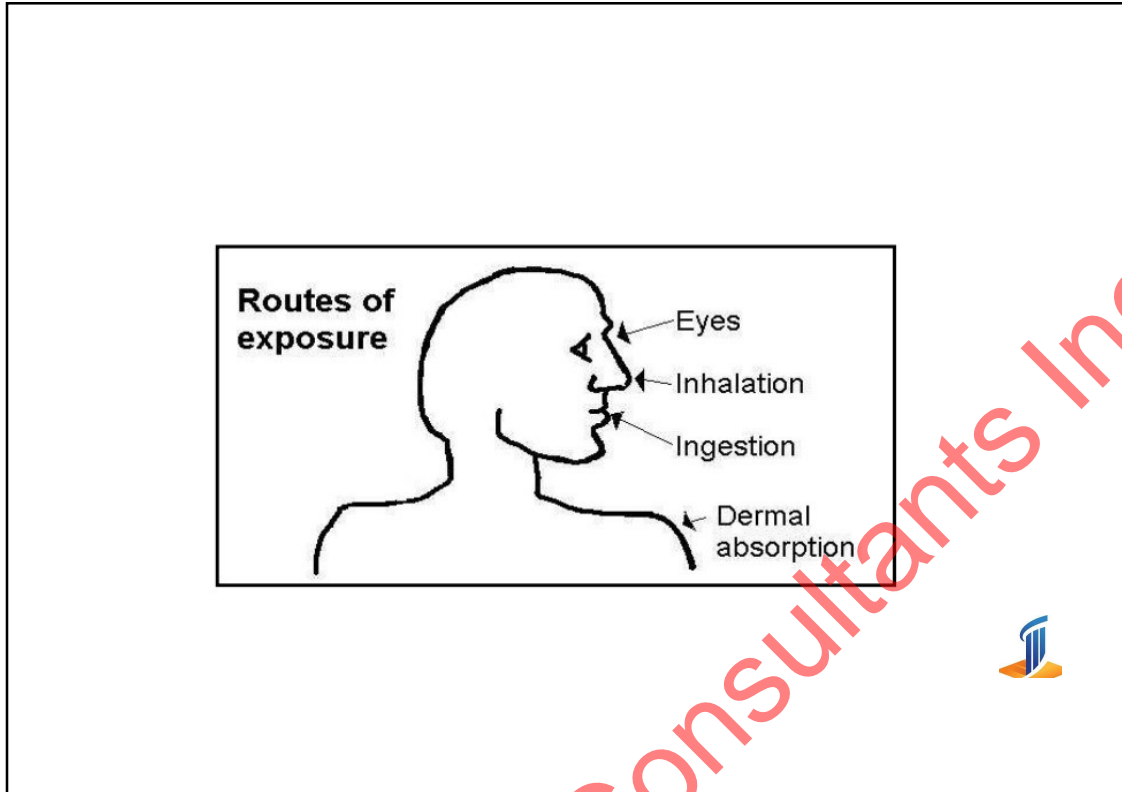
To relate % by volume to parts per million, use: **% by vol. x 10,000 = ppm**

To relate ppm and mg. / liter at approximate room temperatures and standard atmospheric
pressure, use:

$$\text{ppm} = \frac{24,450 \times \text{mg.}}{M} \quad (\text{Where } M = \text{molecular wt. of contaminant})$$

To relate ppm to mg/cm³, use: **ppm = $\frac{24,450 \times \text{mg.}}{M \times 1,000}$**





Who are exposed?

- occupations that deal with plants or animals or their products
- food and food processing workers
- laboratory and medical personnel
- occupations that result in contact with bodily fluids

<https://www.osha.gov/Publications/OSHA3143/OSHA3143.htm>



Prevention & Control

- proper ventilation
- personal hygiene
- adequate infectious waste disposal systems
- proper personal protective equipment
- isolation (contagious diseases e.g. Covid-19)

<https://www.osha.gov/Publications/OSHA3143/OSHA3143.htm>



Physical Hazards

Excessive levels of:

Electromagnetic radiation	Some forms of cancer, infertility
Noise	Temporary and permanent hearing loss
Vibration	HAVS, Spinal disorders Eye problems,
Illumination	headaches Dehydration, elevated
Temperature	blood pressure

<https://www.osha.gov/Publications/OSHA3143/OSHA3143.htm>



Prevention & Control

Radiation

Time

“the shorter the time of exposure the lesser the danger”

Distance

“the farther from the source the lesser the danger”

Shielding

“the greater the protective mass the lower the exposure”

<https://www.osha.gov/Publications/OSHA3143/OSHA3143.htm>



Prevention & Control

Noise Engineering
 “enclosing or shielding”

Administrative
 “limit exposure through time and distance”

PPE
 “ear muffs and ear plugs ”

<https://www.osha.gov/Publications/OSHA3143/OSHA3143.htm>



Prevention & Control

Vibration Limit time of exposure

Mechanical Isolation

Maintenance

Vibration dumping seats

<https://www.osha.gov/Publications/OSHA3143/OSHA3143.htm>



Prevention & Control

Illumination

Clean regularly

Add more lights; use local lightings

Use light paintings in walls

Avoid or eliminate shadows

<https://www.osha.gov/Publications/OSHA3143/OSHA3143.htm>



Prevention & Control

Temperature

Liquid intake

Limit exposure

Protective clothing

Acclimatization

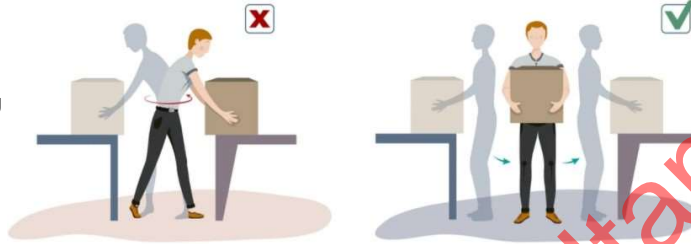
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Ergonomic Hazards

The science of ergonomics studies and evaluates a full range of tasks:

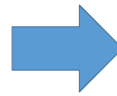
- lifting
- holding
- pushing
- walking
- reaching



<https://www.osha.gov/Publications/OSHA3143/OSHA3143.htm>



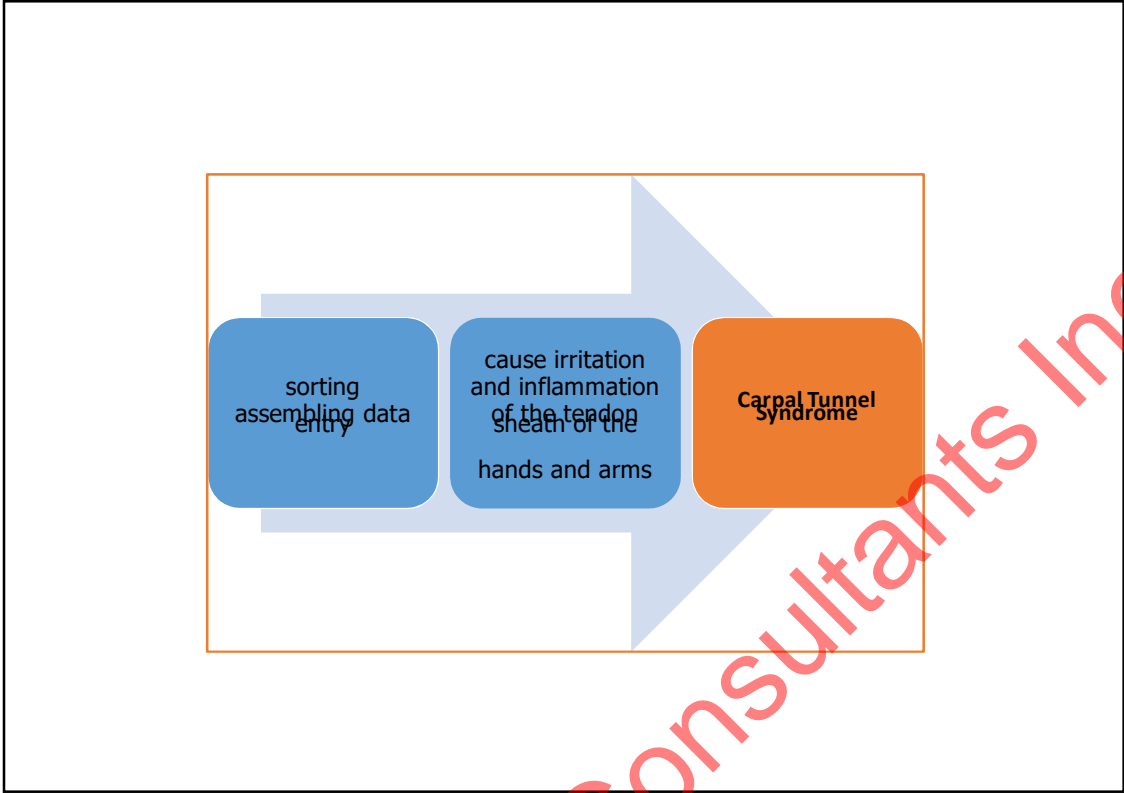
ERGONOMIC
PROBLEMS



ERGONOMIC
HAZARDS

- increased assembly line speeds
- adding specialized tasks
- increased repetition
- poorly designed job tasks

- excessive vibration
- noise
- eye strain
- repetitive motion
- heavy lifting



Prevention & Control

A target diagram with three concentric circles: an outer orange ring, a middle blue ring, and an inner orange circle. Three callout lines extend from the right side of the target to three lines of text:

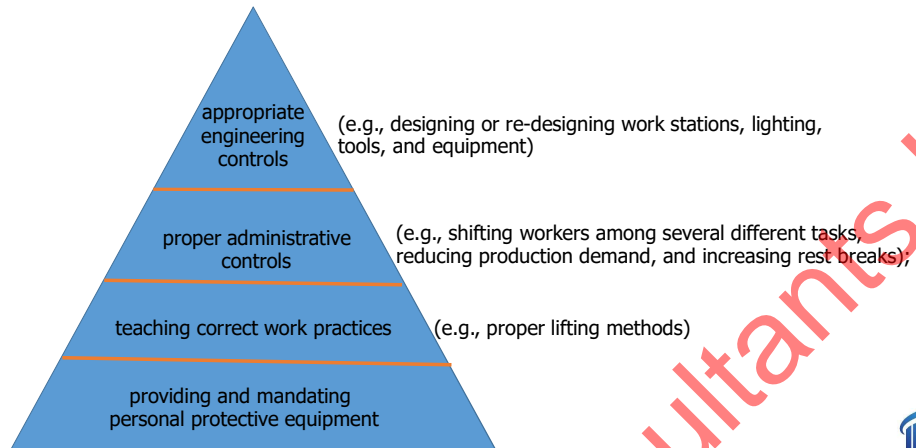
- effective design of a job or jobsite
- better designed tools or equipment
- procedures to correct or control ergonomic hazards

Ergonomic hazards are avoided primarily by

<https://www.osha.gov/Publications/OSHA3143/OSHA3143.htm>

A small logo in the bottom right corner, featuring a stylized blue and orange shape.

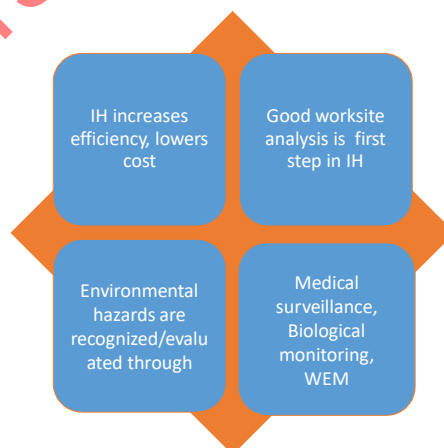
Prevention & Control



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KEY POINTS





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