



Introduction to Occupational health

YEAR

1439-1440 Hijri

2018 - 2019 Gregorian

Objectives

Enlist and understand the effects of exposure of a worker to Physical hazards, Heat and cold, Light, Noise, Vibration, UV light, Ionizing radiation, Chemical hazards, Local effects of chemicals, Inhalation of particles, fumes, and gases, Absorption of various metals and their compounds, Ingestion, Biological hazards, Infectious and parasitic agents, Mechanical hazards, Physiological hazards, Fatigue, Depression, and anxiety

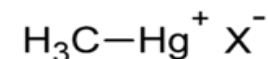


Examples of famous industrial accidents

September 21, 1921: Oppau explosion in **Germany**. Occurred when a tower silo storing **4,500 tonnes** of a mixture of ammonium sulfate and ammonium nitrate fertilizer **exploded** at a BASF plant in Oppau, now part of Ludwigshafen, Germany, **killing 500–600** people and **injuring about 2,000 more**.

1932-1968: The Minamata disaster was caused by the dumping of mercury compounds in Minamata Bay, Japan.

It is estimated that **over 3,000 people** suffered various deformities, **severe mercury poisoning** symptoms or death from what became known as **Minamata disease**. is a medical specialty dealing with **disorders of the nervous system.**



Methylmercury, an organic mercury compound released in factory wastewater and the cause of Minamata disease

December 3, 1984: The Bhopal disaster in India is the largest industrial disaster on record..



A faulty tank containing poisonous methylisocyanate leaked at a Union Carbide plant. About 20,000 people died and about 570,000 suffered bodily damage.

April 26, 1986: Chernobyl disaster.

At the Chernobyl Nuclear Power Plant in Ukraine a test on reactor number four goes out of control, resulting in a nuclear meltdown.

The ensuing steam explosion and fire killed up to 50 people with estimates that there may be up to 4,000 additional cancer deaths over time among the approximately 600,000 most highly exposed people.



March 23, 2005:

Texas City Refinery explosion.

An explosion occurred at a
British Petroleum refinery in
Texas City, Texas.



April 20, 2010: Deepwater
Horizon oil spill in the Gulf of
Mexico.



Occupational
health Divisions

Occupational health can be divided into many divisions and the integration of those divisions is very important. These divisions are:

- ✓ Occupational diseases.
- ✓ Occupational safety.
- ✓ Occupational toxicology.
- ✓ Occupational environment.
- ✓ Analysis of biological samples
- ✓ Occupational Ergonomics.
- ✓ Air pollution.
- ✓ Occupational Legislation.

Internal factors affect Workers:

Internal factors affect Workers are including the worker health, age, genetics, and physical fitness.

Workers with family history of certain diseases are not encourages expose to chemicals and radiation hazards. Even at low exposure level.

Also a young worker of highly physical fitness shows much resistant to occupational diseases than aged one.



External factors affect Workers

- Physical factors: such as the exposure to heat stress noise vibration electromagnetic fields, and radiation.
- Chemical factors: exposure to dust, gases, and acid vapors.
- Biological factors: such as food deficiency, vitamin deficiency, Anthrax for wool industries, Cow Pox for cow farms, Schistosomiasis for agricultural fields.
- Occupational social factors: for workers how immigrates seeking jobs from rural area to urban areas which may cause social problems.

Occupational Hazards:


Physical hazards may include noise, temperature extremes, illumination extremes, ionizing or non-ionizing radiation, and ergonomics.



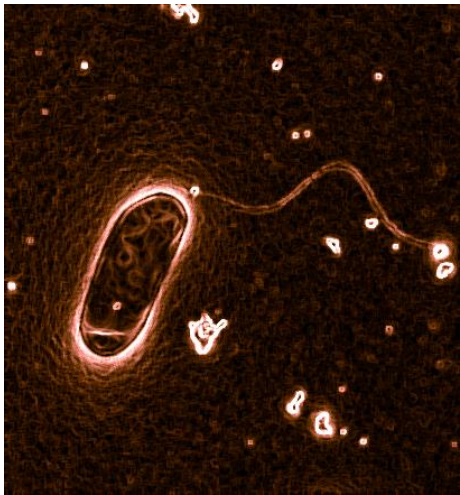
Chemical hazards related to Dangerous Goods or **Hazardous Substances** are frequently investigated by Occupational Hygienists.



Other related areas including **Indoor air quality (IAQ)** and **safety** may also receive the attention of the Occupational Hygienist.



Biological hazards may stem from the potential for **legionella exposure** at work or the investigation of biological injury or effects at work, such as dermatitis may be investigated.



Legionella is a pathogenic **Gram negative bacterium**, including species that cause legionellosis or Legionnaires' disease



Appropriate controls are selected from the hierarchy of control: by

- Elimination, MUSCUT
- Substitution;
- Engineering,

Substitution

Substitution of a More Hazardous Chemical by a Less Hazardous Chemical

Task	Hazardous Chemical	Substitute
Extraction solvents	Ethyl ether; Methyl-t-butyl ether (MTBE) ¹	Hexanes ¹
Oxidation of organic compounds	Chromate ion	Hypochlorite ion ¹
Qualitative test for heavy metals	Sulfide ion	Hydroxide ion ¹
Freezing point lowering	Benzene	Cyclohexane; Sodium chloride solution



Engineering





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Engineering



Heavy metal exposure occurs through three primary routes:

Inhalation. Common examples include workers scraping or sanding **lead paint** and workers in factories where heavy metals are melted and processed.

In the days before **leaded gasoline** was banned, those living alongside heavily traveled roads faced significant exposure through tailpipe emissions.



Ingestion. The leading cause of lead poisoning in children is eating old paint chips.



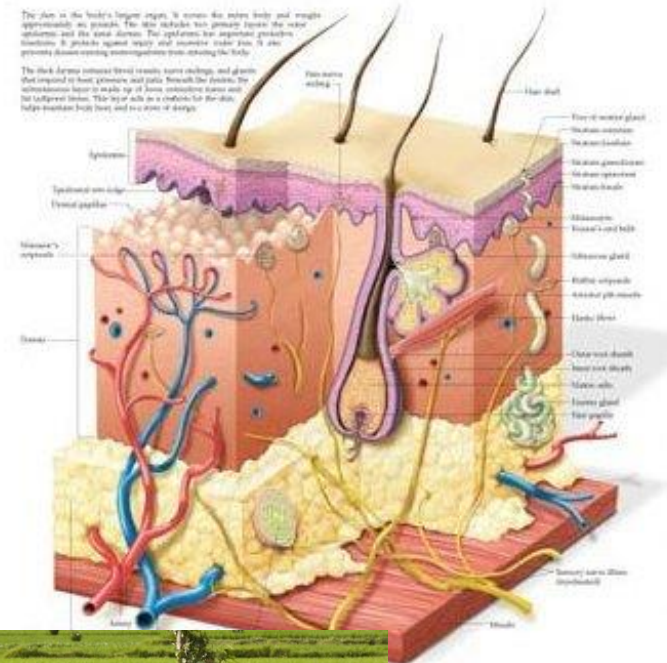
A major source of elevated mercury levels in humans comes from eating **contaminated fish**. And people can drink **arsenic from wells** contaminated by arsenic-containing **pesticides**.



Toxins Released Through the Skin

Skin absorption. Day to day contact with heavy metals can cause poisoning.

Dermal exposure is a serious concern for workers in fields where the irrigation water contains naturally-occurring arsenic (such as Asian rice paddies).





References

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