

# Occupational Health

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ž The workers are the main support of economic and social progress, so their health is an essential factor in development and represents an important human goal.

ž **Definition: ( ILO definition )**

ž Occupational health is the promotion & maintenance of the highest degree of physical, mental, & social well being of the workers in all occupations.

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ž **Occupational Medicine:** refers to preventive & curative medical services to the working population which include the following: Industrial medicine, Agricultural medicine, Navigation medicine, Sport medicine, Military medicine.

ž **Occupational hygiene:** refers to activities concern with the control of working conditions i.e. activities concern with control of the environment.

## **Principles of occupational and environmental disease:**

ž **1.** The clinical and pathologic expression of most environmentally caused diseases are indistinguishable from those of non environmental origin.

- ž 2. Many diseases of occupational and environmental cause are multi factorial.
- ž 3. The effects of occupational and environmental exposures occur after a biologically predictable latent interval following exposure.
- ž 4. The dose of an exposure to an agent is a strong predictor of the likelihood and type of effect.
- ž 5. People differ substantially in their responses to noxious exposures.

### **Occupational and environmental history**

- ž Occupational and environmental history has multiple purposes:
  - ž 1. To increase awareness of occupational and environmental factors.
  - ž 2. To make accurate medical diagnosis.
  - ž 3. To prevent the development of occupational and environmental disease.
  - ž 4. To prevent the aggravation of underlying medical conditions by occupational and environmental factors.
  - ž 5. To identify potential workplace hazards.
  - ž 6. To detect new associations between exposure and disease.
  - ž 7. To establish the basis of compensation for occupational and environmental disease.
- ž
- ž **The patterns of symptoms in relation to time at work may provide helpful hints to both, the diagnosis and the etiological agent.**
- ž These patterns may occur alone or in combination in an individual patient.

- ž 1. Change the symptoms during the workday.
- ž 2. Change in symptoms over the work week.
- ž 3. Change in symptoms on weekend and on vacations.
- ž 4. Onset of symptoms away from work.
- ž 5. Other experiences with work – related events.

### **The effect of work on the health of man:**

- ž As manufacturing techniques improved, machines became speedier and more dangerous. Toxic hazards were also increased because of the prolonged exposure to a wider range of new chemicals which were introduced without considering their possible effect on workers.
- ž 1. Work can cause occupational diseases e.g. Asbestosis.
- ž 2. Work can contribute to or exacerbate non – occupational diseases. e.g. MI & Asthma.
- ž 3. Work may affect the workers ability to work efficiently & safely e.g. noisy atmosphere - accidents
- ž 4. Work may positively affect the health of workers.

### **Problems in studying working population:**

- ž 1. Workers un aware of conditions or substances.
- ž 2. Change occupations overtime, forget former jobs.
- ž 3. Some occupational titles may have different exposures.
- ž 4. Many workers exposed to multiple chemicals.
- ž 5. Cancers may have latency of 20 + years.
- ž 6. Occupation associated with social class.

### **Occupational health services:**

- ž Include the entire form of health care delivery to the working population.
- ž **The aims:**
- ž 1. Safe placement of workers according to their physical, mental, & emotional capacities.
- ž 2. Protection of people at work from hazards which may affect their health and safety.
- ž 3. provision of adequate medical care & rehabilitation of the occupationally ill & injured.
- ž 4. Assistance in measures related to personal health maintenance.
- ž 5. protection of the local environment.

### **Function of the occupational health services:**

- ž **1.Surveillance of the working environment.**
- ž This includes monitoring hazard exposure & comparing it with **Maximum Allowable Concentration**
- ž ( maximum level of exposure below which no adverse health effect).
- ž **2.Surveillance of worker's health.**

Health surveillance may be:

- ž **Passive -----** the worker seek care for occupational or non occupational diseases.
- ž
- ž

ž **Active** includes:

ž **a. Pre – employment medical examination.**

ž It is the process of assessing the health & abilities of future employees before they are appointed.

ž **The purpose of pre – employment examination:**

ž 1.To ensure that the person examined does not have any medical condition that may be aggravated by the job.

ž 2.To ensure that the person examined does not have any medical conditions that may affect the health & safety of others.

ž 3. It serve as a baseline for future evaluations that are part of a medical surveillance programmed.

ž The contents of pre employment examination depends on the type of job for which the worker is being considered.

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ž **b. Periodic medical examinations.**

ž **Objectives:**

ž 1.Detect as early as possible the onset of an occupational diseases.

ž 2.To monitor personal exposure to hazards with the help of biological monitoring.

ž 3.To evaluate the effectiveness of preventive & control measures.

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ž **c. Treatment services.**

ž Providing efficient & quick treatment of injuries, acute poisoning, & minor conditions.

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ž **3. First aid services & emergency care.**

ž \*Training of workers on first aid.

ž \*Arrangement with ambulance services, fire services, local hospitals,

ž **4.General preventive & curative health services.**

ž Occupational health services provide primary health care services to workers & their families.

ž Screening for early evidence of non – occupational diseases.

ž **5.Rehabilitation.**

ž To ensure early return of workers to their work & limit disability.

ž **6.Protection of vulnerable groups.**

ž e.g. children, the aged, the disabled, those with chronic diseases,.....

ž **7.Information, education, & training.**

ž \*Increase workers awareness of occupational hazards to which they are exposed.

ž \*proper use of personal protective equipment.

ž \*promotion healthful behavior in the work place.

ž **8.Epidemiological study & keeping medical records.**

**Occupational epidemiology:**

ž **Definition:** Study the distribution and determinants of the adverse health outcomes in working population with goal of prevention.

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### **Occupational diseases and injuries:**

- ž Occupation & health interact with one another. In **occupational diseases** there is a direct cause and effect relationship between hazard and diseases, for example silica dust and silicosis, lead fumes and lead poisoning.
- ž **In work related diseases**, in contrast, the work environment and the nature of the job contribute significantly, but as only one of the factors, in the causation of a disease of multi factorial etiology, for example ischemic heart disease and musculoskeletal disorders.
- ž **Occupational accidents are more serious and easier to report than other occupational disorders.**
- ž There are 5 main factors that play a role in the high incidence of occupational accidents:
  - ž 1. Inadequately controlled environmental factors;
  - ž 2. Limited safety education;
  - ž 3. Lack of protective equipment;
  - ž 4. Higher susceptibility attributable to difficulties in adapting to mechanized work;
  - ž 5. Low standards of general health.

### **Extent of the problem:**

- ž On one day -----137 workers die from work  
related diseases
- ž -----16 die from injuries on the job.
- ž Every 5 seconds ----- a worker is injured

- ž Every 10 seconds -----a worker is temporarily or permanently disabled.

### **Classification of occupational diseases**

- ž **I-According to agents causing the disease.**

- ž **1. Physical agents:**

- ž Noise, vibration, pressure, thermal ( temperature ), radiation, electricity, illumination.

- ž **2. Chemical agents:** Ammonia, chlorine, phosogen,....etc.

- ž **3. Biological agents:**

- ž Viruses, bacterial, parasites, insects,.....etc.

- ž **4.Psychosocial environment:**

- ž This concerned with psychological climate in the work place & include two important topics:

- ž work – organization.

- ž Job satisfaction.

- ž **5.Mechanical hazards:**

- ž This leads to accidents.

- ž **II-According to target organ system:**

- ž **1.Occupational lung disorders:**

- ž The lungs are the major route of entry of noxious gases and dust. The resulting disorders can be grouped into five categories:

- ž **Acute inflammation:** mainly caused by ammonia, chlorine, nitrous fumes, ozone, sulphur dioxide.

**Asthma:** caused by cotton dust, epoxy resins, isocyanates, various metals, various woods



- ž **Extrinsic allergic alveolitis:**
- ž **\*Air – conditioner disease.** Bacteria, amoebae.
- ž **\*Bagassosis.** Sugar cane mould.
- ž **\*Bird fancier’s disease.** Avian serum proteins.
- ž **\*Farmer’s lung.** *Microsporum faeni*, thermophillic actinomyces from moldy hay.
- ž **\*Animal handler's lung.**
- ž **Pneumoconiosis:** caused by asbestos, coal dust, silica.

**Cancers:** asbestos, chrome, ionizing radiation, nickel, hydrocarbons ( polycyclic ).

## **2. Occupational skin diseases:**

- ž The occurrence of a cluster of cases from the same work place should be highly suspicious. The major industries prone to cause occupationally related dermatoses are:
- ž # agriculture and horticulture;
- ž # building and construction;
- ž # leather manufacture;
- ž # catering and food processing;
- ž # boat building and repair;
- ž # hair dressing;
- ž # wood working;
- ž # chemical and electrical industries.
- ž **Occupational cancer:**
- ž Generally, cancers of occupational origin are not distinguishable by their clinical presentation from other cancers.
- ž Those agents that have been reported to have a high incidence of or mortality from cancer include:

- ž Aromatic amines – high risk of cancer of the bladder ( aniline, & benzidine );
- ž Asbestos – significant increase in risk for cancer of lung, larynx, gastro – intestinal tract;
- ž Benzene – acute myelogenous leukemia;
- ž Beryllium – increased risk of lung cancer;
- ž Cadmium – increased risk of lung cancer;
- ž Chromium – increased risk of nasal and respiratory cancer;
- ž Nickel – increased risk of nasal cancer.
- ž

**General principles for preventing and controlling occupational hazards:**

- ž **1. Educate the workers:**
- ž Inform the workers of the hazards in the working environment and how they can protect themselves and other workers.
- ž **2. Replace hazardous chemical:**
- ž Use the alternative safer compound as replacement for hazardous chemicals.
- ž **3. Modify the process:**
- ž Engineering and other modifications can make a process safer, e.g. wet drilling to reduce dust in milling.
- ž **4. Eliminate toxic process at source:**
- ž Remove the hazardous product to minimize the contamination of the environment, e.g. use exhaust fans to remove dust at the point of drilling.
- ž **5. Limit the number of workers exposed:**
- ž Confine the hazardous process to a restricted area to which only essential workers have access and avoid unnecessary exposure.

ž **6. Protect workers:**

- ž Workers should use protective gowns, gloves, goggles and other protective equipment as required.

ž **7. Monitor the environment:**

- ž Measure the environmental contamination, e.g. dust level.

ž **8. Monitor exposure of workers:**

- ž Measure the degree to which individual workers are exposed, e.g. using film ( radiologist ).

ž **9. Monitor the health of workers:**

- ž Workers in hazardous employment should be monitored to look for early signs of adverse effect, e.g. blood test in workers exposed to lead.

ž **10. Establish emergency and first aid services:**

- ž Workers and health staff should be trained to deal with emergencies.