

Industrial Toxicology

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Definition: Toxicology is refers to the study of various toxic substances such as physical, chemical and biological agents. These substances are administered and interaction between biological system of living being and show the adverse or delayed effects. The toxicology includes the detection, symptoms, pathogenesis, mechanisms and control of toxicity.

Industrial toxicology is the study of poison substance exertion during industrial activity and cause harm for workers. Industry is a commercial activity that provides good and services such as agriculture, translocation, hospitality etc.

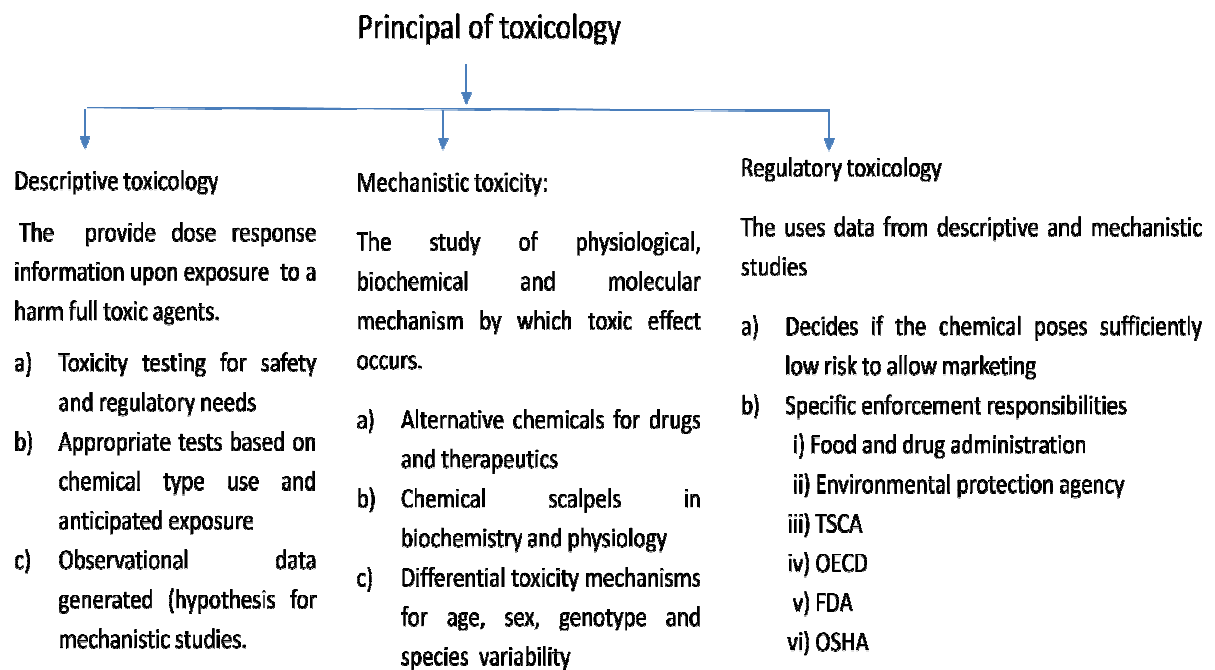
Classification of Industrial Toxins

- Biologic Agents
- Dusts
- Metals
- Chemicals
- Physical Agents
- Personal Physical Stress
- Personal Psychologic Stress
 - Biological agents
 - Bacteria
- Tetanus - construction, gardening
- Anthrax - wool handler
 - Viruses
- Hepatitis B - laboratory workers
- Rubella - obstetric personnel
 - Rickettsia
- Q Fever - animal rendering
- Rocky Mountain Spotted Fever - lumberjacks
 - Fungi
- Coccidioidomycosis - archeologists
- Histoplasmosis – farmers
 - Parasites
- Hookworms - sewer workers
- Fowl mites - poultry workers

- Metals:
- Lead - battery makers
- Mercury - dental assistants
- Arsenic - foundry workers
- Beryllium - aircraft workers
- Nickel - jewelers
- Chromium – electroplaters
- Cadmium - welders
- Manganese – smelters
- Chemicals:
- Pesticides
- Organa-phosphates and carbamates - pest control operators
- Chlorinated hydrocarbons - farmers
 - Plastics - plastic manufacturing
 - Hydrocarbons
- Aliphatic a. Acetylene - welders
- Aromatic
 - Benzene - petrochemical workers
 - Styrene - plastic manufacture
- Alcohols and Glycols
 - Methyl alcohol (methanol) - chemical workers
- Ethers and Esters
 - BCME (Bis-chlororne thyl ether) - laboratory workers
 - Ethyl acetate - resin makers
- Aldehydes
 - Formaldehyde - embalmers
- Ketones a. MEK (Methyl ethyl ketone) - disinfectant makers
- Halogenated Hydrocarbons
 - Trichloroethylene - equipment cleaners
 - PCB (Polychlorinated Biphenyl) - transformer repairmen
- Nitro-Amino Compounds
 - Hydrazine - rocket fuelers
 - Nitroglycerin - explosive manufacturers
- Combinations of different hydrocarbon types
 - Epichlorohydrin (halogenated ether) - epoxy resin workers
 - Inorganic Chemicals
- Acids and Alkalies
 - Hydroflouric acid - metal etching
 - Ammonia - fertilizer production
- Sulfur Compounds
 - Carbon disulfide - fat processors
- Halogens a. Chlorine - water purification workers
- Oxides of nitrogen - combustion engine testers
 - Miscellaneous
- Combustion products

- Carbon monoxide - firemen

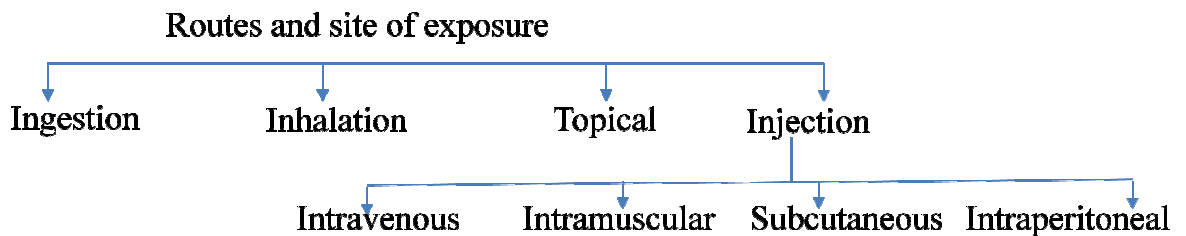
Principles of toxicology: Toxicology is refers to the study of adverse effect of chemicals on living system. A toxicologist is trained to examine and communicate the nature of those effect on living being. The toxicologist research examines cellular, biochemical and molecular mechanism of action as well as functional effects.



Exposure of Toxicants: The toxic response occurs in biological system in depend on the physical and chemical properties of the toxicants, the exposure situation and susceptibility of the biological system. The toxic substances, which are metabolic backdown (biotransformation) product reach appropriate site in the body at a concentration for a length of times. The major factors that influence toxicity as it relative to exposure situation for a specific chemical are the route of administration and the duration and frequency of exposure.

Route and Site of Exposure : The routes and site of exposure is define as nature of toxic substance. The major routes by which toxic substances gain access to the body are GI tract (ingestion), lungs (Inhalation), skin (topical, percutaneous or dermal) and other parenteral routes.

The toxic substances generally produce the greatest effect and most rapid response when given directly into blood stream.



Duration and frequency of exposure: The toxicologist usually divide the exposure of animal to chemical can be divided into four categories

- a) Acute exposure – exposure period less than 24 hr.
- b) Subacute exposure- exposure period 1 month or less
- c) Sub-chronic exposure- exposure period 1 to 3 months
- d) Chronic exposure - exposure period more than 3 months or 1 year but may be longer

These three categories of repeated exposure can be by any route, but most often this occurs by the oral route, with the chemical added directly to the diet.

