Occupational Hazards
Pneumoconiosis

• Group of lung diseases occurring out of specific occupation, caused by inhalation of insoluble dust, over a prolonged period of exposure.
• Characterized by fibrosis of lung parenchyma.
• Progressive, permanent, pulmonary pathology.
• Persistent cough, progressive breathlessness, reduced working capacity of lung.
• Followed by complications like tuberculosis, emphysema, COPD, pulmonary hypertension, cor pulmonale, carcinoma.
Factors influencing pneumoconiosis:

1. Concentration of dust in air
2. Composition of dust.
3. Size of dust particles
4. Duration of exposure
5. Individual susceptibility (health status)
Silicosis

• Silica particles $\rightarrow$ Macrophages $\rightarrow$ Autolysis & Death $\rightarrow$ Fibrogenic factor $\rightarrow$ Fibrogenic reaction in pulmonary interstitium $\rightarrow$ Deposition of collagen & formation of fibrosis $\rightarrow$ Hyalinization of collagen.

• Nodular fibrosis- 3-4 mm, hard, greyish, frequently in the apex & posterior border of lung.

• Silico-tuberculosis
• IP- few mths. to few yrs.
• Clinical features- cough, dyspnea, loss of weight, emphysema, hemoptysis.
• Diagnosis- X-ray chest (snow storm appearance).
• Management- No treatment
• Notifiable disease
Anthracosis (coal worker pneumoconiosis)

• Pathology – coal dust accumulates just before bronchioles open into alveoli (Coal macule)

• Stage I (Simple pneumoconiosis)- ventilatory impairment, atrophy of bronchial smooth muscles, dilation of bronchioles causing focal emphysema.

• Stage II (Progressive massive fibrosis)- Pulmonary hypertension & cor pulmonale leading to cardiac failure & death.
• Predisposing factors- Tuberculosis, smoking, non specific respiratory infections, autoimmunity.
• Beat elbow/ beat knee, Miner’s nystagmus
• X-ray shows multiple nodular densities (Black lung)
Asbestosis

1. Serpentine- white asbestos
2. Amphibole- Crocidolite (blue), amosite (brown)
   • Fibrosis around terminal bronchioles
   • Tissue reaction is due to mechanical irritation usually in lower half of lung.
   • Pleural calcification, neoplasm (bronchogenic carcinoma)
   • X-ray – ground glass appearance
   • Sputum- asbestos bodies.
Byssinosis

- Inhalation of cotton dust.
- Tightness of chest, altered respiratory function, chronic cough, progressive dyspnea, emphysema.

Bagassosis (cane sugar)

- Thermoactinomyces sacchari
- IP- 2-4 months
- X-ray shows mottling appearance
Farmer’s lung

- Mouldy hay or grain dust in agriculture field.
- Moisture- 30%, Temp.- 45 c
- Thermophilic actinomycete fungi (Microspora faeni)
- Allergic reaction
- Bronchial asthma
- Repeated attacks causes pulmonary fibrosis & lung damage (cor pulmonale)
- X ray shows fine nodular density.
Prevention

• Health Promotion

1. Pre-placement examination
2. Health education
3. Provision of healthy physical environment
4. Control of dust
   - prevention of formation
   - prevention of escape of dust
   - Removal of dust
• Specific protection
• Early diagnosis & treatment
• Disability limitation
• Rehabilitation
Lead Poisoning

- Sources- Mines of lead ore, industries of glass, paint, batteries, plumbing material
- Absorption- Inhalation, ingestion
- Storage- Bones, liver & kidney
- Elimination- 90% non-absorbed in stools

- Clinical features- Toxic affect appears if level exceeds 70 mcg/100 ml.
- Involvement of CNS: insomnia, headache, mental confusion, irritability, nervousness, anxiety, convulsions, delirium, coma, death.
• IUGR
• Children- growth failure, progressive mental retardation, low IQ, aggressive behavior, lack of concentration.
• Diagnosis- History, clinical symptomatology, investigation (PBS, Hb, blood level of lead, urinary level of lead)
Management
1. Prevention of further exposure
2. Saline purge
3. Chelating agents as Ca-EDTA, d- penicillamine

Prevention & Control

Health Promotion
1. Preplacement examination
2. Improvement of sanitation
3. Control of dust
4. Unleaded petrol for automobiles
5. Health education
• Specific protection
  Gloves in painters
  Respirators
• Early diagnosis & treatment
• Disability limitation
• Rehabilitation
**Occupational cancers**

- Agent - Chemicals
- Environmental factors - heat, radiation
- Influencing factors
- Features
- Prevention
  1. Preplacement examination
  2. Sanitation
  3. Health education
  4. Protective device - lead apron, gloves, dosimeter
**Occupational dermatosis** - dermatitis, eczema, folliculitis, urticaria, cancer

- Physical agents: heat, radiations
- Chemical agents: acids, alkalies, dye
- Host factor: young, males, summers, lack of hygiene
- Prevention
Agricultural industry

1. Physical hazards
2. Chemical hazards
3. Biological hazards
4. Mechanical hazards
5. Social hazards
6. Miscellaneous