OCCUPATIONAL HEALTH

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INTRODUCTION

- **Occupational health :**
  - promotion and maintenance of highest degree of physical, mental and social well being of workers
  - All three levels of prevention
  - Adaptation of work to man and vice versa

Ergonomics – ergon – work ; nomos – law

- Fitting job to the worker
- Objective – achieve mutual adjustment of man and his work for improvement of human efficiency and well being
- To reduce industrial accidents and increase efficiency of workers

- **Occupational environment**
  - Sum of external conditions and influences –prevail at the place of work –bearing on health of workers
  - 3 interactions
    - Man and agents(Physical, Chemical, Biological)
    - Man and machine
    - Man and man

- **Occupational hazards**

1. Physical
2. Chemical
3. Biological
4. Mechanical
5. Psychosocial

PHYSICAL HAZARDS

Heat and cold

- Common physical hazard – heat
- Direct effect of heat – burns, heat exhaustion, heat stroke, heat cramps
- Indirect effects – decreased efficiency, increased fatigue, enhanced accident rates

- Radiant heat – foundry, glass and steel industry
- Heat stagnation – jute and textile industry
- High temperature – kolar gold mines – **65degC**
- Corrected effective temperature **> 27deg C**- discomfort
- Cold – chilblains, erythrocyanosis, immersion foot, frostbite



- **Light**
  - Poor illumination – eye strain, head ache, eye pain, lacrymation, congestion
  - Miner's nystagmus – chronic effects
  - Intense glare – blurring of vision, accidents

- **Noise**
  - Auditory effects – hearing loss
  - Non auditory – nervousness, fatigue, interfere with communication
  - Degree of injury – intensity & frequency range, duration of exposure, susceptibility

- **Vibration**
  - Affects hands and arms, joints
  - Chronic exposure – fine blood vessels- sensitive to spasm (white finger)

- **UV radiation**
  - Arc weldi
  - Affects –eyes- conjunctivitis, keratitis (Welder's flash)

- **Ionizing radiation**
  - X rays and radio active isotopes(cobalt 60, phosphorous 32)
  - Bone marrow – more sensitive
  - Genetic changes, malformation, cancer, leukemia, depilation, ulceration, sterility, death
  - Maximum permissible – 5 rem/year to whole body

CHEMICAL HAZARDS

- Acts in three ways – local action, inhalation, ingestion
- **Local action**
  - Dermatitis, eczema, ulcer, cancer (irritant action)
  - Aromatic amino and nitro compounds – systemic
- **Inhalation**
  - Respirable dust - <5 microns

- **Dust**
  - organic – cotton, jute
  - Inorganic – silica, mica, coal, asbestos
  - Insoluble – retain in lung – pneumoconiosis
  - Soluble – eliminated by body mechanism

- **Gases**
  - Simple – oxygen, hydrogen
  - Asphyxiating – CO, cyanide, sulphur dioxide, chlorine
  - Anesthetic – chloroform, ether
- **Metals and their compounds**
  - Lead, antimony, beryllium, cadmium, cobalt, manganese, mercury, phosphorous, chromium, zinc etc

- **Ingestion**
  - Lead, antimony, cadmium, mercury, phosphorous, chromium, zinc etc
  - through – contaminated hand or food or cigarettes
- **Biological hazards**
  - Brucellosis, leptospirosis, anthrax, hydatidosis, psittacosis, tetanus, encephalitis, fungal infections, schistosomiasis
  - Working among animal products

- **Mechanical hazards**
  - Machinery, protruding and movin
  - 10% of accidents

on, insecurity, poor human

affect physical and mental health

OCCUPATIONAL DISEASES

- **Pneumoconiosis**
- Dust – 0.5 to 3 microns – health hazard- variable period of exposure – lung disease – pneumoconiosis
- Hazardous effect depends on
  - Chemical composition
  - Fineness
  - Concentration
  - Health status of the person

- **Important dust diseases**
  - silicosis
  - anthracosis
  - byssinosis
  - bagassosis
  - asbestosis
  - farmer's lung
- No cure – only prevention essential

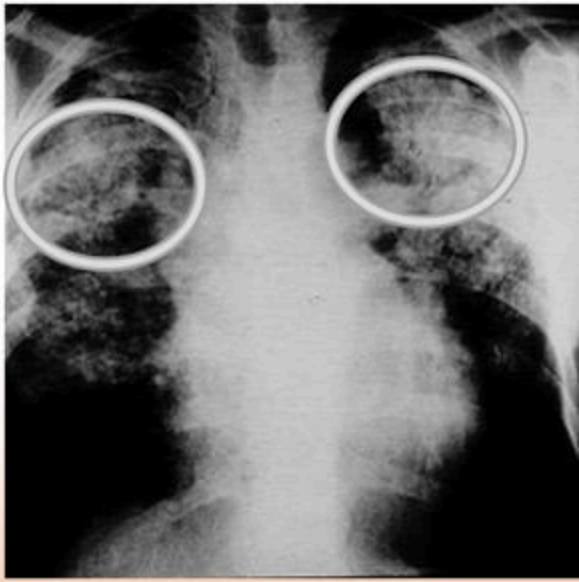
SILICOSIS (NOTIFIABLE- FACTORIES ACT 1948 AND MINES ACT 1952)

- Major cause of disability and mortality
- Inhalation of dust with – silica or silicon dioxide
- Higher concentration – higher hazard
- Incubation period – few months to 6 years
- Particles – phagocytosis – accumulation – block lymph channels
- Dense nodular fibrosis – 3-4mm
- c/f – insidious onset – irritant cough, dyspnoea, chest pain

- Decreased TLC – advanced disease
- X ray – snow-storm appearance
- Prone to PTB – silico-tuberculosis
- No effective treatment
- Fibrotic – cant reversed
- Rigorous dust control
- Regular physical examination by doctors

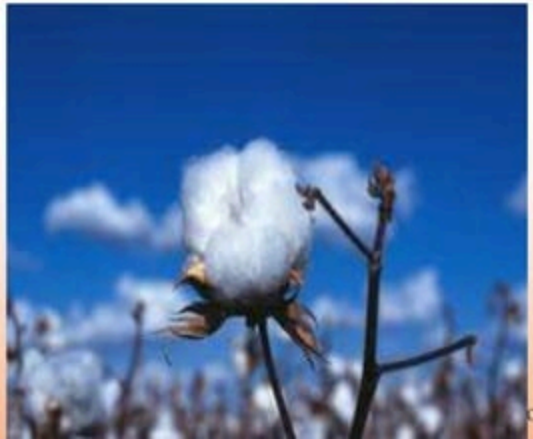
ANTHRACOSIS(NOTIFIABLE-INDIAN MINES ACT 1952, COMPENSATABLE-WORKMEN'S COMPENSATION ACT 1959

- First phase – simple pneumoconiosis – ventilatory impairment – after 12year exposure – anthracite coal dust
- Second phase –
  - progressive massive fibrosis
  - severe respiratory disability
  - premature death
- Once simple pneumoconiosis
  - progress even without further exposure



BYSSINOSIS

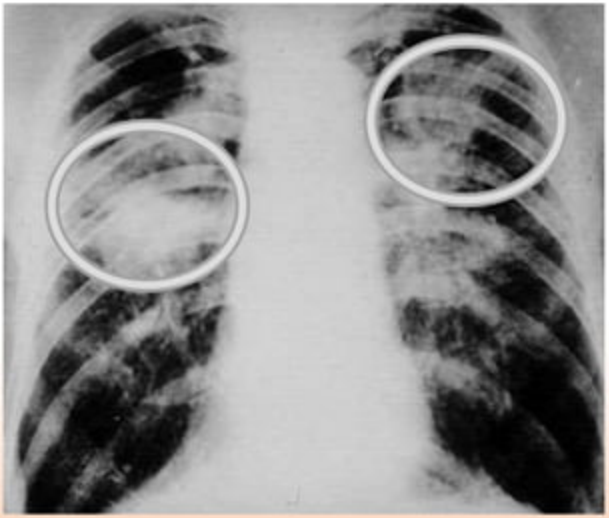
- Inhalation of cotton fiber
- Chronic cough – progressive dyspnoea – chronic bronchitis – emphysema
- India has large textile industry – 35% of factory workers



BAGASSOSIS

- Inhalation of bagasse or sugar-cane dust
- Thermophilic actinomycete – thermoactinomyces sacchari
- Breathlessness, cough, haemoptysis, slight fever
- Acute diffuse bronchiolitis – initial
- Skiagram – mottling in lungs or shadow
- Resolution of inflammation– if treated early

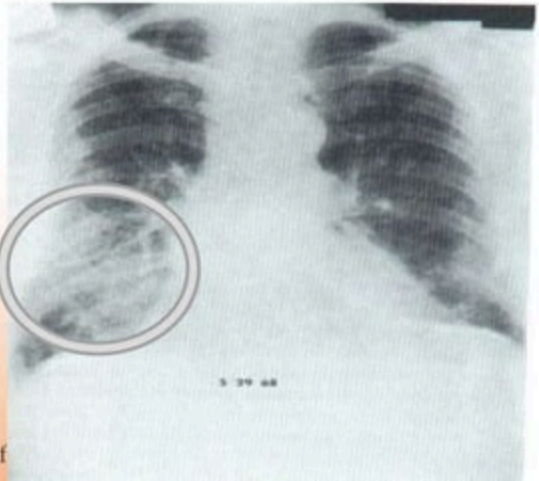
- Untreated – diffuse fibrosis, emphysema, bronchiectasis
- **Preventive measures**:
  - Dust control
    - Wet process
    - Enclosed apparatus
    - Exhaust ventilation



- Personal protection
  - Masks
  - Mechanical filters
- Medical control
  - Initial and periodical medical examinations
- Bagasse control
  - Keeping moisture >20%
  - Spraying bagasse with 2% propionic acid- fungicide

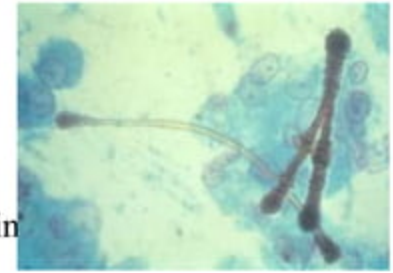
ASBESTOSIS

- Fibrous material – commercial name
- Silicates of varying composition of bases (Mg,Fe,Ca,Na,Al)
- Two types –
  - Serpentine or chrysolite (90% production)
  - Amphibole
    - Crocidolite (blue)
    - Amosite (brown)
    - Anthrophyllite(white)



- Inhalation – ROE
- Insoluble fibers – pulmonary fibrosis – insufficiency – death
- Carcinoma of bronchus (high-if add with smoking)
- Mesothelioma of pleura or peritoneum(crocidolite)
- Disease doesn't appear – until 5-10 yrs of exposure

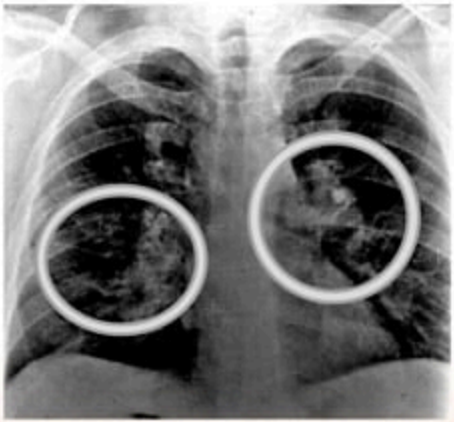
- Irritation – fibrosis – peribronchial – diffuse –basal in location
- Dyspnoea – out of proportion to clinical signs
- Clubbing – cardiac distress – cyanosis
- Sputum – **Asbestos Bodies**(fibers coated with fibrin
- X ray – ground glass appearance – lower third of lung fields



- **Preventive measures**
  - Use of safer type asbestos
  - Substitution of other insulants
  - Rigorous dust control
  - Periodic examination of workers
  - Continuing research

FARMER'S LUNG

- Inhalation of mouldy hay grain dust
- >30% moisture
  - favors bacteria, fungi growth
  - rise temperature 40-50 deg C
  - favors Thermophilic actinomycete



- Micropolyspora faeni – main cause
- Repeated attacks – pulmonary fibrosis – damage - corpulmonale

CONCLUSION

- Pneumoconiosis – one of the occupational disease – due to dust inhalation
- No specific treatment
- Prevention is important
- Periodical examination and preplacement examination of workers also important

Thank u……