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الفرع : طب الاسرة والمجتمع

المرحلة : الرابعة

أستاذ المادة : د بديعه ثامر يحيى

اسم المادة باللغة العربية : الصحة المهنية

اسم المادة باللغة الانكليزية : Occupational health

اسم المحاضرة الرابعه والخامسة باللغة العربيه :الامراض المهنية التن

اسم المحاضرة الرابعه والخامسة باللغة الانكليزية :

Respiratory occupational disease

Occupational skin disease

Occupational injury

Occupational cancer

Respiratory occupational disease
Occupational skin disease
Occupational injury
Occupational cancer

L4 , L5

Occupational lung diseases are a group of illnesses that are caused by either repeated, extended exposure or a single, severe exposure to irritating or toxic substances that leads to an acute or chronic respiratory disorder.

There are two broad categories of occupational lung diseases:

1. Diseases that are not occupation-specific, but are aggravated at work, such as occupational asthma; and
2. Diseases related to a specific occupation, such as asbestosis, coal worker's pneumoconiosis

pneumoconiosis

Classified



Fibrotic

(focal nodule, diffused fibrosis)



1- Asbestosis

2- Silicosis

3- Coal workers' pneumoconiosis

Non fibrotic



Byssinosis

1- Asbestosis

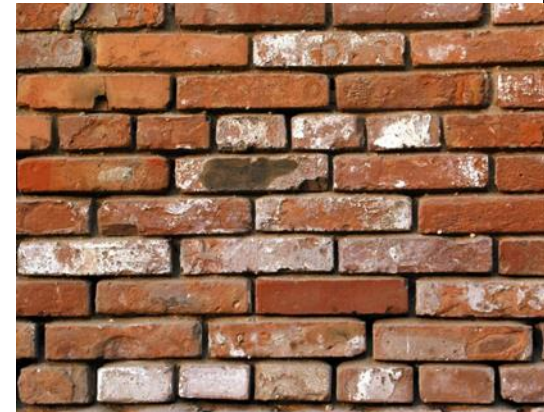


2- Silicosis

*Crystalline silica is one of the most common mineral found in the Earth's crust

- Naturally-occurring
- Incorporated into manmade materials
- Used to manufacture products

*Silica is EVERYWHERE



Industries where exposure occur

- Mining and Quarry work
- Contraction
- Manufacturing
- Ceramics
- Brick making
- Shipyards
- others



Exposure routes of Silica:

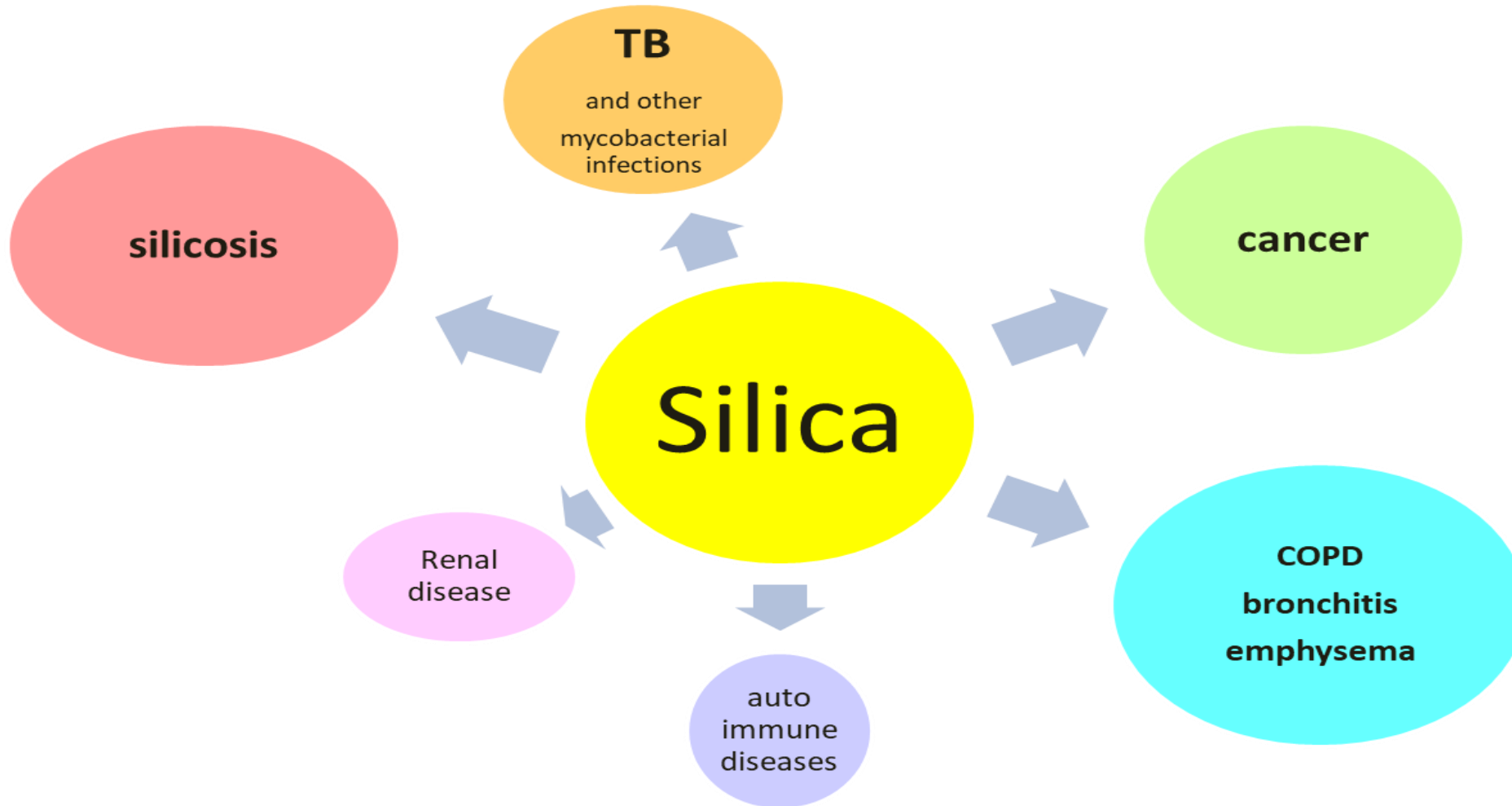
- Primary people are exposed by inhalation
- Breathed in through the nose and mouth can stay in the lungs for years
- Smallest particles enter deep into the lungs



Think about your work environment.
Where could exposure to silica occur?



Diseases associated with Silica



Diseases of Silica: Silicosis

- Silica particles cause scarring and hardness of the lungs
 - Scarring makes it hard for lungs to expand, making it difficult to breath
- Patients have cough, shortness of breath (SOB), weakness and tiredness
 - May lead to death
- Diagnosed by a work history and chest X-ray (CXR) +/- pulmonary function testing (PFTs)
 - Often misdiagnosed as TB



Normal CXR



Small
parenchymal
opacities



Large
parenchymal
opacities

Diseases of Silica: Silicotuberculosis

- TB is a highly contagious disease
 - Silicosis increases the risk of TB by four times
- Patients have cough (sometimes with blood), chest pain, SOB, and tiredness
 - Deadly if untreated
- Diagnosed by CXR or Sputum

Silicosis



Tuberculosis



Silicotuberculosis

Complications:

- Increase in risk of tuberculosis
- Increase incidence of fungal infections
- Risk of lung cancer
- Increase incidence of collagen vascular disease.

Treatment:

- Removal from further exposure, smoking cessation, supportive measures such as supplemental oxygen, treatment of heart failure, observation for early detection and treatment of tuberculosis, and bronchoalveolar lavage

3- Coal workers' pneumoconiosis



- Black lung disease
- It is a fibrotic lung disease caused by inhalation of coal dust and other carbon materials.
- Coal worker's pneumoconiosis occurs in two forms:
 - simple and complicated
 - progressive massive fibrosis



Diagnosis:

- Detailed occupational history
- Physical examination is not helpful, pulmonary function tests are often normal.
- Chest x-ray: round nodules located predominantly in the mid and upper lung zones, cavitations of larger masses may be seen due to necrosis.

Complications:

- Obstructive lung disease
 - Tuberculosis and other infection
 - Lung cancer
-
- No specific treatment
 - Prognosis is good

4- Byssinosis



- Byssinosis is a lung disease caused by occupational exposure to dust from cotton.
- The other name for byssinosis is Monday feeling (the affected workers have more problems on the first day of the week, and then improve after successive work days.)



Diagnosis:

- Appropriate exposure history
- Symptoms of chest tightness and dyspnea, signs of wheezing which is no regular.
- Pulmonary function tests before; during and after a work shift demonstrates airway obstruction.
- Chest x- ray: either normal or hyperinflation.

Treatment:

- Avoidance of further exposure.
- Inhaled bronchodilators, steroids, and sodium cromoglycate.

Prognosis:

- Uncertain. Airway obstruction may persist permanently.

Occupational skin disease

It is among the most common occupational diseases reported.

For a skin disease to be considered occupational in origin, there must be a causal relationship between the occupation or work and the skin disease.



- **Occupational skin exposure :**

- 1- **Chemical exposure**

- Numerous chemicals can cause contact allergic dermatitis
- Vinyl chloride exposure has been implicated in scleroderma.
- Tar and arsenic have been associated with skin cancer
- Oils may cause folliculitis.
- Catechols and phenols may cause depigmentation (leukoderma)
- Cement under occlusion can cause a chemical burn

2- **Biological Exposure**

- Contact with animals may result in infections
- Contact with infected/infested humans may result in infections such as scabies and head lice.
- Contact with aquatic life may result in atypical mycobacterial infection from fish.
- Contact with insects may result in contact urticaria
- Contact with plants may result in urticaria

3- Physical exposure

- Mechanical trauma to the skin leads to cuts, blisters, calluses, and other scars.
- Vibration from vibrating tools may provoke a vibration white finger.
- Direct heat causes thermal burns.
- Hot humid environments may provoke acne and sweat rash...etc.
- Low humidity environments may result in chapping and fissures.
- Cold environments cause frostbite, chilblains, cold urticaria,
- Ultraviolet radiation is the main cause of skin cancer
- Physical irritants such as particulates, rough surfaces, and fibers may cause irritant dermatitis.
- Dermal penetration may introduce poison or infection leading to skin necrosis.

General Principles of Diagnosis:

- It is advisable to screen all patients with skin disease for a work-related cause. If occupational skin disease is suspected, questions should be asked about the exact time relationship between the skin condition and the work exposure, including the effects of time off and return to work.

Occupational history should cover the following points:

- General work conditions and specific activities in the patient's present job that involve skin contact with potential hazards.
- Physical, chemical, and biological agents to which the patient is or may be exposed.
- Presence of skin diseases in fellow workers.
- Control measures to minimize or prevent exposure in the workplace, including personal and occupational hygiene (e.g., handwashing instructions and facilities, showers, laundry service) and the availability of gloves, aprons, shields, and enclosures.

There are three broad groups of occupational skin disease:

1. Irritant contact dermatitis
 2. Allergic contact dermatitis
 3. Another occupational skin disease.
- More than 90% of cases are classified as one or other form of contact dermatitis.

Irritant contact dermatitis :

- Irritant contact dermatitis occurs when contact with chemical or physical agents injures the skin's surface faster than it is able to repair the damage. Occupational irritant contact dermatitis:
- Comprises about 80% of all occupational skin diseases
- Includes chemical burns and most cases of contact urticaria
- Chronic cumulative irritation is often diagnosed by exclusion of an allergic cause for dermatitis, but it may co-exist with allergic contact dermatitis.

Clinical features:

- the rash appears in exposed or contact areas,
- in thin skin more often than thick skin (e.g., dorsum of the hands rather than the palms),
- and in the area around the belt or collar. The rash may be difficult to differentiate from the rash of allergic contact dermatitis.
- Acute lesions are painful, weepy, and vesicular, whereas chronic lesions are dry, erythematous, cracked, and lichenified.
- The lesions assume a clearly demarcated pattern and are often asymmetric and unilateral.
- Hardening or adaptation of the skin may occur as a result of repeated contact with moderate irritants

- **Diagnosis:** The diagnosis is based on the presence of rash in exposed areas and clinical improvement of the rash on the removal of the offending agent.
- **Treatment:** For exposure to severe irritants, the extent of the injury can be reduced by immediate, continuous, and prolonged water irrigation (up to three hours), with contaminated clothing removed while the affected area is under water. With large or full-thickness burns, hospitalization may be necessary

ALLERGIC CONTACT DERMATITIS

- **Clinical Features:** Rash appears in areas exposed to the sensitizing agent, usually with the asymmetric or unilateral distribution. Sensitizing agent on the hands or clothes is often transferred to other body parts. The rash is characterized by erythema, vesicles, and severe edema. Pruritus is the overriding symptom.
- In photoallergic dermatitis, sunlight and exposure to the offending substance usually affect the face and arms, but the sun-shaded area under the chin is generally spared. Although sunlight is essential for the initiation of photosensitization, dermatitis may continue long after the photoallergy is eliminated (a condition is known as a "persistent light eruption

Treatment and Prevention:

- Allergic contact dermatitis improves with the removal of the sensitizing agent.
- Desensitization to agents provides protection that is incomplete and lasts for no more than a few months; thus, desensitization must be repeated each year to maintain partial resistance

OCCUPATIONAL SKIN NEOPLASMS

- Skin tumors can result from exposure to substances such as polycyclic hydrocarbons, inorganic metals, and arsenicals.
- These lesions can also develop because of trauma, burns, and exposure to ultraviolet light or ionizing radiation.
- Frequently, the skin tumors do not appear until two or three decades after the exposure.

How can occupational skin disease be prevented?

Recognition of cause	<ul style="list-style-type: none">•Employers and workers should be involved in identifying workplace hazards.•Evaluate the exposure to hazards and assess the risk of harm.•Maintain a register of accidents/incidents/occupational disease.
Eliminate or enclose	<ul style="list-style-type: none">•Sometimes skin contact with the hazard can be avoided using encapsulated machines or automated equipment, such as dishwashers and food mixers.

Minimize	<ul style="list-style-type: none">•Where a hazard cannot be eliminated, it should be minimized.•Ensure appropriate ventilation and other engineering controls.•Provide personal protective equipment: <u>gloves</u>, aprons, and face shields.•Optimise skin barrier function with suitable <u>emollients</u>, barriers, and moisturizing creams.•Train workers on the causes of occupational skin disease.•Train workers on how to protect their skin from injury and dermatitis.•Move at-risk individuals to alternative work.
Monitor	Where a hazard is minimized, monitor workers' health with respect to that hazard
Appropriate treatment	Topical or <u>oral steroids</u> , <u>emollients</u> , and <u>antibiotics</u> should be prescribed as indicated by a medical professional.

Occupational injury

Occupational cancer

L5

Occupational injuries

- Occupational accidents are more serious and easier to report than other occupational disorders.
- There are 5 main factors that play a role in the high incidence of occupational accidents:
 1. Inadequately controlled environmental factors;
 2. Limited safety education;
 3. Lack of protective equipment;
 4. Higher susceptibility attributable to difficulties in adapting to mechanized work;
 5. Low standards of general health.

Occupational Health Hazards of Health Care Workers

Healthcare workers occupational hazards:

1. Biological (Avian Influenza, SARS, TB, HIV, Hepatitis)
2. Chemical (drugs, disinfectants, pesticides)
3. Ergonomic (lifting, transfers)
4. Stress/Violence (staffing shortages, shift rotation)
5. Physical Hazards (radiation, heat, noise)

Categories of health care workers:

1. Clinical: physicians, dentists, physical therapists.
2. Nursing
3. Clinical support: pharmacists, lab technicians, diagnostic imaging technicians, operating room technicians, security personnel
4. Facility support: engineering personnel, maintenance staff, housekeeping staff, food services staff, administrators.
5. Office based: clerical support personnel

Prevention:

1. **Hand washing** prevents the spread of infection from patient to HCW and from patient to patient
2. **Immunization:** recommended: Hepatitis B, MMR, influenza, varicella, tetanus
3. **Prevent Chemical Exposure:** •Substitute less hazardous chemicals, •Change to non-spill containers, •Keep containers closed, •Work under hoods, •Wear personal protective equipment, (gloves, masks, aprons)
4. **Prevent Physical Injuries:** •Muffle noisy machinery or wear ear plugs., Guards on machines, •Use “sharps” containers, •Dry wet surfaces
5. **Reduce Stress:** •Define aggravating factors, •Establish discussion/support groups, •Change work design, •Involve Employee Assistance personnel
6. **Elimination or substitution of sharp:** eliminate unnecessary injections, and needleless IV systems.
7. **Administrative (policies and training programs)**
8. **Work Practice Controls** (Universal Precautions, no recapping, provision & placement & removal of sharps containers)
9. **Personal Protective Equipment** (gloves, masks, gowns)
10. **Personal hygiene**

Occupational cancer:

Cancer is **specifically attributed** to **significant* levels of exposure** to an **agent*** in **the workplace** and occurs among **substantial*** numbers of workers.

Occupational cancer

is cancer caused by **occupational hazards**

Several cancers have been directly tied to occupational hazards, **including chimney sweep's carcinoma, mesothelioma, and others**

What causes occupational cancer?

Occupational cancer is caused **by exposure to carcinogens in the workplace**. There **are three different types** of occupational carcinogens:

I. Biological carcinogens

some micro-organisms such as viruses have been known to **cause cancer**, for example **Hepatitis B**, **HIV** viruses and so on.

I. Chemical carcinogens

a number of chemicals are known to be carcinogenic.

These chemicals may occur **naturally**, such as asbestos, be **manufactured** like vinyl chloride, or be **by-products of industrial processes**, for example, polycyclic aromatic hydrocarbons.

III. Physical carcinogens

agents such as **ionising** and **ultraviolet (UV)** radiation have the potential to cause cancer. Examples of **ionising radiation** include **X-rays** and alpha, beta and gamma radiation. **UV radiation** some of which are known to cause **skin cancer**.

prevention of occupational cancer :

- **Recognition of hazards and risks**
- **Education of management and workforce**
- **Elimination of exposure** (substitution, automation)
- **Reduction of exposure**
- **Provision of personal protective equipment**
- **Limiting access**
- **Adequate facilities for showering, changing, etc.**
- **Legislative provisions**

Control of industrial cancer :

The control measures comprise the following

- (1) Technical measures like the exclusion of the carcinogen from the industry, well-designed building or machinery, closed system of production, etc.,**
- (2) medical examinations,**
- (3) inspection of factories,**
- (4) notification,**
- (5) licensing of establishments,**
- (6) personal hygiene measures, and**
- (7) research**