



Introduction to Occupational health

Objectives:

- Enlist and understand the effects of exposure of a worker to:
- Physical hazards (heat and cold, light, noise, vibration, UV light, ionizing radiation)
- Chemical hazards (local effects, inhalation, absorption, ingestion)
- Biological hazards (infectious and parasitic agents)
- Mechanical hazards
- Psychological hazards (fatigue, depression, anxiety)

Done by:

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Important | Extra | Notes

[Editing file](#)

Occupational health

It is The prevention of disease and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations.

Similar to preventive medicine but targets the workers mainly.

Ergonomics: قوانين العمل

- Derived from the Greek ergon, meaning work and nomos, meaning law.
- "fitting the job to the worker".
- Objective is "to achieve the best mutual adjustment of man and his work, for the improvement of human efficiency and well-being".

changing factors in the worker, location, or machines to make it safe

Occupational hazards

- Physical hazards
- Chemical hazards
- Biological hazards
- Mechanical hazards
- Psychosocial hazards.

Examples: Personal Protective Equipment or the clip radiologists wear to measure the amount of radiation.

Physical hazards.



Heat and cold

HEAT		COLD
Direct effects:		• Chilblains
• Burns	like bakers and glass blowers	• Erythrocyanosis
• Heat exhaustion	they are exposed for long times to a hot	• Frostbite
• Heat stroke	temperature	• General hypothermia
• Heat cramps		
Indirect effects:		Ex. people who work in meat refrigerators, with dead bodies, or shoveling snow
• Decreased efficiency		
• Increased fatigue		
• Increased accidents rates		

- ❖ Reasonable temperature must be maintained in each work room.



vasoconstriction > bad circulation > tissue death
cases like frostbite could lead to amputation

وزارة العمل والعمال تحدد ساعات وملابس محددة بشأن يتجنبون المضاعفات

Noise

Auditory	non -auditory
<ul style="list-style-type: none"> • Temporary hearing loss • Permanent hearing loss <p>Ex. wearing headphones all day</p>	<ul style="list-style-type: none"> • Nervousness • Fatigue • Interference with communication by speech • Decreased efficiency • Annoyance

- ❖ Factors affecting degree of injury: Different from one person to another
 - 1-intensity and frequency range,
 - 2-duration of exposure and individual susceptibility.

Vibration

- frequency range 10 to 500 Hz,
- drills and hammers.
- usually affects the hands and arms.
- the fine blood vessels of the fingers may become increasingly sensitive to spasm (white fingers).
- injuries of the joints of the hands, elbows and shoulders



Light

whether natural or not it has to be suitable to the job being done

Poor illumination:

Acute effects:

- Eye strain Due to trying to focus with poor illumination and the muscles of the eye get fatigued
 - Headache
 - Eye pain
 - Lachrymation
 - Congestion around the cornea
 - Eye fatigue
- Chronic effects:
- Miner's nystagmus



Excessive brightness: Like bright flashlights, billboards on the street, tv or computer with full brightness

- Discomfort,
 - Annoyance and
 - Visual fatigue
 - Blurring of vision
- Light should be sufficient and suitable, natural or artificial.



Ultraviolet radiation

arc welding. Welders: get UV rays in their eyes so they wear eye shields, if they don't they might get keratitis

mainly affects the eyes:

- intense conjunctivitis
- keratitis (welder's flash).

Symptoms: pain and redness in eyes

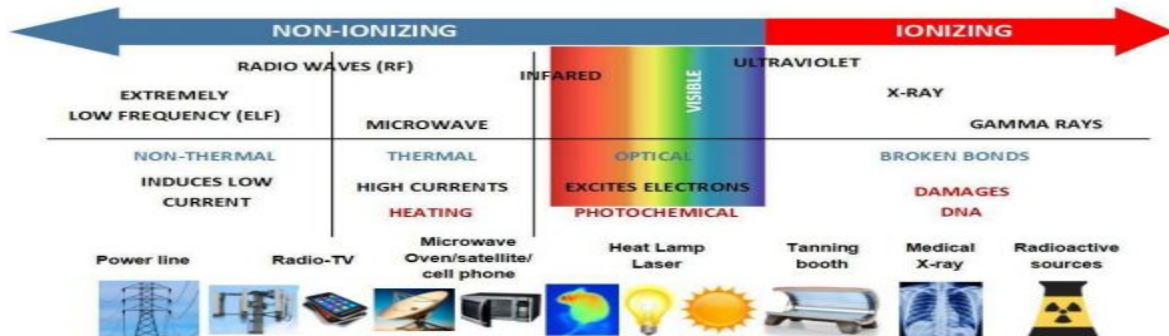
- usually disappear with no permanent effects



biggest source of UV rays: sun
sunblock reduces the effect of UV rays
has benefits but has to be in certain amounts and times
people like builders, security they get long exposure times
for protection they wear hats and cloth to cover their neck
from the back

Ionizing radiation

- e.g., X-rays and radioactive isotopes.
- Some tissues are more sensitive than others.
- Hazards: genetic changes, malformation, cancer, leukaemia, depilation, ulceration, death.
- exposure at 5 rem per year to the whole body



like radioactive iodine
keep the patient in isolation, no interaction with children.
they are considered radioactive objects

Chemical hazards

- local action, absorption, inhalation and ingestion.
- Effects depend on duration quantity of exposure, and individual susceptibility.

effect depends on route of entry into the body



Local action

- Irritation: allergic reactions, dermatitis, eczema, ulcers and cancer
- **Absorption:** systemic effects.
- Occupational dermatitis: machine oil, rubber, caustic alkalies and lime



Inhalation

1-Dust:

- 0.1-150 microns
- Organic (cotton), inorganic (silica, mica, coal, asbestos)
- Soluble, insoluble
- Pneumoconiosis: <5 microns, insoluble dust
- Example of dust disease: silicosis, anthracosis

bleach or vanish: make the hand white due to a reaction from the chemicals
like using perfume, detergent, soap, or cream that causes an allergic reaction.



insoluble > deposition: we can see it in histopathology or X ray
causes silicosis or asbestosis overall called pneumoconiosis
causes malignant diseases

2- Gases:

- simple gases (e.g., oxygen, hydrogen),
- asphyxiating gases (e.g. carbon monoxide, cyanide gas, sulphur dioxide, chlorine)
- anaesthetic gases (e.g., chloroform, ether, trichlorethylene).



CO: prevents oxygen from binding to tissue
its like you're not breathing at all
Chloroform: used for kidnappings

3- Metals and their compounds:

- dust or fumes.
- lead, antimony, arsenic, beryllium, cadmium, cobalt, manganese, mercury, phosphorus, chromium, zinc and others.
- responds favorably to cessation and medical treatment.

lead from batteries and paint (in the past but they noticed people getting lead poisoning due to the pain in their house)
water pipes contain lead, make up can contain lead (cheap make up)



4-Ingestion

- lead, mercury, arsenic, zinc, chromium, cadmium, phosphorus etc.
- contaminated hands, food or cigarettes.
- Most is excreted through feces and only a small proportion may reach the general blood circulation.

Mostly not ingested purposefully unless suicidal or children drinking bleach
Can happen if working in a plant or lab and its still stuck in the workers' hands and they eat, coloring in food, and cigarettes
In high amounts: a systemic manifestation

Biological hazards

Persons working in medical field, among animal products (e.g., hair, wool, hides) and agricultural workers are specially exposed to biological hazards.

ex. microbiologists, lab techs, HC workers from patients, people who work with animals or their products, people who work in agriculture
living agents like mold or fungus

Mechanical hazards

- About 10 % of accidents in industry are due to mechanical causes.

زي اللي يفرم اللحم او يقطع الجبن وتدخل يده او اصبعه فيها

Psychosocial hazards

- Psychological and behavioral changes : hostility, aggressiveness, anxiety, depression, substance abuse, sickness, absenteeism
- Psychosomatic ill-health : fatigue, headache; body pain, peptic ulcer, hypertension, heart disease and rapid aging.

stress or bullying from coworkers, managers or boss, clients

heavy workload, favoritism leading to frustration

bullying non saudis or based on ethnicity

Psychosomatic: patient is stressed or psychologically ill but it shows physical manifestations most commonly PUD

they started a new department called employee relations to plan trips and outings to reduce stress in the workplace

Personal Protective Equipment (PPE)



Summary

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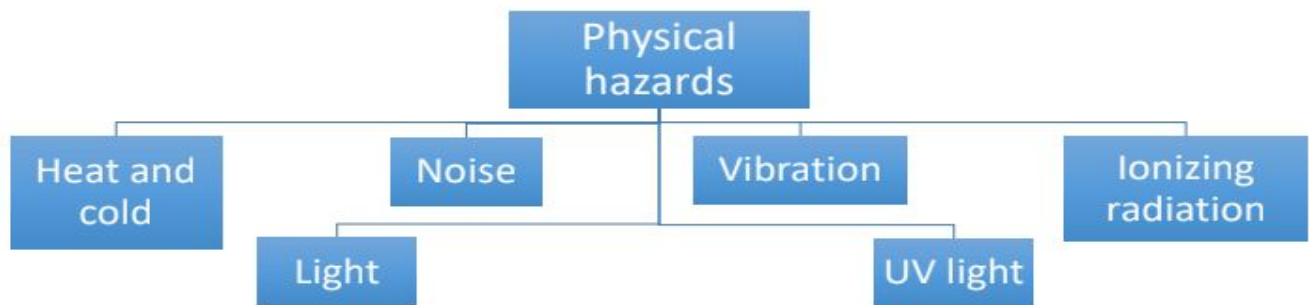
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1-Heat and cold:

HEAT	COLD
-Direct effects:• Burns • Heat stroke • Heat exhaustion • Heat cramps -Indirect effects:• Decreased efficiency •Increased fatigue •Increased accidents rates like bakers and glass blowers they are exposed for long times to a hot temperature	• Chilblains • Erythrocyanosis • Frostbite • General hypothermia

2-Noise:

Auditory	non -auditory
Temporary hearing loss , Permanent hearing loss	Nervousness, Fatigue, Interference with communication by speech, Decreased efficiency,and Annoyance

Factors affecting degree of injury:

1-intensity and frequency range,

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3-Vibration: • frequency range 10 to 500 Hz. • drills and hammers. • the fine blood vessels of the fingers may become increasingly sensitive to spasm (white fingers). • injuries of the joints of the hands, elbows and shoulders .

4-Light:

Poor illumination	Excessive brightness
<p>Acute effects: • Eye strain • Headache • Eye pain • Lachrymation</p> <p>• Congestion around the cornea</p> <p>• Eye fatigue</p> <p>Chronic effects: Miner's nystagmus</p> <p>Due to trying to focus with poor illumination and the muscles of the eye get fatigued</p>	<p>• Discomfort, • Annoyance and Visual fatigue • Blurring of vision.</p> <p>• Light should be sufficient and suitable, natural or artificial.</p>

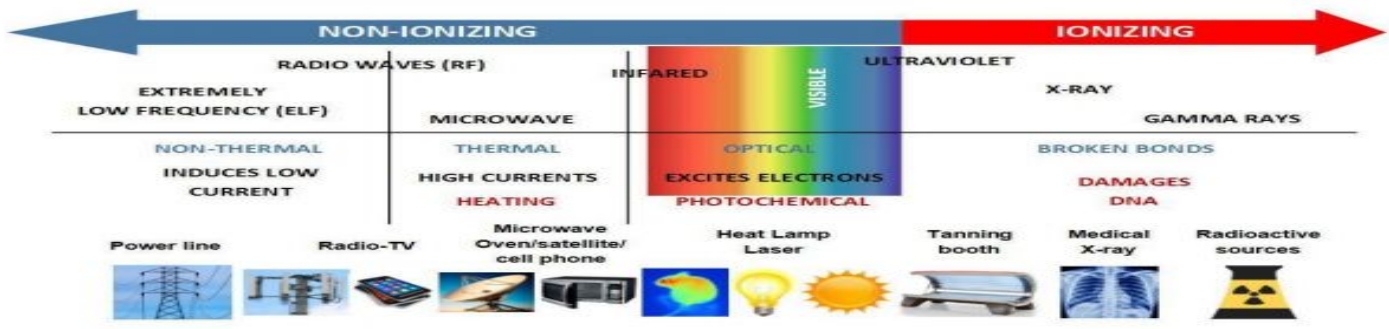
5-Ultraviolet radiation: arc welding. mainly affects the eyes: 1-intense conjunctivitis 2-keratitis (welder's flash).

Symptoms: pain and redness in eyes. usually disappear with no permanent effects.

biggest source of UV rays: sun. sunblock reduces the effect of UV rays

6-Ionizing radiation: • e.g., X-rays and radio-active isotopes. • Hazards: genetic changes, malformation, cancer, leukaemia,

depilation, ulceration, death. • exposure at 5 rem per year to the whole body.



Chemical hazards effect depends on route of entry into the body

• local action, absorption, inhalation and ingestion. • Effects depend on duration quantity of exposure, and individual susceptibility.

-Local action:

•Irritation: allergic reactions, dermatitis, eczema, ulcers and cancer. •Absorption: systemic effects.
 •Occupational dermatitis: machine oil, rubber, caustic alkalis and lime. bleach or vanish: make the hand white due to a reaction from the chemicals. like using perfume, detergent, soap, or cream that causes an allergic reaction.

-Inhalation:

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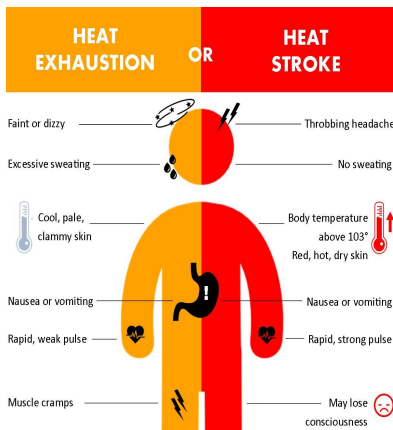
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Personal Protective Equipment (PPE)



What symptom distinguishes between heat stroke and heat exhaustion?

Answer: Dry Skin

Which of the following manifestations is characteristic of "heat stroke" ?

Answer: Dry skin and high temperature

Which of the following mechanism is responsible for the lethal effect of carbon monoxide?

Answer: binding to hemoglobin molecule

OSHA's Permissible Noise Exposures	
Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
<.25	115

Which of the following is the maximum permissible noise exposure for 8 hours/day?

Answer: 90

Good luck!

