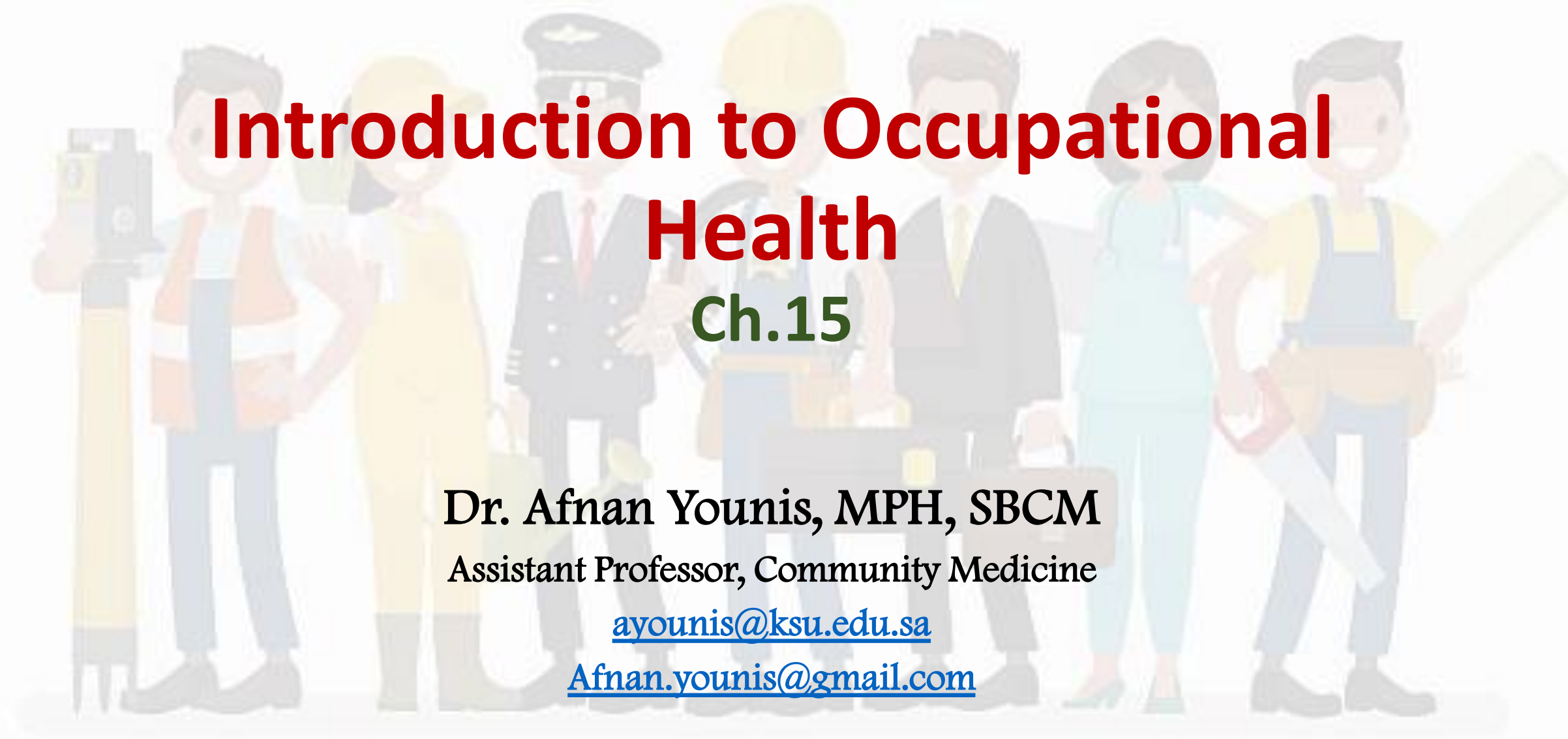

Introduction to Occupational Health

Ch.15

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By the end of this session you will be able to:

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)

Occupational health

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

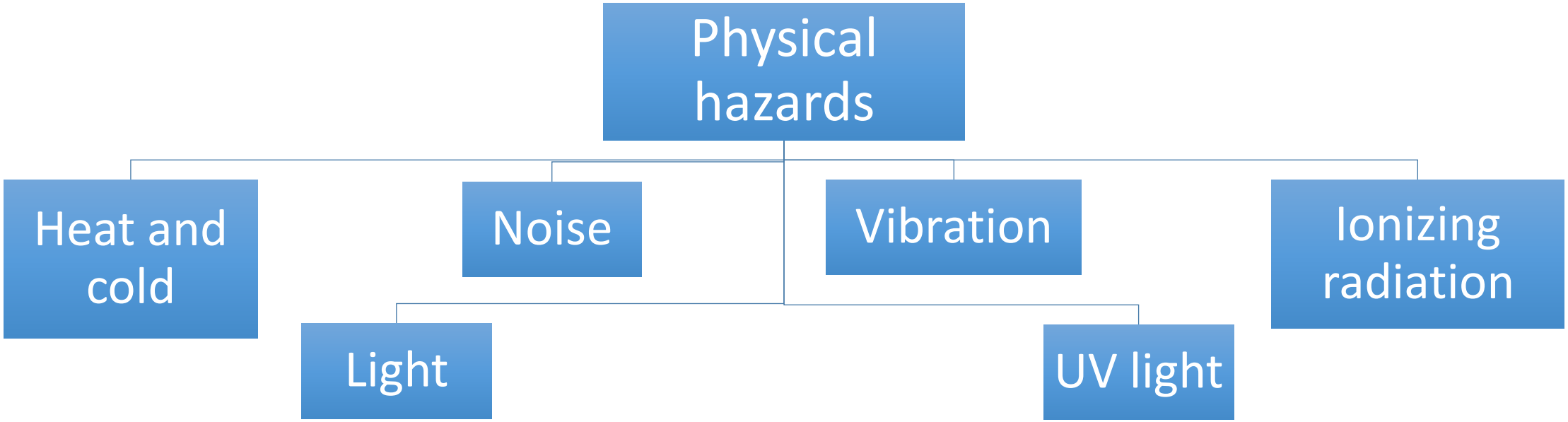
Ergonomics

- 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".

Occupational hazards

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

Physical hazards



Heat and cold

Heat	Cold
Direct effects: • Burns • Heat exhaustion • Heat stroke • Heat cramps Indirect effects: • Decreased efficiency • Increased fatigue • Increased accidents rates	• Chilblains • Erythrocyanosis • Frostbite • General hypothermia

- Reasonable temperature must be maintained in each work room.


Frostbite
1st degree -
Irritates the skin
2nd degree -
Blisters but has
no major damage
3rd degree -
Involves all layers
of the skin and
causes permanent
tissue damage

Light

Poor illumination	Excessive brightness
Acute effects: • Eye strain • Headache • Eye pain • Lachrymation • Congestion around the cornea • Eye fatigue Chronic effects: • Miner's nystagmus	• Discomfort, • Annoyance and • Visual fatigue • Blurring of vision

- Light should be sufficient and suitable, natural or artificial.

Noise

Auditory effects	Non-auditory effects
Temporary hearing loss Permanent hearing loss	Nervousness Fatigue Interference with communication by speech Decreased efficiency Annoyance

- Factors affecting degree of injury: intensity and frequency range, 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

Ultraviolet radiation

arc welding.

mainly affects the eyes:

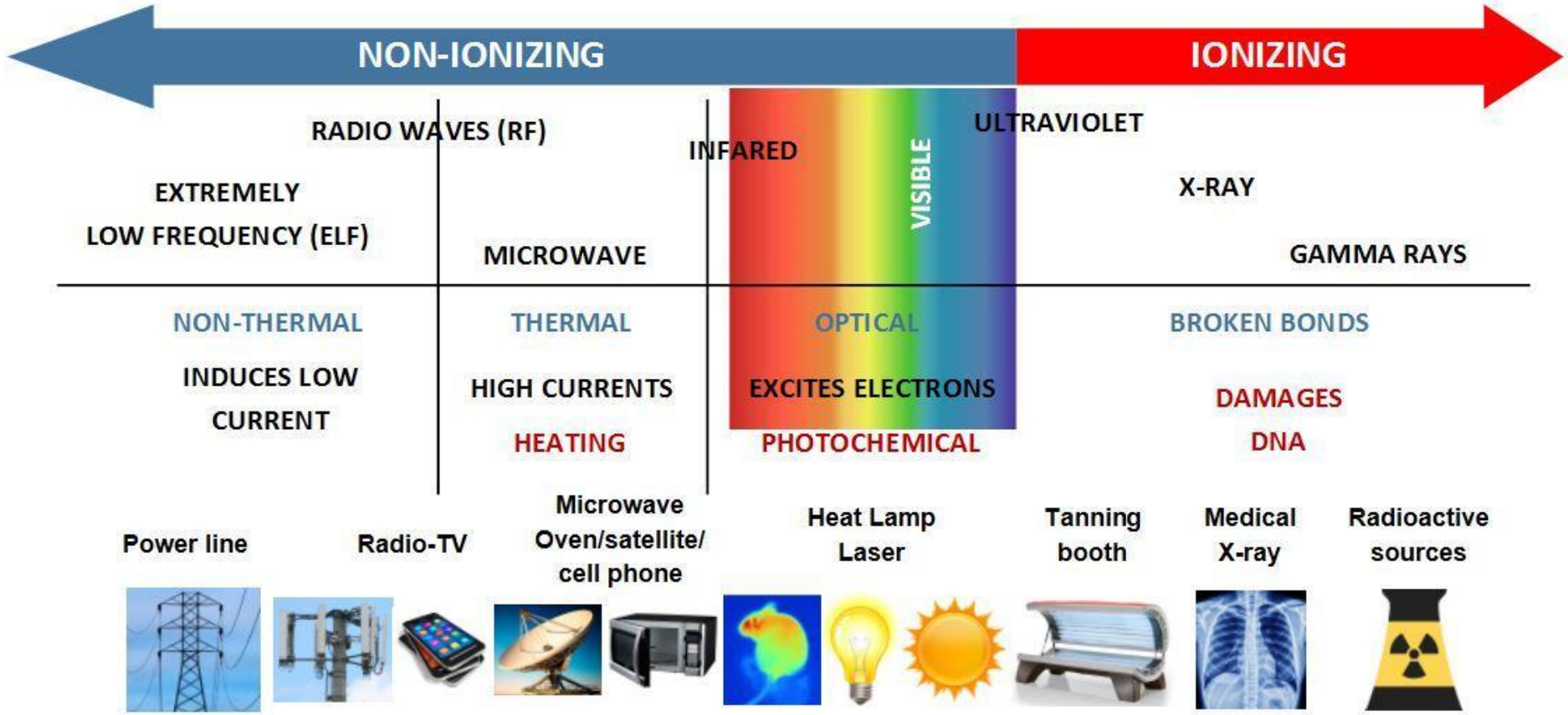
- intense conjunctivitis
- keratitis (welder's flash).

Symptoms: pain and redness in eyes

- usually disappear with no permanent effects

Ionizing radiation

- e.g., X-rays and radio-active 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


NON-IONIZING
IONIZING
RADIO WAVES (RF)
EXTREMELY
LOW FREQUENCY (ELF)
MICROWAVE
INFARED
VISIBLE
ULTRAVIOLET
X-RAY
GAMMA RAYS
NON-THERMAL
INDUCES LOW
CURRENT
THERMAL
HIGH CURRENTS
HEATING
OPTICAL
EXCITES ELECTRONS
PHOTOCHEMICAL
BROKEN BONDS
DAMAGES
DNA
Power line
Radio-TV
Microwave
Oven/satellite/
cell phone
Heat Lamp
Laser
Tanning
booth
Medical
X-ray
Radioactive
sources

Chemical hazards

- 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 alkalies and lime

Inhalation

1-Dust:

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

Inhalation

- **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).

Inhalation

- **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.

Ingestion


HAVE YOU GOT SOME E98 AND E675 FOR 'MA TRAFFORDS HOME BAKED APPLE PIE'?
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Ingestion

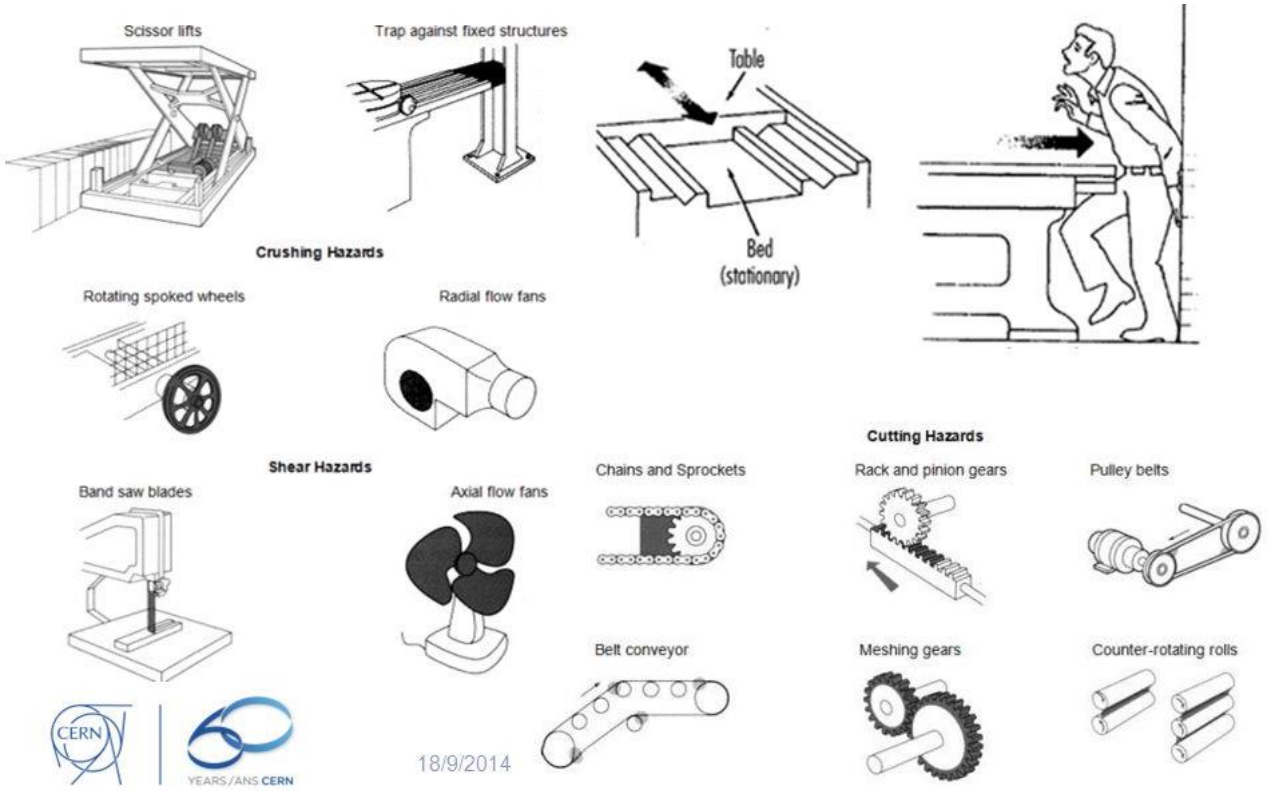
- lead, mercury, arsenic, zinc, chromium, cadmium, phosphorus etc.
- contaminated hands, food or cigarettes.
- Most is excreted through feces and only a small proportion may reach the general blood circulation.

Biological hazards

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

Mechanical hazards

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



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.

Personal Protective Equipment (PPE)

References

Park,s Textbook of Preventive and Social Medicine