

الأخطار البيولوجية

outlines

الهدف من المحاضرة

الأخطار المعملية وأنواعها

الأخطار الكيميائية

الأخطار الفيزيائية

الأخطار البيولوجية

كيف تحدث الإصابة؟

كيفية السيطرة علي الأخطار البيولوجية

objective

- Providing work place free from recognized hazards.
- Chemical hazard (Standard one).
- Respiratory protection, fire, and electrical fire safety.

الأخطار المعملية

الأخطار المعملية تنقسم أساساً الي ثلاثة أقسام تبعاً إلي قواعد الأمان و الإدارة الصحية (OSHA):

1. أخطار كيميائية
2. أخطار بيولوجية
3. أخطار فيزيائية

The chemical agents

- Toxic e.x. (Ethylene oxide)
- Corrosive e.x. strong acid and alkaline
- Irritant or e.x. Dangerous Hydrochloride acid 37%
- Flammable e.x. Methanol, Isopropyl alcohol
- Harmful e.x.(formalin)
- Oxidizing e.x.(Potassium Permanganate).

Chemical signs



Classification of chemical effects

According to duration and dosage

- Acute toxicity results from a single, short exposure. Effects usually appear quickly and are often reversible.
- Chronic toxicity results from repetitive exposure over a long period of time.

Chemical effects

The chemical effect may be

- **locally**
 - corrosive chemicals, such as strong acids, alkalis or oxidizing agents
- **Or systemically**
 - when toxins have been transported through the bloodstream

Such as methanol that has been ingested may cause blindness.

significant skin exposure to nitrobenzene may effect the central nervous system.

Physical hazards

- Gas cylinder
- Electrical system
- Cryogenic materials
- Radiation system
- Heating
- glassware

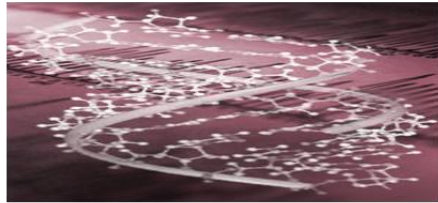
Biological hazards

تعريف الملوثات البيولوجية

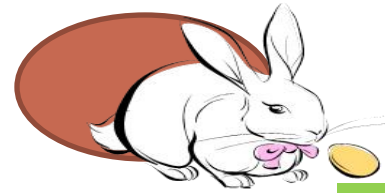


هي مواد حيوية (بيولوجية) تشكل تهديداً علي صحة الكائنات الحية وتحديداً الإنسان.

CLASSIFICATION OF BIOLOGICAL AGENTS ACCORDING TO RISK

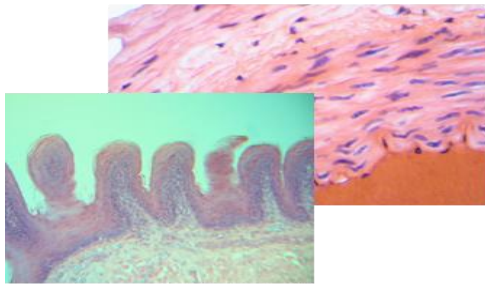


**RECOMBINANT DNA
AND GENETIC
MANIPULATION**



**RISK LEVELS
ASSOCIATED
WITH THE USE
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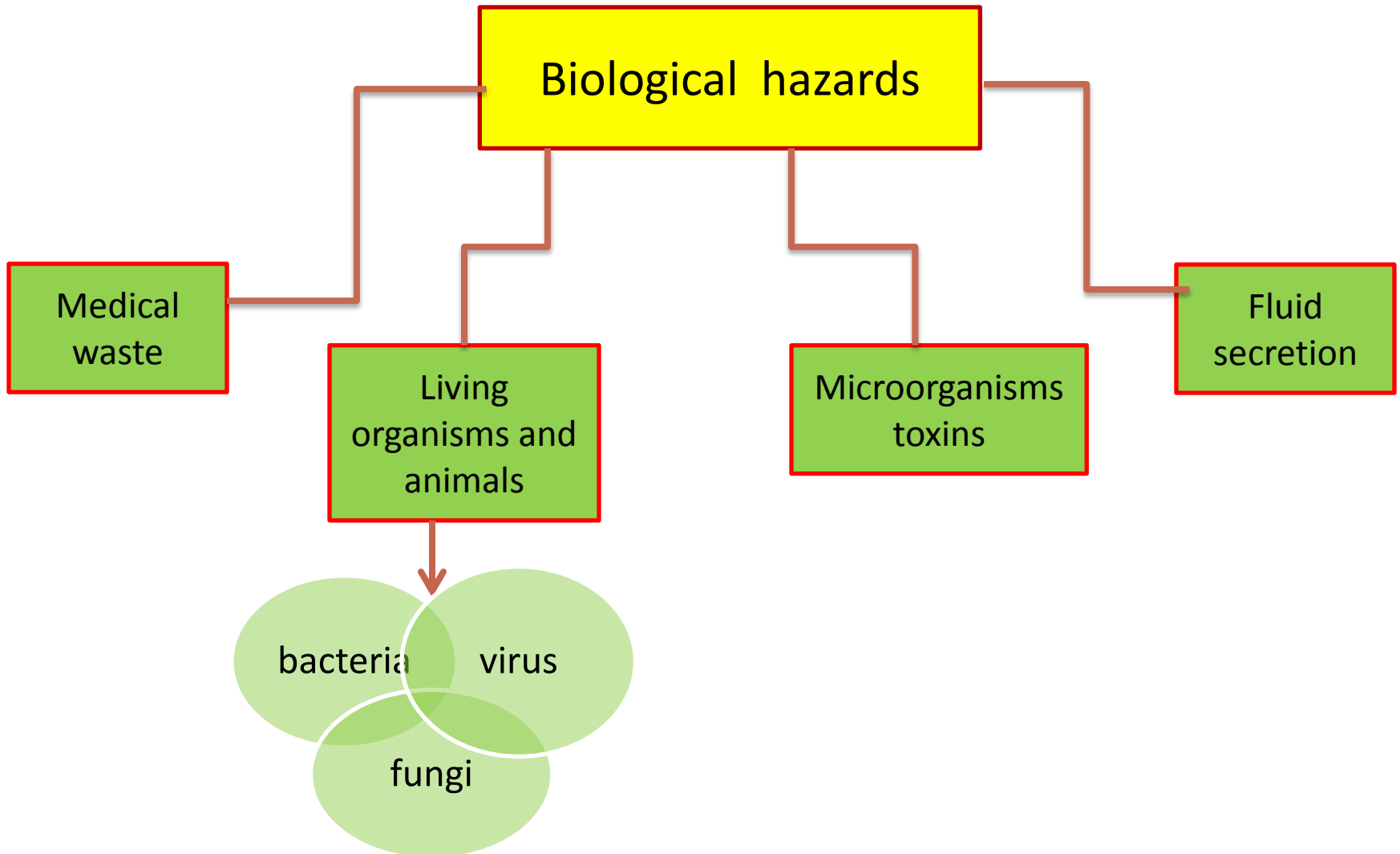


**USE OF
MAMMALIAN
CELLS IN
CULTURE**



**CRITERIA FOR
CLASSIFICATION OF
BIOLOGICAL AGENTS
BY RISK GROUP**

أنواع الملوثات البيولوجية



Classified of biological agents

Biological agents classify into four hazard groups based on **their ability to infect healthy humans**. The classification is based on the following criteria:

- whether the agent is pathogenic for humans.
- whether the agent is a hazard to employees.
- whether the agent is transmissible to the community.
- whether there is effective treatment or prophylaxis available.

Biological Hazards

- Bacteria-Tetanus, Tuberculosis, Anthrax, Brucellosis (Milkmen).
- Virus - Hepatitis, AIDS
- Protozoal&Parasitic Malaria,Hydatid(Dog handlers), tapeworms (Agri-workers), etc.
- Fungi-(Agri-workers) Tinea-infections, Coccidiomycosis, etc.

How can you get these diseases?

- The first step in preventing disease is to keep the organism from entering the body. There are three primary routes of entry:

- **Inhalation**

Air



Infected person coughs or sneezes and spreads the pathogen through the air to others

- **Ingestion**

Food, water



Infected person doesn't wash hands properly (virus in the feces), handles or prepares food/water and contaminates it

- **Contact**

Bloodborne



Infected person transmits pathogen through a route that involves blood/mucous membrane.

Risk of infection depends on several factors?

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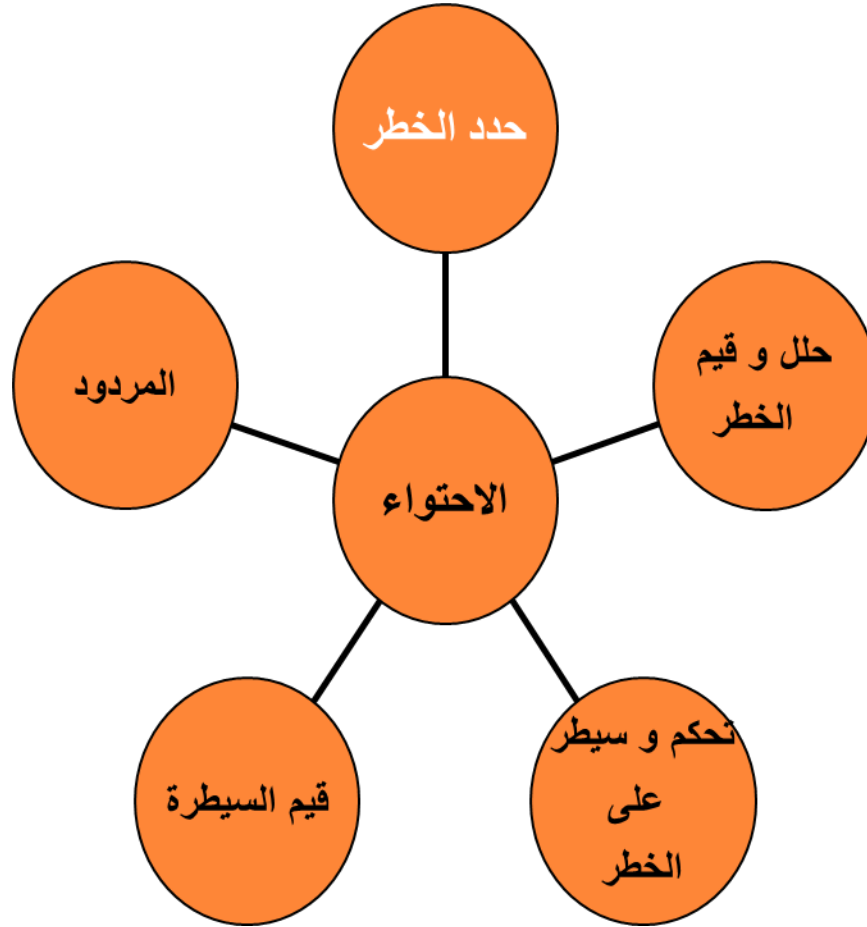
- The pathogen involved
- The type/route of exposure
- The amount of virus in the infected blood at the time of exposure
- The amount of infected blood involved in the exposure
- Whether post-exposure treatment was taken
- Specific immune response of the infected individual

Route of transmission in the lab

- Inhalation
- Skin damage and injuries
- Ingestion

Give example for each one

How you can control of diseases?



كل الثلاجات يجب أن تحمل
علامات مثل غير مسموح بوضع
الطعام أو المواد المتطايرة الا اذا
كانت مخصصة للطعام فقط و أو
المواد القابلة للانفجار



Separation areas

- preparation of media
- holding of materials
- sterilization
- storage of sterile articles
- collection of specimens from patients
- receipt of samples – spill trays should be provided.

Control of biological hazards

- وضع علامات تحذير علي المواد الخطيرة
- استخدام المعدات الوقائية (PPE)
- biosafety cabinet
- الحذر عند التعامل مع البكتيريا التي تنتقل بواسطة الهواء
- ازالة التلوث من اسطح المعمل بعد الإنتهاء من العمل
- التخلص من جميع الفضلات بطريقة صحيحة

What happen if the lab workers do not follow the instructions?

Thank you