

Definition and objective of biosecurity

Introduction

Microorganisms may be contagious, dangerous or toxic, and dealing with them incorrectly will certainly lead to individual or societal health damages. There are many diseases and epidemics that have spread due to the wrong handling of microorganisms.

The concept of wrong handling means following incorrect methods inside laboratories, and this means not adhering to the correct prevention, whether during work or when going out, and this leads to the transmission of microorganisms from inside laboratories and certainly, we will produce health damage that may be reached to the epidemic.

Therefore, biological safety is one of the important practices and its conditions must be followed to avoid the transmission and spread of toxic substances.

Definition

Biosafety is defined as the safe practice associated with handling biological materials, particularly infectious agents, which includes the technology and practices that are implemented to prevent unintended exposure to pathogens and toxins.

OR:-

Biosafety means the need to protect human, animal health, and the environment from the possible adverse effects of the products of modern biotechnology.

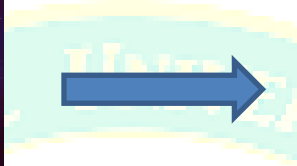
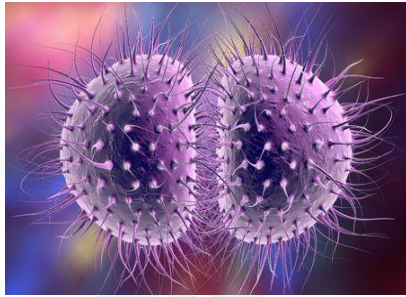
The main reason for the emergence of concepts of biological safety in laboratories is because they contain bacteria, viruses, molds, and parasites that **have the ability to multiply quickly if the appropriate conditions are provided.**

Do we need to apply the principles of biological safety within laboratories only? Why? (H.W)

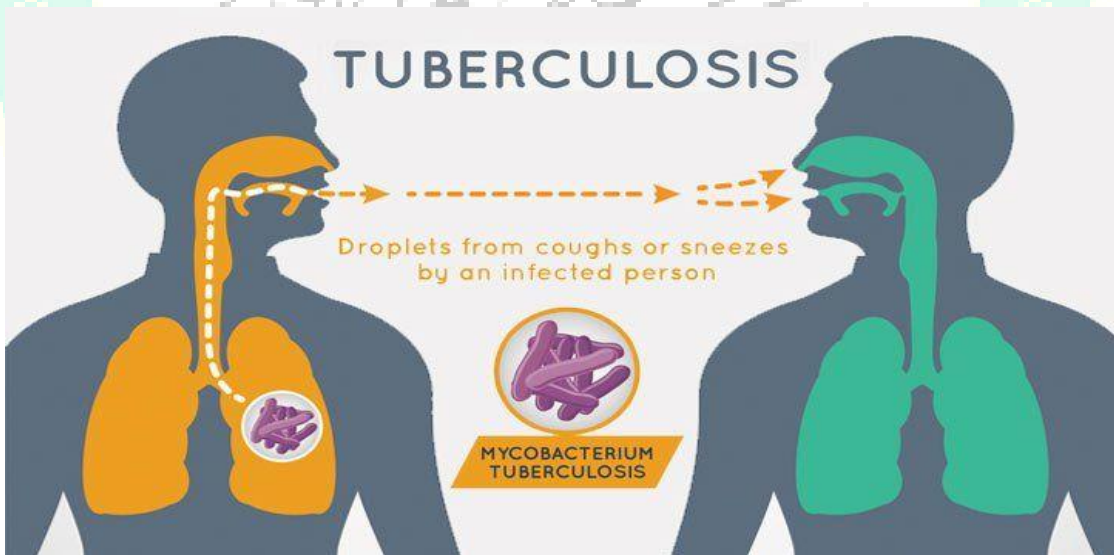
Laboratory workers face the risk of exposure to pathogenic microbes transmitted through the blood through infection with wounds resulting from handling sharp instruments, from exposure to the eyes or mouth, or from exposure of infected skin to blood and other bodily fluids. Certain microbes increase the chance of exposure to infection inside the laboratory, during secondary blood cultures, mixing, stirring, and centrifugation operations.

Medical laboratories that handle infectious materials (clinical samples, bacteria, viruses, and fungi) must follow specific infection control guidelines, to reduce risks associated with handling disease specimens, bacterial cultures (cultures), contaminated sharps and diagnostic equipment. Therefore, laboratory workers must take standard precautions to reduce the risk of infection, as well as provide a safe environment for laboratory workers and others. Among the factors that contribute to the protection of laboratory workers is the design of the laboratory itself and the appropriate equipment for it, in addition to informing its workers about security issues.

Examples of microbes that are transmitted through these operations to laboratory workers are **gonococci "Nisseria"** that causes meningitis, the bacteria that cause **tuberculosis, brucellosis, anthrax (Bacillus), and plague.**



gonococci "Nisseria



Mycobacterium Tuberculosis



Tuberculosis

Brief historical

The great progress of modern biotechnologies at the beginning of the seventies of the twentieth century led scientists to fear its dangers and the need to exercise utmost caution in their work in order to avoid any harmful effects that may result from them. However, the term biosafety was used only in:-

The Biosafety Conference held in the United States of America in **1975**.

In **1976**, the US National Institutes of Health issued biosafety rules, and

In **1985** the Organization for Economic Cooperation and Development (OECD) issued rules for laboratory experiments, and to them were added in **1992** the Rules for Small Field Experiments.

In **1992**, the United Nations Conference on Environment and Development (Earth Summit) was held in Brazil, and the Convention on Biological Diversity was issued, which emphasized the importance of biosafety in protecting biodiversity and implementing the recommendations of this convention September **2003**.

Biological safety objectives

1. Protect workers from disease resulting For dangerous biological agents.
2. Maintain a safe working environment.
3. Prevent the spread of biological contaminants outside sites work.
4. The control of biological contaminants through management and risk assessment in the workplace.

In order to achieve the above-mentioned objectives, the following elements must be present:

1. Purposeful technical planning for the foundations of prevention in facilities.
2. Legislation stemming from the need to implement this technical planning.
3. Execution based on sound scientific foundations during construction operations with the provision of equipment specialized technical to ensure the continued implementation of occupational safety and health services.

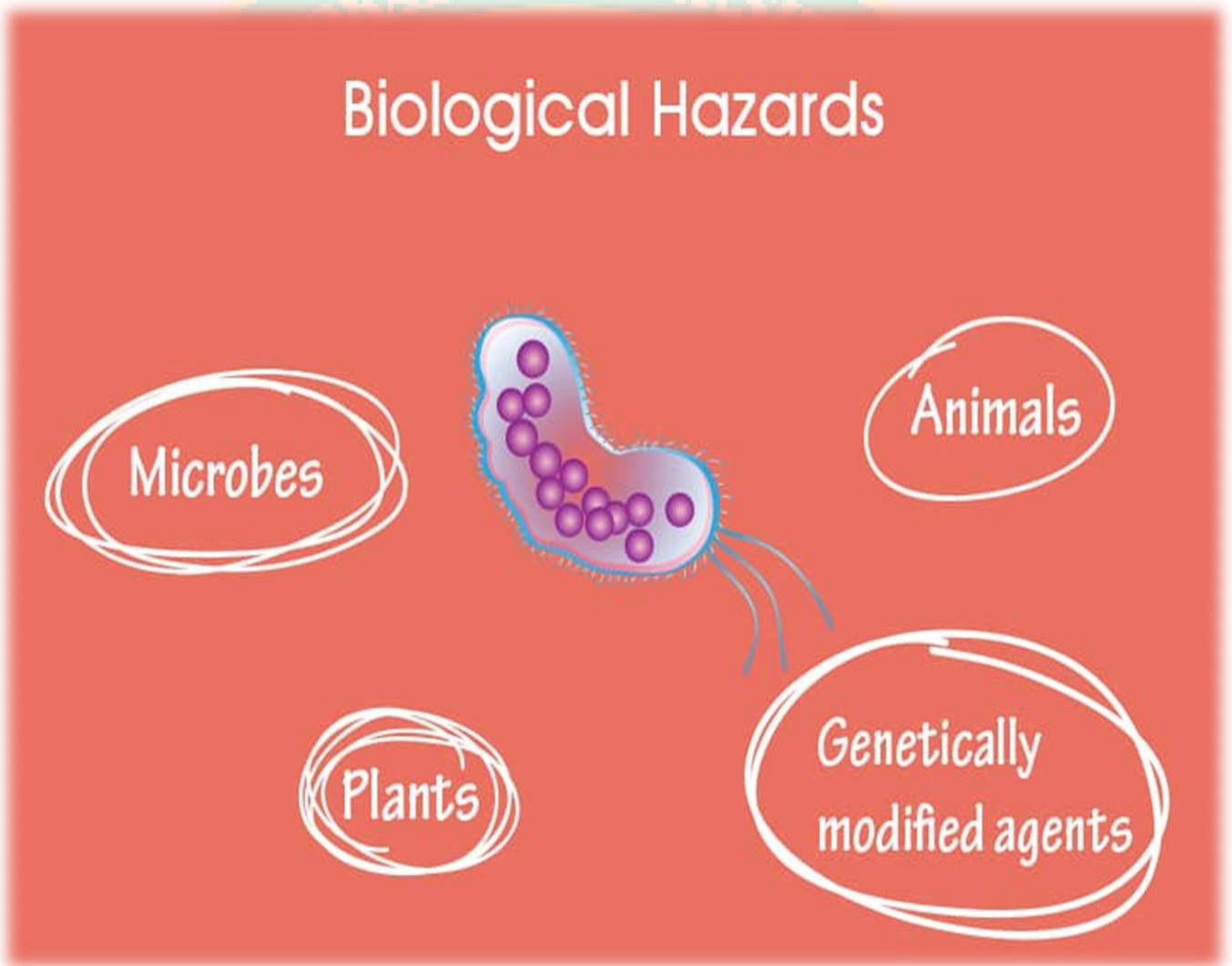
The best way to prevent diseases is to

Reduce

OR

Eliminate

The source of exposure to biological hazards.



So to control biological hazards:-

1. Personal hygiene (continuous).
2. Cleaning and disinfecting work surfaces.
3. Cleaning stains immediately.
4. Safely treat and dispose of all hazardous biological waste. Blood and any other body fluids should always be handled as if they could be infectious. In the event of injury or bleeding, each individual should be treated in a manner that minimizes exposure to blood and body fluids.
5. Wear personal protective equipment (such as gloves, masks).

