BLOODBORNE PATHOGENS

Bloodborne pathogens are microrganisms, such as viruses and bacteria, that are carried in blood and are able to cause disease in humans.

Bloodborne pathogens include:

- Plasmodium Malariae
- Brucella
- Treponema Pallidum
- Human hepatitis B Virus
- Human hepatitis C Virus
- Human Immunodeficiency Virus

With regard to **HBV**, this pathogen causes infection and inflammation of the liver; it is primarily transmitted through ‘’blood – to – blood’’ contact and can survive in dried blood up to one week.

The vaccination is available since 1982.

HCV is a pathogen affecting the liver, too.

It is the most common bloodborne infection among the medical care workers. This virus seems to be unstable to storage at room temperature and to repeated freezing and thawing.

About **HIV**, finally, which causes the A.I.D.S. (Acquired Immunodeficiency Syndrome), this pathogen does not survive for long outside the body: in dry environment it survives only for a few hours while in a wet environment, such as syrings or needles, it can survive longer.

The **biological samples** include:

- whole blood, that is plasma and cells;
- serum that is plasma without coagulation factors;
- Tissues;
- blood products, that is coagulation factors, immunoglobulins, concentrate of red blood cells, concentrate of platelets;
- biological body specimens (secretions or excretions) such as urine, cerebrospinal fluid, tears, saliva;
- blood contaminated specimens.

The following are the rules that must be complied:

- to affix the biohazard warning signs;
- to limit the access to the authorized staff only;
- to change the clothes before entering the room;
- to wear PPE: gloves, face protection, etc.
- to consider if there is the need for entry by visitors, and cleaning / maintenance staff;
- to take the ‘’needles / sharps’’ precautions;
- to use dedicated equipment
- to decontaminate daily work surfaces.

The cleaning is very important and must be carefully performed.

When cleaning up surfaces, use an appropriate disinfectant, spray it and let it rest for 10 minutes, then wipe it up.
In addition, dispose of all wipes in biohazard containers and put the removed PPE in such containers.

In order to confine the risk of infection spreading in presence of blood, of all the biological fluids, both human and animal, and in case of isolation / production of: viruses, cells or animals infected with bloodborne viruses, these practical rules are recommended and must be implemented:

- use mechanical pipetting device;
- limit the use of needles and blades;
- don’t put the cap on already used needles;
- use of gloves and proper PPE;
- wash the hands after removing gloves and after completing laboratory activities;
- affix the biohazard warning sign.

Hand washing is one of the most important and simple procedures in order to prevent the transmission of bloodborne pathogens.

If possible, it is better to use a soft antibacterial soap and to be sure that it is applied for the right time, as indicated by the producer.

A hand sanitizer can be used, but you must wash with soap and running water as soon as possible.

Avoid the pointing of the soap in the dispenser, if possible.

The use of **Personal Protective Equipment (PPE)** is essential.

In regard to *gloves*, which can be made of latex, nitril or rubber, it is important to always check them before and to wear them avoiding lenthening.

Furthermore, wearing two pairs of gloves guarantees a better protection.

In detail, the rules about the use of PPE are the following:

- always check PPE for defects or tears before using;
- if PPE becomes torn or has lost its ability to function as a barrier, remove and get new;
- remove PPE before leaving a contaminated area;
- do not reuse disposable equipment.

Sterilization is the process of killing all living microorganisms (usually by heat or chemicals), both pathogen and not, spores included.

Cleaning, decontamination and sterilization are vital steps in order to protect the laboratory workers from infectious diseases, to prevent the release of biohazardous agents into the community and to assure a good quality of scientific research.