

Sterilization and specimen collection



Sterilization



Definitions

Sterilization	Disinfection
Is a process that kills all forms of microbial life, including bacterial spores.	Is a process that destroys pathogenic organisms, but not necessarily all microorganisms, endospores.



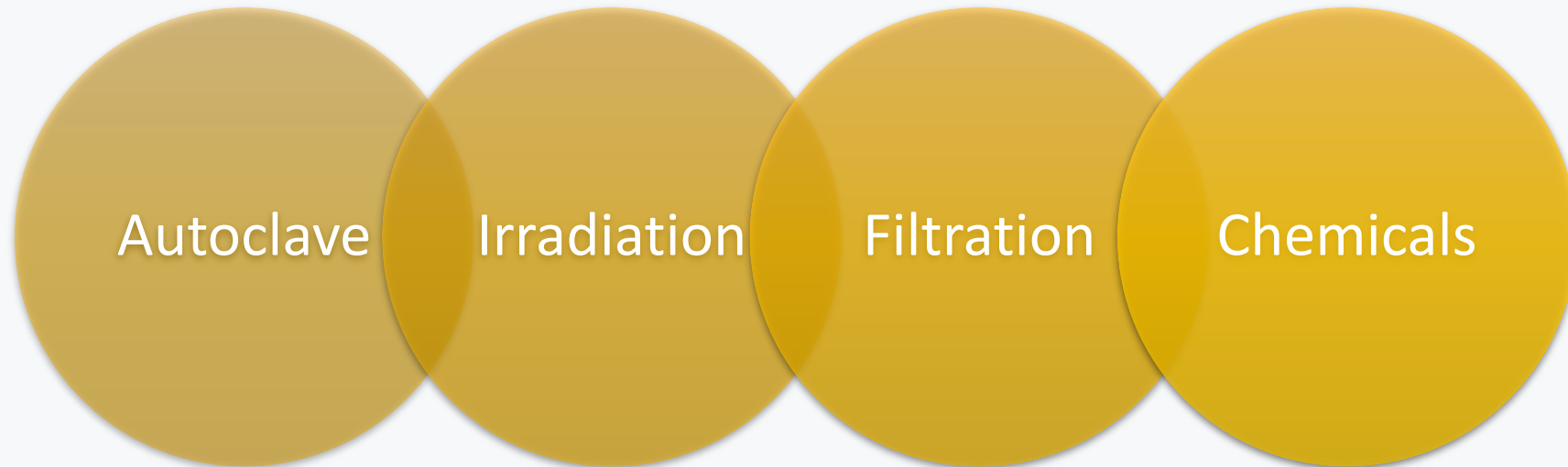
Definitions

Disinfectant	Antiseptic
A substance used to kill or inhibit most microbes on surface.	A chemical agent used safely on skin or living tissue to kill or inhibit most microbes.
Ex: 10% bleach, virkon	Ex: ethyl or isopropyl alcohol 70%, chlorohexidine, iodine.



Sterilization in hospital

Sterilization can be done in the hospital through several methods:



Autoclave

A machine that use heat for 121°C With high pressure used for:

- Surgical instruments
- Surgical dressings
- Cotton and gauze
- Gowns of physicians, surgeon and In-patient
- Bed sheets
- Culture media for microbiology labs



- Autoclave tape:

Is an adhesive tape that is attached to items before autoclaving, used as indicator for quality control, and contains a chemical that changes color when the correct temperature is reached.

Before:



After:



Irradiation

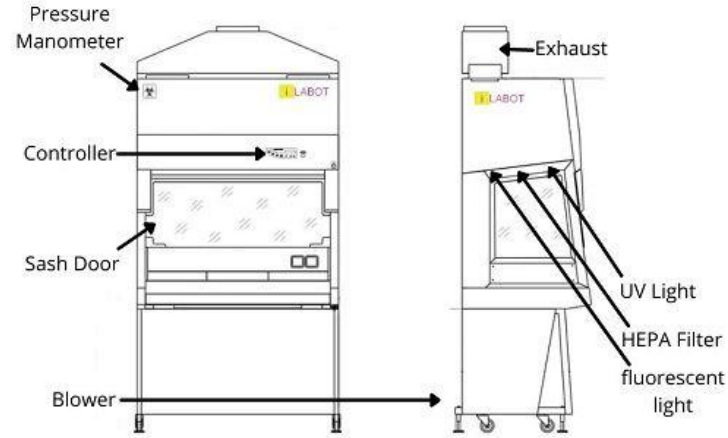
Ionizing Radiation	Non-Ionizing Radiation
<p>Gamma or Beta rays; it has <u>high</u> penetration power</p>	<p>Ultraviolet rays (UV); it has <u>weak</u> penetration power</p>
<p>Used For prepacked disposable plastic items that can't withstand heat</p>	<p>Used in air disinfection</p>
<p>Plastic syringes Plastic Catheters Plastic I.V infusion set Plastic Surgical sutures Plastic Gloves Plastic petri dishes</p>	<p>Operation Rooms Drug Filling Cubicles Bio Safety Cabinets (Laminar Flow Cabinets)</p>



Filtration

Air filters	Millipore Membrane Filters
For sterilization of large volume of air	For sterilize heat labile medical solutions
<p><u>It is used in:</u></p> <p>Operation Rooms Drug Filling Cubicles Bio Safety Cabinets (Laminar Flow Cabinets)</p>	<p><u>such as:</u></p> <p>Serum and Plasma Liquid antibiotics Liquid medications Liquid hormones and vitamins.</p>

Biosafet Cabinet



Biological Safety Cabinets (BSCs)



Bio Safety Cabinets

two methods of sterilization:

Air filter

protect the lab worker from the infection and to **protect the specimen** from contamination while processing

U.V

to **sterilize inside the cabinet** after processing the specimens and keep it sterile until next processing

Chemicals

- **Endoscopes , Artificial Respirators, kidney Dialysis and Dental lees** ,immersed 10 min. in beaker containing Cresol 5% or hydrogen peroxide (H₂O₂) or glutaraldehyde or paracetic acid.
- **Surfaces, floors, A.C openings, incubators and spilled cultures**, phenol 5% or chlorine.
- **Skin antiseptic**, alcohol 70% or iodine.
- **Hand hygiene**, chlorhexidine.



Medicine sterilization

Solid Medicines	Liquid Medicines
<p>(tablets and capsules) By X-ray or U.V (in lower wave lengths)</p>	<ul style="list-style-type: none"> • By Millipore membrane filters • By Arnold method (Heating at 100C for 20 minutes for three successive days) or called Fractional Sterilization or Intermittent Sterilization or Koch's sterilizer.

Arnold Method



Specimen collection





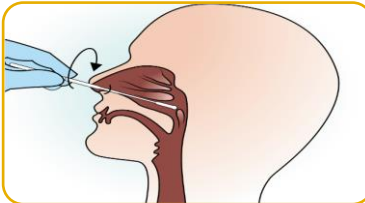
Cotton swab: used to take sample from

- Eyes , Ears, Nose, Mouth and throat, Skin,Wounds, pustules and abscesses, Vagina, cervix and anus.



Transport Media: transporting clinical specimen from the clinic to the laboratory.

- prevent contamination of the specimen
- preserve delicate microorganisms
- some of them are with charcoal To protect delicate microorganisms that affected by light.



Pernasal Swab:

- It is used for sampling from nasopharynx
- It is long, thin and flexible wire.
- it ends with calcium alginate **to protect** bacteria in some cases that is delicate



Sterile Container:

For urine, stool (with small spatula) , sputum, CSF, Pus and body fluids, Blood

Urine container



stool container



CSF container



Pus and body fluid container



blood container

