SNS COLLEGE OF ALLIED HEALTH SCIENCE

Affiliated to The Tamil Nadu Dr M.G.R Medical University, Chennai

DEPARTMENT OF PHYSICIAN ASSISTANT

COURSE NAME: CLINICAL MICROBIOLOGY

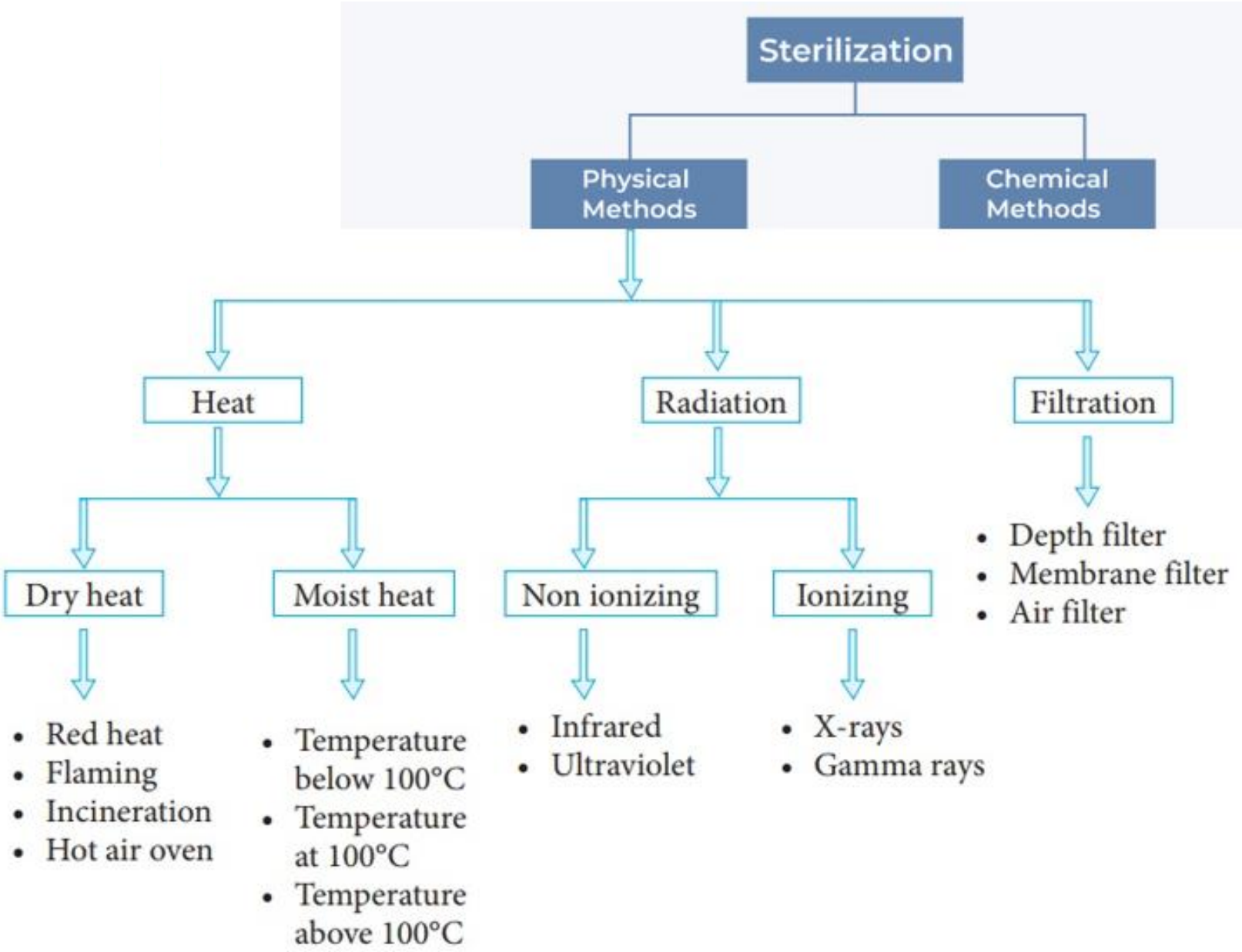
UNIT : 1

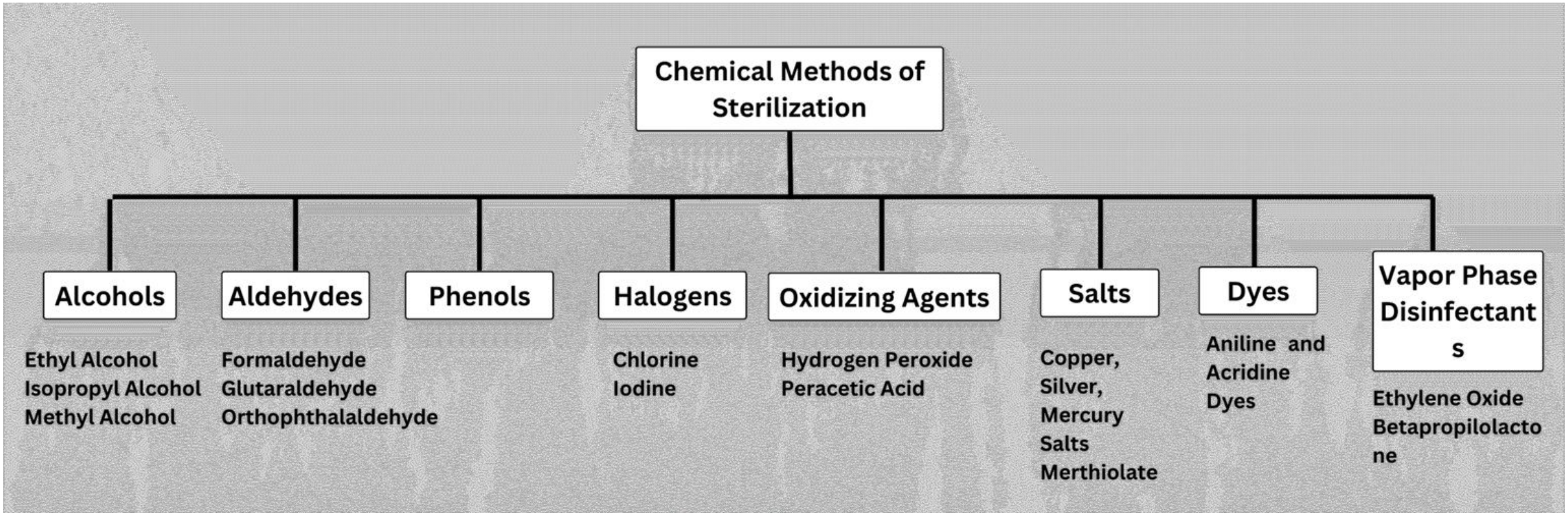
TOPIC : STERILIZATION – PHYSICAL METHOD – DRY HEAT

FACULTY NAME: MITHRA V

STERILIZATION (DEFINE)

- Process of destroying/eliminating all forms of microbial life, including bacteria, viruses, fungi, and spores.
- **Purpose:**
- Ensures safety in medical, healthcare laboratory and industrial settings.
- **Importance:**
- Prevents infections (disease transmission) and contamination.

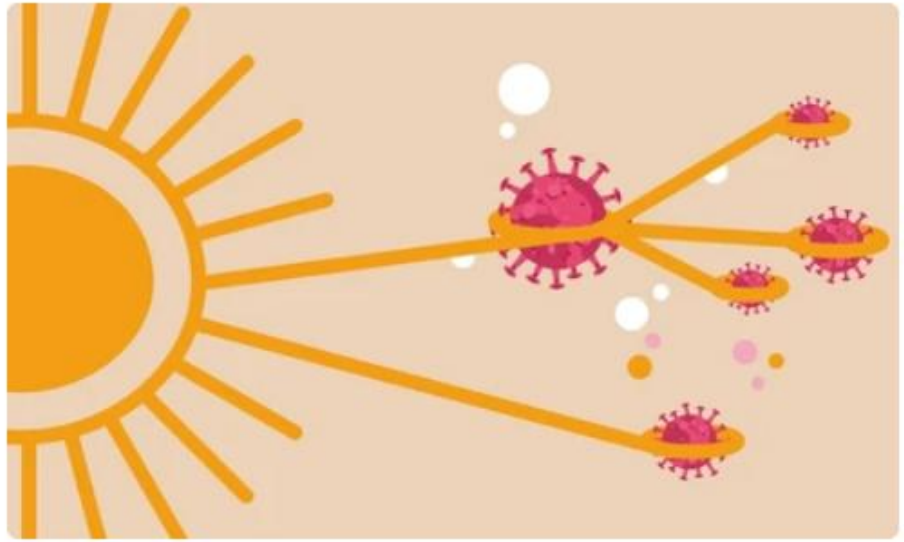

Sterilization
Physical Methods
Chemical Methods
Heat
Radiation
Filtration
Dry heat
Moist heat
Non ionizing
Ionizing
Red heat
Flaming
Incineration
Hot air oven
Temperature below 100°C
Temperature at 100°C
Temperature above 100°C
Infrared
Ultraviolet
X-rays
Gamma rays
Depth filter
Membrane filter
Air filter


Chemical Methods of Sterilization
Alcohols
Ethyl Alcohol
Isopropyl Alcohol
Methyl Alcohol
Aldehydes
Formaldehyde
Glutaraldehyde
Orthophthalaldehyde
Phenols
Halogens
Chlorine
Iodine
Oxidizing Agents
Hydrogen Peroxide
Peracetic Acid
Salts
Copper, Silver, Mercury Salts
Merthiolate
Dyes
Aniline and Acridine Dyes
Vapor Phase Disinfectants
Ethylene Oxide
Betapropilolactone

PHYSICAL METHODS

- **SUNLIGHT**

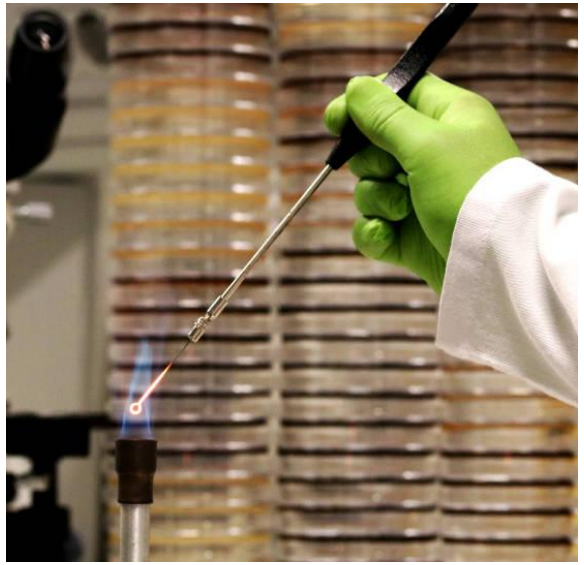
- Microbicidal activity is due to ultraviolet rays.
- More effective with the combination of ultraviolet rays and heat.
- Provides a natural method of disinfection for water bodies by killing bacteria suspended in water

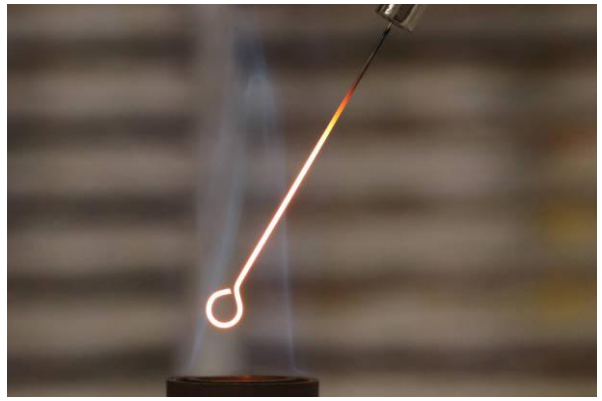


DRY HEAT

I. RED HEAT

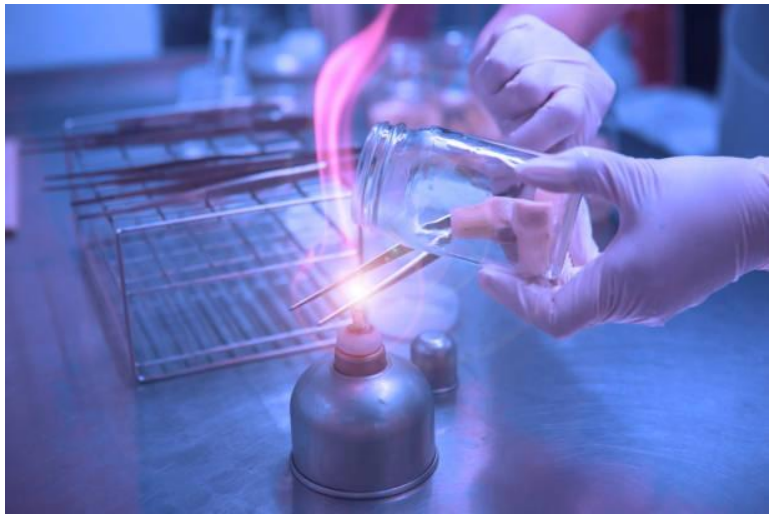
- Sterilizes articles like inoculation loops, wires, forceps tips, or needles being held in the flame of a Bunsen burner until they become visibly red hot.
- Simple and effective method to inhibit microbial contamination.
- Ensures complete destruction of microorganisms





II. FLAMING

- Method of passing the article over a Bunsen flame, but not heating it to redness.
- Eg: Scalpels, mouth of test tubes, flasks, glass slides andcover slips over a Bunsen flame a few times without heating to redness.

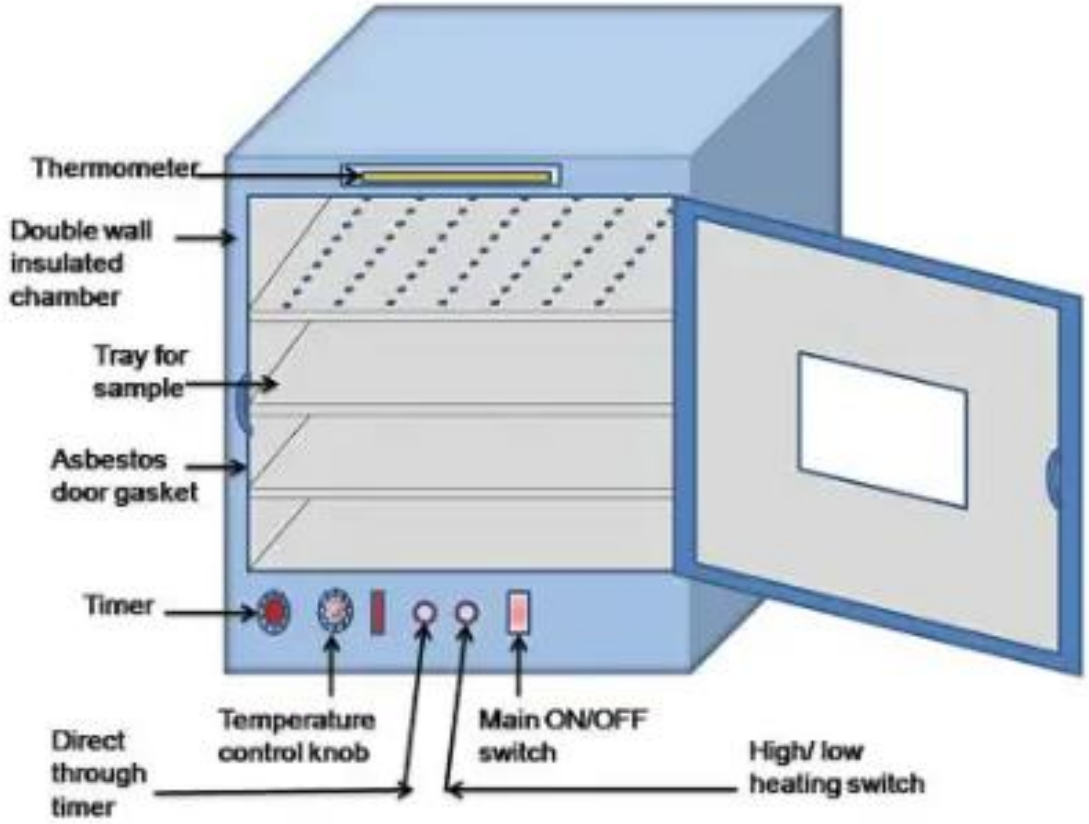


III. INCINERATION

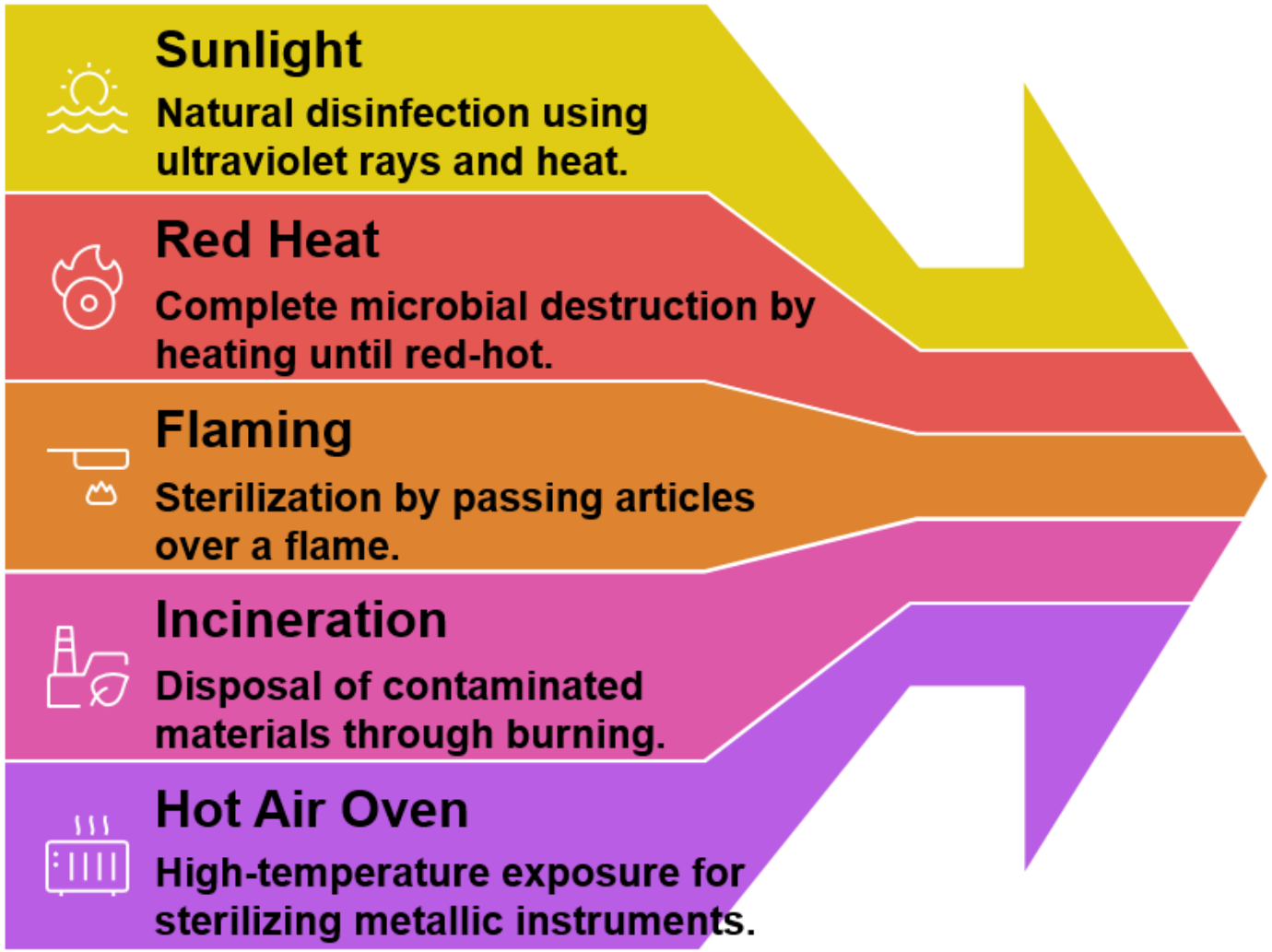
- Destroying contaminated material by burning in an incinerator.
- Suitable only for articles that must be disposed of, resulting in their loss.
- Examples include soiled dressings, animal carcasses, pathological material, and beddings.

IV. HOT AIR OVEN

- Articles are exposed to high temperature in an electrically heated oven.
- Fan ensures even heat distribution.
- Articles sterilized include metallic instruments, glasswares, oils, grease, petroleum jelly and some pharmaceutical products.
- Different temperature-time relationships exist for holding time, such as 60 minutes at 160°C, 40 minutes at 170°C, and 20 minutes at 180°C.
- The oven should not be opened until the temperature falls below 60°C to prevent glassware breakage.


Thermometer
Double wall insulated chamber
Tray for sample
Asbestos door gasket
Timer
Temperature control knob
Main ON/OFF switch
High/ low heating switch
Direct through timer

SUMMARY



Effective Sterilization

- Eliminates all microbial life (bacteria, viruses, fungi, spores).
- Ensure safety and prevent infections in medical, laboratory, and industrial settings.

REFERENCES

- Study.com – Dry Heat Sterilization: Definition, Process & Validation https://study.com/academy/lesson/dry-heat-sterilization-definition-process-validation.html
- Despatch – Dry Heat Metal Instruments: A Guide to Effective Sterilization Techniques https://www.despatch.com/blog/dry-heat-metal-instruments-a-guide-to-effective-sterilization-techniques/
- SlideShare – Sterilization by dry heat (applied microbiology) https://www.slideshare.net/slideshow/sterilization-by-dry-heatapplied-microbiology/249892184

THANK YOU