SNS COLLEGE OF ALLIED HEALTH SCIENCE

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

DEPARTMENT OF CARDIAC TECHNOLOGY

COURSE NAME: MICROBIOLOGY

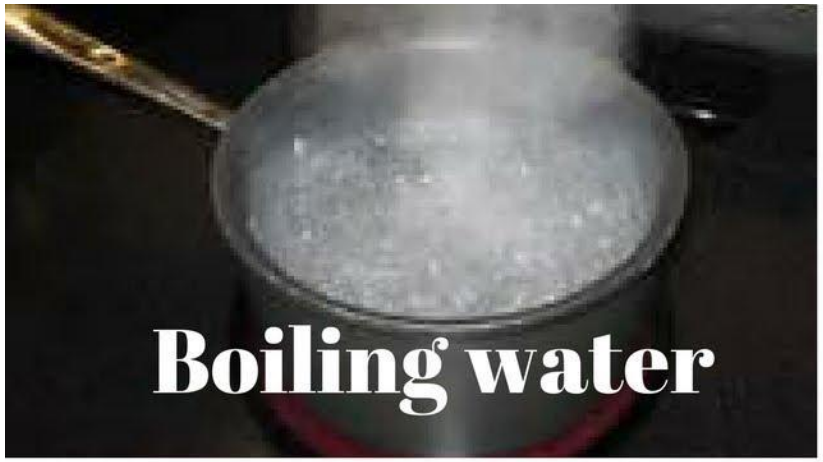
UNIT : 1

TOPIC : STERILIZATION – PHYSICAL METHOD – MOIST HEAT

FACULTY NAME: MITHRA V

RECAP – STERILIATION - MOIST HEAT (DEFINE)

- Uses steam or hot water vapor to kill all microorganisms, including spores
- Techniques include - boiling, pasteurization, autoclave and tyndallization
- Frequently used for sterilizing surgical instruments, laboratory glassware, media, heat-tolerant medical items.
- Not suitable for moisture-sensitive or heat-labile items and may cause rusting on metallic tools



MOIST HEAT AT <100°C

PASTEURIZATION

- Used in food and dairy industries to destroy milk-borne pathogens

  (e.g., Salmonella, Mycobacteria, Streptococci, Staphylococci, Brucella).
- Employed by Louis Pasteur, followed in food and dairy industry.

METHODS OF PASTEURIZATION

- **Holder Method**:
- Heating at 63°C for 30 minutes.
- **Flash Method**:
- Heating at 72°C for 15 seconds, followed by rapid cooling to 13°C.
- **Ultra-High Temperature (UHT)**:
- Heating at 140°C for 15 seconds or 149°C for 0.5 seconds.

VACCINE BATH

- Inactivates contaminating bacteria in vaccine preparations by heating at 60°C for one hour.
- Only vegetative bacteria are killed; spores may survive.

- **SERUM BATH**:
- Inactivates bacteria in serum by heating at 56°C for one hour over several days.
- Higher temperatures may coagulate proteins.

- **INSPISSATION**:
- Used to solidify and disinfect egg or serum-containing media by heating at 80-85°C for 30 minutes on three successive days.

MOIST HEAT AT 100°C

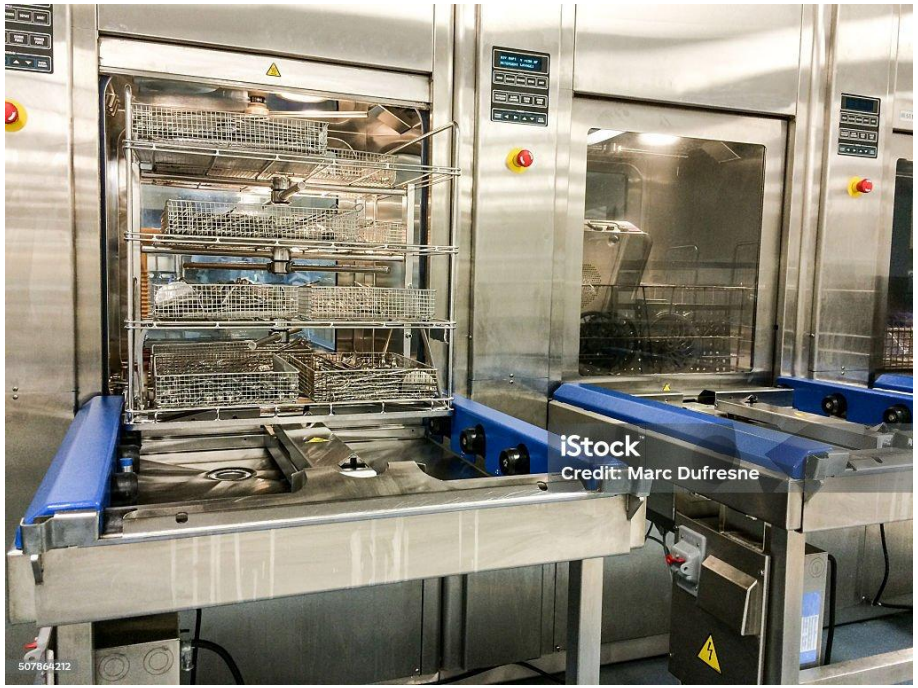
BOILING

- Kills most vegetative bacteria and viruses immediately but may not eliminate bacterial spores or heat-resistant toxins.
- Enhanced by adding 2% sodium bicarbonate.
- Used for disinfecting metal articles and glassware (10-20 minutes) when absolute sterility is not required.

MOIST HEAT AT >100°C

AUTOCLAVE

- Sterilization at temperatures above 100°C using pressurized steam.
- At 15 lbs pressure, the temperature reaches 121°C, sterilizing articles in 15 minutes.
- Effectively kills bacterial spores, vegetative cells, and other microbial forms.
- Water’s boiling point increases with pressure in a closed chamber.



Types of Autoclaves

Pressure Cooker Type

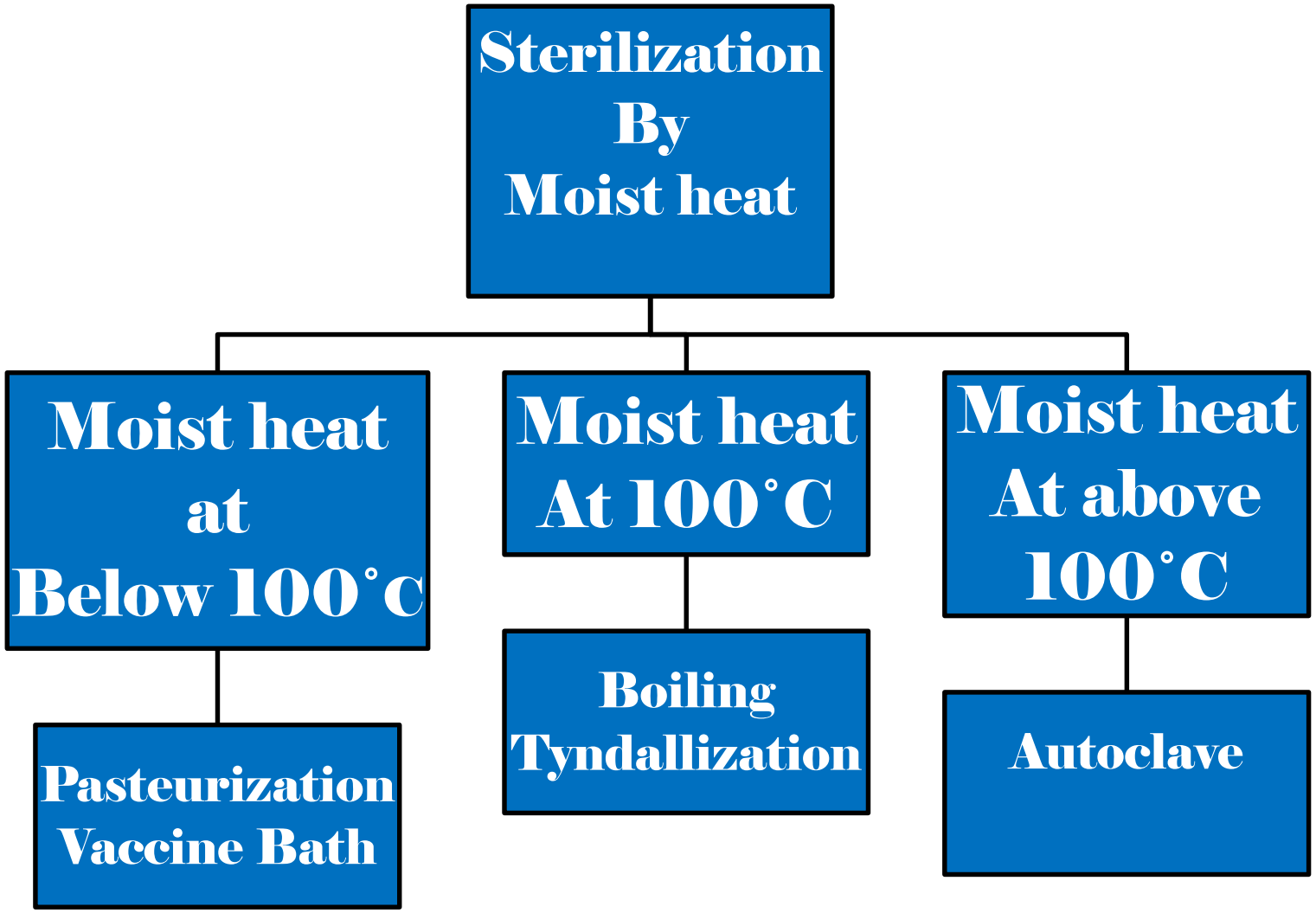
Common Laboratory Autoclave

Vertical Autoclave

Horizontal Autoclave

Large Automatic Hospital Autoclave

SUMMARY - MOIST HEAT



REFERENCES

- Walker, J.T., & LaGrange, L. Sterilization of Health Care Products: Moist Heat – Requirements for the Development, Validation, and Routine Control of a Sterilization Process. ISO 17665, 2024.
- SlideShare: Sterilization and Disinfection | PPT
  - https://www.slideshare.net/slideshow/sterilization-and-disinfection-151028352/1510283522
- Microbe Notes: Physical Methods of Sterilization – Heat, Filtration, Radiation
  - https://microbenotes.com/physical-methods-of-sterilization/

THANK YOU