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ASQua
ASIAN SOCIETY FOR QUALITY IN HEALTH CARE

Continuing Quality Education (CQE) Series
(An initiative of CAHO Quality Professionals Wing)

Theme 4

Disinfection & Sterilization Practices : Update 2021

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Sterilization Methods & Indicators

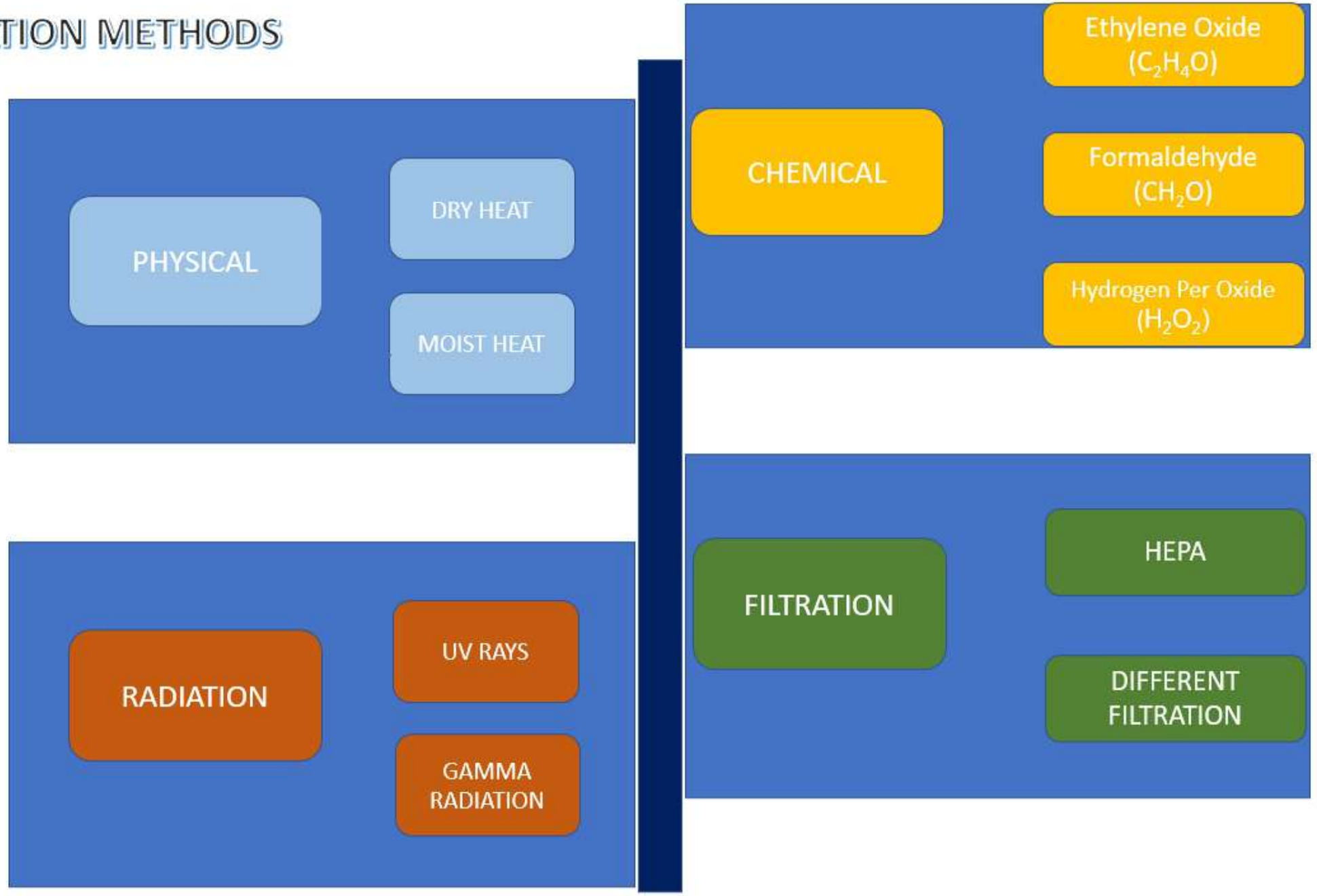
EVIDENCE BASED

References:

I. https://www.cdc.gov/infectioncontrol/guidelines/disinfection/ Guideline for Disinfection
II. www.google.com
III. http://apsic-apac.org/wp-content/uploads/2017/01/APSIC-Sterilization-guidelines-2017.pdf
IV. https://wfhss.com/
V. https://www.who.int/infection-prevention/en/
VI. https://nabh.co/shco-Definition.aspx
VII. AAMI ST 79
VIII. Central Service Technical Manual – CRCST & CBSPDT

STERILIZATOIN METHODS
&
INDICATORS

STERILIZATION METHODS



STERILIZATION METHODS

PHYSICAL

- DRY HEAT
- MOIST HEAT

DRY HEAT STERILIZATION:

160 °C (320 °F) for 2 hours
170 °C (340 °F) for 1 hour
High Velocity Hot Air sterilisers
190°C (375°F) for 6 to 12 minutes.

Note:
Items should be dried before sterilization.

MOIST HEAT STERILIZATION:

121°C (250°F) – 15-20 minutes (Minimum)
134°C (270°F) – 3-4 Minutes (Minimum)

Note:

- **Gravity and Pre-Vacuum Two Main Types of Sterilizers**
- **Main Difference is Air-removal and Steam Penetration**
- **No BD Test for Gravity Type**

STERILIZATION METHODS

CHEMICAL

- Ethylene Oxide (C_2H_4O)
- Formaldehyde (CH_2O)
- Hydrogen Per Oxide (H_2O_2)

Ethylene Oxide (C_2H_4O)

37C – 3 Hrs (Gas Expose)
55C – 1 Hr (Gas Expose)
Aeration – 12-16 Hours

Low Temperature Steam Formaldehyde (CH_2O)

- Operates at a temperature between 60-80 Degree Celsius
- Cycle time can be 4-6 Hrs
- RH between 75-100%

Hydrogen Per Oxide (H_2O_2)

In an enclosed chamber the Gas Plasma is generated under deep vacuum using radio frequency and eventually that produces charged particles.

Note : 37-44°C and has a cycle time between 25 to 75 minutes.

MAIN STERILIZATION PROCESSES

Sterilization Processes	Advantage	Disadvantage
Steam Sterilization	• Cheapest, easily available and most reliable sterilization process.	• Only compatible with Heat-Resistant Medical Devices.
Gas Sterilization	• Long lumens can be sterilized easily due to the big chamber capacity. • Good Sterilant Penetrability • Material Compatibility	• Total Cycle duration is long. • By-product is Carcinogenic.
Plasma Sterilization	• Powered surgical & heat sensitive instruments can easily be sterilized in a very short Turn Around Time.	• Highly sensitive. • Cellulosic materials/ linens can't be. • Long and narrow Lumens sterilization is a concern
Dry-Heat Sterilization	• Bulk powder, oil can be sterilized.	Cycle duration is too long. 2-4 Hrs. Not compatible for heat sensitive items
Low Temperature Steam Formaldehyde (LTSF)	• Faster cycle time compared to EO • After sterilization most loads are available for immediate use	• The vapour is extremely irritating. • Weak penetrating power compared to EO • Formaldehyde residue can remain on the sterilized goods if the rinsing phase is not 100% efficient. • This can be harmful for the patients. • A relative humidity of ~ 75% is required in order to be effective as the gas has to dissolve in a film of moisture surrounding the bacteria • Not approved by FDA and only recognized in some countries.

STERILIZATION METHODS

WHICH IS THE BEST STERILIZER

a.Autoclave
b.ETO
c.Plasma
d.LTSF

These are different Sterilization Methods

WHICH IS THE BEST STERILIZER

The usage is different

a. Autoclave
b. ETO
c. Plasma
d. LTSF

Hence,

We have to select the proper method of sterilization as per the type of product to be sterilized and other critical factors!

INDICATORS


PHYSICAL INDICATORS


CHEMICAL INDICATORS


CHEMICAL INDICATORS

INDICATORS


CHEMISIX
STEAM
4 MIN 132°C
CHEMISIX
STEAM
4 MIN 132°C

QUALITY INITIATIVES

A One Day Activity To Pass the Audit

Or

Need to be a Daily Habit ?