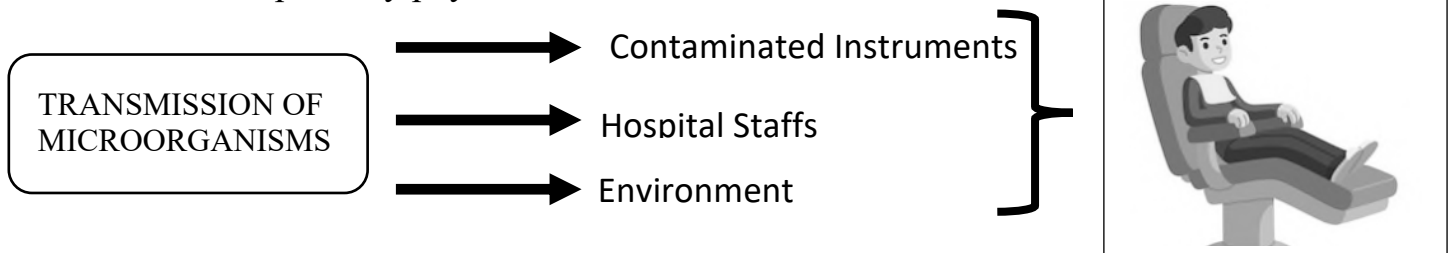


STERILISATION, DISINFECTION AND INFECTION CONTROL

Common Definitions

- **Asepsis:** The absence of pathogenic micro-organisms on any living tissues.
- **Antiseptic:** A chemical agent that either kills pathogenic micro-organisms, or inhibits their growth on animate (living) tissue. Example: Chlorhexidine
- **Disinfectant:** A germicidal chemical substance that kills micro-organisms on inanimate objects. Example: glutaraldehyde.
- **Disinfection:** the destruction or removal of micro-organisms, but not necessarily their spores and viruses found on non-living objects.
- **Sterilization:** complete elimination of microbial viability, including vegetative forms of bacteria and spores by physical or chemical means.



Infection control:

1. Preprocedural mouth rinse.
 - Using chlorhexidine mouthwash or any other mouthwash.
2. Hand sanitization / Hand washing.
 - Using chlorhexidine or Parachlorometexylenol (PCMX) based hand cleansers
3. Use of proper personal protective equipment (PPE)/ Protective barrier as a major component of standard precautions
 - Various barriers are – gloves, masks, protective eye wear, surgical head cap and overgarments.
4. Following principles of surgical asepsis

Principles of surgical asepsis

1. Use only sterile instruments/materials within a sterile field.
2. Scrubbed personnel are gowned and gloved.
3. Sterile personnel operate within a sterile field
4. Sterile drapes are used to create a sterile field.
5. All instruments/materials used in a sterile field must be sterile.
6. All instruments/materials introduced onto a sterile field should be opened, dispensed and transferred by methods that maintain sterility and integrity.
7. A sterile field should be maintained and monitored constantly.

Hand Scrubbing Technique



Physical Sterilization

Most commonly used sterilization method.

A] Dry Heat:

Mechanism of Action: Denaturation or destruction of cellular proteins.

1. Flaming: Used to sterilized the instruments like blade, needles passing over the flame of gas burner till red hot, destroys bacteria.

2. Hot air oven: Sterilization of metal instruments and glassware. A temperature of 120°C for 8 hours, 160°C for 1 hour and 180°C for 20-30 minutes is usually sufficient.

B] Moist heat:

Mechanism of action: Denaturation of major cell constituents.

1. Boiling: Uses temperature of 100°C for at least 15 minutes to sterilize syringes and needles.

2. AUTOCLAVING:

- Autoclave means- self locking and is used to denote an apparatus that sterilizes by the use of steam under pressure.

used to sterilize: surgical equipment's,
laboratory/instruments etc

- Instruments should be packed either loose or in muslin cloth /steam permeable plastics.

Parameters: uses:

- 121°C/250°F - for 15 mins - at 15 Psi

- 132°C/270°F – for 3-7 mins – at 30 Psi – for unwrapped instruments.

Ad: Simple to operate and relatively in expensive.

Disad: - nonstainless metal instruments may oxide.

Low melting plastics and rubber cups may melt/distort

Gas sterilization

1. Ethylene oxide gas:

- Effective against all types of microorganisms.

- Kill microorganisms by altering their normal cellular metabolism and replication through alkylation of protein, ribonucleic acids and deoxyribonucleic acid.

- The effectiveness of ethylene oxide gas as a sterilizing agent depends on:

- ✓ Gas concentration: 450 – 1500 mg/L.
- ✓ Temperature: usually 21- 60°C/120°F
- ✓ Exposure time: 48 mins to 2-3 hours.

Used to sterilize: plastics, rubbers, handpieces, casts and appliances etc.

Advantages: sterilizes virtually anything except liquids, at room temperature.

Disadvantages: - potentially mutagenic and carcinogenic,
- Directly toxic to skin.

Chemical or cold sterilization

-Used for sharp edged instruments like scalpel blades and hypodermic needles.

- Spores and Viruses may not be destroyed so not used for critical instruments.

A] Alcohols:

Mechanism of action: by Protein denaturation, metabolic interruption and cell lysis.

Isopropyl alcohol (50-70%) and ethyl alcohol (70%) used for spot cleaning and injection site preparation.

Dis: It is corrosive to stainless steel.

B] Aldehyde:

Mechanism of action: By protein and nucleic acid alkylation.

1. Formaldehyde:

- It is in the form of formalin, 37-40% solution of formaldehyde and water.

-Capable of killing all bacteria, viruses and spores.

2. GLUTARALDEHYDE:

- 2% solution of glutaraldehyde is used for disinfection of lenses, dental equipment's, delicate instruments or anaesthetic accessories.

- Depending on their use, glutaraldehyde's are effective up to 28 days after activation.

C] Chlorhexidine:

- An antiseptic agent available in detergent, tincture and aqueous formulations.

- 0.75-1% solution used for scrubbing.

- Widely used for preparation of surgical patients and for surgical hand scrubs due to non-irritating property to skin.

D] Quaternary ammonium compounds

It is also used in fumigation/fogging of OT for 45 mins. e.g., Microgen D-125.

E] Phenol and its derivative:

-2% solution used for disinfection.

-Acts by disrupting the cell membranes and precipitate cellular proteins.

Irradiation

- Type : Ionising and non-ionising radiation.

- Used to sterilize pre-packed items:

Surgical blades, Swabs, Catheters, Syringes, gowns, drapes, table covers etc.

FARINA MEHRIN,
FINAL YEAR BDS.

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