

Infection Control

Ø Infection control terms:

1. Terms used:

Asepsis – automated washer processor – barrier technique – bioburden – biological control – biological monitor – bloodborne pathogens – engineering controls – exposure incident – exposure time – infectious micro organism – infectious waste – unit dose – nosocomial infection – occupational exposure – sterile – sterilization – sterilization area – saturated steam sterilization – chemical disinfection – chemical indicator – contaminated – culture –personal protective attire – work practice controls – universal precautions – immunization & testing – medical history review – number of microorganisms –susceptible host – portals of entry.

2. Types of infections:

- a) Acute infection: sever symptoms appear soon after the initial infection.
- b) Chronic infection: infection present for long duration & may persist for live.
- c) Latent infection: persistent infection in which symptoms come & go.
- d) Opportunistic infection: caused by normally nonpathogenic organisms in compromised individuals.

3. Classification of pathogenic microorganisms:

- a) Bacterial spores: they are resistant to heat, dryness & bactericidal chemicals.
- b) Viruses: they are classified into bacterial, animal & plant viruses.
- c) Protozoa: single celled animals without rigid cell wall.

d) Fungi: they are plants that lack chlorophyll.

4. Dental item classification:

a) Critical items: items used for invasive procedures.

b) Semicritical items: items in contact with mucous membrane but cannot be sterilized.

c) Noncritical items: items exposed to splatters, sprays, or splashing of blood.

Ø Cleaning, disinfection & sterilization:

1. Cleaning:

It is the removal of all adherent visible soil from the surface.

Water quality - cleaning agent type (detergents–enzymatic cleaners).

2. Disinfection:

a) Thermal disinfection: washer disinfector 70°C for 100 minutes or 80°C for 10 minutes or 90°C for 1 minute.

b) Chemical disinfection:

Alcohol: it denatures protein through dehydration.

Chlorine: used for treatment of water.

Glutaraldehyde: used for heat sensitive instruments.

c) Other methods of disinfection: boiling – low temperature steam – ultra violet radiation.

3. Sterilization:

Complete destruction of all forms of microorganisms.

a) Steam sterilization (autoclave):

Affected by: steam quality – moisture content – contaminated steam.

Types of steam sterilizer:

- Prevacuum steam sterilizer: it produces shorter cycle times.

- Downward displacement steam sterilizer: 30 minutes at 121-123°C & 15-17 psi, or 15 minutes at 132-135 °C & 30-32 psi.
- Downward displacement flash steam sterilizer: fast sterilization, it produces the instruments unwrapped, wet & very hot.
- Bench top steam sterilizer: only suitable for porous loads.
- b) Dry heat sterilization: it takes long time.
- c) Types of sterilization monitors: biological monitors – internal indicators – external indicators.

Ø Universal precautions in the dental treatment room:

1. Immunization & testing.

2. Medical history review.

3. Barrier techniques & protective attire:

- a) Gloves: sterile surgical gloves – procedural gloves – latex examination gloves.
- b) Clinical apparel: smokes – scrubs – laboratory coats.
- c) Face mask & shield.
- d) Protective eyewear.
- e) Protective headwear.

4. Preparation of the dental treatment room:

Unit water supply system – working surfaces.

5. Disinfecting the DTR between patients:

Dental instruments – liquid regulated waste – three way syringe tips – disposable sharps – dental handpieces – barrier clean up – cleaning unprotected areas.

6. Preparing for the next patient:

Hand washing: water based cleaning agents (iodophores – chlorohexidine gluconate) – waterless hand washing agents.

7. Securing the DTR.

Ø Preparation of instruments for sterilization & disinfection:

1. Functional flow of the sterilization process:

Large dental clinics have a permanent central sterilization room (CSR) technician assigned to the CSR.

- a) Traffic control: controlled access to the sterilization areas minimizes the transfer of microorganisms from area to another.
- b) Receiving & cleaning: these area must be separate from the reminder of the sterilization area.
- c) Processing: all inspecting, sorting, wrapping & packaging occur here.
- d) Sterilization process: it takes place in the CSR & it is safer & cost effective.
- e) Sterile storage: these areas should not be in the vicinity of the contaminated processing areas.

2. Management of contaminated instruments:

Instrument cleaning: cleaning the instruments must be done while wearing gloves, it is done by the use of automated washer processor or by using ultrasonic cleaner or manual scrubbing.

3. Presterilization processing:

Inspection& sorting of instruments – wrapping & packaging – shelf life (time related- event related) – sterile storage.

Ø Effective methods of sterilization & disinfection:

1. Steam heat sterilization:

Steam under pressure is the most effective means of sterilization in dentistry.

2. Types of steam sterilizers:

Gravity displacement sterilizer – prevacuum steam sterilizer – flash sterilization.

3. Dry heat sterilization:

The least expensive form of heat sterilization, it is suitable for metal instruments that rusts or dulls in presence of moisture.

4. Low temperature sterilization:

Chemical vapor sterilization – ethylene oxide sterilization.

5. Bead & salt sterilizers.

6. Chemical disinfection:

Glutaraldehyde based solutions – chlorine dioxide based solutions – iodophors – phenolics.

7. Factors influencing germicidal procedures:

- a) Nature of the material.
- b) Bioburden.
- c) Organic debris present.
- d) Type & concentration of the germicide.

Ø Sterilization & disinfection of the dental instruments:

1. Critical category items require sterilization:

- a) Surgical instruments.
- b) Handpieces.
- c) Burs & diamonds.
- d) Endodontic files & gates glidden burs.

2. Semicritical category items:

- a) Three way syringe tips.
- b) High volume evacuator.
- c) Saliva ejector.

3. Noncritical category items:

- a) Dental delivery system.
- b) Portable dental units.
- c) x ray machine.

4. Hand washing:

Hand washing guidelines – hand washing techniques.

