

INFECTION CONTROL IN DENTAL PRACTICE

- Both patients and dental health care personnel (DHCP) can be exposed to pathogens.
 - Contact with blood, oral and respiratory secretions, and contaminated equipment occurs.
 - Proper procedures can prevent transmission of infections among patients and DHCP
 - Dental patients and dental health care workers may be exposed to a variety of microorganisms such as bacteria, viruses, and fungi during dental treatment.
 - Among these, the diseases of foremost concern are infections caused by
 - **Human immunodeficiency virus (HIV).**
 - **Hepatitis viruses B, C, and D.**
 - **Mycobacterium tuberculosis.**
- ☐ Infections may be transmitted in the dental operator through the following routes:
- ▶ Direct contact with blood, oral fluids, or other secretions.
 - ▶ Indirect contact with contaminated instruments, operator equipment, or environmental surfaces.
 - ▶ Contact with airborne contaminants present in either droplet spatter or aerosols of oral and respiratory fluids.

Aerosols:

- Aerosol is defined as small droplets, which can remain suspended in air for some time.
- They have the potential to penetrate and lodge in the smaller passages of the lungs and transmit infections.
- Diseases such as tuberculosis, influenza, and SARS (Severe Acute Respiratory Syndrome) are known to be spread by droplets or aerosols.
- Dental hand pieces, air motors, air/water syringes, and ultrasonic scalers produce large amounts of aerosols.
- The risk of infection from aerosols can be minimized by:
 - a. Use of protective barriers.
 - b. Pre-procedural rinsing with 0.2% chlorhexidine.
 - c. Use of saliva ejectors and high volume suctions.

Biofilms:

- Adhesion of bacteria and other microorganisms to solid surfaces in aqueous environments can result in the formation of a slime-like material called biofilm
- Biofilm protects the bacteria from disinfectants.
- Biofilms can form within dental water lines by two ways:
 - Bacteria may be pulled into the water lines during treatment from the patient's mouth which may later transmit to other patients.

- Bacteria present in the main water supply can concentrate in the dental unit water line especially in warm and stagnant conditions.
- Biofilm formation can be minimized by:
 - Independent water reservoirs for the dental unit
 - Using sterile water
 - Drain and flush water lines for several minutes before beginning clinic each day
 - After each patient, run high-speed hand pieces and scalers for a minimum of 20-30 seconds to discharge contaminated water and air that may have entered the water line

Hand Hygiene & Personal Hygiene:

Hands are the most common mode of pathogen transmission, their disinfection:

- Reduces spread of antimicrobial resistance.
- Prevent health care-associated infections.

Hands should be cleaned when:

- Visibly dirty.
- After touching contaminated objects with bare hands.
- Before and after patient treatment (before glove placement and after glove removal).

Note: As a personal hygiene, fingernails must be kept short and jewelry on the hands and watches should be removed since they tend to trap organisms and may tear the gloves. Hair should be put up tightly.

Handling of sharp instruments:

- Care must be taken while handling needles and other sharp instruments during and after procedures, while cleaning used instruments, and during disposal of used needles.
- Forceps must be used to handle sharp instruments.
- Disposable needles, scalpel blades and other sharp items should be discarded into puncture-resistant containers that are easily accessible for disposal.
- When recapping needles, both hands should NEVER be used; instead a one-handed "Scoop technique" or another instrument should be used.

Handling Sterile Instruments:

- Never touch sterile instruments or other materials like cotton with contaminated gloved hand or used instruments.
- Sterilized materials and instruments should be handled with a sterilized chittle forceps, which should be stored with the tip immersed in a disinfectant solution.

Packaging and sealing of instruments:

- Instruments should be carefully packaged in functional sets before sterilization.
- This packaging protects the instruments after sterilization and before use at chair side.
- A variety of packaging materials are available. Self-sealing, paper-plastic, peel pouches are the most convenient.

Classification of Instruments to be Sterilized:

- Dental instruments are classified into three categories depending on their risk of transmitting infection and the need to sterilize them between use
 - Critical
 - Semi-critical
 - Non-critical

Critical:

- Surgical and other instruments used to penetrate soft tissue or bone.
- Should be sterilized after each use.

Examples are:

- Forceps, periosteal elevators.
- Scalpels, scissors, suture needles.
- Bone chisels.
- Surgical burs.
- Scaling instruments.
- Endodontic instruments.

Semi-critical:

- Instruments that do not penetrate soft tissue or bone but contact oral tissues.
- These instruments should also be sterilized after each use.

Examples are:

- Mouth mirrors.
- Burs.
- Hand pieces.
- Tweezers.
- Restorative instruments.
- Impression trays.

Non-critical:

- Those items, which do not come into contact with body fluids.
- Have a relatively low risk of transmitting infection.

Examples are:

- Medication bottles.
- Light cure tips.
- Glass slab and cement spatula.
- Instrument trays.
- Orthodontic pliers.

Surface Asepsis:

- Use surface barriers to protect clinical contact surfaces, particularly those that are difficult to clean (e.g., switches on dental chairs).
- Change surface barriers between patients.

Disinfection of Dental Equipment:

- Clinical contact surfaces and dental equipment that are not covered should be cleaned and disinfected with a hospital level disinfectant (activity against HIV, HBV, and Mycobacterium tuberculosis) after each patient.
- Sodium hypochlorite (household bleach) is an effective and economical surface disinfectant.
- Spray-wipe-spray technique:
 - Spray the disinfectant solution on the surface.
 - Using a gauze piece, wipe the surfaces in overlapping strokes.
 - Spray again.
 - Allow the disinfectant to dry on the surface for about 10 minutes.

Surface Coverage:

Why Surface Coverage is important?

- Disease-causing microorganisms may be transmitted from infected patients to surfaces and remain viable for long periods (hours to days)
→ disease transmission
- Plastic Wraps: Shield surfaces from direct and indirect exposure, used on:
 - Light handles.
 - Controls.
 - Air-water syringes.

- Saliva ejectors.
- Working trays

Note: They must be changed between patients!

Prosthodontic Clinical Protocol:

Impression Trays:

- Metal Trays:
 - ✓ Cleaned immediately after separation of impression and casts.
 - ✓ Soaked in detergent solution and wiped with alcohol sponges to remove adhesive deposits.
 - ✓ Placed in bags & sterilized.
 - ✓ Stored in unopened bags.
 - Custom imp. trays & record bases must be disinfected after construction with sodium chloride.
 - Plastic trays are disposable & should never be used for more than one patient.
 - Laboratory knives
 - Wax spatulas.
 - Acrylic burs.
 - Wax carvers
- } Must be sterilized

Alginate Impression:

- Rinsed thoroughly in running tap water to remove all traces of saliva/ blood.

- Sprayed with appropriate sodium chloride solution.
- Loosely wrapped in plastic and left for less than 2 min.
- Poured in no more than 12 min.

Note: Poly sulfide, polyvinyl siloxane & zinc oxide eugenol→ disinfected the same as alginate.

RPDs:

- RPD should be washed with germicidal soap.
- Sprayed with diluted sodium hypochlorite and rinsed.
- Kept in sealed bags with clean water.
- Never to use concentrated sodium hypochlorite→Alloys will be pitted and/or discolored.
- Used dentures must be disinfected before & after any modification.
