



# Disinfection In Prosthodontics: An Overview

**Dr. Mahesh Ghadage**  
P.G Student

**Dr. Geeta Hatte**  
P.G Student

**Dr. Nikita B.K**  
P.G Student

**Dr. Nilesha Kadam**  
P.G Student

Dept of Prosthodontics Bharati Vidyapeeth Deemed  
University Dental College & Hospital  
Navi Mumbai

**D**isinfection is the process of destruction of or removal of all pathogenic organisms capable of giving rise to an infection.<sup>1</sup>

**Regardless of which disinfectant is used, certain procedures must be followed.**

- Agent must be properly formulated and discarded periodically as per manufactures instructions.
- Instruments must remain in contact with solution for designated period.
- No new contaminated instruments must be added.
- All instruments must be washed free of blood and organic debris.
- After disinfection instruments must be rinsed.

### Disinfection of Impressions:

Many studies have been performed to evaluate effects of various disinfectants on different types of impression materials but research findings have been contradictory to each other. No single disinfectant is compatible with all impression materials.

### Methods of Disinfection 2:

1. Rinsing
2. Use of Disinfectants
  - A) Spraying
  - B) Immersion
3. Other methods

- Radiofrequency glow discharge and UV light

### 1. Rinsing of Impressions:

- Impression is placed under running water to remove blood or saliva. (Fig.1)

### 2. Use of disinfectant:

#### A. By Spraying:

- Rinsed impression is spread liberally with an acceptable disinfectant and placed in plastic zipped bag and sealed to create “charged atmosphere” which reduces exposure to vapors and liquid. (Fig.2 & Fig.3)
- This impression is removed from plastic bag at the end of exposure time and rinse in running water and excess is shaken off.

#### Advantage:

- Uses less disinfectant & same disinfectant can often be used to disinfect environmental surfaces

#### Disadvantage:

- Disinfectant can be released into air increasing occupational exposure and it is not as effective as immersion.

#### A. By Immersion:

- This method is preferred over spraying as it provides a constant contact of the disinfectant with all surfaces of the impression & done by immersing the impression in a zipped plastic bag with the appropriate disinfectant.

American Dental Association (1988), Council on Dental Materials in association with the

office of the Council on Dental Therapeutics recommended; Immersion Procedure for irreversible hydrocolloid, polysulphide and addition silicone whereas for polyether, Spraying with Chlorine Compound was recommended for 2–3 minutes.

**Polyether materials cannot be immersed in disinfectants due to potential for absorption and distortion (hydrophilic)<sup>2</sup>**

- Recently developed “Sodium peroxy-monosulphate” which is active in 2% solution against bacteria, fungi and viruses has a 10 mins immersion period and can be used with the full range of dental impression materials, with the exception of reversible hydrocolloids.

Table 1- Disinfection methods of various impression materials

Impressions	Recommended Method	Alternative Method
Alginate & Zinc Oxide Eugenol Paste	Rinse Get Rid of Excess Water. Spray With 0.1% Sodium Hypo Chlorite, Put In Closed Container For 10 Secs.	Iodophors Can Also Be Used.
Polysulphide Rubber Base	Rinse & Immerse In 2% Glutaraldehyde For 10 Mins.	Iodophors, Sodium Hypo Chlorite Can Also Be Used
Polyether	Chlorine Compound(spraying)	
Silicon Rubber	2% Glutaraldehyde, Iodophors, Chlorine Compound	
Impression Compound	Rinse, Under Running Tap Water And Immerse In Iodophors Or Chlorine Compound	

### In known hepatitis and AIDS patients

- Impressions are disinfected by their immersion in 2% glutaraldehyde under acidic, neutral and alkaline conditions for 10 hrs or with a phenolic buffer for 6-7 hours.
- When making denture for such patients it is



necessary to produce multiple copies of the working models as these will become contaminated with oral washing from the surface during stages of denture construction.

- It is not possible to sterilize a gypsum based model satisfactorily and hence these need to be discarded after each clinical stage.
- **OSHA's (Occupational Safety & Health Administration) principles for potentially infectious materials sent to the lab:**
- Potentially infectious materials should be placed in a container which prevents leakage during handling, processing, storage, transport or shipping along with this labeling and colour coding is also recommended.

### Various Disinfection Methods For Prosthodontic Materials

#### 1. Dental Casts: (Fig. 4)

- It is very difficult to disinfect dental casts
- If casts must be disinfected, there are two options;
- Stone casts may be sterilized in an ethylene oxide sterilizer or disinfected by immersion for 10mins in diluted iodophor, then rinse.<sup>2</sup>
- a) Soak casts for 30 minutes in 0.5% concentration of sodium hypochlorite and saturated calcium dihydrate solution (SDS). SDS is produced by placing uncontaminated, set gypsum (i.e. stone) in a container of distilled water and allowing them to soak for a minimum of 48 hours.<sup>3</sup>

#### 2. Impression Trays

- Steel trays are sterilized via autoclave, chemical vapor or dry heat and

disinfected by ethylene oxide (Fig.5)

- Custom acrylic trays are discarded after use, for reuse in next visit disinfection should be done (Fig.6)
- Plastic trays are discarded after use.
- **3. Wax bites/Rims, Bite Registrations**
- Immersion disinfection may cause distortion to some items therefore Iodophor disinfection sprays should be used.
- Heavy-body bite registration materials are usually not susceptible to distortion and can be disinfected in same manner as an impression of the same material

#### 4. Orally Soiled Prostheses

- Scrub with sterilized brush and antimicrobial soap to remove debris and contamination from orally soiled prostheses and place this prosthesis in sealable plastic bag or beaker filled with ultrasonic cleaning solution or calculus remover.

#### 5. Disinfection of Dentures (Fig.7)

- Hardness, flexural strength and colour stability of denture base resins is significantly affected by disinfectant solutions such as gluteraldehyde, chlorhexidine, phenolic base, alcohol based and hypochlorite disinfectants so microwave irradiation for 6 minutes at 650 W was used in sterilization of dentures contaminated with S. aureus and C. albicans.<sup>4</sup>

#### 6. Extracted teeth

Extracted human teeth are routinely used for educational purposes in dental institutions. In recent years infection control guidelines have been revised due to the possibility of cross-contamination from these extracted teeth.

10% Formalin, 5.25% Sodium Hypochlorite and autoclaving have been

suggested as the most effective, but previous studies recommend formalin and autoclaving because they are simple, cheap and suitable for routine use in preclinical courses, exercises and research purposes.<sup>5</sup>

### Conclusion

- Dental safety is a key area of concern & needs to be taken care on top priority. Development of vaccines, sterilization of instruments and disinfection of the surrounding environment are few well read and achieved successes. All general practitioners and specialists alike should be educated about aseptic techniques and their benefits so that the dental environment is less hazardous one to work in.

### References

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3. Dental laboratory procedures: complete dentures. Morrow RM, Rudd KD, Rhoads JE. 1986, Vol. 1, 2nd ed. p. 104
4. Effectiveness of microwave irradiation on the disinfection of complete dentures. Silva MM, Vergani CE, Giampalo ET. IJP 2006; vol.19, 288
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### Legends

- Fig. 1- Rinsing of impression
- Fig. 2- Spraying of impression
- Fig. 3- Impression with disinfectant sealed in plastic zipped bag
- Fig. 4- Disinfected dental casts
- Fig. 5- Disinfected stainless steel tray
- Fig. 6- Disinfected custom acrylic tray
- Fig. 7- Disinfection of dentures

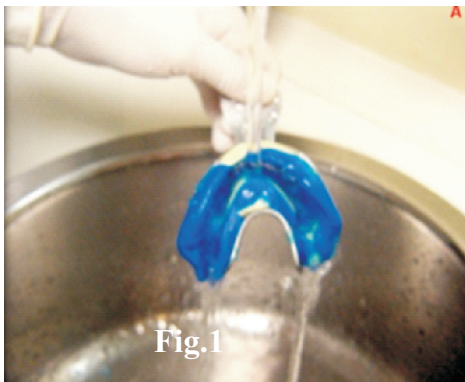


Fig.1

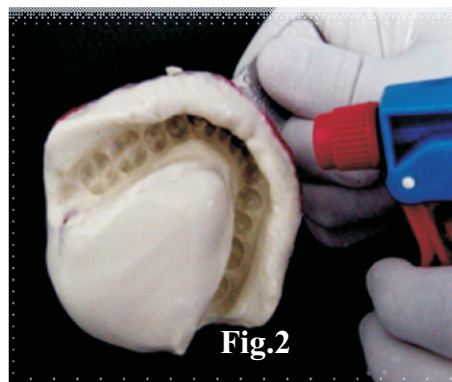


Fig.2



Fig.3

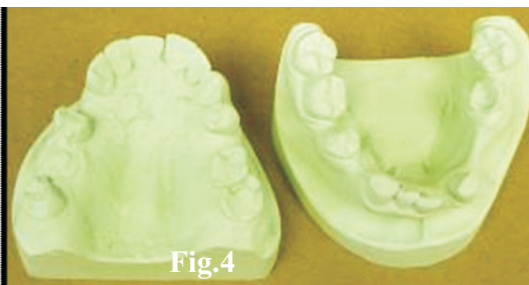


Fig.4



Fig. 5

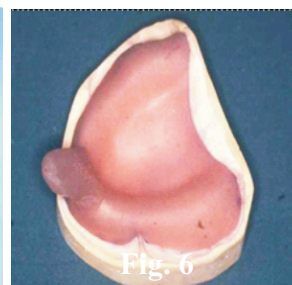


Fig. 6



Fig. 7