

GUIDELINES ON INFECTION CONTROL IN THE DENTAL LABORATORY

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ABSTRACT:

Infection control in the dental laboratory is an essential part of dentistry and is no longer an option but a requirement. The dental laboratory has been shown to be an area of potential disease transmission between patients and dental health care personnel i.e., dentists, lab technicians etc. potential pathogens can be transported to laboratory through microbially soiled impressions, dental prostheses/appliances. The increased awareness of infectious diseases and the recognition of the potential for transmission of numerous infectious micro organisms during dental procedures has led to an increased concern for and attention to infection control, in diseases to consider. This article reviews various methods and precautions to be taken towards infection control in the dental laboratory.

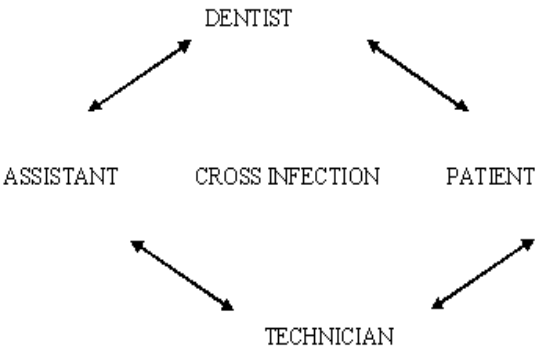
KEYWORDS: Disinfection, Dental Health Care Personnel, Cross – Contamination, Infectious Diseases.

INTRODUCTION

Living on the edge” is often the term referred to dental and medical professionals as they are exposed to a wide variety of microorganisms from blood and saliva of the patients. According to ‘Runnels’ 23 common and serious infectious diseases¹ (virus, fungi and bacteria-induced) have been found in dentistry. These microorganisms can cause infections diseases such as common cold, pneumonia, herpes, viral hepatitis, tuberculosis and AIDS. In addition to known pathogens, microorganisms that are generally harmless can become pathogenic in patients debilitated by age and these aged individuals are most likely to have prosthodontic needs. It is impossible to determine all highly infectious patients from medical histories or from patient conversations². Therefore, every patient must be considered as having the potential to transmit infectious agents to dental personnel i.e., Dentists and lab technicians.

The universal infection control rules³ should encompass six elements: Routine patient evaluation, personal protection with barrier techniques, instrument sterilisation including sterilisation control, surface and equipment disinfection, asepsis in the laboratory and appropriate disposal of contaminated waste including sharps. The Federation Dentaire International (FDI)⁴ states that all patients impressions and prostheses should be cleaned

and disinfected before delivery to the laboratory. If infected impressions and prostheses are allowed directly into the lab, that put the lab technicians at risk. If of disinfection is not practiced routinely, a cycle of cross infection may occur.



cross contamination can occur from dental office to lab and back to dental office. The best way to deal with the problem of decontamination is through chair side disinfection. If it is not performed, then disinfection must be performed in the lab. Lab personnel may be exposed through direct contact (through cuts and abrasions) or inhalation of aerosols created during lab procedures.

Goals of infection control

Strive to make dental lab as safe as possible and potential for disease transmission can be minimized through immunization, barrier techniques'. Written Infection control (IC) policy should be established and standard precautions must be observed in the lab at all times and are used by all lab personnel to prevent cross-contamination by dental items entering the lab. All patients should be treated as if they could transmit a disease caused by blood borne pathogen like HIV, Hepatitis – B.

Basics of infection control

- Need Co ordination Between Dental office and Lab.
- Use of Proper Methods / Materials for Handling and Decontaminating Microbially Soiled Impressions and Prostheses.
- All Contaminated Items like impressions or prostheses should be cleaned and disinfected before being handled by lab personnel and before returned to patient.

Infection control policy

Laboratory infection control policy should be precise, concise and written in a language that is easy to understand and it should be reviewed annually and updated whenever necessary. It should include

- 1) Protection of the dental health care personnel
- 2) Disinfection of the working area
- 3) Unit-dose concept
- 4) Disinfection of the all prosthodontic materials and items.

1) Protection of the dental health care personnel:- Epidemiologic evidence suggests that infectious disease acquisition and transmission by dentists and auxiliary personnel may be greatly minimized by the routine use of gloves, masks and lab coat.

GLOVES

- **Disposable gloves** – use when there is potential for direct hand contact with contaminated items (when pouring impressions, while receiving occlusal rims etc)

They should be changed and disposed of appropriately after completion of procedure. Hands should be washed before wearing gloves and after removal.

- **Utility gloves** – should be used when cleaning or disinfecting equipment or surfaces.

Mask and protective eye wear ; Must be used when there is potential for splashes, spray, or aerosols. Eg: when using Lathes, model trimmers etc.

Lab coat; It should be cleaned daily, Should be worn at all times during fabrication process and coat should not be worn outside of the lab and it should be laundered appropriately.

2) Disinfection of the working area: - Maintenance of a schedule for cleaning and disinfecting laboratory surfaces is mandatory. The cleaning and disinfecting materials and equipment required to do any cleaning and disinfecting procedure should be provided to the personnel who is going to do the work, by the dental office. All the equipment like vibrators, model trimmers, Lathes, handpieces, burs, bench tops should be cleaned and disinfected with disinfecting solutions. Dental office and

laboratory can be disinfected by fumigation once in a week. If any potentially harmful material is spilled away, it should be cleaned and disinfected immediately.

3) Unit-dose concept⁵ : The dispensing of an amount of material or device which is sufficient to accomplish the procedure and where excess may be discarded at completion is referred to as a “unit-dose”. Cross-contamination can be minimized by this concept.

E.g.: unit doses of petroleum Jelly, Impression materials etc.

4) Disinfection of Prosthodontic Materials / items used in dental office or Laboratory: The occupational safety and health administrations (OSHA)⁶ standard for occupational exposure to blood borne pathogens consider items contaminated with saliva or blood in the dental procedures, that have not been decontaminated as potentially infectious such items must be kept in closed container and that are labeled as biohazard or colored red.

Dental office personnel should label the impressions, dental prostheses or appliances that have been inserted in the mouth and are contaminated with saliva or blood, if these items re not disinfected and directly transported to the laboratory, the lab personnel should be communicated regarding infection control.

5)Impression Disinfection: Disinfection of impressions was first recommended by ADA in 1985.

The impressions should be thoroughly rinsed under tap water to remove any saliva or blood before disinfecting. Impressions can be disinfected by spraying, dipping or immersing in the disinfectant, usually immersion method is used. The exposure time should be that recommended by manufacturers of the disinfectant solution. After disinfection impression should be rinsed thoroughly and cast should be poured. Iodophors, sodium hypochlorite, phenols can be used as disinfectants.

6)Dental Casts: Very difficult to disinfect and it is preferable to disinfect impressions. It casts are to be disinfected immersion in disinfectant solution like sodium hypochlorite is preferred and casts to be disinfected should be fully set.

7)Microbially soiled prostheses⁷ : Any prostheses placed in the oral cavity are a potential source of infection. The prostheses should be scrub with brush to remove any debris and place the prostheses in disinfectant solutions. Occusal rims/wax bites/Trial dentures immersion disinfection may distort some items so, spray disinfection using iodophor is preferred.

8) Impression trays:Custom acrylic trays can be disinfected by spraying or immersion in 1:10 sodium hypochlorite. Stock trays are first cleaned in ultrasonic cleaner and then they can be heat sterilized. Articulators, Face bows, Rubber bowls spatulas, shade guides etc can be disinfected by spray method.

Sterilization

All metal and heat – stable instruments that contact oral tissues, contaminated appliances can be heat-sterilized after each use. Eg;-face bow fork, metal impression trays, burs, polishing points, rag wheels, laboratory knives etc.

CONCLUSION

All laboratory infection control activities are designed to accomplish a single goal i.e., breaking the chain of disease transmission². If the person to person flow of infection can be interrupted ideally before the laboratory process begins, the safety of work environment will be improved. Effective communication and understanding between the dental office and lab are important in achieving the goal of infection control policy. An infection control policy in the laboratory is an effort to reduce occupational exposure to blood borne pathogens and protect lab personnel from being infected. In conclusion, we emphasize that the time is ripe, to put infection control into practice instead of just discussing it in the theory.

References

1. Runnels R.R. An overview of infection control in dental practice. J Prosthet Dent 1988; 59:625-29. [doi:10.1016/0022-3913\(88\)90083-2](https://doi.org/10.1016/0022-3913(88)90083-2)
2. Charles John Palenik, Chris H.Miller. Laboratory asepsis: Disinfection of impression materials and microbially soiled dental prostheses. QDT 1990/1991:179-182.
3. Lakshman samaranayake. Rules of infection control Int. J. Prostho 1993;43: 578-84
4. M.R.J.Mc Neill, W.A. Coulter, Disinfection of irreversible hydrocolloid impressions – A comparative study. Int.J.Prostho. 1992; 5:536-67. [doi:10.1016/0022-3913\(81\)90291-2](https://doi.org/10.1016/0022-3913(81)90291-2)
5. Mitchell A. Stern, Robert J. Whitacre. Avoiding cross contamination in prosthodontics. J Prosthet Dent; 1981;46:2:120-22. [doi:10.1016/0022-3913\(81\)90291-2](https://doi.org/10.1016/0022-3913(81)90291-2)
6. Bo Bergman. Disinfection of prosthodontic impression materials: A literature review. Int. J. Prostho. 1989;2:6:537-42. PMID:2701067
7. American dental Association council on dental materials instruments, equipments, council on dental therapeutics, council on dental research, council on dental practice: Infection control recommendations for dental office and dental laboratory J.Am.Dent.Assoc.1992:123(8).108.

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