

AVOIDING CROSS CONTAMINATION; A PROTOCOL FOR PROSTHODONTIC CLINICS AND LABS

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ABSTRACT

The potential for transmission of infectious diseases within the dental office environment has risen considerably which presents a significant health hazard to dental personnel and patients. In view of the potentially life threatening consequences of disease transmission serious considerations on part of every practitioner are required.

With world wide media coverage and various government campaigns to educate public about AIDS and Hepatitis B, there is an increased awareness amongst patients about possibility of disease being spread by infected blood, since dentistry is licensed to spill it, the public is understandably anxious'. During provision of dental treatment viral and bacterial infections may be transmitted from patient to dental personnel and from infectious member of the dental team to other patients. In this vicious circle of cross contamination, the dentist may act as a vector for disease spread through contaminated instruments, materials and prostheses. (Fig I).

Increase in the incidence of communicable diseases such as Hepatitis B and Acquired Immuno Deficiency Syndrome AIDS has led to a significant change in attitude towards the importance of cross infection control in dentistry².

A wide variety of microorganisms present in the blood and saliva of patients can affect the dental personnel through direct contact with blood, saliva,

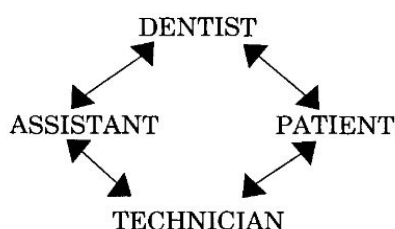


Fig I. The Circle of Cross Contamination¹.

open wounds, smears, air borne and respiratory drop-let infection. As cross infection from patient to dentist to patient has been demonstrated. One need only study the increasing seriousness of the diseases such as Hepatitis B, AIDS, herpes, tetanus, influenza, tuberculosis, cytomegalo virus, mono nucleosis (caused by Epstein Bar Virus), rubella and syphilis ^{1,3-5}. Some of these diseases may have obvious clinical manifesta-

tions, e.g., herpes or measles, others may have none, e.g., hepatitis carriers.

SOURCES OF INFECTION

Many instruments and materials used in the dental surgery and dental laboratory can be a source of cross infections. These items can be divided into critical, semi-critical and least critical according to their use in and around the oral cavity.

• Critical

Items that penetrate oral mucosa and vascular tissues and are non-disposable, e.g., cutting instruments.

• Semi-Critical

Items that come into contact with intact mucous membrane and saliva, e.g., impression materials, special trays and prostheses.

• Least Critical

Items or surfaces not in direct contact with patient.

Analysis of prosthodontic setups shows that many instruments and support equipment carry the potential to transmit diseases.

The main sources of transmission of infection from patient to dental technicians are impressions, impression trays and stone casts⁷⁻⁸⁻⁹. In addition the dental prostheses at various stages of trial and insertion can transmit infection from dental personnel to patient. Other items that could pose a problem include shade guides, mould guides, immediate dentures, indelible pencils, rulers, mixing spatulas, knives, contaminated prosthesis returned from laboratory, face bows, articulators and torches⁶⁻⁷.

Concerns & Objectives

- 1 To protect the prosthodontist, his staff and patients from disease acquisition and transmission by breaking the circle of cross infection.

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- 2 To minimize the cross contamination with prosthodontic instrumentation.

Methods to Eliminate Cross Infection

Total elimination of cross infection in prosthodontics is presently not possible but steps can be taken to reduce it. Education of dental personnel is vitally important in effective implementation of safety measures for cross infection control¹⁰. According to the British Dental Association guidelines¹¹ besides personal protection and patient screening, sterilization and disinfection are the most popular and widely used methods for control of infection. Since it is not possible to screen every patient for every infection and since the patients known to be infected cannot be denied treatment, infection must be blocked by methods which are practical, easy and satisfactory. Sterilization and disinfection are therefore on the top of this list. Cleaning prior to disinfection and sterilization is mandatory.

o Sterilization

Sterilization is defined as the act of killing or removal of all microorganisms including viruses and spores. There are five reliable ways of rendering something sterile.

- o Steam in an autoclave
- o Ethylene oxide gas in an autoclave
- o Chemiclave (alcohol and formaldehyde at 132°C in an autoclave).
- o Dry heat sterilizer
- o Immersion in a recognized chemical sterilant, e.g., glutaraldehyde.

o Disinfection

Disinfection implies the destruction most of the pathogenic organisms and is relative depending upon amongst other factors, the duration of exposure to the disinfecting agent. Properly diluted chemical solution, e.g., glutaraldehyde, sodium hypochlorite and iodophore disinfectants can be used for immersion disinfection and surface disinfection. Things like face bows, articulates, gauges, torches, indelible and lead pencils, impressions and prostheses can be disinfected.

o Unit Dose Concept

Use of an amount of material necessary to complete the procedures where excess may be discarded is referred to as unit dose concepts. Care should be taken to get materials dispensed by non-contaminated assistants.

o Personal Protection

Epidemiologic studies show that infectious disease acquisition and transmission can be greatly reduced by vaccination, protective eyeglasses and use of latex gloves and masks¹². Cuts and abrasions should be kept covered and punctured gloves should be changed.

Masks prevent blood and saliva droplets from direct contact with operator's face during rotary instrument use. It also prevents the exchange of exhaled air between patient and operator.

CONCLUSIONS

The potential for cross contamination in prosthodontic clinics and labs may be reduced by:

- 1 Hygiene maintenance throughout clinic and lab area.
- 2 Thorough cleaning of instruments before sterilization and disinfection.
- 3 Use of surface covers, e.g., clear plastic bags or wraps over instruments like face bow, articulators and torch handles.
- 4 Use of sterilization regime, e.g., autoclave, dry heat, and chemiclaves.
- 5 Use of chemical disinfectants to disinfect new and readjusted or repaired prostheses, frameworks, impressions, stone casts, stock trays, acrylic resin burs, brushes, gauges, rulers, indelible and lead pencils, shade guides, molds, spatulas, bite forks, occlusal plane guides, wax trial insertions and various surfaces etc.
- 6 Use of unit doses of impression materials, waxes, petroleum jelly, adhesives etc.
- 7 Use of a proper disinfectant to make pumice slurry for polishing.
- 8 Use of protective eyeglasses, disposable masks and latex gloves while examining and performing any procedure on patients.
- 9 Use of disposable masks and gloves while examining and performing any procedure on patients.

Proper application of these procedures can greatly reduce the possibility of cross contamination in prosthodontics.

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