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Cross-Infection Control in Dental Setting: An Insight

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ABSTRACT

Infection control procedures are precautions taken in health care settings to prevent the spread of disease. The Centers for Disease Control and Prevention has developed special recommendations for use in dental offices. Along with the proper sterilization of instruments and materials, sterilizer monitoring is an essential part of any in-office infection control program. Infection prevention in dentistry is an important topic that has gained more interest in recent years and guidelines for the prevention of cross-transmission are common practice in many countries. However, little is known about the real risks of cross-transmission, specifically in the dental healthcare setting. This paper emphasizes the risk of cross-transmission and infection of viruses and bacteria that are of particular relevance in the dental practice environment.

KEYWORDS: Cross-Transmission, Cross-Infection, Dentistry, Bacteria, Viruses, Healthcare-Associated Infections

INTRODUCTION

Infection prevention and control (IPAC) is a critically important part of safe patient care. In recent years, concerns about the possible spread of blood-borne diseases, and the impact of emerging, highly contagious respiratory and other illnesses have grown. Dentists and other health care workers have a clear responsibility to establish, evaluate, continually update and monitor their IPAC strategies and protocols. In the 1980s, the ADA Foundation's Health Screening Program helped identify hepatitis B virus as an occupational hazard in dentistry. The ADA responded by being the first entity to recommend that dentists and dental offices follow standard infection control procedures. The ADA subsequently worked with the Centers for Disease Control and Prevention (CDC) to develop CDC's own infection control recommendations for dentistry, which were originally issued in 1993. In addition to the standard infection control procedures discussed on this page, the CDC recommends the following nonpharmaceutical interventions (NPIs) to help limit the spread of influenza, urging dental staff and patients to always:

- Stay home when ill.
- Practice good respiratory etiquette: cough or sneeze into a tissue or a shirt sleeve and immediately wash your hands with soap and water or use an alcohol-based hand sanitizer (at least 60% ethanol or isopropanol) to disinfect them.
- Routinely clean all frequently touched surfaces, using standard infection control procedures as directed in the CDC 2003 guidelines on infection control² where appropriate.

- During influenza pandemics, CDC recommends more stringent NPIs:⁴
- People living with a person who has influenza should stay home for up to three days after their initial contact with the ill person.
- Persons who are ill should wear a face mask if they must go out of the house.

The 2003 CDC Guidelines and 2016 Summary are comprehensive and evidence-based sources for infection control practices relevant to the dental office that have been developed for the protection of dental care workers and their patients. The new resource includes tools to help dental health care personnel follow infection prevention guidelines, including:

- A summary of basic infection prevention principles and recommendations for dental settings;
- A checklist to help evaluate dental staff compliance with administrative and clinical practice infection prevention recommendations; and
- key references and resources for each area of focus including sterilization, safe injection practices and hand hygiene in dental settings.

IMPORTANCE OF INFECTION CONTROL IN DENTAL OFFICE

- **Prevents the growth of bacteria:** Bacteria are among the fastest growing organisms in the world. And when they carry disease, the results can be deadly. But proper sterilization techniques in the dental office can stop them in their tracks. Frequently disinfecting tools and equipment kills bacteria.

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- **Prevents spread of disease:** Those bacteria can carry a host of diseases. The bacteria associated with periodontal disease can be spread through saliva. But there are other diseases that can be far more concerning such as tuberculosis, hepatitis, and HIV.
- **Prevents fatality:** Bacteria often carry disease. Disease can cause illness and death. Healthcare associated infections are among the leading causes of death But they are easily preventable with proper infection control in medical and dental offices.
- **Protects staff:** The prevention of patient-to-patient transfer of bacteria and disease is a top priority for dental professionals. But it's also important to protect the dentist, dental assistants, hygienists, and other staff. Infection control helps keep the entire staff healthy.
- **Maintains practice reputation:** One small mistake in infection control could have obvious health consequences. But if word gets out that your practice doesn't follow proper procedures and puts patients in jeopardy, it could cost you your good reputation.

ROUTES OF INFECTION TRANSMISSION

- Direct contact with blood, oral fluids, or other infected materials,
- Indirect contact with contaminated objects, such as instruments, environmental surfaces, or equipment,
- Contact of conjunctival, nasal, or oral mucosa with droplets, such as spatter, containing microorganisms from an infected person and propelled by coughing, sneezing, or talking, or
- Inhalation of airborne microorganisms that can remain suspended in the air for long periods.

It is important to consider that the pathways of contamination can be bidirectional. An infectious microorganism may be transferred from the patient to members of the dental team, but also vice versa, e.g. through the hands of the dental team. Moreover, another infectious association is the transfer of pathogens from patient to patient, without the mediation of the dental staff, but rather through a surface located in the dental practice, or a device or instrument used during dental procedures. This can apply in the case of inadequate sterilization of the dental instruments or disinfection of the dental unit

CROSS-INFECTION CONTROL

Instrument and Equipment Sterilization: The CDC Statement reaffirmed and clarified 2003 CDC recommendations² and emphasized three key points:

- Clean and heat sterilize handpieces and other intraoral instruments that can be removed from the air lines and waterlines of dental units.
- For handpieces that do not attach to air lines and waterlines, use FDA-cleared devices and follow the

validated manufacturer's instructions for reprocessing these devices.

- If a dental handpiece cannot be heat sterilized and does not have FDA clearance with validated instructions for reprocessing, do not use that device.

Monitoring Sterilizers: Many factors can cause sterilization to fail—from procedural errors that are easily remedied, like overloading, to mechanical problems that can take a sterilizer out of service until repairs can be made. Since this variety of factors can influence successful sterilization, the ADA and CDC encourage dentists to regularly assess the efficiency of their in-office sterilizers.

Sterilization is best monitored using a combination of mechanical, chemical, and biological indicators.⁸ The CDC has provided the following recommendations:

Mechanical Indicators: Record cycle time, temperature, and pressure as displayed on the sterilizer gauges for each instrument load.

Chemical Indicators: Use chemical indicators, such as indicator tapes, with each instrument load. These indicators change color after exposure to the proper sterilization environment.

Failure of the indicator to change color indicates that it was not exposed to the proper sterilization environment (e.g., proper pressure or temperature). In such cases, the instrument load should be re-sterilized.

Biological Indicators: The CDC recommends monitoring sterilizers at least weekly with biological indicators. Biological monitoring can be done in two ways:

- In-office incubator and spore monitoring strips (contact your dental supplier for a list of products). This method usually gives results in 24-48 hours.
- Mail-in spore monitoring programs. This process usually takes a week. Although it takes longer to get results using a service, third-party monitoring programs may provide more accuracy than in-house monitoring. A positive spore test result indicates that sterilization failed. According to CDC recommendation.

CROSS-INFECTION CONTROL SIGNIFICANCE

Initial patient screening is accomplished by the prosthodontist during history-taking interactions before entering the operatory. The dentist's review of the patient's medical history is mandatory at the onset of every clinical appointment. Multiple reviews give the dentist opportunities to establish baseline medical history data and to compare individual patient responses over an extended period of time as well as a brief review of any infectious disease the patient is suffering.

Personal Hygiene: The dentist's personal hygiene is an

absolute necessity. As patients become more aware of the potential danger to themselves from materials and instruments that are not disinfected or sterilized, their confidence and acceptance of dental treatment become directly proportional to the image the clinician presents. Specific notes of hygiene include. Hair is cleared away from the face. If a clinician's hair falls in such a way that it may contact the patient or dental equipment, it is fixed at the back of the head, or a surgical cap is worn. Facial hair is covered by a face mask or shield. Jewelry is removed from the hands, arms, or facial area during patient treatment. Fingernails are kept clean and short to prevent perforation of gloves and accumulation of debris. Fingernail polish is not worn. Thorough forearm and hand washing are mandatory before and after treatment.

Instrument Processing. It involves:

- Presoaking and cleaning
- Packaging
- Sterilization: It involves Steam at 121 degrees C for 20 to 30 minutes or 134 degrees C for 2 to 10 minutes. Other methods include: Dry heat (Oven Type) – 1 to 2 hours at 160 C

Surface Asepsis: There are two general approaches to surface asepsis: Clean and disinfect contaminated surfaces, and Prevent surfaces from becoming contaminated by the use of surface covers. A combination of both may also be used. Following chemicals are suitable for surface and equipment asepsis:

- Chlorine – e.g., sodium hypochlorite.
- Phenolic compounds
- Water-based – Water with ortho-phenylphenol or tertiary amylphenol or O-benzyl-p-chlorophenol
- Alcohol-based – Ethyl or isopropyl alcohol with ortho-phenylphenol or tertiary amylphenol
- Iodophor – butoxy polypropoxy polyethoxy ethanol iodine complex

STEPS INVOLVED IN CROSS INFECTION CONTROL

The following procedures are required when treating patients in the clinic:

- Before seating the patient the operatory and chair are cleaned and wiped with a disinfectant solution; the area is sprayed and left for a minimum 10 minutes.
- All patients rinse with chlorhexidine gluconate 0.12% before treatment.
- Patients wear protective eyewear.
- Hands are washed with an antimicrobial cleanser before gloving. Once gloved, only the patient and barrier-covered areas or areas that have been cleaned and disinfected are touched.
- Alternatively, an appropriate barrier must be used on

the pen and over the portion of the record that is to be touched.

- The doctor should not leave the operatory without removing their gloves and outer barrier garments.
- Large, nonsterilizable items used in the operatory, such as impression material dispensing guns, articulators, face bows, water bath, silicone spray bottles, tooth shade, and mold guides are disinfected by wiping, spraying, or immersion with the appropriate disinfectant solution.
- All items leaving the clinic after being used in direct patient care or touched during patient care procedures that cannot be subjected to sterilization procedures are disinfected or placed in the phenol disinfection solution within a sealed plastic bag before departure.
- New latex gloves are worn for the disinfection procedures.
- Items bagged in disinfection solution must remain in solution for 10 minutes.

CONCLUSION

Infection control measures reported by dental surgeons during their practices are deficient. It is necessary to educate, raise awareness of professionals, and promote constant updating courses on procedures which aim at improving safety of dental care.

REFERENCES

1. Centers for Disease Control and Prevention. Recommended infection-control practices for dentistry, 1993. MMWR Recomm Rep 1993;42(RR-8):1-12
2. Centers for Disease Control and Prevention. Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care. In: Services DoHaH, editor. Atlanta, GA: Centers for Disease Control and Prevention; 2016.
3. Kohn WG, Harte JA, Malvitz DM, et al. Guidelines for infection control in dental health care settings--2003. J Am Dent Assoc 2004;135(1):33-47.
4. Cuny E. California Infection Control Regulations for Dental Professionals. J Calif Dent Assoc. 2017 Apr;45(4):179-84
5. Yoon HY, Lee SY. Establishing a laboratory model of dental unit waterlines bacterial biofilms using a CDC biofilm reactor. Biofouling. 2017 Nov;33(10):917-926.
6. ADA Professional Product Review Back to Basics: Sterilization Monitoring in the Dental Office. American Dental Association November 15, 2015.
7. Pankhurst CL. Risk assessment of dental unit waterline contamination. Prim Dent Care. 2003;10:5-10.

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