

2020

Maintaining Effective Infection Control Protocol

Lauren Eusner

Old Dominion University, leusner@odu.edu

Kimberly Lintag

Old Dominion University, klintag@odu.edu

Follow this and additional works at: https://digitalcommons.odu.edu/dentalhygiene_fac_pubs



Part of the [Dental Hygiene Commons](#), and the [Dental Public Health and Education Commons](#)

Original Publication Citation

Eusner, L., & Lintag, K. (2020). Maintaining effective infection control protocol. *Dimensions of Dental Hygiene*, 18(3), 22-25.

This Article is brought to you for free and open access by the Dental Hygiene at ODU Digital Commons. It has been accepted for inclusion in Dental Hygiene Faculty Publications by an authorized administrator of ODU Digital Commons. For more information, please contact digitalcommons@odu.edu.

From *Dimensions of Dental Hygiene*. March 2020;18(3):22–25.
<https://dimensionsofdentalhygiene.com/article/maintaining-effective-infection-control-protocol/> (accessed July 3, 2020)

Maintaining Effective Infection Control Protocol

The safety of clinicians and patients in the dental office rests on adherence to evidence-based infection control standards.

By [Lauren Eusner, RDH, BSDH, MS](#) and [Kimberly Lintag, RDH, BSDH, MS](#) On **Mar 20, 2020**

Editor's Note: While dental practices are now closed, this information was written prior to the COVID-19 outbreak and should be valid for the future. If permanent changes are made to infection control guidelines for dental settings, Dimensions will update the article immediately. At this time, no permanent changes have been made.

Oral health professionals must have a solid understanding of the United States Centers for Disease Control and Prevention (CDC) infection control guidelines in order to protect themselves and their patients. Disease transmission can occur in a dental setting from patient to clinician, from clinician to patient, and from one patient to another. Following appropriate infection control guidelines can prevent disease transmission and cross contamination.

Understanding pathogens and disinfectants is key to preventing disease transmission. Bloodborne and respiratory pathogens can survive on clinical surfaces for days, weeks, or even months.¹ Selecting an appropriate surface disinfectant is vital to prevent clinical contact surfaces from becoming reservoirs for potential cross contamination. The US Environmental Protection Agency registers and categorizes hospital disinfectants based on their efficacy against certain pathogens.² Disinfectants are categorized by their effectiveness against bacteria, viruses, and fungi. High-level disinfectants are considered sterilants under certain conditions but are used for shorter contact times to disinfectant. High-level disinfectants are not to be used on environmental surfaces, but are for immersion of heat sensitive instruments and devices only. Intermediate-level disinfectants are considered tuberculocidal and are also effective against human immunodeficiency virus (HIV) and hepatitis B virus (HBV). Low-level disinfectants may be potent against HIV and HBV but do not carry the tuberculocidal claim.³

To prevent disease transmission, patient-care items are either single use or sterilized/disinfected. Reusable critical items enter soft tissue, bone, or the bloodstream, such as periodontal scalers and ultrasonic inserts. Critical items must be heat sterilized between patients. Semi-critical items contact mucous membranes or nonintact skin such as dental handpieces, mouth mirrors, and X-ray sensors. Between patients, semi-critical items should be heat sterilized or may be high-level disinfected only if they cannot withstand heat sterilization, or be single-use disposable. Noncritical items only come in contact with intact skin such as X-ray machine tubeheads and blood pressure cuffs.³ Noncritical items should be covered with barriers if possible, or cleaned and disinfected using a low- or intermediate-level disinfectant. Depending on the item, the appropriate level disinfectant should be used. Offices should avoid using cotton gauze presoaked

From *Dimensions of Dental Hygiene*. March 2020;18(3):22–25.
<https://dimensionsofdentalhygiene.com/article/maintaining-%e2%80%a8effective-infection-control-protocol/> (accessed July 3, 2020)

in a disinfectant solution as homemade cleaning wipes because this is not effective for the disinfection of surfaces.⁴

Liquid chemical sterilants and high-level disinfectants have been widely used in dentistry for many years. These germicides are sometimes referred to as “cold sterile.”⁵ The CDC recommends reserving liquid chemical sterilants/high-level disinfectants for items that are semi-critical and neither heat tolerant nor single-use disposable.⁶ As such, few items used in dentistry today actually require the use of a liquid sterilant/high-level disinfectant.⁵ Liquid chemical sterilants require closely following the manufacturer instructions to be effective.^{4,5} Misuse of the product by adding items, agitating the solution, or not adhering to expiration dates of mixed liquids may leave vital microbes. Even under ideal usage conditions, it is not possible to monitor efficacy of the process, which is possible with heat-sterilization biological monitoring.⁴

DEBRIS REMOVAL

Cleaning instruments is required prior to heat sterilization of critical and heat-tolerant semi-critical patient-care items. Commonly, ultrasonic cleaners are used to remove debris from item surfaces that can be immersed into the ultrasonic bath. Different types of ultrasonic cleaner solutions are available, including effervescent tablets, powders, premixed solutions, and concentrates. Manufacturer instructions should be followed to ensure removal of debris prior to packaging patient care items for sterilization.

Over time, ultrasonic cleaner solutions can lose efficacy, especially as they become contaminated with bioburden throughout the day. The solution should be replaced at least daily, when it becomes cloudy or discolored, or more frequently if recommended by the manufacturer. When a new solution is prepared and added to the ultrasonic cleaner, a “degassing” period is recommended by many ultrasonic cleaner manufacturers. Degassing removes the dissolved gases from fresh aqueous solutions by running an empty cleaning cycle. This is important because dissolved gasses within the ultrasonic cleaner solution may interfere with debris removal.⁷ Other options are washer-disinfectors or manual cleaning. Washer-disinfectors must be FDA-cleared, indicating their ability to reduce microbial load and visible debris.^{8,9} Household dishwashers are not FDA-cleared and have not been proven to reduce microbes and visible debris. Due to the risk of percutaneous injury and the potential to leave debris behind, manual cleaning should be reserved only for instruments that cannot withstand automated cleaning.³ Historically, ultrasonic inserts were manually cleaned and not to be immersed in an ultrasonic cleaner; however, this is now the recommended method for cleaning according to major manufacturers.^{8,9}

STERILIZATION

To ensure autoclaves are functioning at conditions needed to effectively sterilize instruments, the CDC recommends the use of biological monitoring at least weekly. Biological monitoring evaluates the sterilization ability of the autoclave directly through the killing of resistant organisms. Both in-office or mail-in laboratory testing are available through dental supply companies. CDC recommendations also include the use of internal chemical indicators within

From *Dimensions of Dental Hygiene*. March 2020;18(3):22–25.
<https://dimensionsofdentalhygiene.com/article/maintaining-%e2%80%a8effective-infection-control-protocol/> (accessed July 3, 2020)

each sterilization package. External chemical indicators are only necessary if the internal indicator cannot be seen through the packaging.^{3,6}

Chemical indicators are available in strips, tapes, tubes, and other test packs, and incorporated into sterilization pouches. Six types of chemical indicators are available that determine whether one or more of the three critical variables involved with sterilization were met: time, temperature, and steam. Chemical indicators do not assure sterility of items, only that the heat and/or time required to reach sterility has been reached and provide an easy visual clue for tracking instruments through reprocessing.^{3,6} However, type 5 (integrating) and type 6 (emulating) chemical indicators determine if the stated values of all three critical variables were met, and thus meet the performance requirements of biological indicators, but are not a substitute for biological monitoring.

Special considerations are recommended for dental handpieces. According to the CDC, “Dental handpieces and associated attachments, including low-speed motors and reusable prophylaxis angles, should be heat sterilized between patients and not high level or surface disinfected.”⁶ The rationale the CDC offers is that the internal surfaces of the handpieces can harbor potentially infectious materials, which can then be spread to other patients through activation of the handpiece due to the airflow through the motor. Many manufacturers offer handpiece bundles with one motor and several changeable nose cones. The changing of the nosecone alone is not enough to reduce the risk of spreading potentially infectious materials; the motor must be heat sterilized.^{3,6}

Rechargeable, cordless, electric handpieces are an alternative to air-driven handpieces. In 2018, the CDC announced that oral health professionals should follow the FDA regulation that requires following manufacturer instructions for reprocessing this type of handpiece.¹⁰ Typically, these handpieces require an FDA-approved barrier; a sterilizable, changeable nosecone or sheath; and disposable prophylaxis angles.

X-ray sensors are heat-intolerant semi-critical items that should be covered using barriers and then cleaned and disinfected with intermediate-level disinfectants between patients. Reusable items, such as sensor holders, should be heat sterilized prior to reuse. When using film opposed to digital radiography, film packets should be dried with a gauze, paper towel, or disinfectant wipe to remove blood and excess saliva prior to being placed in a container.³ This is important prior to transporting the films to the darkroom. When removing the film from the packet, the packet must be opened using gloves without touching the film and dropping the film onto a clean surface. Once all film packets have been opened, the clinician can then remove his or her gloves and process the films with clean hands. This technique is important in preventing disease transmission.

EQUIPMENT MAINTENANCE

In addition to proper disinfection and sterilization of dental items, maintenance of dental equipment should also be considered. Dental unit waterlines consist of long tubing with narrow

From *Dimensions of Dental Hygiene*. March 2020;18(3):22–25.
<https://dimensionsofdentalhygiene.com/article/maintaining-%e2%80%a8effective-infection-control-protocol/> (accessed July 3, 2020)

lumens. This, in combination with the water required for many dental procedures, promotes the development of microbial biofilms within the dental waterlines, which have the potential to transmit bacteria and fungi to the patient.¹¹ Following some high-profile cases of infection due to contaminated dental waterlines, awareness of the potential for infection due to dental waterlines has grown.¹² Fortunately, dental supply companies offer many continuous and intermittent waterline disinfectants. These are available in a variety of types, applications, and price points. To ensure the efficacy of waterline disinfectants, manufacturer instructions must be followed and the waterlines should be tested periodically to ensure that the bacterial load remains equal to or less than what is considered safe for drinking water (500 CFU/mL).^{3,13}

Clinicians should follow dental unit or waterline treatment instructions.¹³ Options for waterline testing include in-office kits and outside testing. To reduce the likelihood of transmission of potentially infectious materials from patient to patient, the CDC and Organization for Safety, Asepsis and Prevention (OSAP) both recommend flushing all dental waterlines for at least 20 seconds to 30 seconds at the beginning of the day, between patients, and at the end of the day.¹³ Both OSAP and the CDC agree that flushing dental waterlines should not be the sole means of maintaining water quality. However, it is important to discharge both air and water from the lines after patient use.^{3,13}

CONCLUSION

Various protocols must be in place in the dental setting to prevent cross contamination of infectious diseases. Using the appropriate disinfectant for the appropriate contact time is necessary in order to effectively reduce microbes present on surfaces. Special considerations are needed for the handling of dental handpieces and X-ray sensors/films. A review of sterilization protocols, including removal of debris prior to the use of autoclaves, is necessary. The use of internal and external indicators and biological monitoring must be used to determine if autoclaves are functioning properly. Lastly, dental waterlines must be disinfected and regularly tested to reduce the likelihood of transmitting infectious diseases from patient to patient. All employees in the dental setting should regularly review infection control protocols in their offices to ensure everyone's safety.

EDUCATE YOUR PATIENTS ABOUT CORONAVIRUS DISEASE 2019

From quarantined cruise ship passengers to questions regarding the world's ability to handle a true pandemic, the coronavirus disease 2019 (COVID-19) is dominating our news cycle. Originating in China's Wuhan City, COVID-19 is transmitted via person-to-person contact.^{1,2} The first case in the United States was reported on January 30, 2020.¹ According to the World Health Organization, coronaviruses are "a large family of viruses that cause[s] illness ranging from the common cold to more severe diseases such as Middle East respiratory syndrome and severe acute respiratory syndrome."² Common signs and symptoms are fever and respiratory problems, including cough, shortness of breath, and trouble breathing.²

From *Dimensions of Dental Hygiene*. March 2020;18(3):22–25.
<https://dimensionsofdentalhygiene.com/article/maintaining-%e2%80%a8effective-infection-control-protocol/> (accessed July 3, 2020)

With the continued spread of the virus into additional countries and a lack of effective treatment, patients may be concerned about the safety of receiving dental care. Oral health professionals can reassure patients by providing a brief overview of their office’s infection control protocol. Monitoring the number of cases in the practice’s state and sharing this information with patients may also help ease dental anxiety, especially if the practice is located in a state with few or no diagnosed cases of COVID-19.¹

Dental practices can serve at the forefront of COVID-19 prevention by screening patients and providing up-to-date information. When confirming appointments, office staff should inquire about any respiratory symptoms and reschedule patients as needed to prevent spreading infection. Patients should also be rescheduled if they present with respiratory symptoms at their dental appointment. Dental hygienists should ask about patients’ recent travel and if they have been in contact with individuals who have visited mainland China or other hot spots for the virus. At-risk patients with respiratory symptoms should be referred immediately to a health care provider. For more information specific to the dental setting, read the American Dental Association’s coronavirus resources at: ada.org/en/practice-management/patients/. Essential information and updates regarding COVID-19 can be found at the US Centers for Disease Control and Prevention’s website: cdc.gov/coronavirus/2019-ncov/index.html.

REFERENCES

1. United States Centers for Disease Control and Prevention. Coronavirus Disease 2019 (COVID-19). Available at: cdc.gov/coronavirus/2019-ncov/index.html. Accessed February 25, 2020.
2. World Health Organization. Coronavirus. Available at: who.int/health-topics/coronavirus. Accessed February 25, 2020.

REFERENCES

1. Kramer A, Schwebke I, Kampf G. How long do nosocomial pathogens persist on inanimate surfaces? A systemic review. *BMC Infect Dis*. 2006;6:130.
2. United States Environmental Protection Agency. Selected EPA-registered disinfectants. Available at: epa.gov/v/pesticide-registration/selected-epa-registered-disinfectants. Accessed February 25, 2020.
3. Kohn WG, Harte JA, Malvitz DM, et al. Guidelines for infection control in dental health-care settings *J Am Dent Assoc*. 2004;135:33–47.
4. US Centers for Disease Control and Prevention. Guideline for disinfection and sterilization in healthcare facilities, 2008. Available at: cdc.gov/infectioncontrol/guidelines/disinfection/index.html. Accessed February 25, 2020.
5. Hunter T. Myth busters for dental assistants: cold sterile-glutaraldehyde. Available at: dentistryiq.com/dental-assisting/workplace-safety/article/16367685/myth-busters-for-dental-assistants-cold-sterileglutaraldehyde. Accessed February 25, 2020.

From *Dimensions of Dental Hygiene*. March 2020;18(3):22–25.
<https://dimensionsofdentalhygiene.com/article/maintaining-%e2%80%a8effective-infection-control-protocol/> (accessed July 3, 2020)

6. US Centers for Disease Control and Prevention. Summary of infection prevention practices in dental settings: basic expectations for safe care. Available at: [cdc.gov/oralhealth/infectioncontrol/pdf/safe-care2.pdf](https://www.cdc.gov/oralhealth/infectioncontrol/pdf/safe-care2.pdf). Accessed February 25, 2020.
7. Eskin DG. Ultrasonic degassing of liquids. In: *Power Ultrasonics*. Gallego-Juarez JA, Graff KF, eds. Sawston, Cambridge, United Kingdom: Woodhead Publishing; 2015.
8. Palenik, CJ. Ultrasonic cleaner checkup time. Available at: dentaleconomics.com/macro-op-ed/article/16392013/ultrasonic-cleaner-checkup-time. April 1, 2007. Accessed February 25, 2020.
9. US Food and Drug Administration. Class II Special Controls Guidance Document: Medical Washers And Medical Washer-Disinfectors; Guidance For The Medical Device Industry And FDA Review Staff. Available at: [fda.gov/regulatory-information/search-fda-guidance-documents/class-ii-special-controls-guidance-document-medical-washers-and-medical-washer-disinfectors-guidance](https://www.fda.gov/regulatory-information/search-fda-guidance-documents/class-ii-special-controls-guidance-document-medical-washers-and-medical-washer-disinfectors-guidance). Accessed February 25, 2020.
10. US Centers for Disease Control and Prevention. Reprocessing Dental Handpieces. Available at: [cdc.gov/oralhealth/infectioncontrol/statement-on-reprocessing-dental-handpieces.htm](https://www.cdc.gov/oralhealth/infectioncontrol/statement-on-reprocessing-dental-handpieces.htm). Accessed February 25, 2020.
11. Mills S. The dental unit waterline controversy: defusing the myths, defining the solutions. *J Am Dent Assoc*. 2000;131:1427–1441.
12. Peralta G, Tobin-D'Angelo M, Parham A, et al. Notes from the field: mycobacterium abscesses infections among patients of a pediatric dentistry practice—Georgia, 2015. *MMWR Morb Mortal Wkly Rep*. 2016;65:355–356.
13. Mills S, Porteous N, Zawada J. Dental unit water quality: organization for safety, asepsis and prevention white paper and recommendations—2018. *Journal of Dental Infection Control and Safety*. 2018;1(1):1–27.

From *Dimensions of Dental Hygiene*. March 2020;18(3):22–25.
<https://dimensionsofdentalhygiene.com/article/maintaining-%e2%80%a8effective-infection-control-protocol/> (accessed July 3, 2020)