In Practice

Dentistry’s Newsletter for Infection Control and Safety

Surface Disinfectants for Dentistry

Tools for selecting and using surface disinfectants in dental settings

Have you ever wondered what the real story is behind the labels on surface disinfectants? Are you unsure of what makes a disinfectant “good” or “safe”? If so, you are not alone. Chemical disinfectants are an important part of dental office infection control, but it can be a challenge to figure out which one is right for the job. While there is no one perfect disinfectant, there are important things to understand about chemical germicides when selecting and using these products.

Selection considerations

Among the factors to consider when selecting a disinfectant for the dental office are:

- Environmental Protection Agency (EPA) registration,
- Ability to inactivate TB, HIV and Hepatitis B,
- Compatibility with equipment, devices and materials the disinfectant contacts,
- Mixing, storage and shelf-life,
- Sensitivity to temperature extremes,
- Suitability for use as a cleaner and a disinfectant,
- Contact time requirements, and
- Health hazards and precautions.

While all of the previously mentioned factors may play a role in product selection, the ability to use the product safely deserves close attention by the dental team.

Safety

Chemicals are responsible for hundreds of thousands of occupational injuries each year in the United States. Understandably, dental personnel are concerned about any chemical that they come into contact with on a regular basis. Fortunately, there is ample information available for dental workers to learn about safety precautions and potential hazards associated with any chemical disinfectant.

The manufacturer’s Material Safety Data Sheet (MSDS) is the best source of information regarding the safe storage, use and disposal of the product. The Occupational Safety and Health Administration (OSHA) requires employers to provide this information to employees before they work with any chemical product. The MSDS explains the type of personal protective equipment (PPE) that is appropriate, the potential health hazards associated with the product and the first aid response needed if an exposure occurs.

The most likely potential routes of hazardous exposure include inhalation, direct contact with skin and mucous membranes and ingestion. Many disinfectants are toxic if ingested or absorbed through the skin.

While all of the previously mentioned factors may play a role in product selection, the ability to use the product safely deserves close attention by the dental team.

Learning Objectives

After reading this article, the reader should be able to:

- Define the desirable characteristics of surface disinfectants.
- Understand the safe use and disposal of chemical disinfectants.
- Understand the advantages and disadvantages of the classes of surface disinfectants.

continued on page 2
Surface Disinfectants for Dentistry

continued from front cover

fectants contain sensitizing chemicals which can result in skin or mucous membrane irritation. Repeated exposure to chemical agents can cause symptoms to worsen. With these factors in mind, using appropriate PPE stands out as a major element in safely handling chemicals. Always wear utility gloves, a mask and protective eyewear at a minimum when mixing, using and discarding chemical disinfectants.

Efficacy

Measures of how well a disinfectant works on environmental surfaces is determined by laboratory testing against selected organisms. Manufacturers submit test data to the EPA to receive registration of the product as an antimicrobial pesticide. The registration is required for any product sold in the U.S. market.

The EPA does not use the traditional Spaulding Classification of low, intermediate and high-level disinfection (see ICIP Vol. 3 No. 3 April 2004 Managing Environmental Surfaces). The EPA registers the disinfectants according to which organisms they inactivate. For hard surface disinfection, the EPA maintains separate lists for products registered as follows:

- Effective against Mycobacterium tuberculosis.
- Effective against Human HIV-1 Virus.
- Effective against Human HIV-1 and Hepatitis B Virus (HBV).
- Effective against Mycobacterium spp, Human HIV-1 and HBV.
- Effective against Hepatitis C Virus (HCV).

The methods of registration and the label claims of some products produce confusion among professionals faced with selecting disinfectants. While HBV, HIV and HCV are important from a disease transmission standpoint in the dental environment, they are relatively easy to destroy using a variety of chemical germicides. A more critical organism is Mycobacterium tuberculosis (M. tuberculosis), typically spread by the airborne route rather than by indirect contact with contaminated surfaces. M. tuberculosis is resistant to many types of disinfectants, making it an excellent benchmark for antimicrobial testing. The Centers for Disease Control and Prevention (CDC) defines intermediate level disinfectants as those having a tuberculocidal claim on their label. The CDC lists EPA-registered hospital disinfectants that lack a tuberculocidal claim as low-level disinfectants.

Because the OSHA Bloodborne Pathogens Rule focuses only on the diseases transmitted by blood or other body fluids containing blood, they do not require that disinfectants have a tuberculocidal claim. Products that inactivate HIV and HBV are acceptable. Nevertheless, CDC recommends intermediate-level tuberculocidal surface disinfectants for clinical contact surfaces contaminated with blood.

-OSAP
Disinfectant: Used on hard inanimate surfaces and objects to destroy or irreversibly inactivate infectious fungi and bacteria but not necessarily their spores. Disinfectant products are divided into two major types: hospital and general use. Hospital type disinfectants are the most critical to infection control and are used on medical and dental instruments, floors, walls, bed linens, toilet seats, and other surfaces. General disinfectants are the major source of products used in households, swimming pools, and water purifiers.


OSHA "...OSHA has reconsidered the limitations in the memorandum of November 1, 1996, and has decided that the policy that requires the use of EPA-registered tuberculocidal disinfectants and/or a diluted bleach solution to decontaminate contaminated work surfaces will be expanded to include EPA-registered disinfectants that are labeled as effective against HIV and HBV, provided such surfaces have not become contaminated with agent(s) or volumes of or concentrations of agent(s) for which higher level disinfection is recommended." Memorandum to regional administrators from Stephen Mallinger, acting director, OSHA Office of Health Enforcement. 2/28/1997

Kathy Eklund, RDH, MHP

OSHA "Ensure that noncritical patient-care items are barrier-protected or cleaned, or if visibly soiled, cleaned and disinfected after each use with an EPA-registered hospital disinfectant. If visibly contaminated with blood, use an EPA-registered hospital disinfectant with a tuberculocidal claim (i.e., intermediate level)."

CDC. Guidelines for Infection Control in Dental Health-Care Settings - 2003 MMWR, December 19, 2003:52(RR-17)

EPA "...OSHA has reconsidered the limitations in the memorandum of November 1, 1996, and has decided that the policy that requires the use of EPA-registered tuberculocidal disinfectants and/or a diluted bleach solution to decontaminate contaminated work surfaces will be expanded to include EPA-registered disinfectants that are labeled as effective against HIV and HBV, provided such surfaces have not become contaminated with agent(s) or volumes of or concentrations of agent(s) for which higher level disinfection is recommended." Memorandum to regional administrators from Stephen Mallinger, acting director, OSHA Office of Health Enforcement. 2/28/1997

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Infection Control and Education
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P. 2, Chris Miller, PhD
Selecting and using disinfectant products for surfaces and items in the dental office does not have to be a difficult task. OSAP offers some guidance for putting it all together.

Tip: copy this page and use it for annual infection control reviews and for training new personnel. Maintain completed copies in your safety manual.

Identify clinical contact surfaces that require management:
- Cart attachments and hoses
- Curing light
- X-ray equipment
- Overhead patient light
- Control knobs on cart and chair
- Handles/knobs on cabinetry
- Armrests and head of chair
- Endodontic microscope
- Laser handpiece and control knobs
- Intraoral camera
- Computer keyboards
- Supply storage area
- Others:

Use impervious barriers or clean and disinfect using a low to intermediate-level disinfectant for these items and surfaces.

Determine the characteristics desired from the chemical disinfectant:
- Compatible with all metals
- Non-staining
- Non-drying to materials such as plastics
- Compatible with impression materials
- Contains a cleaner and a disinfectant
- Easy to use
- Premixed
- Concentrate
- Long shelf life
- Few health hazards listed
- Pleasant smelling
- Short contact time
- Others:

Gather Information:
- Reference the chemical chart in this issue of ICIP
- Contact distributors and manufacturers to request information about specific disinfectants
- Contact dental equipment manufacturers to request information regarding compatibility with disinfectant types

At the completion of the above steps, you should have enough information to make an informed selection of a chemical disinfectant for your dental practice needs. It may be possible that more than one product is appropriate. For example, the disinfectant you select for dental equipment may be different from the one you select for laboratory materials.

Put into practice:
- Review MSDS information
- Dispense in properly labeled containers when using concentrates
- Use proper PPE
- Spray-wipe-spray, or, if using a disinfectant wipe, wipe discard-wipe using a second cloth
- Rotate stock according to expiration date

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Ask OSAP

**Q:** What is the appropriate technique for disinfecting impressions?

**A:** Different materials require different handling techniques. Gently scrub impressions with a camel hair brush (i.e., artists brush, one-half inch bristle) and a liquid detergent to remove debris. Scrubbing gently with dental stone sprinkled into the impression will remove stubborn materials. Always consult the impression material manufacturer or the instructions for use on compatible disinfectants. Spray hydrocolloid and polyether impression materials to saturate then place in a plastic bag or sealed container for the required time. Immerse more stable silicone (vinyl polysiloxane) or rubber-based impression completely for the manufacturer’s required time (usually 3-10 minutes). — OSAP

**Q:** Is it okay to use disinfectant wipes instead of spray disinfectants?

**A:** Disinfectant wipes are an acceptable means of cleaning and disinfecting clinical contact surfaces in the dental operatory. The EPA regulates these products in the same manner as liquid disinfectants. Follow the same protocol as you would for spray disinfectants by first wiping surfaces clean, then applying adequate disinfectant to remain for the time indicated on the product label (usually 3-10 minutes). As a result, the spray-wipe-spray procedure now becomes wipe-discard-wipe using a second cloth. — OSAP

Do you have an inquiry about infection control, occupational health, or practice safety? Ask OSAP. Send your questions to office@OSAP.org
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*Studies by Klein and DeForest suggest that hydrophilic are more resistant than lipophilic viruses and therefore represent a greater risk to surface disinfection. Hydrophilic viruses include various strains of Poliovirus, Coxsackievirus, Rhinovirus and Rotavirus.*
Calendar

To help practices stay on track, OSAP provides this calendar listing typical schedules for periodic maintenance, record-keeping, and infection control activities. This schedule is intended only to serve as a guide. Proper practices, procedures, and maintenance schedules can vary according to the kinds of products used, the practice type, and patient volume. Always follow the device or equipment manufacturer's instructions for maintenance and infection control.

For a monthly dental office calendar you can customize to best meet the needs and schedules in your practice, visit osap.org/calendars/index.htm. (Adobe Acrobat Reader required.)

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1. The government agency that registers the claims of surface disinfectants is:
   a. the CDC  b. the ADA  c. the EPA  d. OSHA

2. The organism that indicates a disinfectant is a broad-spectrum intermediate-level disinfectant is:
   a. M. tuberculosis  b. hepatitis B virus  c. hepatitis C virus  d. human immunodeficiency virus

3. You will find the most comprehensive safety information regarding a product:
   a. on the label  b. on the MSDS  c. from OSAP  d. from the EPA

4. Which of the following is not a clinical contact surface?
   a. walls  c. air/water syringe handle  
   b. hoses on cart attachments  d. sonic scaler handle

5. How many occupational injuries in the U.S. each year are associated with chemicals?
   a. dozens  b. hundreds  c. thousands  d. hundreds of thousands

6. Which of the following is the least likely potential route of hazardous chemical exposure?
   a. inhalation  c. percutaneous exposure  
   b. direct contact  d. ingestion

7. Worsening of a chemical sensitivity may occur when the worker:
   a. uses nonlatex gloves  c. uses wipes instead of sprays  
   b. has repeated exposure  d. uses barriers instead of sprays

8. Disinfectants usually require between _________________ minutes contact time:
   a. 1-5  b. 3-5  c. 3-10  d. 5-20

9. In order to register disinfectants, the EPA relies on information from:
   a. the CDC  b. the MSDS  c. Spaulding’s Classification  
   d. the manufacturer

10. The term for surfaces directly contaminated from patient materials is:
    a. housekeeping surfaces  b. clinical contact surfaces  c. biohazard surfaces  
    d. high risk surfaces

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Understanding why and when to monitor the water quality of dental units, and identifying who will perform monitoring procedures are important considerations for a successful water management program.

Why? The purpose of monitoring is not to verify the effectiveness of FDA-cleared devices or solutions, but rather to show that water treatment procedures are being performed properly. Early identification of technique errors can help ensure consistent delivery of safe water for dental treatment. Since water from untreated dental units almost always has bacterial counts that are higher than are permitted in drinking water, there is little reason to monitor untreated systems.

When? Target the last day of the work week. Monitoring can be done either in the clinic using commercially available self contained water test kits or by a laboratory that specializes in dental waterline testing. In either case, the test samples must incubate for several days to produce readable counts. If the samples are taken on the last day of the work week, they can incubate over the weekend when the units are not in use. If colony counts exceed recommended standards on Monday morning, the unit can be re-treated before patients are seen. By using the weekend days as a "buffer" you can reduce the risk of treating patients with poor quality water.

Who? To get the best results, assign water treatment and monitoring duties to specific staff members. The office safety or infection control coordinator should oversee the water monitoring program and record the results along with spore tests in a logbook. Involving the staff in water monitoring procedures and allowing them to see the actual test results (especially with in-office tests) provides an excellent way to help build staff buy-in to the importance of dental water maintenance procedures.