

Disinfection

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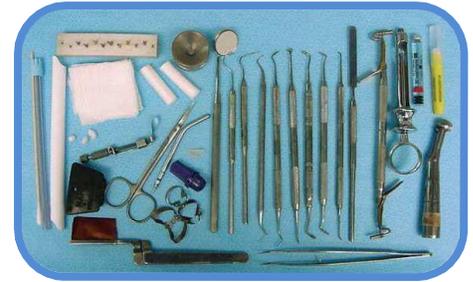
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Avoiding Cross Contamination of Dental Supplies (11/11)

Question: Do you have any suggestions for avoiding cross contamination of dental supplies?

Answer: Because many dental materials are packaged in multidose containers, bottles, or tubes, dental health-care personnel (DHCP) need to avoid cross-contaminating these supplies when handling them during patient treatment. It is preferable to unit dose materials and supplies, that is dispense small amounts sufficient for care of one patient before treatment begins. Whatever is not used with the patient is discarded. Dental manufacturers are aware of the potential for cross contamination and many companies now offer unit-dose packages of their product. Whenever



possible, apply unit-dose practices because this limits contamination and time-consuming cleaning and disinfection procedures. If unit-dosing techniques are not used, the item should be covered with a barrier to avoid contamination. If a barrier is not used, the item must be cleaned and disinfected between patients if it becomes contaminated.

Whenever retrieving an item for patient-care during treatment, aseptic technique must be practiced. DHCP should use a sterile instrument (e.g., cotton pliers, forceps) when retrieving

an item for use to avoid contamination of unused items in the container or drawer.

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Tuberculocidal Claim (10/11)

Question: Since tuberculosis (TB) isn't transmitted via contaminated environmental surfaces, why is it important for a disinfectant to be tuberculocidal?

Answer: Many times there is confusion regarding the claim for tuberculocidal activity for disinfectants. You are correct that TB is not transmitted via environmental surfaces but rather by the airborne route. Potency against *Mycobacterium tuberculosis* has been recognized as a substantial benchmark to measure germicidal potency. Accordingly, use of such products on environmental surfaces plays no role in preventing the spread of tuberculosis. However, because mycobacteria have among the highest intrinsic levels of resistance among the vegetative bacteria, viruses, and fungi, any germicide with a



tuberculocidal claim on the label is considered capable of inactivating a broad spectrum of pathogens, including such less-resistant organisms as bloodborne pathogens (e.g., hepatitis B virus, hepatitis C virus, and HIV). It is this broad-spectrum capability, rather than the product's specific potency against mycobacteria, that is the basis for protocols and regulations dictating use of tuberculocidal chemicals for environmental surface disinfection.

Reference

CDC. Guidelines for infection control in dental health-care settings - 2003. MMWR 2003; 52(No. RR-17).

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Cleaning & Disinfecting Toys in the Dental Clinic (8/10)

Question: Are children's toys allowed in our dental clinic waiting rooms? If they are allowed, are we required to clean and disinfect them?

Answer: Because shared toys may become a means of transmitting respiratory viruses or pathogenic bacteria, the Centers for Disease Control and Prevention (CDC) offers infection control guidance to facilities that have waiting areas with children's toys. The CDC recommends establishing policies and procedures for cleaning toys at regular intervals. The CDC provides the following guidance which may be helpful as you develop policy in your facility.



- ☑ Select play toys that can be easily cleaned and disinfected.
- ☑ Do not permit use of stuffed furry toys if they will be shared.
- ☑ Clean and disinfect large stationary toys (e.g., climbing equipment) at least weekly and whenever visibly soiled.
- ☑ If toys are likely to be mouthed, rinse with water after disinfection; alternatively wash in a dishwasher.
- ☑ When a toy requires cleaning and disinfection, do so immediately or store in a designated labeled container separate from toys that are clean and ready for use.

Reference

Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee. Guideline for isolation precautions: preventing transmission of infectious agents in healthcare settings, 2007: 82. Available at www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html. Accessed September 2010.

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MTF List of Approved Disinfectants (7/09)

Question: We want to switch to a new disinfectant; however I cannot locate the medical treatment facility (MTF) list of approved products to check if the product is acceptable. Do you know where I could find the list? I've also heard that if the product is not on the approved product list, we can't use it; is this true?

Answer: The MTF list of approved disinfectants is usually located in the MTF Infection Control Instruction or as an attachment to the Infection Control Annual Plan. If the product you've chosen is not on the list it does not mean it is not acceptable for use. You'll have to obtain approval through your local infection control committee/review function before purchase and use. If this is necessary, I would recommend having as much of the product information available as possible when you present your request. Keep in mind that minimal requirements for disinfectants used in USAF dental facilities include that the product must be:

- registered with the Environmental Protection Agency (EPA),
- hospital-grade (i.e., kills three specific organisms: *Staphylococcus aureus*, *Salmonella enterica* [formerly *Salmonella choleraesuis*], *Pseudomonas aeruginosa*), and
- intermediate-level (i.e., have tuberculocidal activity).

When meeting with the MTF infection control officer or committee to discuss your request it may be helpful to have the following information available: EPA-registration number, a list of active ingredients,



recommended contact times, directions for use, storage and disposal information, and any other safety information (most manufacturers provide the product MSDS on their Web site).

References

- Air Force Instruction 44-108, Infection Control Program.
- USAF Guidelines for Infection Prevention & Control in Dentistry.

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Washing Utility Gloves (10/08)

Question: Can I wash my utility gloves?

Answer: Unlike gloves used during patient-care activities, utility gloves are not regulated by the Food and Drug Administration (FDA) and can be washed or disinfected for reuse. Utility gloves should be routinely inspected and replaced if tears, cracks or other signs of deterioration occur.



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Computer Equipment in the Dental Operatory (8/05)

Question: Are there special considerations for cleaning and disinfecting computer equipment in the dental operatory? Does DECS know of any computer equipment that is waterproof?

Answer: Computers present unique infection-control challenges. Studies have shown that computer equipment can serve as a potential reservoir for infectious agents. A computer keyboard and the mouse are



excellent examples of difficult, if not impossible, items to clean. The best results with the least damage to the equipment are obtained by following manufacturer's directions, however most computer companies only provide basic cleaning instructions for their computer hardware and do not offer instructions for disinfection in health-care settings. Avoiding



contamination is important because many items cannot be properly cleaned and disinfected or sterilized. Good hand-hygiene is important. Before touching any office equipment, ensure your hands are clean, and if wearing gloves select a powder-free brand. The basic principles of cleaning and disinfection used routinely in the dental operatory also apply to computer equipment. Therefore computer equipment that can tolerate the use of liquid disinfectant products may be preferable and easier to maintain. If the cleaning and disinfecting products used in the dental clinic are not compatible with the computer equipment, the computer equipment should be covered with a plastic barrier when contamination is likely. Like any barrier used during patient care, it should be changed between patients. If a reusable form-fitted barrier is used, it should be cleaned and disinfected between patients. Listed below is a brief list of infection-control related items for computer equipment and the companies that manufacture or sell them.

Keyboard Covers

Product	Company	Contact Information
Flexshield Keyboard Protection Skins	Hooleon	(800) 937-1337 www.hooleon.com/index.htm
Large QUIKcaps	Practicon Dental	(800) 959-9505 www.practicon.com
Seal'nType	Kador Ltd.	(800) 878-6720 www.kador.com/comp.htm
Viziflex Keyboard Seels	Viziflex	(800) 627-7752 www.viziflex.com

Liquidproof/Waterproof Keyboard

Product	Company	Contact Information
SlimKey MD	IKEY	(800) 866-6506 www.ikey.com
Washable Keyboards	Unotron	(972) 438-8900 www.unotron.com/
Water Resistant Keyboards	Man & Machine Medical Products	(301) 341-4900 www.man-machine.com
Flexible Dental Keyboard and Mouse™	Hayes Handpiece – Greater Long Island Repair Center	(516) 650-1443 http://www.hayesgli.com

Liquidproof/Waterproof Mouse

Product	Company	Contact Information
AquaPoint™ Optical Mouse.	IKEY	(800) 866-6506 www.ikey.com
Mighty Mouse	Man & Machine Medical Products	(301) 341-4900 www.man-machine.com

Note: The listing or omission of a product does not imply endorsement, approval, or disapproval by DECS.

Selected References

- Hartmann B, Benson M, Junger A, Quinzio L, Rohrig R, Fengler B, et al. Computer keyboard and mouse as reservoir of pathogens in an intensive care unit. *J Clin Monit Comput* 2004;18:7–12.
- Hassoun A, Vellozzi EM, Smith MA. Colonization of personal digital assistants carried by health care professionals. *Infect Control Hosp Epidemiol* 2004;25:1000–1001.
- Ivey JC, Oomen B, Forstall G. Fungal contamination related to personal computer devices installed in a hospital intensive care unit. *Am Soc Microbiol Abstrs* 2001;L1:469.
- Man GS, Olapaju M, Chadwick MV, Vuddamalay P, Hall AV, Edwards A, et al. Bacterial contamination of ward-based computer terminals. *J Hosp Infect* 2002;52:314–315.
- Neely AN, Maley MP, Warden GD. Computer keyboards as reservoirs for *Acinetobacter baumannii* in a burn hospital. *Clin Infect Dis* 1999;29:1358–1360.
- Neely AN, Weber JM, Daviau P, MacGregor A, Miranda C, Nell M, Bush P, Lighter D. Computer equipment used in patient care within a multihospital system: Recommendations for cleaning and disinfection. *Am J Infect Control* 2005;33:233–237.
- Schultz M, Gill J, Zubairi S, Huber R, Gordin F. Bacterial contamination of computer keyboards in a teaching hospital. *Infect Control Hosp Epidemiol* 2003;24:302–303.

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Disinfecting with Liquids or Wipes (4/11) **UPDATED** (3/14)

Question: Our clinic is considering switching over to disinfectant wipes to decrease the amount of chemicals sprayed into the air. Is this a good idea, and if so, how do we go about choosing one?

Answer: “Overspraying” chemical disinfectants in the dental operatory can compromise the integrity of equipment, discolor surfaces, and has reportedly caused clinical symptoms such as respiratory problems, allergies, eye and skin irritation, and headaches. Using pump dispensers vs. aerosol sprays can decrease the amount of chemicals sprayed in the environment. Also, holding a paper towel behind the surface, when spraying the disinfectant, can reduce the excess spray. If used correctly, disposable disinfectant wipes are an effective choice for environmental asepsis in health-care settings. Because disinfectant wipes are presaturated with chemical cleaners and antimicrobial agents they decrease the amount of chemicals sprayed in the environment. Most of the currently available disinfectant wipes contain a range of isopropanol concentrations in addition to other chemical agents which function primarily as surface cleaners. Just as when using a liquid disinfectant, the surface must be cleaned first and then disinfected. Therefore, to be effective it’s necessary to use two cloths—one for cleaning and another for disinfecting the surface. While these disinfectant cloths may be a more convenient alternative to spraying chemicals to clean and disinfect surfaces, **the user is ultimately responsible for ensuring that the product is used correctly**



and meets all of the requirements of a traditional liquid spray disinfectant. In USAF dental clinics, use environmental surface disinfectants that are:

- registered with the Environmental Protection Agency (EPA),
- hospital-grade (i.e., kills three specific organisms: *Staphylococcus aureus*, *Salmonella enterica* [formerly *Salmonella choleraesuis*], *Pseudomonas aeruginosa*), and
- intermediate-level (i.e., have tuberculocidal activity).

SELECT INTERMEDIATE-LEVEL (TUBERCULOCIDAL) SURFACE DISINFECTANT WIPES¹

Always follow manufacturer instructions regarding use, specifically contact time. Contact times vary with different brands and for different microbes; it is recommended to use the **longest contact time** on the label for disinfection.

Note: The contact times are current as of 3/2014; users should refer to the product label for the most current instructions. Contact times are listed for comparison purposes and are subject to change.

Product Category	Examples of Active Ingredients	Product Example Brand name (Company)	Tuberculocidal Contact Time (minutes)	Longest Recommended Contact Time (minutes)	Contact Information
Chlorines	Sodium hypochlorite, with added surfactants	Clorox Healthcare® Bleach Germicidal Wipes (Bosworth Company)	3	3	www.bosworth.com (800) 323-4352
Phenolics	Alcohol- or water-based and multiple phenolic compounds	Birex® Disinfectant Wipes (Biotrol)	10	10	www.biotrol.com (800) 822-8550
		ProSpray™ Wipes (Certol International, LLC)	10	10	www.certol.com (800) 843-3343
Alcohol-Based Quaternary Ammonium Compounds²	Alcohol and multiple quaternary ammonium compounds	CaviWipes® (Metrex)	3	3	www.metrex.com (800) 841-1428
		CaviWipes1™ (Metrex)	1	1	www.metrex.com (800) 841-1428
		Sani-Cloth® AF3 Germicidal Disposable Wipe (PDI)	3	3	www.pdipdi.com (800) 999-6423
		Super Sani-Cloth® Germicidal Disposable Wipe (Professional Disposables, Inc.)	1	2	www.pdipdi.com (800) 999-6423
		Sani-Cloth® Plus Germicidal Disposable Wipe (PDI)	5	5	www.pdipdi.com (800) 999-6423
		Sanitex Plus Wipes™ (Crosstex International)	5	5	www.crosstex.com (888) 276-7783
Others/Misc	Accelerated hydrogen peroxide	OPTIM® 33TB Wipe (SciCan)	5	5	www.scican.com (800) 572-1211
		Clorox® Hydrogen Peroxide Cleaner Wipes (Bosworth Company)	5	5	www.bosworth.com (800) 323-4352
		CleanCide Wipes (Wexford Labs)	5	10	www.wexfordlabs.com (800) 506-1146
	Sodium bromide and chorine	MicroStat 2™ (Septodont, Inc)	5	5	www.septodontusa.com (800) 872-8305

The listing or omission of a product in this table does not imply endorsement, approval, or disapproval by DECS. The product examples listed are not intended to be all-inclusive or represent recommendations by the USAF.

¹ Disposable wipe/cloth presaturated with disinfectant

² All alcohol-free quaternary ammonium compounds (quats) are categorized as low-level disinfectants and do not have tuberculocidal activity.

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Cleaning Dental Anesthetic Cartridges Before Surgical Procedures (5/04)

Question: Can local anesthetic cartridges be heat sterilized before use during a surgical procedure?

Answer: The contents of a local anesthetic cartridge are sterile; the exterior surface of the cartridge is not. Therefore, anesthetic cartridges should be stored in a manner that prevents cross contamination and handled aseptically before any dental procedure. Although one study indicated that heat sterilizing the cartridges did not affect the cartridge contents,¹ manufacturers do not recommend heat sterilizing anesthetic cartridges because the high temperatures can affect the cartridge contents (e.g., breakdown of the vasoconstrictor) and can cause cartridge failure (e.g., extruded plunger). While it is not recommended to soak the cartridges in a disinfectant solution prior to use, most manufacturers agree that it is acceptable to use an alcohol wipe to clean the anesthetic cartridge prior to placing the cartridge on the surgical tray. If contamination is suspected, the cartridge should be discarded immediately.



References

1. Kelly JR, Dalm GW. Stability of epinephrine in dental anesthetic solutions: implications for autoclave sterilization and elevated temperature storage. *Mil Med* 1985;150:112-114.

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The Importance of Chemical Disinfectants in Infection Control (Updated September 2004)

Question: What role do chemical disinfectants play in an infection control program? Should we brief the staff about disinfectants? What features are important?

Answer: Chemical disinfectants are an essential part of an infection control program. When used properly, disinfectants can help control the environment and make the dental clinic a much safer place for patients and dental health-care personnel (DHCP). In many clinics, very little emphasis is placed on the proper selection and application of chemical disinfectants. It is important to establish a system that aids workers in using chemicals wisely. The goal should be to ensure all staff members understand the types of chemicals used and how to properly use them.

It is important to stress the difference between **cleaners** that remove soil but do not kill microbes, and **disinfectants**, which are designed to kill some microorganisms. Many clinics choose agents that are both cleaners and disinfectants. This saves resources and time. Dental clinics must make the correct choice when selecting chemical disinfectants.

Employees should understand that not all disinfectants are of equal strength. Disinfectants are generally grouped into three categories: low level, intermediate level, and high level. Dental clinics need to select the appropriate strength disinfectant for the job. Low- and intermediate- level disinfectants are used to disinfect environmental surfaces. High-level disinfectants are used to disinfect heat-sensitive semicritical items.

At each of these levels there are several different chemical types from which to choose. Factors influencing selection include application, item compatibility, and contact time. Every worker should be provided with basic information about the types of chemical disinfectants used in their clinic. Training should include information about the strength and limits of each disinfectant and its proper use.

Chemical compatibility with the item to be disinfected is a major consideration in selection. It is important to remember that some disinfectants can have a very detrimental effect on specific materials, resulting in immediate damage or long-term effects that can shorten the life of an item.

Proper disinfection begins with selecting the right product, but it must also be applied correctly. Often, failures encountered with disinfectants are related to human error. To avoid problems, **read the label first and then follow the instructions exactly**. The label will provide information about the product's ability to kill specific microbes and give guidelines for proper application.

Failure to follow these instructions may result in failure to achieve the desired results. Also, disinfectants must be used in the right concentration for efficacy, meaning they must be measured exactly. If the concentrate is too diluted, it may not be adequate to do the job. Another problem with improper measurement is using too much. Solutions that are too strong will tend to be less effective as well. Using more chemicals than are needed also results in increased exposure to personnel and increased operating costs for the clinic.

Along with selecting the proper disinfectant and mixing it correctly, all staff members should ensure that items to be disinfected have been properly prepared. Disinfectants must come in direct contact with all surfaces to work completely. Once a disinfectant has been applied correctly, it must remain in contact for the labeled contact time. Again, remember that successful use depends on the user. The chemicals will only do what the label claims and are unable to compensate for human error. **Success is based on proper preparation, precise dilution, correct application, and adequate exposure time.**

Misuse of disinfectants leads to a false sense of security. Improperly-processed items may look clean and safe which lull the user into thinking all is well. When this happens, the risk of cross-contamination is increased, and unsuspecting DHCP or patients may come into contact with these items. Inadequate disinfection processes lead to failure of the clinic infection control system. Prevention requires that all personnel understand their role in chemical disinfection.

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70.5% Ethyl Alcohol Solutions as Surface Disinfectants (Originally published in the May 2001 issue of InCONTROL)

Question: Our clinic is contemplating purchasing a new surface disinfectant because it is cheaper than what we are presently using. The product we want to buy is a 70.5% ethyl alcohol solution. Would you recommend our clinic purchase this product?

Answer: No, alcohols generally do not make suitable surface disinfectants because they are ineffective in the presence of tissue proteins such as those found in blood and saliva. Also, alcohols are poor cleaners and evaporate rapidly, decreasing disinfection activity.

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Factors to Consider in Selecting a Surface Disinfectant (7/08)
(Originally published in the Jan 2001 issue of InControl)

Question: Our clinic is considering purchasing a new environmental surface disinfectant for our dental operatories. What criteria should we use for selection?

Answer: The choice of specific cleaning or disinfecting agents is largely a matter of judgment, guided by product label claims and instructions and government regulations. A single product might not satisfy all disinfection requirements in a given dental facility. Use of disinfectant products depends on consideration of multiple factors, including the degree of microbial killing required; the nature and composition of the surface, item, or device to be treated; and the cost, safety, and ease of use of the available agents.



In USAF dental clinics, environmental surface disinfectants must be

1. registered with the Environmental Protection Agency (EPA),
2. hospital-grade (i.e., kills three specific organisms: *Staphylococcus aureus*, *Salmonella enterica* [formerly *Salmonella choleraesuis*], *Pseudomonas aeruginosa*), and
3. intermediate-level (i.e., have tuberculocidal activity).

Many times there is confusion regarding the claim for tuberculocidal activity. Many people wonder why it is important for a disinfectant to be tuberculocidal. The reason is that *Mycobacterium tuberculosis* is the

most difficult microorganism to destroy (next to spore-producing microbes) because of its waxy outer cell wall. If you can kill *M. tuberculosis* in a certain amount of time, you have also destroyed HIV, Hepatitis B/C and all other microorganisms, except spore-producers. As a reminder, the tuberculocidal claim is used only as a benchmark to measure germicidal potency. Tuberculosis is not transmitted via environmental surfaces but rather by the airborne route. Accordingly, use of such products on environmental surfaces plays no role in preventing the spread of tuberculosis.

Chemical compatibility with the item to be disinfected is a major consideration in selection. It is important to remember that some disinfectants can have a very detrimental effect on specific materials, resulting in immediate damage or long-term effects that can shorten the life of an item. Dental device and equipment manufacturers should provide information regarding material compatibility with liquid chemical germicides, whether equipment can be safely immersed for cleaning, and how it should be decontaminated if servicing is required.

Disposal issues should also be considered. In some locations, there may be restrictions on the use of phenolic or chlorine-based disinfectants. It is also important to consider shelf life (i.e., how long the disinfectant is effective in the unopened container) and use-life (i.e., how long it is effective after opening or mixing) when evaluating the cost-effectiveness of the disinfectant. Issues regarding disposal are more likely to be a problem if significant quantities of the solution must be routinely disposed of due to expiration dating.

Also, don't forget to check the Medical Treatment Facility (MTF) list of approved disinfectants (usually located in the MTF Infection Control Instruction or as an attachment to the Infection Control Annual Plan). If the product you've chosen is not on the list, you'll have to obtain approval through the local infection control committee/review function before purchase and use.

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The Best Way to Disinfect a Dental Chair (Originally published in the Jan 2001 issue of InCONTROL)

Question: What are the recommendations for disinfecting dental chairs?

Answer: My first choice would be to barrier protect the chair. If that is not possible, I would follow the chair manufacturer's recommendations for disinfection. After the proper contact time with the disinfectant, I would recommend rinsing and drying the chair. This should help reduce staining and cracking of the upholstery. The chair (except perhaps for control buttons and the headrest) is not considered a high risk for cross contamination and does not require disinfection between patients unless visibly soiled.

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Regulating Chemical Germicides (Updated September 2004)

Question: Who is responsible for regulating chemical germicides?

Answer: The Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA) share the regulatory responsibility. Recently the FDA and EPA signed a memorandum of understanding to clarify each organization's authority. General-purpose disinfectants (low/intermediate level) will be regulated by the EPA and will eventually be exempt from 510 (k) requirements. The FDA will regulate high-level disinfectants and chemical sterilants.

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The Proper Way to Disinfect an Environmental Surface (Originally published in the May 2002 issue of InCONTROL) (UPDATED May 2012)

Question: What is the proper way to disinfect an environmental surface?

Answer: Disinfection consists of three steps.

1. Donning utility gloves, mask, protective eyewear, and protective clothing to guard against chemical exposure during cleaning and disinfection.

2. Cleaning the surfaces with a cleaning agent by vigorously wiping the contaminated surfaces with paper towels.

3. Disinfecting the precleaned surface by applying the disinfectant over the entire precleaned surface. Allow the surface to remain moist for the contact time recommended by the manufacturer. If the surface is still wet when patient treatment is to begin, wipe the surface dry with clean towels. If the surface will contact the patient's skin, rinse the residual disinfectant with water.

If used correctly, disposable cloth or paper disinfectant wipes are an effective choice for environmental asepsis in health-care settings and because cloth or paper disinfectant wipes are presaturated with chemical cleaners and antimicrobial agents, they decrease the amount of chemicals sprayed in the environment. Just as when using a liquid disinfectant, the surface must be cleaned first and then disinfected. Therefore, to be effective it's necessary to use two cloths—one for cleaning and another for disinfecting the surface. The disinfectant wipes need to be an EPA-registered hospital-grade disinfectant having at least intermediate-level (i.e., tuberculocidal claim) activity.

Most infection control experts agree that using a single product that is formulated to both clean and disinfect environmental surfaces can improve clinic turn-around time and reduce cost.

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Detergent Options for the Miele G7781 Dental Thermal Disinfector (Originally published in May 2002)

Question: I'm confused about what detergents and rinses need to be used with the Miele Instrument Washer. Can you explain it, and are there alternatives to using the Miele company's detergents?

Answer: Many Air Force dental clinics use the Miele G7781 thermal disinfector for cleaning and disinfecting contaminated instruments prior to sterilization. Deciding on the type of detergent and how to use it with the unit can be confusing. This article will explain the use of Miele brand detergents as well as a third-party option. Depending on what detergent is used, the Miele may use up to three chemicals per wash cycle: the detergent, a neutralizing rinse, and a final rinse aid.

Wash Cycle Summary

1. Detergent:

Either an alkaline or a neutral detergent can be used. Alkaline detergents are reported to be more efficacious than neutral detergents for removing protein, fats, and oils, but alkaline detergents can damage anodized aluminum instruments and cassettes. Previous testing by DIS (see DIS 47-39) showed that Getinge/Castle's Neutrawash detergent (pH 7) cleaned as well as Miele's alkaline wash (pH 11.4 - 11.9) and acid rinse combination, and the cost was considerably less.

Detergents are available in either powder or liquid form.

Powder detergent option With this type of detergent, the powder is placed inside the unit each time a cycle is run. It is placed into a dispensing unit with a lid, which is located inside the Miele washer. This is similar to adding powder detergent to a home dishwasher.

Liquid detergent option Use of liquid detergents avoids the extra step of adding powder to each cycle because the liquid detergent is dispensed automatically by the Miele. Use of a liquid detergent requires purchasing an accessory, the DOS Module C60 (approximately \$550). This is a small "control box" that regulates the automatic dispensing of liquid detergent into the washer. The DOS Module and detergent container sit outside of the washer. An optional cabinet (Miele model G7796, \$1500) is available for storing them. It matches the Miele washer and can be placed immediately beside it. One storage cabinet can hold DOS Modules and detergent containers for two Miele washers.

2. Neutralizing Rinse:

If the detergent used is strongly alkaline, it must be followed by an acidic neutralizing rinse to neutralize the alkalinity. This acid neutralizer is always a liquid. The container for the neutralizer resides outside of the washer, and tubing runs between the washer and the detergent container. An automatic dispensing pump for the neutralizing rinse is incorporated into the washer as standard equipment. The container for the liquid neutralizing agent can be placed inside the optional G7796 storage cabinet mentioned above.

3. Final Rinse:

A "rinse aid" solution may be added in the final rinse cycle. This solution is automatically dispensed from a container located in the door of the washer. The rinse aid helps break down surface tension for faster drying and helps minimize residual spots and films.

CHOICES

Wash cycle comparisons and product comparisons are shown in the tables below. Note that the most economical detergent solution may be to use Castle's Neutrawash. If inadequate cleaning of protein debris is a problem, switching to Castle's Tec Wash III may help.

Company contact information:

Miele Appliances, Inc.

9 Independence Way
Princeton, NJ 08540
(800) 843-7231
(609) 419-9898
(609) 419-4298 FAX
www.miele.com
e-mail: products@mieleusa.com

Getinge/Castle, Inc.

1777 E. Henrietta Road
Rochester, NY 14623-3133
(800) 394-4638
(585) 475-1400
(585) 272-5033 FAX
www.getinge.com/us-ca
e-mail: info@getingeusa.com

Government facilities, contact Getinge/Castle at:

P.O. Box 9766
Arnold, MD 21012
(585) 475-1400
(585) 272-5033 FAX
e-mail: gov@getinge.com

Comparisons of Wash Cycles

	Detergent	Neutralizer	Final Rinse
Option 1	Miele neodisher FA (liquid, pH 11.4 to 11.9)	Miele neodisher N (liquid, pH 2.1 to 2.4)	Miele neodisher Mielclear
Option 2	Miele neodisher MA (powder, pH 11.2 to 12.0)	Miele neodisher N (liquid, pH 2.1 to 2.4)	Miele neodisher Mielclear
Option 3	Castle Neutrawash (liquid, pH 7)	None	None (Neutrawash contains a rinsing agent)
Option 4	Castle Tec Wash III (liquid, pH 11*)	None	Castle Tec Rinse
Option 5	Castle Tec Wash Powder (powder, pH 11*)	None	Castle Tec Rinse
Option 6	Castle Alkaline Detergent (liquid, pH 13)	Castle Acid Detergent (acidic liquid, pH 2.6)	None

*Note: Castle claims that Tec Wash III liquid and Tech Wash powder, while somewhat alkaline, will not harm aluminum and do not require the use of a neutralizing acid rinse.

Product Comparisons

Product	Liquid or Powder	pH at Use Dilution	Quantity	Company Part Number	Govt cost	Govt cost (per fl oz)
Miele neodisher FA	liquid	11.4 - 11.9	5 ltr	2141679	\$75	44¢
Miele neodisher MA	powder	11.2 - 12.0	10 kg	2141687	\$125	35¢ (oz)
Miele neodisher N	liquid	2.1 - 2.4	5 ltr	2141703	\$75	44¢
Miele neodisher Mielclear	liquid	3.2 - 3.8	1 ltr	2141695	\$30	89¢
Castle Neutrawash	liquid	7	1 gal	61301600009	\$9	7¢

USAF Dental Evaluation & Consultation Service

			5 gal 15 gal	61301600010 61301600011	\$43 \$124	7¢ 6¢
Castle Tec Wash III	liquid	11	1 gal 5 gal 15 gal 30 gal 55 gal	61301668309 61301667776 61301667777 61301600844 61301600845	\$12 \$57 \$161 \$321 \$569	9¢ 9¢ 8¢ 8¢ 8¢
Castle Tec Wash Powder	powder	11	25 lb	61301647025	\$30	8¢ (oz)
Castle Alkaline Detergent	liquid	13	1 gal 5 gal 15 gal 30 gal 55 gal	61301602539 61301600040 61301600041 61301602228 61301601081	\$12 \$54 \$151 \$294 \$504	9¢ 8¢ 8¢ 8¢ 7¢
Castle Acid Detergent	liquid	2.6	1 gal 5 gal 15 gal 30 gal 55 gal	61301602540 61301600042 61301600043 61301602229 61301601082	\$14 \$65 \$189 \$380 \$656	11¢ 10¢ 10¢ 10¢ 9¢
Castle Tec Rinse	liquid	3.4	1 gal 5 gal 15 gal 30 gal 55 gal	61301600842 61301664156 61301664157 61301601299 61301603797	\$19 \$86 \$248 \$486 \$967	15¢ 13¢ 13¢ 13¢ 14¢

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