



Infection Control and Digital Radiography

Introduction

Digital radiographic equipment and the associated supporting devices such as the computer, keyboard, mouse, and printer present unique infection-control challenges. Managing these devices and equipment is dependent upon the location of the items and how they will be used. For example, equipment placed in the treatment area will be managed differently than that which is placed outside of the treatment area and devices that are used intraorally will be managed differently than those which only contact intact skin of the patient or uncontaminated hands of dental health-care personnel (DHCP). When using these devices and equipment in patient treatment areas, avoiding contamination is important because many of these items cannot be properly cleaned and disinfected or sterilized. This fact sheet describes recommended infection-control practices for digital radiography sensors and imaging plates and supporting computer equipment.



Questions to ask before purchasing equipment for use in the dental operatory:

- Can it be adequately decontaminated?
- Can it be cleaned with soap and water?
- Do you have to disassemble it before cleaning?
- Is there more than one approach to decontamination?
- Will the approach you choose affect the life of the equipment?
- Can it be heat sterilized?
- Will barrier covers interfere with its function?

Key Terms

Barrier material: material that prevents the penetration of microorganisms, particulates, and fluids. Barrier choices range from inexpensive plastic food wrap to commercially available custom-made covers.

Cleaning: the removal of visible soil, organic, and inorganic contamination from a device or surface.

Clinical contact surface: a surface contaminated from patient materials either by direct spray or spatter generated during dental procedures or by contact with dental health-care personnel's (DHCP) gloved hands. These surfaces can subsequently contaminate other instruments, devices, hands, or gloves. Examples of such surfaces include: light handles, switches, dental radiograph equipment, dental chairside computers, reusable containers of dental materials, drawer handles, faucet handles, countertops, pens, telephones, and doorknobs.

Disinfectant: a chemical agent used on inanimate (i.e., nonliving) objects (e.g., floors, walls, sinks) to destroy virtually all recognized pathogenic microorganisms, but not necessarily all microbial forms (e.g., bacterial endospores).

Disinfection: the destruction of pathogenic and other kinds of microorganisms by physical or chemical means. Disinfection is less lethal than sterilization, because it destroys most recognized pathogenic microorganisms, but not necessarily all microbial forms, such as bacterial spores. Disinfection does not

ensure the margin of safety associated with sterilization processes.

High-level disinfection: a disinfection process that inactivates vegetative bacteria, mycobacteria, fungi, and viruses but not necessarily high numbers of bacterial spores. The Food and Drug Administration (FDA) further defines a high-level disinfectant as a sterilant used under the same contact conditions except for a shorter contact time.

Intermediate-level disinfection: a disinfection process that inactivates vegetative bacteria, most fungi, mycobacteria, and most viruses but not bacterial spores. An intermediate-level disinfectant is a liquid chemical germicide with an Environmental Protection Agency (EPA) registration number as hospital disinfectant and with a label claim of potency as a tuberculocidal.

Noncritical: the category that describes medical items or surfaces that carry the least risk of disease transmission. This category has been expanded to include not only noncritical medical devices but also environmental surfaces. Noncritical medical devices (e.g., blood pressure cuff) touch only unbroken (intact) skin. Noncritical environmental surfaces can be further divided into clinical contact surfaces (e.g., light handle) and housekeeping surfaces (e.g., floors).

Semicritical: the category that describes medical devices or instruments (e.g., mouth mirror) that come into contact with mucous membranes and do not ordinarily penetrate body surfaces.

Managing Devices and Equipment Used in the Patient's Mouth but Will Not Penetrate Soft Tissue or Tooth Structure (i.e., Semicritical Items)

Digital Radiography Sensors/Imaging Plates

General Considerations

- Digital radiography sensors/imaging plates come into contact with mucous membranes and are considered semicritical devices. Ideally, therefore they should be cleaned and heat-sterilized or high-level disinfected between patients.

- **At this time, however, the sensors/plates cannot withstand heat sterilization or complete immersion in a high-level disinfectant.** Therefore, these devices should, at a minimum, be barrier protected by using an Food and Drug Administration (FDA)-cleared barrier to reduce gross contamination during use. However, use of a barrier does not always protect from contamination. To minimize the potential for patient cross-contamination, the Centers for Disease Control and Prevention recommends cleaning and disinfecting the sensor with an Environmental Protection Agency (EPA)-registered intermediate-level (i.e., tuberculocidal) disinfectant after removing the barrier and before use on another patient.



- In USAF dental clinics the standard digital sensors/plates used are from Schick, Kodak, and Air Techniques. DECS has reviewed the instruction manuals and consulted with technical support personnel from each of these manufacturers. A summary of infection-control recommendations to minimize the potential for patient cross-contamination follows. (*Note: If using other brands of sensors/plates, consult with the manufacturer for compatibility of disinfectant products and procedures.*)

- When using Schick or Kodak Sensors:

- Cover the sensor and any cords that may contact intraoral surfaces or contaminated hands with an FDA-cleared barrier.
- After the procedure remove the barrier and discard appropriately.
- Between patients, clean and disinfect the sensor/plate with an EPA-registered hospital disinfectant with intermediate-level (i.e., tuberculocidal claim) activity. Using disinfecting cloths/wipes with intermediate-level (i.e., tuberculocidal claim) activity may be easier than spraying the sensor/plate and then wiping it.

- *Note: Schick's Sensor Care Guide states that "for best results use an ethanol (80%) based product."*

- *Note: chlorine-based (e.g., bleach) products may be too corrosive to use on the sensors and should be avoided.*

- Consult with the equipment manufacturer if you have any additional questions or concerns about specific disinfection procedures or products.
- If you are using other brands of sensors consult with the manufacturer for compatibility of disinfectant procedures and products.

- When using Air Techniques Imaging Plates:

- Cover the imaging plate with an FDA-cleared barrier.
- After the procedure remove the barrier and discard appropriately.
- Air Techniques recommends cleaning the plate with "100% cotton gauze and anhydrous isopropyl alcohol" and drying the plate completely before use. The manufacturer further states that a "2% glutaraldehyde solution will not damage" the imaging plate, however it must be noted that glutaraldehyde products are **not** allowed in USAF dental facilities.
- Consult with the equipment manufacturer if you have any additional questions or concerns about specific disinfection procedures or products.
- If you are using other brands of sensors consult with the manufacturer for compatibility of disinfectant procedures and products.

Radiographic Positioning Devices

- Most, if not all positioning devices are heat tolerant.
 - Before reuse on a patient, clean, package, and heat sterilize.
- If disposable positioning devices are used, use once and dispose of appropriately; do not attempt to clean and heat sterilize disposable items for reuse.



Managing Computers and Related Equipment in the Dental Operator that are Not Used In the Patient's Mouth (i.e., Noncritical Items)

Computer Equipment in the Dental Operator

General Considerations

- 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 operator also apply to computer equipment. Computer equipment is considered a clinical contact surface. Therefore, if the potential for contamination exists, use plastic protective surface barriers to prevent contamination. **If you don't expect an item to be contacted or contaminated, then nothing is required. Only barrier-protect items that are likely to be contacted or contaminated during treatment.**

- Place computer equipment which is unlikely to be touched during treatment (e.g., CPU, monitor) in a location where it won't be contaminated with direct spray or spatter. Alternatively, consider installing a clear barrier shield, which can be disinfected, and place the equipment behind it. This would allow visualization of the equipment during patient treatment and minimize or prevent contamination.

To minimize the potential for patient cross-contamination of the computer keyboard and mouse:

a. Adequately cover all surfaces with plastic barriers that will be contacted with gloved or contaminated hands or that may be contaminated by spatter/spray.

- Barrier examples for the computer keyboard:

- Single use plastic disposable cover (e.g., plastic sheets, self-adhesive plastic, headrest cover): change between patients.
- Reusable preformed plastic keyboard covers that fit over the keyboard: clean and disinfect between patients.

- Barrier examples for the computer mouse:

- Single use plastic disposable cover (e.g., plastic sheets, self-adhesive plastic): change between patients.
- Use a headrest cover and place your gloved hand into the headrest cover, then use the mouse normally. The mouse is outside the headrest cover and is not covered. After removing your hand from the headrest cover, attempt to keep it propped open so you can place your hand back into it if necessary. Discard the headrest cover after each patient.



Selected References (Updated October 2010)

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