



DENTAL RADIOLOGY INFECTION CONTROL PRACTICES

What personal protective equipment should be worn when exposing radiographs?



When performing dental radiology procedures, the possibility exists for contacting blood, blood-contaminated saliva, or mucous membranes. Gloves must be worn when taking radiographs and handling contaminated film packets. Powder-free gloves are recommended because powder can affect the film's emulsion layer and cause image artifacts. Other personal protective equipment (e.g., surgical mask, protective eyewear, gowns) also should be considered if spattering of blood or other body fluids is likely. For example, it would be advisable to wear additional PPE when treating patients with gagging problems or respiratory infections (e.g., common cold).

Is handwashing necessary when taking radiographs?



Hand hygiene is the most important means of preventing disease transmission. Gloves are not a substitute for handwashing. Dental health-care personnel (DHCP) must wash their hands before gloving and after removing gloves. Alcohol-based hand rubs may be useful in radiology work areas where multiple patients are seen in a short period of time and frequent handwashing is indicated. These products are fast-acting and have the potential to cause less dermatitis. However, it's important to note that alcohol-based handrubs cannot be used if hands are visibly contaminated with blood or other potentially infectious materials.

What are the advantages to unit dosing radiology supplies?

Prior to film exposure, the area should be prepared using aseptic technique. All necessary supplies, equipment, and instruments should be prepared before the patient is seated; only the amount necessary for each procedure should be dispensed. This concept, known as unit dosing, is essential for minimizing cross contamination. In addition, unit dosing reduces both chairside time and DHCP contact with environmental surfaces. Examples of items to unit dose in dental radiology include paper towels; powder-free gloves; cotton rolls/gauze; surface barriers; sterile or disposable film holders; radiographic film(s); and the leaded apron and thyroid collar.



Should I clean and disinfect contaminated radiology equipment or use surface barriers?

The potential to cross-contaminate equipment and environmental surfaces is high if aseptic technique is not practiced. Surface barriers are particularly effective in preventing contamination of clinical contact surfaces that are difficult to clean (e.g., x-ray tube head, control panels on radiology equipment, dental chairs). In addition, barriers can speed room turnaround time and minimize the use of disinfectant sprays. Disposable plastic wrap, plastic sheets or tubing, plastic-backed paper or other material impervious to moisture are effective barriers. Radiology equipment should be protected with surface barriers that are changed between



patients. If barriers are not used, equipment that is contaminated must be cleaned and disinfected with an intermediate level disinfectant between each patient use. Personal protective equipment (e.g., gloves, surgical mask, protective eyewear, gowns) should be worn until cleaning and disinfection are complete. As a general rule, the best way to minimize contamination of environmental surfaces is to touch as few surfaces as possible. Once gloves have been put on and exposure of x-ray films begins DHCP should only touch barrier-protected surfaces.



Examples of Surfaces to Clean, Disinfect, and/or Protect with Surface Barriers in Dental Radiology

- The entire tube head (including the swivel arms used to turn the tube head)
- Arm rest, chair controls, head rest, and any adjustment controls
- Exposure panel (including all adjustment knobs and exposure buttons)
- Work areas/countertops onto which exposed film packets or film-holding devices are laid between films taken on the same patient
- Leaded apron and thyroid collar

Do instruments used for dental radiology need to be sterilized after each use?

Many items used in dental radiology are single-use (disposable) devices, that is they are used once then discarded. Most reusable items used for dental radiology are heat-tolerant items (e.g., film-holding and positioning devices) and should be heat sterilized before patient use.



How should films without barriers be handled?

- Place a paper towel on the work surface
- Next to the paper towel, place the disposable container containing the films
- Secure the door and turn out the darkroom light (if applicable)
- Don gloves
- Remove one contaminated film from the container
- Open the film packet tab, slide out the lead foil backing and black paper, and discard the film packet wrapping
- Rotate the lead foil away from the black paper and discard as per local/state regulations
- Open the black paper wrapping without touching the film and allow the film to drop onto the paper towel
- Discard the black paper wrapping
- Discard the container after all film packets have been emptied
- Remove gloves and wash hands
- Process films, handling them by their film edges
- Label a film mount or paper envelope with the patient's name and date to hold the processed films
- Any area touched by contaminated, gloved hands or film should be cleaned and disinfected



What is the purpose of film barriers?

Film barriers offer a simple method for maintaining proper infection control measures by protecting the film packets from contamination while also reducing both the preparation and processing time. Commercially available film barriers such as ClinAsept (Eastman Kodak, Rochester, NY; 800-933-8031) may be purchased with the film inserted into the barrier.



How should films with barriers be handled?

- Place a paper towel on the work surface
- Next to the paper towel, place the disposable container containing the films
- Don gloves
- Remove one contaminated film from the container
- Open the film barrier, carefully avoiding contact with the film packet
- Allow the film packet to drop onto the paper towel; dispose of the film barrier
- Discard the container after all film barriers have been opened
- Remove gloves and wash hands
- Unwrap and process films, handling them by their film edges
- Label a film mount or paper envelope with the patient's name and date to hold the processed films



Do the same infection control practices apply when taking panoramic or cephalometric films?

Because contamination from blood or saliva is highly unlikely during extraoral radiologic procedures, the infection control practices that should be followed are rather simple. The main infection control concern when taking a panoramic radiograph is the bite guide. This guide may be disposable, reusable and sterilized between each patient, or barrier-protected.

Infection Control Practices During Extraoral Radiographic Procedures

- Wash hands prior to taking the extraoral radiograph
- If barriers are used they should be placed before positioning the patient
- The patient can be asked to remove the contaminated barrier on the bite guide or the disposable bite guide and place it in the regular waste receptacle or DHCP should don gloves before removing the contaminated item—gloves should then be removed and hands washed prior to handling the film cassette.
- For hygienic purposes, the patient chin rest, head-positioning guides, and handgrips can be barrier-protected or cleaned after film exposure.
- Since patient secretions normally do not contaminate extraoral cassettes, cassettes can be handled with ungloved hands
- No other infection control steps are necessary for processing

Is it better to barrier-protect digital radiology sensors or disinfect them between each patient?

Digital radiography sensors 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, there are no sensors that can withstand heat sterilization or complete immersion in a high-level disinfectant.



These devices should, at a minimum, be barrier protected by using an FDA-cleared barrier to reduce gross contamination during use. However, use of a barrier does not always protect from contamination. One study determined that a brand of commercially available plastic barriers used to protect dental digital radiography sensors failed at a substantial rate (44%). This rate dropped to 6% when latex finger cots were used in conjunction with the plastic barrier. To minimize the potential for patient cross-contamination, the Centers for Disease Control and Prevention recommends cleaning and disinfecting the sensor with an EPA-registered intermediate-level (tuberculocidal) disinfectant after removing the barrier and before use on another patient. Because the sensors and associated computer components vary by manufacturer and are expensive, manufacturers should be consulted regarding specific disinfection products and procedures.

Selected References:

American Dental Association Council on Scientific Affairs and the ADA Council on Dental Practice. Infection control recommendations for the dental office and the dental laboratory. *J Am Dent Assoc* 1996;127:672–80.

CDC. Guidelines for infection control in dental health-care settings – 2003. *MMWR* 2003; 52(No. RR-17):1–66.

Crawford JJ. Clinical asepsis in dentistry. Mesquite TX: Oral Medicine Press, 1987:27–35.

Glass BJ, Terezhalmay G. Infection control in dental radiology. In: Cottone JA, Terezhalmay GT, Molinari JA, eds. *Practical infection control in dentistry*, 2nd ed. Baltimore: Williams & Wilkins, 1996:229–238.

Haring JI, Jansen L. Infection control and the dental radiographer. In: *Dental Radiography: Principles and Techniques*, 2nd Edition, Philadelphia: WB Saunders, 2000:194–204.

Hokett SD, Honey JR, Ruiz F, Baisden MK, Hoen MM. Assessing the effectiveness of direct digital radiography barrier sheaths and finger cots. *J Am Dent Assoc* 2000;131:463–467.

Langland OE, Langlais RP. Radiology infection control procedures. In: *Principles of Dental Imaging*. Baltimore: Lippincott, Wilkins & Wilkins; 1997: 69–84.

Miller CH, Palenik CJ. Sterilization, disinfection, and asepsis in dentistry. In: Block SS ed. *Disinfection, sterilization, and preservation*, 5th Edition, Philadelphia: Lippincott Williams & Wilkins, 2001:1062–1063.