

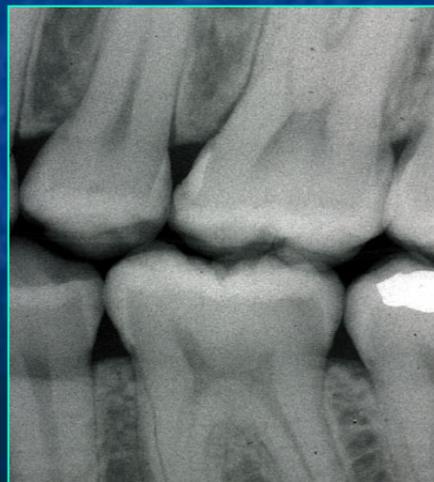
INFECTION CONTROL PRACTICES FOR DENTAL RADIOLOGY





Abbreviations

- DHCP - Dental Health-Care Personnel
- IC - Infection Control
- OPIM - Other Potentially Infectious Materials
- PPE - Personal Protective Equipment





Dental Radiology Infection Control Practices

- Identical to those used in the dental operator
- Standard Precautions
 - Apply to all patients
 - Apply to
 - Blood body fluids, secretions, excretions except sweat, regardless of whether or not they contain blood
 - Non-intact skin
 - Mucous membranes

Potential Routes of Transmission of Bloodborne Pathogens

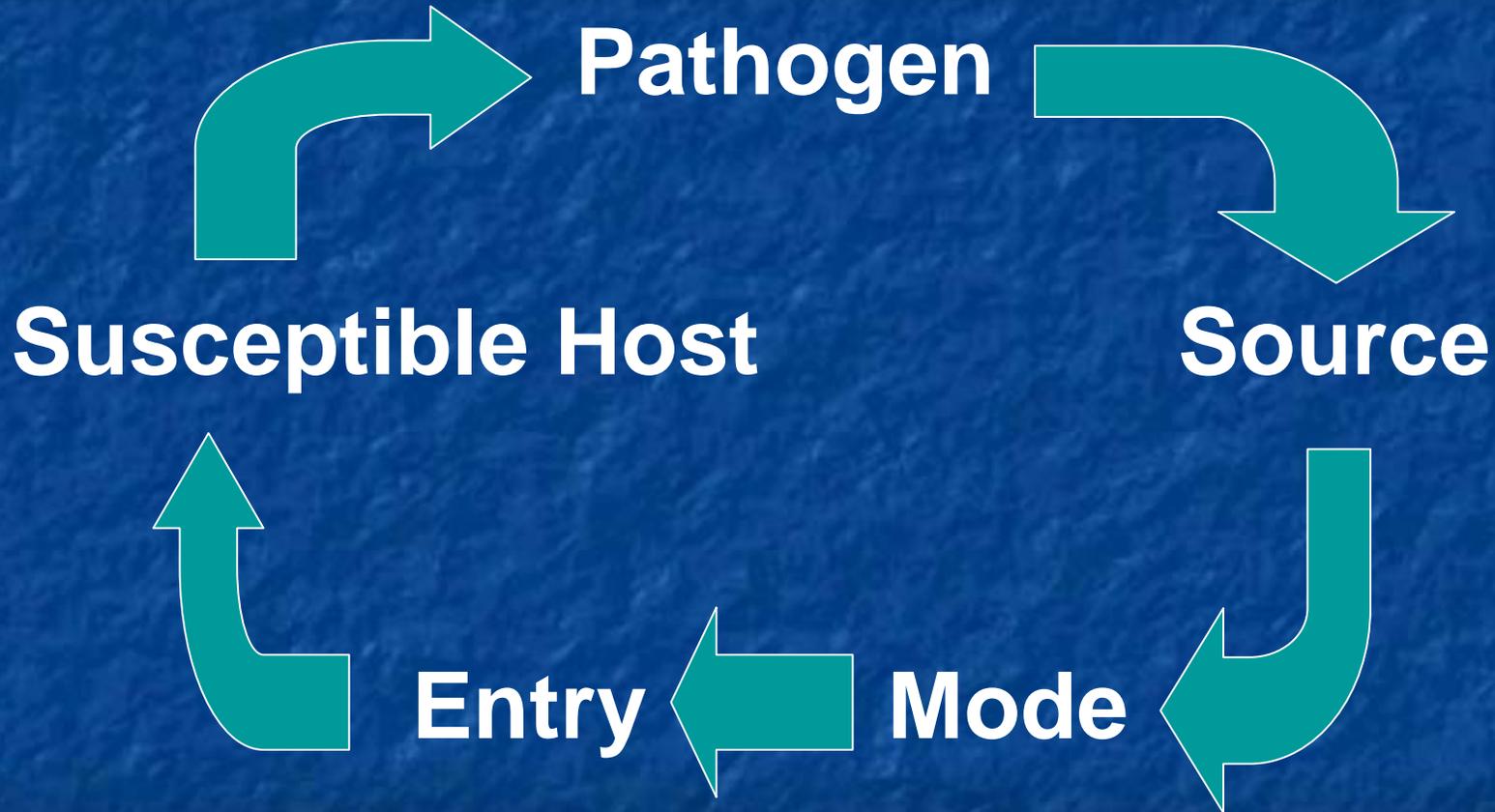


Patient  **DHCP**

DHCP  **Patient**

Patient  **Patient**

Goal is to Break the Chain of Infection



Potential Sources of Cross-Contamination



- Film packet(s)
- Film-holding devices
- DHCP gloved hands
- Tube head
- Extension cone
- Control panel
- Exposure button
- Environmental surfaces
- Chair/ headrest controls
- Darkroom
- Processor and solutions



Research

- Oral microorganisms
 - Remain viable on radiographic equipment for at least 48 hours
 - Can survive in used developer/fixer for up to 2 weeks
- Processor and daylight loader
 - Remained contaminated after 48 hours of inactivity



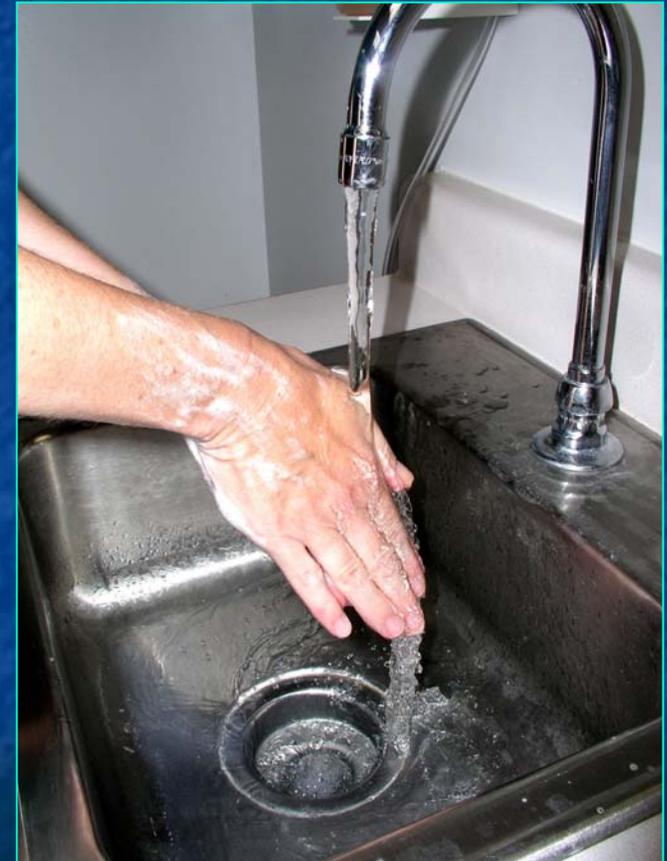
Prevention

- Hand hygiene
- Personal protective equipment (PPE)
- Environmental IC
 - Surface barriers
 - Cleaning and disinfection
- Cleaning/disinfection/sterilization of instruments/items



Hand Hygiene

- Important means of preventing disease transmission
- Before and after patient treatment
 - Before gloving/after removing gloves
- After touching any contaminated item/surface when ungloved
- Gloves are not a substitute for hand hygiene !





Hand Hygiene

- Alcohol-based hand rubs may be useful in dental radiology
 - Multiple patients are seen in short period of time
 - Effective, fast acting, requires less time than handwashing, and potentially causes less dermatitis
- DO NOT use if hands are visibly contaminated with blood or OPIM





PPE – Gloves

- Gloves must be worn when taking intraoral radiographs and handling contaminated film packets, equipment, or instruments
 - Single-use
 - Change between patients





PPE – Gloves

- Powder can affect emulsion layer causing image artifacts
 - Consider using powder-free gloves

**Powdered
Gloves**



Additional PPE

- Wear a surgical mask, protective eyewear, long-sleeved gown if spattering of blood or OPIM is likely
 - May be indicated when treating patients with gagging problems or respiratory infections (e.g., common cold)





Environmental IC General Principles

- Potential to cross-contaminate equipment and environmental surfaces is high if aseptic technique is not practiced
- Use surface barriers or clean and disinfect contaminated surfaces and equipment between patients



Environmental IC General Principles

- To minimize contamination, touch as few surfaces as possible
- Once gloves are put on and exposure of radiographic films begins, DHCP should only touch barrier-protected surfaces



Environmental IC Surface Barriers

Advantages

- Effective
- Simple to use
- Shortens patient turnaround time
- Minimizes use of disinfectants





Environmental IC Surface Barriers

- Cover surfaces/objects that may be touched with contaminated gloved hands or film packets, especially difficult to clean and disinfect surfaces





Environmental IC Surface Barriers

- Use disposable, impervious materials (e.g., plastic wrap &/or bags)
- Change between patients
- Gloves should be worn when removing and discarding barriers



Cleaning and Disinfection



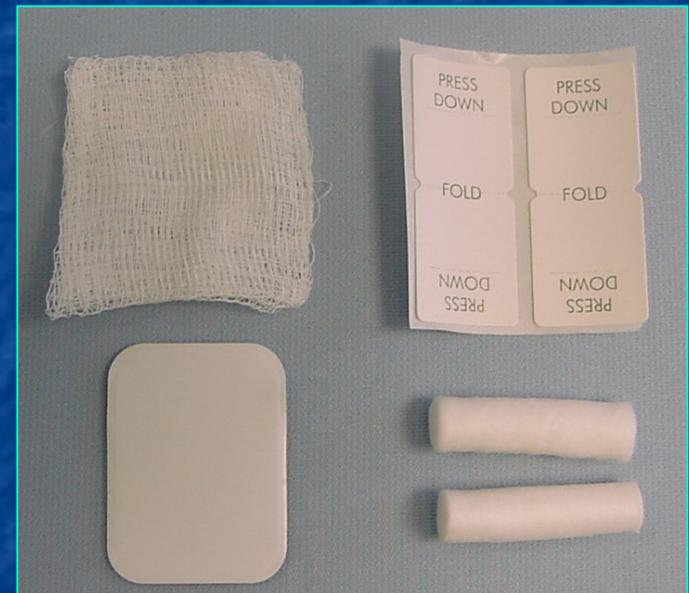
- If contaminated during procedure clean and disinfect
- Follow manufacturer's instructions
 - Dilution, use, material compatibility
- Wear PPE until cleaning and disinfection is completed





Cleaning and Sterilization

- Many items are single-use disposable
 - Used once and discarded appropriately





Cleaning and Sterilization

- Most reusable items (e.g., film holding and positioning devices) are heat tolerant
- Clean, package, and heat sterilize between patients



Cleaning and High Level Disinfection



- If heat-tolerant instruments or single-use disposable alternatives are not available, at a minimum clean and immerse in a liquid chemical germicide labeled as a high-level disinfectant or chemical sterilant.
- Always follow the manufacturer's instructions
- Use of heat-tolerant or single-use disposable items is preferable



Infection Control Practices

- Before film exposure
- During film exposure
- After film exposure
- Processing





Before Film Exposure

- Prepare the area aseptically before seating the patient
- Unit dose supplies, equipment, and instruments
- Place surface barriers





Examples of Radiology Supplies to Unit Dose

- Paper towels/cups
- Surface barriers
- Powder-free gloves
- Radiographic film(s)
- Sterile or disposable film holders
- Overgloves
- Leaded apron with thyroid collar
- Cotton rolls





Before Film Exposure

Unit Dosing Advantages

- Minimizes cross-contamination
- Reduces chairside time
- Reduces DHCP contact with environmental surfaces





Examples of Surfaces to Barrier Protect

- Tubehead/yoke
- X-ray cone
- Control panel
- Exposure button
- Headrest
- Headrest & chair adjustment controls
- Work areas/countertops





Before Film Exposure Radiographic Film

- Aseptically dispense from central supply area
- Place in a disposable container





Before Film Exposure

Other Considerations

- Dispense cotton rolls and paper towels to
 - Stabilize film placement
 - Remove excess saliva from film
 - Protect work surfaces
- Seat patient
 - Adjust headrest, chair
 - Place leaded apron with thyroid collar
 - Have patient remove eyeglasses/dentures



Before Film Exposure

Other Considerations

- Wash hands, don gloves
- Remove film holding/positioning devices from sterile package with gloved hands and assemble in presence of patient





During Film Exposure

- Touch as few surfaces as possible
 - Ideally, surfaces should be barrier-protected
- After film exposure and before glove removal
 - Dry film with paper towel or disposable gauze to remove excess saliva or blood
 - Place in disposable container for transport to the developing area
- Do not touch disposable container with contaminated gloves
- Film-holding devices should be transferred to a covered work surface after use





During Film Exposure Managing Interruptions

- Remove gloves
- Wash hands
- Leave the area/obtain necessary supplies
- Re-wash hands before donning new gloves





After Film Exposure

- Place reusable film-holding devices in designated area
- Discard all disposable contaminated items
 - Follow local/state environmental regulations
- Carefully unwrap all barrier-protected surfaces
- Remove gloves, wash hands
- Remove leaded apron, dismiss patient
- Clean and disinfect all contaminated non-barrier-protected surfaces



Processing

- Transport exposed films in a disposable container
- Unit dose supplies for processing
 - Gloves
 - Paper towel(s)
 - Paper cup(s)
 - Film mount/paper envelope





Radiographic Film Barriers

Simple method for maintaining IC measures by protecting the film packets from contamination and reduces preparation and processing time.

- Commercially available





Film Barrier – Advantages

- Protects films from contamination
- Reduces preparation and processing time
 - Open in lighted area with gloved hands
 - Drop film packet onto paper towel or into paper cup
 - Film can then be opened with ungloved hands in the darkroom
- Simplest method when using daylight loader

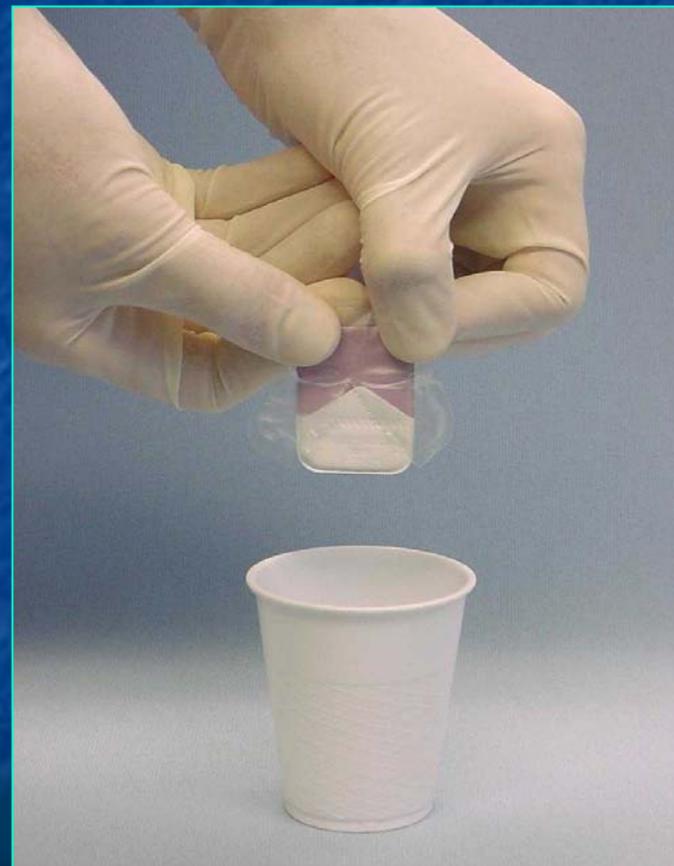




Processing

Handling Film with Barriers

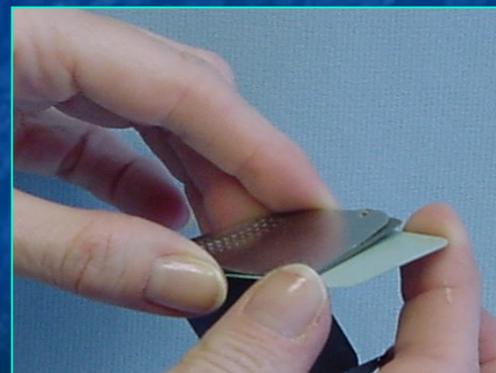
- Place paper towel on the work surface
- Place container with films next to paper towel
- Don gloves
- Remove film, open barrier carefully avoiding contact with the film packet
- Allow film packet to drop onto paper towel or in a disposable cup





Processing Handling Film with Barriers

- Dispose of barrier
- After all barriers are removed, dispose of container
- Remove gloves, wash hands
- Unwrap and process films, handling them by their film edges
- Label film mount or envelope





Processing

Handling Film without Barriers

- Place paper towel on the work surface
- Place container with films next to paper towel
- Secure door, turn out darkroom lights (if applicable)
- Don gloves
- Remove one contaminated film from container
- Open film packet
- Dispose of contents

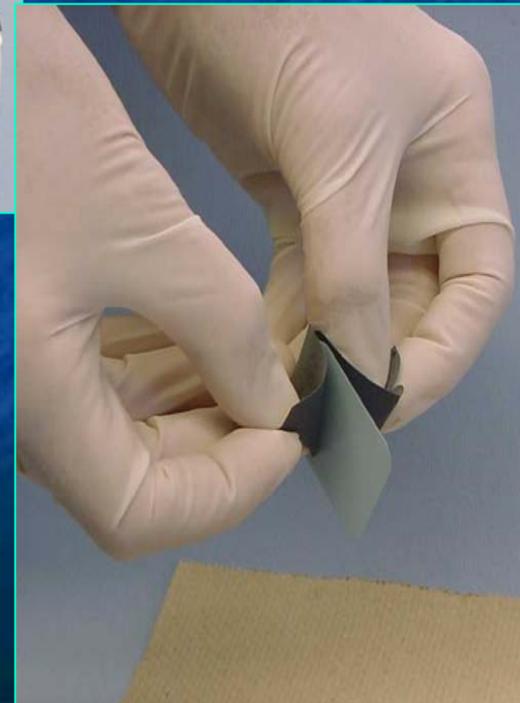


From left to right: film packet, sheet of lead foil, black light-proof paper, radiographic film



Processing Handling Film without Barriers

- Allow film to drop onto paper towel
- Discard container after all film packets are opened
- Remove gloves, wash hands
- Process films by edges only
- Label film mount or envelope
- Clean and disinfect contaminated surfaces





Processing

Daylight Loader Procedures

- Additional infection control challenge
 - Have cloth or rubber sleeves, cuffs or flaps to allow access to chamber while minimizing light exposure



Processing

Daylight Loader Procedures



- Place paper towel, paper cup, powder-free gloves inside loader compartment
- Place container with contaminated films next to paper cup
- Close the lid and place hands through sleeves





Processing Daylight Loader Procedures

- Don gloves
- Remove one film from container
- Open film packet as previously described
- Allow film to drop onto paper towel or processor film feed slot
- Dispose of film packet contents in empty paper cup
- After opening all film packets, remove gloves and place in cup



Processing Daylight Loader Procedures

- Feed all films,
handling by edges
- Remove hands
through sleeves
- Wash hands
- Lift lid, remove all
contents
- Label film mount or
envelope





Extraoral Radiographic Procedures

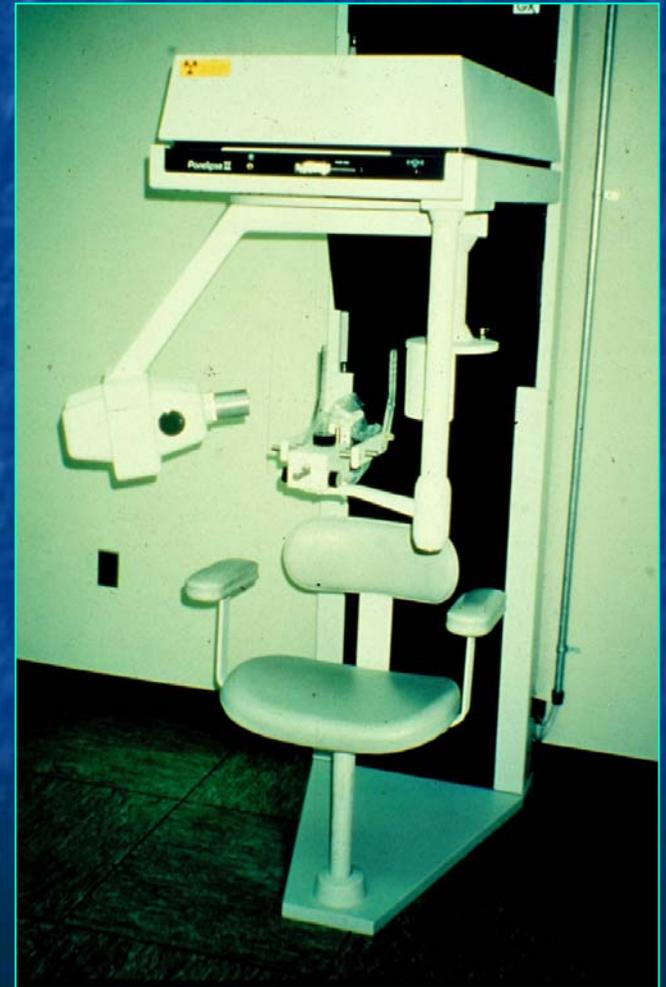
- Infection control practices are simplified when taking extraoral radiographs (e.g., panoramic or cephalometric films)
 - Minimal potential for contamination from blood or saliva
- Handwashing
- Extraoral cassettes can be handled with ungloved hands



Extraoral Radiographic Procedures



- Bite guide
 - Sterilize between each patient use
 - Single-Use Disposable
 - Barrier protect
- For hygienic purposes consider barriers for chin rest, head positioning guides, handgrips





Extraoral Radiographic Procedures

- After exposure
 - Patient can aseptically remove the contaminated barrier from the bite guide and discard **OR**
 - DHCP should don gloves before removing the contaminated barrier. Gloves should be removed and hands washed prior to handling the film cassette.





Digital Imaging General Considerations

- Equipment difficult, if not impossible, to clean and disinfect
- Barrier protect clinical contact surfaces (leaving the air vents uncovered)
 - Examples: CPU, monitor



Digital Imaging

General Considerations

- Keyboard/Mouse
 - Vinyl/plastic form-fitted cover; clean and disinfect between patients
 - Barrier protect with plastic wrap; change between patients
- New technologies- keyboards that can withstand cleaning and disinfecting procedures, keyless keyboards, flat-panel touchscreens



Digital Radiology Sensors

- Barriers do not always protect the item from potential contamination.
 - 44% failure of a commercially available barrier
 - 6% when latex finger cot used in conjunction with the barrier





Digital Radiology Sensors

- Use FDA-cleared barriers
- Clean & heat sterilize or high-level disinfect barrier protected semicritical items between patients.
- If the item cannot tolerate these procedures then, at a minimum clean & disinfect with an EPA-registered product with intermediate level activity.





Summary

- Dental radiology infection control practices are identical to those used in the operator.
- Potential for cross-contamination in dental radiology is high if aseptic technique is not practiced.
- Recommended infection control practices can significantly reduce cross-contamination—protecting patients and staff members.



Selected References

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