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Recommendations and Reports

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Guidelines for Infection Control in Dental Health-Care Settings — 2003



INSIDE: Continuing Education Examination

**DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION**

Recommendations

Each recommendation is categorized on the basis of existing scientific data, theoretical rationale, and applicability. Rankings are based on the system used by CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC) to categorize recommendations:

Category IA. Strongly recommended for implementation and strongly supported by well-designed experimental, clinical, or epidemiologic studies.

Category IB. Strongly recommended for implementation and supported by experimental, clinical, or epidemiologic studies and a strong theoretical rationale.

Category IC. Required for implementation as mandated by federal or state regulation or standard. When IC is used, a second rating can be included to provide the basis of existing scientific data, theoretical rationale, and applicability. Because of state differences, the reader should not assume that the absence of a IC implies the absence of state regulations.

Category II. Suggested for implementation and supported by suggestive clinical or epidemiologic studies or a theoretical rationale.

Unresolved issue. No recommendation. Insufficient evidence or no consensus regarding efficacy exists.

I. Personnel Health Elements of an Infection-Control Program

A. General Recommendations

1. Develop a written health program for DHCP that includes policies, procedures, and guidelines for education and training; immunizations; exposure prevention and postexposure management; medical conditions, work-related illness, and associated work restrictions; contact dermatitis and latex hypersensitivity; and maintenance of records, data management, and confidentiality (IB) (5,16–18,22).
2. Establish referral arrangements with qualified health-care professionals to ensure prompt and appropriate provision of preventive services, occupationally related medical services, and postexposure management with medical follow-up (IB, IC) (5,13,19,22).

B. Education and Training

1. Provide DHCP 1) on initial employment, 2) when new tasks or procedures affect the employee's occupational exposure, and 3) at a minimum, annually, with education and training regarding occupational exposure to potentially infectious agents and infection-control procedures/protocols appropriate for and spe-

cific to their assigned duties (IB, IC) (5,11,13,14,16,19,22).

2. Provide educational information appropriate in content and vocabulary to the educational level, literacy, and language of DHCP (IB, IC) (5,13).

C. Immunization Programs

1. Develop a written comprehensive policy regarding immunizing DHCP, including a list of all required and recommended immunizations (IB) (5,17,18).
2. Refer DHCP to a prearranged qualified health-care professional or to their own health-care professional to receive all appropriate immunizations based on the latest recommendations as well as their medical history and risk for occupational exposure (IB) (5,17).

D. Exposure Prevention and Postexposure Management

1. Develop a comprehensive postexposure management and medical follow-up program (IB, IC) (5,13,14,19).
 - a. Include policies and procedures for prompt reporting, evaluation, counseling, treatment, and medical follow-up of occupational exposures.
 - b. Establish mechanisms for referral to a qualified health-care professional for medical evaluation and follow-up.
 - c. Conduct a baseline TST, preferably by using a two-step test, for all DHCP who might have contact with persons with suspected or confirmed infectious TB, regardless of the risk classification of the setting (IB) (20).

E. Medical Conditions, Work-Related Illness, and Work Restrictions

1. Develop and have readily available to all DHCP comprehensive written policies regarding work restriction and exclusion that include a statement of authority defining who can implement such policies (IB) (5,22).
2. Develop policies for work restriction and exclusion that encourage DHCP to seek appropriate preventive and curative care and report their illnesses, medical conditions, or treatments that can render them more susceptible to opportunistic infection or exposures; do not penalize DHCP with loss of wages, benefits, or job status (IB) (5,22).

3. Develop policies and procedures for evaluation, diagnosis, and management of DHCP with suspected or known occupational contact dermatitis (IB) (32).

4. Seek definitive diagnosis by a qualified healthcare professional for any DHCP with suspected latex allergy to carefully determine its specific etiology and appropriate treatment as well as work restrictions and accommodations (IB) (32).

F. Records Maintenance, Data Management, and Confidentiality

1. Establish and maintain confidential medical records (e.g., immunization records and documentation of tests received as a result of occupational exposure) for all DHCP (IB, IC) (5,13).

2. Ensure that the practice complies with all applicable federal, state, and local laws regarding medical recordkeeping and confidentiality (IC) (13,34).

II. Preventing Transmission of Bloodborne Pathogens

A. HBV Vaccination

1. Offer the HBV vaccination series to all DHCP with potential occupational exposure to blood or other potentially infectious material (IA, IC) (2,13,14,19).

2. Always follow U.S. Public Health Service/CDC recommendations for hepatitis B vaccination, serologic testing, follow-up, and booster dosing (IA, IC) (13,14,19).

3. Test DHCP for anti-HBs 1–2 months after completion of the 3-dose vaccination series (IA, IC) (14,19).

4. DHCP should complete a second 3-dose vaccine series or be evaluated to determine if they are HBsAg-positive if no antibody response occurs to the primary vaccine series (IA, IC) (14,19).

5. Retest for anti-HBs at the completion of the second vaccine series. If no response to the second 3-dose series occurs, nonresponders should be tested for HBsAg (IC) (14,19).

6. Counsel nonresponders to vaccination who are HBsAg-negative regarding their susceptibility to HBV infection and precautions to take (IA, IC) (14,19).

7. Provide employees appropriate education regarding the risks of HBV transmission and the availability of the vaccine. Employees who decline

the vaccination should sign a declination form to be kept on file with the employer (IC) (13).

B. Preventing Exposures to Blood and OPIM

1. General recommendations

a. Use standard precautions (OSHA's blood-borne pathogen standard retains the term universal precautions) for all patient encounters (IA, IC) (11,13,19,53).

b. Consider sharp items (e.g., needles, scalers, burs, lab knives, and wires) that are contaminated with patient blood and saliva as potentially infective and establish engineering controls and work practices to prevent injuries (IB, IC) (6,13,113).

c. Implement a written, comprehensive program designed to minimize and manage DHCP exposures to blood and body fluids (IB, IC) (13,14,19,97).

2. Engineering and work-practice controls

a. Identify, evaluate, and select devices with engineered safety features at least annually and as they become available on the market (e.g., safer anesthetic syringes, blunt suture needle, retractable scalpel, or needleless IV systems) (IC) (13,97,110–112).

b. Place used disposable syringes and needles, scalpel blades, and other sharp items in appropriate puncture-resistant containers located as close as feasible to the area in which the items are used (IA, IC) (2,7,13,19,113, 115).

c. Do not recap used needles by using both hands or any other technique that involves directing the point of a needle toward any part of the body. Do not bend, break, or remove needles before disposal (IA, IC) (2,7,8,13,97,113).

d. Use either a one-handed scoop technique or a mechanical device designed for holding the needle cap when recapping needles (e.g., between multiple injections and before removing from a nondisposable aspirating syringe) (IA, IC) (2,7,8,13,14,113).

3. Postexposure management and prophylaxis

a. Follow CDC recommendations after percutaneous, mucous membrane, or nonintact skin exposure to blood or other potentially infectious material (IA, IC) (13,14,19).

III. Hand Hygiene

A. General Considerations

1. Perform hand hygiene with either a nonantimicrobial or antimicrobial soap and water when hands are visibly dirty or contaminated with blood or other potentially infectious material. If hands are not visibly soiled, an alcohol-based hand rub can also be used. Follow the manufacturer's instructions (IA) (123).
2. Indications for hand hygiene include
 - a. when hands are visibly soiled (IA, IC);
 - b. after barehanded touching of inanimate objects likely to be contaminated by blood, saliva, or respiratory secretions (IA, IC);
 - c. before and after treating each patient (IB);
 - d. before donning gloves (IB); and
 - e. immediately after removing gloves (IB, IC) (7–9, 11, 13, 113, 120–123, 125, 126, 138).
3. For oral surgical procedures, perform surgical hand antisepsis before donning sterile surgeon's gloves. Follow the manufacturer's instructions by using either an antimicrobial soap and water, or soap and water followed by drying hands and application of an alcohol-based surgical hand-scrub product with persistent activity (IB) (121–123, 127–133, 144, 145).
4. Store liquid hand-care products in either disposable closed containers or closed containers that can be washed and dried before refilling. Do not add soap or lotion to (i.e., top off) a partially empty dispenser (IA) (9, 120, 122, 149, 150).

B. Special Considerations for Hand Hygiene and Glove Use

1. Use hand lotions to prevent skin dryness associated with handwashing (IA) (153, 154).
2. Consider the compatibility of lotion and antiseptic products and the effect of petroleum or other oil emollients on the integrity of gloves during product selection and glove use (IB) (2, 14, 122, 155).
3. Keep fingernails short with smooth, filed edges to allow thorough cleaning and prevent glove tears (II) (122, 123, 156).
4. Do not wear artificial fingernails or extenders when having direct contact with patients at high risk (e.g., those in intensive care units or operating rooms) (IA) (123, 157–160).
5. Use of artificial fingernails is usually not recommended (II) (157–160).

6. Do not wear hand or nail jewelry if it makes donning gloves more difficult or compromises the fit and integrity of the glove (II) (123, 142, 143).

IV. PPE

A. Masks, Protective Eyewear, and Face Shields

1. Wear a surgical mask and eye protection with solid side shields or a face shield to protect mucous membranes of the eyes, nose, and mouth during procedures likely to generate splashing or spattering of blood or other body fluids (IB, IC) (1, 2, 7, 8, 11, 13, 137).
2. Change masks between patients or during patient treatment if the mask becomes wet (IB) (2).
3. Clean with soap and water, or if visibly soiled, clean and disinfect reusable facial protective equipment (e.g., clinician and patient protective eyewear or face shields) between patients (II) (2).

B. Protective Clothing

1. Wear protective clothing (e.g., reusable or disposable gown, laboratory coat, or uniform) that covers personal clothing and skin (e.g., forearms) likely to be soiled with blood, saliva, or OPIM (IB, IC) (7, 8, 11, 13, 137).
2. Change protective clothing if visibly soiled (134); change immediately or as soon as feasible if penetrated by blood or other potentially infectious fluids (IB, IC) (13).
3. Remove barrier protection, including gloves, mask, eyewear, and gown before departing work area (e.g., dental patient care, instrument processing, or laboratory areas) (IC) (13).

C. Gloves

1. Wear medical gloves when a potential exists for contacting blood, saliva, OPIM, or mucous membranes (IB, IC) (1, 2, 7, 8, 13).
2. Wear a new pair of medical gloves for each patient, remove them promptly after use, and wash hands immediately to avoid transfer of microorganisms to other patients or environments (IB) (1, 7, 8, 123).
3. Remove gloves that are torn, cut, or punctured as soon as feasible and wash hands before regloving (IB, IC) (13, 210, 211).
4. Do not wash surgeon's or patient examination gloves before use or wash, disinfect, or sterilize gloves for reuse (IB, IC) (13, 138, 177, 212, 213).

5. Ensure that appropriate gloves in the correct size are readily accessible (IC) (13).
6. Use appropriate gloves (e.g., puncture- and chemical-resistant utility gloves) when cleaning instruments and performing housekeeping tasks involving contact with blood or OPIM (IB, IC) (7,13,15).
7. Consult with glove manufacturers regarding the chemical compatibility of glove material and dental materials used (II).

D. Sterile Surgeon's Gloves and Double Gloving During Oral Surgical Procedures

1. Wear sterile surgeon's gloves when performing oral surgical procedures (IB) (2,8,137).
2. No recommendation is offered regarding the effectiveness of wearing two pairs of gloves to prevent disease transmission during oral surgical procedures. The majority of studies among HCP and DHCP have demonstrated a lower frequency of inner glove perforation and visible blood on the surgeon's hands when double gloves are worn; however, the effectiveness of wearing two pairs of gloves in preventing disease transmission has not been demonstrated (Unresolved issue).

V. Contact Dermatitis and Latex Hypersensitivity

A. General Recommendations

1. Educate DHCP regarding the signs, symptoms, and diagnoses of skin reactions associated with frequent hand hygiene and glove use (IB) (5,31,32).
2. Screen all patients for latex allergy (e.g., take health history and refer for medical consultation when latex allergy is suspected) (IB) (32).
3. Ensure a latex-safe environment for patients and DHCP with latex allergy (IB) (32).
4. Have emergency treatment kits with latex-free products available at all times (II) (32).

VI. Sterilization and Disinfection of Patient-Care Items

A. General Recommendations

1. Use only FDA-cleared medical devices for sterilization and follow the manufacturer's instructions for correct use (IB) (248).
2. Clean and heat-sterilize critical dental instruments before each use (IA) (2,137,243,244, 246,249,407).
3. Clean and heat-sterilize semicritical items before each use (IB) (2,249,260,407).
4. Allow packages to dry in the sterilizer before they are handled to avoid contamination (IB) (247).

5. Use of heat-stable semicritical alternatives is encouraged (IB) (2).
6. Reprocess heat-sensitive critical and semi-critical instruments by using FDA-cleared sterilant/ high-level disinfectants or an FDA-cleared low-temperature sterilization method (e.g., ethylene oxide). Follow manufacturer's instructions for use of chemical sterilants/high-level disinfectants (IB) (243).
7. Single-use disposable instruments are acceptable alternatives if they are used only once and disposed of correctly (IB, IC) (243,383).
8. Do not use liquid chemical sterilants/high-level disinfectants for environmental surface disinfection or as holding solutions (IB, IC) (243,245).
9. 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) (IB) (2,243,244).
10. Inform DHCP of all OSHA guidelines for exposure to chemical agents used for disinfection and sterilization. Using this report, identify areas and tasks that have potential for exposure (IC) (15).

B. Instrument Processing Area

1. Designate a central processing area. Divide the instrument processing area, physically or, at a minimum, spatially, into distinct areas for 1) receiving, cleaning, and decontamination; 2) preparation and packaging; 3) sterilization; and 4) storage. Do not store instruments in an area where contaminated instruments are held or cleaned (II) (173,247,248).
2. Train DHCP to employ work practices that prevent contamination of clean areas (II).

C. Receiving, Cleaning, and Decontamination Work Area

1. Minimize handling of loose contaminated instruments during transport to the instrument processing area. Use work-practice controls (e.g., carry instruments in a covered container) to minimize exposure potential (II). Clean all visible blood and other contamination from dental instruments and devices before sterilization or disinfection procedures (IA) (243,249–252).
2. Use automated cleaning equipment (e.g., ultrasonic cleaner or washer-disinfector) to remove

- debris to improve cleaning effectiveness and decrease worker exposure to blood (IB) (2,253).
- 3. Use work-practice controls that minimize contact with sharp instruments if manual cleaning is necessary (e.g., long-handled brush) (IC) (14).
- 4. Wear puncture- and chemical-resistant/heavy-duty utility gloves for instrument cleaning and decontamination procedures (IB) (7).
- 5. Wear appropriate PPE (e.g., mask, protective eyewear, and gown) when splashing or spraying is anticipated during cleaning (IC) (13).

D. Preparation and Packaging

- 1. Use an internal chemical indicator in each package. If the internal indicator cannot be seen from outside the package, also use an external indicator (II) (243,254,257).
- 2. Use a container system or wrapping compatible with the type of sterilization process used and that has received FDA clearance (IB) (243,247,256).
- 3. Before sterilization of critical and semicritical instruments, inspect instruments for cleanliness, then wrap or place them in containers designed to maintain sterility during storage (e.g., cassettes and organizing trays) (IA) (2,247,255,256).

E. Sterilization of Unwrapped Instruments

- 1. Clean and dry instruments before the unwrapped sterilization cycle (IB) (248).
- 2. Use mechanical and chemical indicators for each unwrapped sterilization cycle (i.e., place an internal chemical indicator among the instruments or items to be sterilized) (IB) (243,258).
- 3. Allow unwrapped instruments to dry and cool in the sterilizer before they are handled to avoid contamination and thermal injury (II) (260).
- 4. Semicritical instruments that will be used immediately or within a short time can be sterilized unwrapped on a tray or in a container system, provided that the instruments are handled aseptically during removal from the sterilizer and transport to the point of use (II).
- 5. Critical instruments intended for immediate reuse can be sterilized unwrapped if the instruments are maintained sterile during removal from the sterilizer and transport to the point of use (e.g., transported in a sterile covered container) (IB) (258).
- 6. Do not sterilize implantable devices unwrapped (IB) (243,247).

- 7. Do not store critical instruments unwrapped (IB) (248).

F. Sterilization Monitoring

- 1. Use mechanical, chemical, and biological monitors according to the manufacturer's instructions to ensure the effectiveness of the sterilization process (IB) (248,278,279).
- 2. Monitor each load with mechanical (e.g., time, temperature, and pressure) and chemical indicators (II) (243,248).
- 3. Place a chemical indicator on the inside of each package. If the internal indicator is not visible from the outside, also place an exterior chemical indicator on the package (II) (243,254,257).
- 4. Place items/packages correctly and loosely into the sterilizer so as not to impede penetration of the sterilant (IB) (243).
- 5. Do not use instrument packs if mechanical or chemical indicators indicate inadequate processing (IB) (243,247,248).
- 6. Monitor sterilizers at least weekly by using a biological indicator with a matching control (i.e., biological indicator and control from same lot number) (IB) (2,9,243,247,278,279).
- 7. Use a biological indicator for every sterilizer load that contains an implantable device. Verify results before using the implantable device, whenever possible (IB) (243,248).
- 8. The following are recommended in the case of a positive spore test:
 - a. Remove the sterilizer from service and review sterilization procedures (e.g., work practices and use of mechanical and chemical indicators) to determine whether operator error could be responsible (II) (8).
 - b. Retest the sterilizer by using biological, mechanical, and chemical indicators after correcting any identified procedural problems (II).
 - c. If the repeat spore test is negative, and mechanical and chemical indicators are within normal limits, put the sterilizer back in service (II) (9,243).
- 9. The following are recommended if the repeat spore test is positive:
 - a. Do not use the sterilizer until it has been inspected or repaired or the exact reason for the positive test has been determined (II) (9,243).

- b. Recall, to the extent possible, and reprocess all items processed since the last negative spore test (II) (9,243,283).
- c. Before placing the sterilizer back in service, rechallenge the sterilizer with biological indicator tests in three consecutive empty chamber sterilization cycles after the cause of the sterilizer failure has been determined and corrected (II) (9,243,283).

10. Maintain sterilization records (i.e., mechanical, chemical, and biological) in compliance with state and local regulations (IB) (243).

G. Storage Area for Sterilized Items and Clean Dental Supplies

- 1. Implement practices on the basis of date- or event-related shelf-life for storage of wrapped, sterilized instruments and devices (IB) (243, 284).
- 2. Even for event-related packaging, at a minimum, place the date of sterilization, and if multiple sterilizers are used in the facility, the sterilizer used, on the outside of the packaging material to facilitate the retrieval of processed items in the event of a sterilization failure (IB) (243,247).
- 3. Examine wrapped packages of sterilized instruments before opening them to ensure the barrier wrap has not been compromised during storage (II) (243,284).
- 4. Reclean, repack, and resterilize any instrument package that has been compromised (II).
- 5. Store sterile items and dental supplies in covered or closed cabinets, if possible (II) (285).

VII. Environmental Infection Control

A. General Recommendations

- 1. Follow the manufacturers' instructions for correct use of cleaning and EPA-registered hospital disinfecting products (IB, IC) (243–245).
- 2. Do not use liquid chemical sterilants/high-level disinfectants for disinfection of environmental surfaces (clinical contact or housekeeping) (IB, IC) (243–245).
- 3. Use PPE, as appropriate, when cleaning and disinfecting environmental surfaces. Such equipment might include gloves (e.g., puncture- and chemical-resistant utility), protective clothing (e.g., gown, jacket, or lab coat), and protective eyewear/face shield, and mask (IC) (13,15).

B. Clinical Contact Surfaces

- 1. Use surface barriers to protect clinical contact surfaces, particularly those that are difficult to

clean (e.g., switches on dental chairs) and change surface barriers between patients (II) (1,2,260, 288).

- 2. Clean and disinfect clinical contact surfaces that are not barrier-protected, by using an EPA-registered hospital disinfectant with a low- (i.e., HIV and HBV label claims) to intermediate-level (i.e., tuberculocidal claim) activity after each patient. Use an intermediate-level disinfectant if visibly contaminated with blood (IB) (2,243,244).

C. Housekeeping Surfaces

- 1. Clean housekeeping surfaces (e.g., floors, walls, and sinks) with a detergent and water or an EPA-registered hospital disinfectant/detergent on a routine basis, depending on the nature of the surface and type and degree of contamination, and as appropriate, based on the location in the facility, and when visibly soiled (IB) (243,244).
- 2. Clean mops and cloths after use and allow to dry before reuse; or use single-use, disposable mop heads or cloths (II) (243,244).
- 3. Prepare fresh cleaning or EPA-registered disinfecting solutions daily and as instructed by the manufacturer. (II) (243,244).
- 4. Clean walls, blinds, and window curtains in patient-care areas when they are visibly dusty or soiled (II) (9,244).

D. Spills of Blood and Body Substances

- 1. Clean spills of blood or OPIM and decontaminate surface with an EPA-registered hospital disinfectant with low- (i.e., HBV and HIV label claims) to intermediate-level (i.e., tuberculocidal claim) activity, depending on size of spill and surface porosity (IB, IC) (13,113).

E. Carpet and Cloth Furnishings

- 1. Avoid using carpeting and cloth-upholstered furnishings in dental operatories, laboratories, and instrument processing areas (II) (9,293–295).

F. Regulated Medical Waste

- 1. General Recommendations
 - a. Develop a medical waste management program. Disposal of regulated medical waste must follow federal, state, and local regulations (IC) (13,301).
 - b. Ensure that DHCP who handle and dispose of regulated medical waste are trained in appropriate handling and disposal methods

and informed of the possible health and safety hazards (IC) (13).

2. Management of Regulated Medical Waste in Dental Health-Care Facilities
 - a. Use a color-coded or labeled container that prevents leakage (e.g., biohazard bag) to contain nonsharp regulated medical waste (IC) (13).
 - b. Place sharp items (e.g., needles, scalpel blades, orthodontic bands, broken metal instruments, and burs) in an appropriate sharps container (e.g., puncture resistant, color-coded, and leakproof). Close container immediately before removal or replacement to prevent spillage or protrusion of contents during handling, storage, transport, or shipping (IC) (2,8,13,113,115).
 - c. Pour blood, suctioned fluids or other liquid waste carefully into a drain connected to a sanitary sewer system, if local sewage discharge requirements are met and the state has declared this an acceptable method of disposal. Wear appropriate PPE while performing this task (IC) (7,9,13).

VIII. Dental Unit Waterlines, Biofilm, and Water Quality

A. General Recommendations

1. Use water that meets EPA regulatory standards for drinking water (i.e., ≤ 500 CFU/mL of heterotrophic water bacteria) for routine dental treatment output water (IB, IC) (341,342).
2. Consult with the dental unit manufacturer for appropriate methods and equipment to maintain the recommended quality of dental water (II) (339).
3. Follow recommendations for monitoring water quality provided by the manufacturer of the unit or waterline treatment product (II).
4. Discharge water and air for a minimum of 20–30 seconds after each patient, from any device connected to the dental water system that enters the patient's mouth (e.g., handpieces, ultrasonic scalers, and air/water syringes) (II) (2,311,344).
5. Consult with the dental unit manufacturer on the need for periodic maintenance of antiretraction mechanisms (IB) (2,311).

B. Boil-Water Advisories

1. The following apply while a boil-water advisory is in effect:
 - a. Do not deliver water from the public water system to the patient through the dental

operative unit, ultrasonic scaler, or other dental equipment that uses the public water system (IB, IC) (341,342,346,349,350).

- b. Do not use water from the public water system for dental treatment, patient rinsing, or handwashing (IB, IC) (341,342,346,349,350).
- c. For handwashing, use antimicrobial-containing products that do not require water for use (e.g., alcohol-based hand rubs). If hands are visibly contaminated, use bottled water, if available, and soap for handwashing or an antiseptic towelette (IB, IC) (13,122).

2. The following apply when the boil-water advisory is cancelled:
 - a. Follow guidance given by the local water utility regarding adequate flushing of waterlines. If no guidance is provided, flush dental waterlines and faucets for 1–5 minutes before using for patient care (IC) (244,346,351,352).
 - b. Disinfect dental waterlines as recommended by the dental unit manufacturer (II).

IX. Special Considerations

A. Dental Handpieces and Other Devices Attached to Air and Waterlines

1. Clean and heat-sterilize handpieces and other intraoral instruments that can be removed from the air and waterlines of dental units between patients (IB, IC) (2,246,275,356,357,360,407).
2. Follow the manufacturer's instructions for cleaning, lubrication, and sterilization of handpieces and other intraoral instruments that can be removed from the air and waterlines of dental units (IB) (361–363).
3. Do not surface-disinfect, use liquid chemical sterilants, or ethylene oxide on handpieces and other intraoral instruments that can be removed from the air and waterlines of dental units (IC) (2,246,250,275).
4. Do not advise patients to close their lips tightly around the tip of the saliva ejector to evacuate oral fluids (II) (364–366).

B. Dental Radiology

1. Wear gloves when exposing radiographs and handling contaminated film packets. Use other PPE (e.g., protective eyewear, mask, and gown) as appropriate if spattering of blood or other body fluids is likely (IA, IC) (11,13).

2. Use heat-tolerant or disposable intraoral devices whenever possible (e.g., film-holding and positioning devices). Clean and heat-sterilize heat-tolerant devices between patients. At a minimum, high-level disinfect semicritical heat-sensitive devices, according to manufacturer's instructions (IB) (243).
3. Transport and handle exposed radiographs in an aseptic manner to prevent contamination of developing equipment (II).

4. The following apply for digital radiography sensors:
 - a. Use FDA-cleared barriers (IB) (243).
 - b. Clean and heat-sterilize, or high-level disinfect, between patients, barrier-protected semicritical items. If the item cannot tolerate these procedures then, at a minimum, protect with an FDA-cleared barrier and clean and disinfect with an EPA-registered hospital disinfectant with intermediate-level (i.e., tuberculocidal claim) activity, between patients. Consult with the manufacturer for methods of disinfection and sterilization of digital radiology sensors and for protection of associated computer hardware (IB) (243).

C. Aseptic Technique for Parenteral Medications

1. Do not administer medication from a syringe to multiple patients, even if the needle on the syringe is changed (IA) (378).
2. Use single-dose vials for parenteral medications when possible (II) (376,377).
3. Do not combine the leftover contents of single-use vials for later use (IA) (376,377).
4. The following apply if multidose vials are used:
 - a. Cleanse the access diaphragm with 70% alcohol before inserting a device into the vial (IA) (380,381).
 - b. Use a sterile device to access a multiple-dose vial and avoid touching the access diaphragm. Both the needle and syringe used to access the multidose vial should be sterile. Do not reuse a syringe even if the needle is changed (IA) (380,381).
 - c. Keep multidose vials away from the immediate patient treatment area to prevent inadvertent contamination by spray or spatter (II).
 - d. Discard the multidose vial if sterility is compromised (IA) (380,381).

5. Use fluid infusion and administration sets (i.e., IV bags, tubings and connections) for one patient only and dispose of appropriately (IB) (378).

D. Single-Use (Disposable) Devices

1. Use single-use devices for one patient only and dispose of them appropriately (IC) (383).

E. Preprocedural Mouth Rinses

1. No recommendation is offered regarding use of preprocedural antimicrobial mouth rinses to prevent clinical infections among DHCP or patients. Although studies have demonstrated that a preprocedural antimicrobial rinse (e.g., chlorhexidine gluconate, essential oils, or povidone-iodine) can reduce the level of oral microorganisms in aerosols and spatter generated during routine dental procedures and can decrease the number of microorganisms introduced in the patient's bloodstream during invasive dental procedures (391–399), the scientific evidence is inconclusive that using these rinses prevents clinical infections among DHCP or patients (see discussion, Preprocedural Mouth Rinses) (Unresolved issue).

F. Oral Surgical Procedures

1. The following apply when performing oral surgical procedures:
 - a. Perform surgical hand antisepsis by using an antimicrobial product (e.g., antimicrobial soap and water, or soap and water followed by alcohol-based hand scrub with persistent activity) before donning sterile surgeon's gloves (IB) (127–132,137).
 - b. Use sterile surgeon's gloves (IB) (2,7,121,123,137).
 - c. Use sterile saline or sterile water as a coolant/irrigant when performing oral surgical procedures. Use devices specifically designed for delivering sterile irrigating fluids (e.g., bulb syringe, single-use disposable products, and sterilizable tubing) (IB) (2,121).

G. Handling of Biopsy Specimens

1. During transport, place biopsy specimens in a sturdy, leakproof container labeled with the biohazard symbol (IC) (2,13,14).
2. If a biopsy specimen container is visibly contaminated, clean and disinfect the outside of a

container or place it in an impervious bag labeled with the biohazard symbol, (IC) (2,13).

H. Handling of Extracted Teeth

1. Dispose of extracted teeth as regulated medical waste unless returned to the patient (IC) (13,14).
2. Do not dispose of extracted teeth containing amalgam in regulated medical waste intended for incineration (II).
3. Clean and place extracted teeth in a leakproof container, labeled with a biohazard symbol, and maintain hydration for transport to educational institutions or a dental laboratory (IC) (13,14).
4. Heat-sterilize teeth that do not contain amalgam before they are used for educational purposes (IB) (403,405,406).

I. Dental Laboratory

1. Use PPE when handling items received in the laboratory until they have been decontaminated (IA, IC) (2,7,11,13,113).
2. Before they are handled in the laboratory, clean, disinfect, and rinse all dental prostheses and prosthodontic materials (e.g., impressions, bite registrations, occlusal rims, and extracted teeth) by using an EPA-registered hospital disinfectant having at least an intermediate-level (i.e., tuberculocidal claim) activity (IB) (2,249,252,407).
3. Consult with manufacturers regarding the stability of specific materials (e.g., impression materials) relative to disinfection procedures (II).
4. Include specific information regarding disinfection techniques used (e.g., solution used and duration), when laboratory cases are sent off-site and on their return (II) (2,407,409).
5. Clean and heat-sterilize heat-tolerant items used in the mouth (e.g., metal impression trays and face-bow forks) (IB) (2,407).
6. Follow manufacturers' instructions for cleaning and sterilizing or disinfecting items that become contaminated but do not normally contact the patient (e.g., burs, polishing points, rag wheels, articulators, case pans, and lathes). If manufacturer instructions are unavailable, clean and heat-sterilize heat-tolerant items or clean and disinfect with an EPA-registered hospital disinfectant with low- (HIV, HBV effectiveness claim) to intermediate-level (tuberculocidal claim) activity, depending on the degree of contamination (II).

J. Laser/Electrosurgery Plumes/Surgical Smoke

1. No recommendation is offered regarding practices to reduce DHCP exposure to laser plumes/surgical smoke when using lasers in dental practice. Practices to reduce HCP exposure to laser plumes/surgical smoke have been suggested, including use of a) standard precautions (e.g., high-filtration surgical masks and possibly full face shields) (437); b) central room suction units with in-line filters to collect particulate matter from minimal plumes; and c) dedicated mechanical smoke exhaust systems with a high-efficiency filter to remove substantial amounts of laser-plume particles. The effect of the exposure (e.g., disease transmission or adverse respiratory effects) on DHCP from dental applications of lasers has not been adequately evaluated (see previous discussion, Laser/Electrosurgery Plumes or Surgical Smoke) (Unresolved issue).

K. *Mycobacterium tuberculosis*

1. General Recommendations
 - a. Educate all DHCP regarding the recognition of signs, symptoms, and transmission of TB (IB) (20,21).
 - b. Conduct a baseline TST, preferably by using a two-step test, for all DHCP who might have contact with persons with suspected or confirmed active TB, regardless of the risk classification of the setting (IB) (20).
 - c. Assess each patient for a history of TB as well as symptoms indicative of TB and document on the medical history form (IB) (20,21).
 - d. Follow CDC recommendations for 1) developing, maintaining, and implementing a written TB infection-control plan; 2) managing a patient with suspected or active TB; 3) completing a community risk-assessment to guide employee TSTs and follow-up; and 4) managing DHCP with TB disease (IB) (2,21).
2. The following apply for patients known or suspected to have active TB:
 - a. Evaluate the patient away from other patients and DHCP. When not being evaluated, the patient should wear a surgical mask or be instructed to cover mouth and nose when coughing or sneezing (IB) (20,21).
 - b. Defer elective dental treatment until the patient is noninfectious (IB) (20,21).

- c. Refer patients requiring urgent dental treatment to a previously identified facility with TB engineering controls and a respiratory protection program (IB) (20,21).

L. Creutzfeldt-Jakob Disease (CJD) and Other Prion Diseases

1. No recommendation is offered regarding use of special precautions in addition to standard precautions when treating known CJD or vCJD patients. Potential infectivity of oral tissues in CJD or vCJD patients is an unresolved issue. Scientific data indicate the risk, if any, of sporadic CJD transmission during dental and oral surgical procedures is low to nil. Until additional information exists regarding the transmissibility of CJD or vCJD during dental procedures, special precautions in addition to standard precautions might be indicated when treating known CJD or vCJD patients; a list of such precautions is provided for consideration without recommendation (see Creutzfeldt-Jakob Disease and Other Prion Diseases) (Unresolved issue).

M. Program Evaluation

1. Establish routine evaluation of the infection-control program, including evaluation of performance indicators, at an established frequency (II) (470-471).

Infection-Control Internet Resources

Advisory Committee on Immunization Practices

<http://www.cdc.gov/nip/ACIP/default.htm>

American Dental Association

<http://www.ada.org>

American Institute of Architects Academy of Architecture for Health

<http://www.aahaia.org>

American Society of Heating, Refrigeration, Air-conditioning Engineers

<http://www.ashrae.org>

Association for Professionals in Infection Control and Epidemiology, Inc.

<http://www.apic.org/resc/guidlist.cfm>

CDC, Division of Healthcare Quality Promotion

<http://www.cdc.gov/ncidod/hip>

CDC, Division of Oral Health, Infection Control

<http://www.cdc.gov/OralHealth/infectioncontrol/index.htm>

CDC, Morbidity and Mortality Weekly Report

<http://www.cdc.gov/mmwr>

CDC, NIOSH

<http://www.cdc.gov/niosh/homepage.html>

CDC Recommends, Prevention Guidelines System

<http://www.phppo.cdc.gov/cdcRecommends/AdvSearchV.asp>

EPA, Antimicrobial Chemicals

<http://www.epa.gov/oppad001/chemregindex.htm>

FDA

<http://www.fda.gov>

Immunization Action Coalition

<http://www.immunize.org/acip>

Infectious Diseases Society of America

<http://www.idsociety.org/PG/toc.htm>

OSHA, Dentistry, Bloodborne Pathogens

<http://www.osha.gov/SLTC/dentistry/index.html>

<http://www.osha.gov/SLTC/bloodbornepathogens/index.html>

Organization for Safety and Asepsis Procedures

<http://www.osap.org>

Society for Healthcare Epidemiology of America, Inc., Position Papers

<http://www.shea-online.org/PositionPapers.html>

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