USAF Guidelines for Infection Prevention & Control in Dentistry

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# USAF Guidelines for Infection Prevention & Control in Dentistry

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Prepared by the
Military Consultant to the USAF Surgeon General for Dental Infection Control and Patient Safety

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CHAPTER 1

USAF DENTAL SERVICE INFECTION PREVENTION & CONTROL PROGRAM

1.1. INTRODUCTION. The goals of the USAF Dental Service Infection Prevention and Control Program are to protect the health of all patients, staff, volunteers and visitors and to comply with applicable federal, state and local regulations governing infection prevention and control, occupational safety and management of regulated medical waste. These guidelines are designed to comply with current federal regulations including those issued by the Occupational Safety and Health Administration (OSHA), the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA). Guidelines and recommendations issued by non-regulatory agencies including the American Dental Association (ADA), the Centers for Disease Control and Prevention (CDC) and The Joint Commission (TJC) are also used as references in the development of Air Force Dental Service (AFDS) infection prevention and control programs. The most current federal, state and local (including host country) regulations and guidelines and Air Force Instructions (AFI) take precedence over these guidelines whenever they are more stringent.

This document provides guidance for USAF dental clinics to develop an infection prevention and control program. It also provides appropriate guidance on issues which the dental clinic can adopt or modify to ensure that reasonable precautions are being taken to prevent, control and contain infections in patients, staff, volunteers and visitors. Background information and supporting references for specific recommendations are provided in the CDC Guidelines for Infection Control in Dental Health-Care Settings–2003 and Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care–March 2016 are available on the CDC website at www.cdc.gov/oralhealth/infectioncontrol or the DECS website at http://www.airforcemedicine.af.mil/decs. This document supersedes all previous editions of USAF dental infection control guidelines. According to AFI 47-101, personnel in USAF dental facilities (in coordination with the medical treatment facility [MTF] infection control committee or function) must follow the most current USAF Guidelines for Infection Prevention and Control in Dentistry. These guidelines are minimum standards and in some instances dental commanders may set more stringent policy to ensure uniformity within the clinic or MTF (e.g., wearing scrub suits for all patient-care activities; wearing head and shoe covers during all procedures with the potential to generate spray or spatter of blood or other potentially infectious materials [OPIM]; or daily biological monitoring of sterilizers).

Dental healthcare personnel (DHCP) refers to all paid and unpaid personnel in the dental healthcare setting who could be occupationally exposed to infectious materials, including body substances and contaminated supplies, equipment, environmental surfaces, water, or air. DHCP include dentists, dental hygienists, dental assistants, dental laboratory technicians, students and trainees, contractual personnel and other persons not directly involved in patient care but could be potentially exposed to infectious agents (e.g., administrative, clerical, housekeeping, maintenance, or volunteer personnel).

Dental Treatment Facilities (DTFs) may develop an operating instruction (OI) that specifically outlines the way an individual clinic will implement guidelines and use work practice controls to reduce the potential for infection transmission.

1.2. RESPONSIBILITIES

1.2.1. The Consultant to the Surgeon General For Infection Control and Patient Safety. The USAF Surgeon General appoints a Dental Consultant for Infection Control and Patient Safety. The duties of this special consultant include, but are not limited to, the following:

1.2.1.1. Advise HQ USAF/SG3/5D and AFMOA/SGD on current issues relevant to dental infection prevention and control and patient safety.

1.2.1.2. Act as liaison between other USAF consultants and dental specialties including but not limited to, infectious diseases and epidemiology, operating room nursing, instrument processing, Bioenvironmental Engineering (BEE), Public Health (PH) and MTF infection preventionists.

1.2.1.3. Open and maintain lines of communication with federal regulatory and advisory agencies including OSHA, FDA, EPA, Organization for Safety Asepsis and Prevention (OSAP) and the CDC as well as with other recognized authorities in the fields of dental infection prevention and control and patient safety.

1.2.1.4. Develop and publish HQ USAF/SG3/5D approved guidelines for the USAF Dental Infection Prevention and Control Program. The consultant will update this guidance, as needed, based on changes in federal regulations, national standards, recommendations from advisory agencies and current USAF policy.

1.2.1.5. Assist USAF dental clinics in developing effective programs by disseminating information via periodic infection prevention and control updates and by direct, written and web-based communication.

1.2.1.6. Provide assistance in resolving operational issues to include helping conduct investigations and review
1.2.2. **The Chief of Dental Services (CDS)** assumes overall responsibility for oversight of dental service infection prevention and control and occupational safety programs within the base dental service. The CDS ensures these programs are compliant with federal, state and local regulatory standards and guidelines. He or she will appoint a dental officer and/or dental noncommissioned officer (NCO) to assume these duties. Appropriate education and training are strongly encouraged (e.g., OSAP Boot Camp or other infection control training with dental specific infection control coordinator curricula and specific instrument processing training).

1.2.3. **The Dental Infection Preventionist.** Responsibilities include, but are not limited to the following:

1.2.3.1. Developing and implementing a written base dental service infection prevention and control program including measures to comply with current USAF policy, guidelines and OSHA requirements for protection of DHCP. Coordinate the dental infection prevention and control OI with the MTF Infection Prevention and Control Program and PH exposure control plan. The dental OI should not conflict with the MTF Infection Prevention and Control Medical Group Instructions or any other exposure control plans.

1.2.3.2. Representing the dental service on the MTF Infection Control Committee (ICC)/Infection Control Function (ICF).

1.2.3.3. Ensuring initial, annual and recurring training for DHCP on dental infection prevention and control and occupational exposure to bloodborne pathogens in accordance with (IAW) OSHA regulations and CDC guidelines is accomplished and documented (see Chapters 2 and 3).

1.2.3.4. Conducting ongoing surveillance coordinated with guidance from the MTF ICC/ICF (see Chapter 10).

1.2.3.5. Developing and implementing programs for the management of regulated waste within the dental clinic IAW federal, state and local regulations and coordinated with facility management or the Medical Logistics Flight.

1.2.3.6. Maintaining a dental infection prevention and control program notebook that contains, at a minimum, the following items:


   1.2.3.6.2. CDC Guidelines for Infection Control in Dental Health-Care Settings–2003 and CDC Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care–March 2016. Available at [www.cdc.gov/oralhealth/infectioncontrol](http://www.cdc.gov/oralhealth/infectioncontrol).


   1.2.3.6.4. Installation and/or MTF regulations on infection prevention and control, occupational exposure to bloodborne pathogens, management of regulated medical waste and other relevant guidance.

   1.2.3.6.5. Appointment letter(s)

1.2.3.7. Maintain access to the following:

   1.2.3.7.1. OSHA 29 CFR Part 1910.1030 and other regulatory and advisory documents (this can be accomplished through the internet).

   1.2.3.7.2. Instructions for Use (IFU) for products, reusable instruments and devices to be reprocessed in instrument processing centers.
CHAPTER 2

EMPLOYEE HEALTH ELEMENTS OF AN INFECTION PREVENTION & CONTROL PROGRAM

2.1. INTRODUCTION. A protective health component for all DHCP is an integral part of a dental infection prevention and control program. The objectives are to educate DHCP regarding the principles of infection prevention and control, identify work-related infection risks, institute preventive measures and ensure prompt exposure management and medical follow-up. Coordination between the dental infection preventionist and other qualified healthcare professionals within the MTF is necessary to provide DHCP with appropriate services. AFI 44-108 includes extensive discussions on Employee Health Programs in the MTF and the dental program should supplement the local MTF program.

2.2. KEY TERMS

Immunity: protection against a disease. Immunity is indicated by the presence of antibodies in the blood and can usually be determined with a laboratory test. Immunization: the process by which a person becomes immune, or protected, against a disease. This term is often used interchangeably with vaccination or inoculation. However, the term “vaccination” is defined as the injection of a killed or weakened infectious organism in order to prevent the disease. Thus, vaccination, by inoculation with a vaccine, does not always result in immunity.

Occupational Exposure: according to OSHA Bloodborne pathogens standard, means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee’s duties.

OPIM (Other Potentially Infectious Materials): an OSHA term that refers to the following human body fluids: (1) Saliva in dental procedures, semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, any body fluid that is visibly contaminated with blood and all body fluids in situations where it is difficult or impossible to differentiate between body fluids; (2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and (3) Human immunodeficiency virus (HIV)-containing cell or tissue cultures, organ cultures and HIV- or Hepatitis B virus (HBV)-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

Postexposure prophylaxis: the administration of medications following an occupational exposure in an attempt to prevent infection.

Qualified healthcare professional: any licensed healthcare provider who can provide counseling and perform all medical evaluations and procedures IAW the most current recommendations of the U.S. Public Health Service (USPHS), including postexposure prophylaxis when indicated.

Respiratory Hygiene/Cough Etiquette: A combination of measures designed to minimize the transmission of respiratory pathogens via droplet or airborne routes in healthcare settings. The components of Respiratory Hygiene/Cough Etiquette are (1) covering the mouth and nose during coughing and sneezing, (2) using tissues to contain respiratory secretions with prompt disposal, (3) offering a surgical mask to persons who are coughing to decrease contamination of the surrounding environment and (4) turning the head away from others and maintaining spatial separation, ideally >3 feet, when coughing. These measures are targeted to all patients with symptoms of respiratory infection and their accompanying family members or friends beginning at the point of their initial encounter with a healthcare setting (e.g., reception/front desk, ambulatory clinics, healthcare provider offices).

Standard precautions: are the minimum infection prevention practices that apply to all patient care regardless of suspected or confirmed infection status of a patient. Standard precautions include: (1) Hand hygiene; (2) Use of PPE; (3) Respiratory hygiene/cough etiquette; (4) Sharps safety (engineering and work practice controls; (5) Safe injection practices; (6) Sterile instruments and devices; (7) Clean and disinfected environmental surfaces. They integrate and expand the elements of universal precautions into a standard of care designed to protect healthcare personnel (HCP) and patients from pathogens that can be spread by blood or any other body fluid, excretion, or secretion. Standard precautions apply to contact with blood; all body fluids, secretions and excretions (except sweat), regardless of whether they contain blood; nonintact skin; and mucous membranes. Saliva has always been considered a potentially infectious material in dental infection control; thus, no operational difference exists in clinical dental practice between universal precautions and standard precautions.

Universal precautions: (an old term that can still be found in OSHA documents) were based on the concept that all blood and body fluids that might be contaminated with blood should be treated as infectious because patients with bloodborne infections can be asymptomatic or unaware they are infected. In 1996 the CDC expanded the concept and changed the term to standard precautions.

Vaccination: see immunization

Vaccine: a product that produces immunity; therefore, protecting the body from the disease. Vaccines are administered through needle injections, by mouth and by aerosol.
2.3. **General Recommendations**

2.3.1. Work with the MTF Employee Health Program. Ensure the program is a comprehensive program 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. This information can be found under “Dental Health Care Personnel Safety” in the CDC *Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care*—March 2016, available at [www.cdc.gov/oralhealth/infectioncontrol](http://www.cdc.gov/oralhealth/infectioncontrol) and in AFI 44-108.

2.3.2. Establish/coordinate with PH how referrals to qualified healthcare professionals will be made to ensure prompt and appropriate provision for occupational related medical services and postexposure management with medical follow-up (e.g., following exposure to bloodborne pathogens or tuberculosis). Establish/coordinate a plan for after-hours care for on-call providers, housekeeping personnel, etc.

2.4. **Education and Training**

2.4.1. Provide DHCP with comprehensive education and training regarding occupational exposure to potentially infectious agents and infection prevention and control procedures/protocols appropriate for and specific to their assigned duties:

2.4.1.1. Upon initial employment

2.4.1.2. When new tasks or procedures affect the employee’s occupational exposure

2.4.1.3. At least annually

2.4.2. Training should include:

2.4.2.1. Description of their exposure risks

2.4.2.2. Review of prevention strategies and infection prevention and control policies and procedures

2.4.2.3. Discussion regarding how to manage work-related illness and injuries, including postexposure prophylaxis

2.4.2.4. Review of work restriction if exposed to or infected with certain pathogens

2.4.3. Provide newcomer’s orientation training for all DHCP, including administrative personnel, before starting direct patient care, clinical or assigned duties. Inclusion of DHCP with minimal exposure risks (e.g., administrative personnel) in annual or recurring education and training programs is optional, but should be considered as a means of enhancing facility-wide understanding of infection prevention and control principles and the importance of the program.

2.4.4. Provide educational information appropriate in content and vocabulary to the educational level, literacy and language of DHCP, including the opportunity for interactive questions and answers.

2.4.5. For a period of three years, maintain training records documenting each training session provided by the dental service or MTF IAW current OSHA and MTF guidelines. Include the following in the records:

2.4.5.1. The date of training

2.4.5.2. A content outline or a summary of the training

2.4.5.3. The trainer’s name and qualifications

2.4.5.4. The names and job titles of all persons attending the training

2.5. **Immunization Programs**

2.5.1. Coordinate immunization services with PH and immunization departments within the MTF.

2.5.2. Ensure DHCP receive all appropriate immunizations (e.g., varicella, measles, mumps, rubella, influenza) based on USAF policy, the latest recommendations from the Advisory Committee on Immunization Practices (ACIP) and the Healthcare Infection Control Practices Advisory Committee (HICPAC) as well as their medical history and risk for occupational exposure.

2.5.3. Offer the HBV vaccination series to all DHCP (including civilian personnel, volunteers and dental laboratory personnel) with potential occupational exposure to blood or OPIM.

2.5.3.1. Follow USPHS/CDC recommendations for hepatitis B vaccination, serologic testing, follow-up and booster dosing.
2.5.3.2. Provide personnel appropriate education regarding risks of HBV transmission and availability of the vaccine. Have personnel who decline the HBV vaccination sign a declination form (using the wording found in Appendix A of the OSHA bloodborne pathogens standard [1910.1030]) to be kept on file with the employer.

2.6. Exposure Prevention and Postexposure Management

2.6.1. An exposure is a percutaneous injury (e.g., needlestick or cut with a sharp object) or contact of mucous membrane or nonintact skin with blood saliva or OPIM.

   Use standard precautions for all patient encounters. Standard precautions include: traditional items such as, Personal Protective Equipment (PPE), hand hygiene, sharps safety, safe injection practices, cough etiquette and respiratory hygiene; and newly included items such as Instrument processing, sterilization and disinfection of patient care items and devices as well as environmental surface disinfection.

2.6.2. Coordinate a comprehensive post-exposure management and medical follow-up program with PH and/or other appropriate MTF departments.

   2.6.2.1. Include policies and procedures for prompt reporting, evaluation, counseling, treatment and medical follow-up of occupational exposures.

   2.6.2.2. Establish mechanisms for referral to a qualified healthcare professional for medical evaluation and follow-up when expertise and resources are not available within the MTF.

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

2.7.1. The public health flight and/or other appropriate MTF departments will oversee the employee health program which includes work-related illness protocols and work restrictions for providers in patient care and exposure risk determination.

2.7.2 Elements of the employee health program include but are not limited to, vaccinations, exposure management, post-exposure prophylaxis, bloodborne pathogen standard compliance and work restrictions related to contagious healthcare workers.
CHAPTER 3
BLOODBORNE PATHOGENS

3.1. INTRODUCTION. OSHA has determined that medical/dental personnel face a significant health risk as a result of occupational exposure to blood and OPIM because these may contain bloodborne pathogens. This risk can be minimized or eliminated by using a combination of engineering and work practice controls, PPE, training, surveillance, vaccinations, signs, labels and other provisions. Although OSHA originally used the term universal precautions (see Key terms Chapter 2), the CDC now uses the term standard precautions to include other preventive measures that have become standard in hospitals and healthcare facilities: hand hygiene, PPE, respiratory hygiene/cough etiquette, sharps safety, safe injection practices, sterile instruments and devices and clean and disinfected environmental surfaces.

3.2. KEY TERMS
Bloodborne pathogens: disease-producing microorganisms spread by contact with blood or other body fluids contaminated with blood from an infected person. Examples include hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV).

Bloodborne pathogens standard: a standard developed, promulgated and enforced by OSHA directing employers to protect personnel from occupational exposure to blood and OPIM.

Engineering controls: controls (e.g., sharps disposal containers, self-sheathing needles, safer medical devices, such as sharps with engineered sharps injury protections and needleless systems) that isolate or remove the bloodborne pathogens hazard from the workplace.

Occupational exposure incident: can be defined as a percutaneous injury (e.g., needlestick or cut with a sharp object) or contact of mucous membrane or non-intact skin (e.g., exposed skin that is chapped, abraded, or afflicted with dermatitis) with blood, saliva, tissue, or other body fluids that are potentially infectious that may result from the performance of an employee's duties.

OPIM: see Key Terms in Chapter 2.

Parenteral: means piercing mucous membranes or the skin barrier through such events as needlesticks, human bites, cuts and abrasions.

Postexposure prophylaxis: see Key Terms in Chapter 2.

Qualified healthcare professional: see Key Terms in Chapter 2.

Standard precautions: see Key Terms in Chapter 2.

Transmission-Based-Precautions: a set of enhanced practices that apply to patients with documented or suspected infection or colonization with highly transmissible or epidemiologically important pathogens for which precautions beyond standard precautions are needed to interrupt transmission in healthcare settings (i.e., airborne, contact, droplet precautions). Refer to the most current CDC and Healthcare Infection Control Practices Advisory Committee (HICPAC) isolation recommendations (www.cdc.gov/hicpac/pubs.html) when treating patients requiring additional precautions beyond standard precautions.

Work practice controls: practices incorporated into the everyday work routine that reduce the likelihood of exposure to pathogens by altering the manner in which a task is performed (e.g., prohibiting recapping of needles by a two-handed technique).

3.3. Preventing Exposures to Blood and OPIM

3.3.1. General Recommendations

3.3.1.1. Use standard precautions for all patient encounters (Note: OSHA’s Bloodborne Pathogens Standard retains the term universal precautions in some sections). All blood and body fluids are treated as potentially infectious. Do not delay or deny access to patient care solely on the basis of known or suspected seropositivity for bloodborne pathogens.

3.3.1.2. In addition to standard precautions, other measures (e.g., transmission-based precautions) might be necessary to prevent potential spread of certain diseases (e.g., tuberculosis [TB], influenza and varicella) that are contracted through airborne, droplet, or contact transmission. When acutely ill with these diseases, patients do not usually seek routine dental outpatient care. Necessary additional precautions might include patient placement (e.g., isolation), adequate room ventilation (negative pressure), respiratory protection (e.g., N-95 masks) for DHCP, or postponement of nonemergency dental procedures. Follow current MTF guidance and recommendations in the most current CDC isolation guidelines available at www.cdc.gov/hicpac/pubs.html.

3.3.1.3. Consider sharp items (e.g., needles, scalers, burs and orthodontic wires) that are contaminated with blood and saliva as potentially infectious and establish engineering controls and work practices to prevent injuries.
3.3.1.4. Implement a written, comprehensive program designed to minimize and manage DHCP exposure to blood and body fluids (i.e., exposure control plan). Ensure it is accessible to personnel, available to OSHA and reviewed/updated at least annually. A copy of a generic exposure control plan for healthcare facilities to use and modify can be found on the DECS Web site http://www.airforcemedicine.af.mil/DECS. Develop a training program IAW current OSHA guidelines on controlling occupational exposure to bloodborne pathogens in dentistry.

3.3.1.5. Dental services are not required to prepare a separate, exposure control plan if the MTF or installation plan covers the entire facility including dental. However, dental service specific procedures for protection of personnel from occupational exposure to bloodborne pathogens should be incorporated into either a dental specific exposure control plan, a dental infection prevention and control OI or an occupational safety OI.

3.3.1.6. Include an occupational exposure determination (without regard to the use of PPE) as part of the exposure control plan IAW current OSHA guidelines. Include a determination as to whether there is actual or potential exposure to blood or OPIM involved in duty performance and identification of all individuals who work in areas where there is reasonably anticipated exposure to blood or OPIM. If dental has been included in the MTF/Installation plan there is no requirement to create another plan specifically for dental.

3.3.2. Engineering and work-practice controls

3.3.2.1. The dental infection preventionist is considered the local authority on dental-specific safety devices and must be knowledgeable about available devices (e.g., safety anesthetic syringes, safety scalpels), be able to discuss the advantages/disadvantages of each device with the MTF infection preventionist/ICC/ICF and be able to address staff member concerns. Local MTF policy must be followed regarding device selection, use and documentation.

3.3.2.2. Do not recap used needles 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 except to remove needles from non-disposable dental anesthetic syringes.

3.3.2.3. Use either a one-handed scoop technique or a mechanical device designed for safely recapping needles (e.g., between multiple injections and before removing from a non-disposable aspirating syringe).

3.3.2.4. Place used disposable syringes, needles, scalpel blades, orthodontic wires, burs, endodontic files and other sharp items in appropriate puncture-resistant containers (i.e., sharps containers) located as close as feasible to the area in which the items are used. Appropriate containers are puncture resistant and red or labeled with biohazard signs.

3.4. Preventing Hepatitis B Transmission. Coordinate with public health flight and /or appropriate MTF department to ensure the hepatitis B vaccination series is offered to all DHCP (including civilian personnel, volunteers and dental laboratory personnel) with potential occupational exposure to blood or OPIM (see immunization programs in Chapter 2.

3.5. Postexposure management and prophylaxis

3.5.1. Promptly report, document and review any occupational exposures to blood or OPIM (including saliva, regardless of whether blood is visible) in dental settings.

3.5.2. A qualified healthcare professional should evaluate any occupational exposure incident to blood or OPIM (including saliva, regardless of whether blood is visible) in dental settings.

3.5.3. Follow MTF policy and CDC recommendations (www.cdc.gov/niosh/topics/bbp/guidelines.html) after percutaneous, mucous membrane, or non-intact skin exposure to blood or OPIM.

3.5.4. After each occupational exposure incident, review the circumstances surrounding the injury and the postexposure management plan to evaluate the plan’s effectiveness. Provide education and training and implement practice changes as appropriate.
CHAPTER 4
HAND HYGIENE

4.1. INTRODUCTION. Hand hygiene in healthcare facilities is the single most important aseptic procedure in the prevention of transmission of infection. Hand hygiene significantly reduces microbes on the hands and protects both patients and the dental staff. Hand hygiene products include plain soap, soaps or detergents with antimicrobial activity and alcohol based hand rubs containing 60% - 95% alcohol alone or 50% - 95% alcohol when combined with limited amounts of a quaternary ammonium compound. The wearing of gloves does not replace hand hygiene practices, but is an adjunct providing protection from bloodborne pathogens and is required by OSHA. See Table 1 for a summary of hand hygiene methods and indications.

4.2. KEY TERMS

Alcohol-based hand rub: an alcohol-containing preparation designed for application to the hands for reducing the number of viable microorganisms on the hands. In the United States, such preparations usually contain 60%–95% ethanol or isopropanol. These are waterless antiseptic agents not requiring the use of exogenous water. After applying such an agent, the hands are rubbed together until the agent has dried. Use preparations containing 60% - 95% alcohol alone or 50% - 95% alcohol when combined with limited amounts of a quaternary ammonium compound.

Antimicrobial soap: a soap (i.e., detergent) containing an antiseptic agent.

Antiseptic handwashing: washing hands with water and soap or detergents containing an antiseptic agent.

Antiseptic hand rub: the process of applying an antiseptic hand-rub product to all surfaces of the hands to reduce the number of microorganisms present.

Artificial nails: substances or devices applied or added to the natural nails to augment or enhance the wearer’s own nails. They include, but are not limited to, bondings, tips, wrappings and tapes.

Handwashing: washing hands with plain (non-antimicrobial) soap and water.

Hand hygiene: general term that applies to handwashing, antiseptic handwash, antiseptic hand rub, or surgical hand antisepsis.

Oral surgical procedure: involves the incision, excision, or reflection of tissue that exposes normally sterile areas of the oral cavity. Examples include biopsy, periodontal surgery, apical surgery, implant surgery and surgical extractions of teeth (e.g., removal of erupted or nonerupted tooth requiring elevation of mucoperiosteal flap, removal of bone or sectioning of tooth and suturing if needed).

Persistent activity: the prolonged or extended activity that prevents or inhibits the proliferation or survival of microorganisms after application of the product. Manufacturer’s description of product should include persistent antimicrobial activity.

Plain or non-antimicrobial soap: soap or detergent that does not contain antimicrobial agents or contains very low concentrations of such agents solely as preservatives.

Resident flora: species of microorganisms that are colonized and always present on or in the body; not easily removed by mechanical friction.

Surgical hand antisepsis: antiseptic handwash or antiseptic hand rub performed preoperatively by surgical personnel to eliminate transient and reduce resident hand flora. Antiseptic detergent preparations often have persistent antimicrobial activity.

Transient flora: microorganisms that may be present in or on the body under certain conditions and for certain lengths of time; more amenable to removal by mechanical friction than resident flora.

4.3. General Recommendations

4.3.1. Perform hand hygiene with either a non-antimicrobial or antimicrobial soap and water when hands are visibly soiled or contaminated with blood or OPIM. If hands are not visibly soiled, an alcohol-based hand rub can also be used. Follow the manufacturer’s Instructions for Use (IFU).

4.3.2. Indications for hand hygiene include:

4.3.2.1. When hands are visibly soiled

4.3.2.2. After barehanded touching of inanimate objects likely to be contaminated by blood, saliva, or respiratory secretions

4.3.2.3. Before donning gloves (i.e., before treating each patient)

4.3.2.4. Immediately after removing gloves (i.e., after treating each patient)

4.3.2.5. Before leaving any patient-care (e.g., dental operatory, radiography), laboratory or instrument processing area

4.3.3. For oral surgical procedures, perform surgical hand antisepsis before donning sterile surgeon’s gloves. Follow the manufacturer’s IFU by using either an antimicrobial soap and water, or plain soap and water followed by
drying hands and application of an alcohol-based surgical hand-scrub/rub product with persistent activity.

4.3.4. Store liquid hand-care products in disposable closed containers. Do not add soap or lotion to a partially empty dispenser.

4.3.5. Use MTF-approved hand-hygiene products (e.g., soaps, lotions, alcohol-based hand rubs).

4.4. Special Considerations for Hand Hygiene and Glove Use

4.4.1. Use MTF-approved hand lotions to prevent skin dryness associated with handwashing.

4.4.2. Consider the compatibility of lotion and antiseptic products (e.g., alcohol-based hand rubs, antimicrobial soaps) and the effect of petroleum or other oil emollients on the integrity of gloves during product selection and glove use. Petroleum-based products can cause breakdown of latex gloves.

4.4.3. Lotions should be dispensed in small, individual-use containers or pump dispensers. Product for dispensers should be packaged in unit-dose inserts to prevent “topping off” partially empty dispensers in an effort to reduce contaminants and bacterial growth.

4.4.4. Keep fingernails short with smooth, filed edges to allow thorough cleaning and prevent glove tears. Long nails make glove placement more difficult and may result in glove perforation. Use of artificial fingernails is prohibited.

4.4.5. Chipped nail polish can harbor bacteria. Unchipped nail polish on short natural nails is acceptable.

4.4.6. Do not wear hand or nail jewelry if it makes donning gloves more difficult or compromises the fit and integrity of the glove.

4.4.7. All cases of hand dermatitis should be evaluated for treatment and follow-up. If open sores or weeping dermatitis exists, refrain from direct patient contact and handling of patient-care equipment until the condition is resolved.

Table 1: Hand-Hygiene Methods and Indications

<table>
<thead>
<tr>
<th>Methods</th>
<th>Agent</th>
<th>Technique</th>
<th>Duration (minimum)</th>
<th>Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine handwash</td>
<td>Water and non-antimicrobial</td>
<td>- Wet hands and wrists under cool running water</td>
<td>15 seconds</td>
<td>- When visibly soiled³ - After bare-handed touching of inanimate objects likely to be contaminated by blood or saliva - Before and after treating each patient (e.g., before glove placement and after glove removal) - Before leaving patient-care, laboratory, or instrument processing areas - Before gloving after removing gloves that are torn, cut, or punctured</td>
</tr>
<tr>
<td></td>
<td>detergent (e.g., plain soap⁴)</td>
<td>- Dispense handwashing agent sufficient to cover hands and wrists</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Rub the agent into all areas, with particular emphasis around nails and between fingers, before rinsing with cool water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Dry hands completely with disposable towels before donning gloves</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Use a towel to turn off the faucet if automatic controls are not available</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rub hands until the agent is dry⁴</td>
<td>15 seconds</td>
<td></td>
</tr>
<tr>
<td>Antiseptic handwash</td>
<td>Water and antimicrobial</td>
<td>- Apply the product to palm of one hand</td>
<td>2-6 minutes</td>
<td>- Before donning sterile, surgeon’s gloves for oral surgical procedures</td>
</tr>
<tr>
<td></td>
<td>agent/detergent (e.g., chlorhexidine, iodine and idophor, chloroxylenol [PCMX], iodocain)</td>
<td>- Rub hands together, covering all surfaces of hands and fingers, until hands are dry⁵</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Follow manufacturer’s recommendations regarding volume of product to use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antiseptic hand rub</td>
<td>Alcohol-based hand rub⁷</td>
<td>- Remove rings, watches, and bracelets</td>
<td>2-6 minutes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Remove debris from underneath fingernails using a nail cleaner under running water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Wet hands and wrists under cool running water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Using an antimicrobial agent, scrub hands and forearms for the length of time recommended by the manufacturer’s instructions before rinsing with cool water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical antisepsis</td>
<td>Water and antimicrobial</td>
<td>- Dry hands completely (using a sterile towel is ideal) before donning sterile surgeon’s gloves</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>agent/detergent (e.g., chlorhexidine, iodine and idophor, chloroxylenol [PCMX], iodocain)</td>
<td>Follow manufacturer instructions for surgical hand-scrub product with persistent activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>followed by an alcohol-based surgical hand-scrub product with persistent activity</td>
<td>Follow manufacturer instructions for surgical hand-scrub product with persistent activity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

³ Pathogenic organisms have been found on or around bar soap during and after use. Use of liquid soap with hands-free dispensing controls is preferable.
⁴ 60%–65% ethanol or isopropanol. Alcohol-based hand rubs should not be used in the presence of visible soil or organic material. If using an alcohol-based hand rub, apply adequate amount to palm of one hand and rub hands together, covering all surfaces of the hands and fingers, until hands are dry. Follow manufacturer’s recommendations regarding the volume of product to use. If hands feel dry after rubbing hands together for 10–15 seconds, an insufficient volume of product likely was applied. The drying effect of alcohol can be reduced or eliminated by adding 1%–3% glycerol or other skin-conditioning agents.
⁵ Use a towel to turn off the faucet if automatic controls are not available.
CHAPTER 5
PERSONAL PROTECTIVE EQUIPMENT

5.1. INTRODUCTION. Personal protective equipment (PPE) is designed to protect the skin and the mucous membranes of the eyes, nose and mouth of DHCP from exposure to blood or OPIM. Use of PPE is dictated by the exposure risk posed by the procedure, not by the known or suspected serologic status of the patient. Primary PPE used in healthcare settings includes gloves, face masks, protective eyewear, face shields and protective clothing (e.g., long-sleeved gowns/jackets). Shoe and head covers are less frequently used types of PPE, but should be considered if contamination is likely.

5.2. KEY TERMS

- **Contaminated**: the presence of blood or OPIM (including saliva) on an item or surface (including PPE).
- **OPIM**: see Key Terms in Chapter 2.
- **Oral surgical procedure**: see Key Terms in Chapter 4.
- **Personal protective equipment (PPE)**: specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., scrub suits, uniforms, pants, shirts or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment. The type and characteristics of PPE will depend upon the task and degree of exposure anticipated.
- **Soiled**: describes a textile product that has been used or worn and soiled by perspiration, body oils, or one of the many other items to which it may have been exposed.
- **Spatter**: visible drops of liquid or body fluid that are expelled forcibly into the air and settle out quickly, as distinguished from particles of an aerosol, which remain airborne indefinitely.

5.3. General Recommendations

5.3.1. Wear scrub suits during patient-care and instrument processing activities. Scrub suits are not PPE. Military uniforms or civilian clothing, supplemented with a clinic smock or laboratory coat, may be worn if spray or spatter of blood or OPIM is not anticipated (e.g., dental exams [when the air/water syringe is not used] or radiography procedures).

5.3.2. Ensure the appropriate military uniform is available for the duty day.

5.3.3. Supplement scrub suits with PPE when exposure to blood or OPIM is reasonably anticipated.

5.3.4. Uncontaminated scrub suits may be worn in designated areas according to local policy.

5.3.5. Have visitors in instrument processing areas wear the same attire that instrument processing technicians wear when they are not manually cleaning instruments. Visitors also have the option to wear a laboratory coat or other cover gown over civilian or military attire if spray or spatter is not anticipated. Have visitors wear shoe covers when visiting decontamination area to protect shoes from contamination.

5.4. Personal Protective Equipment

5.4.1. Masks and Protective Eyewear

5.4.1.1. Wear a face mask and eye protection with solid side shields (e.g., glasses, 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. Protective eyewear meeting American National Standards Institute (ANSI) Standard Z87.1-1989 is encouraged, although not required to meet OSHA standards.

5.4.1.2. Change masks between patients or during patient treatment if the mask becomes wet.

5.4.1.3. Clean according to manufacturer IFU, or if visibly soiled, clean and disinfect reusable facial protective equipment (e.g., clinician and patient protective eyewear, face shields) between patients.

5.4.2. Head and Shoe Covers

5.4.2.1. The use of shoe covers is optional, but should be considered when contamination of footwear is anticipated (e.g., surgical procedures where unusually heavy bleeding may be anticipated [i.e., maxillofacial reconstructive surgery, trauma surgery]).

5.4.2.2. The use of head covers should be considered when exposure to blood and OPIM in the form of droplet, spray and spatter are anticipated. Use head covers for procedures involving sonic or ultrasonic scaling and surgical procedures using rotary or ultrasonic instrumentation.

5.4.2.3. The use of head covers is required when preforming manual and ultrasonic cleaning of dental instruments where spray and spatter may be generated. This includes rinsing instruments after ultrasonic cleaning. Head covers are also required when entering or working on the clean side of instrument processing.
5.4.3. Protective Clothing

5.4.3.1. Wear protective clothing (e.g., long-sleeved reusable or disposable gown, clinic jacket, laboratory coat) that covers clothing and skin (e.g., forearms) likely to be soiled with blood, saliva, or OPIM. PPE does not have to be fluid impervious or fluid resistant to meet OSHA standards, but must prevent contamination of clothing or skin. For dental procedures, cotton or cotton/polyester laboratory coats or clinic jackets are satisfactory. If laboratory coats are worn as PPE, they must be turned in at the end of the day for laundering like other soiled and contaminated reusable PPE.

5.4.3.2. Procedures likely to result in spattering of blood or OPIM that require the use of long-sleeved protective clothing include but are not limited to, the following: the use of high- or low-speed handpieces or sonic or ultrasonic scalers; manipulation with sharp cutting instruments during periodontal and prophylaxis treatments; spraying water and/or air into a patient’s mouth using the air water syringe or other device; oral surgical procedures; and manual instrument cleaning/rinsing of instruments.

5.4.3.3. Change protective clothing if visibly soiled; change immediately or as soon as feasible if penetrated by blood or other potentially infectious fluids.

5.4.3.4. Remove PPE, including gloves, mask, eyewear and gown before departing the work area (e.g., patient-care, instrument processing, or laboratory areas). Work area definitions may vary depending on local policy. OSHA and CDC guidelines prohibit PPE to be worn outside of the work area.

5.4.4. Gloves

5.4.4.1. Wear medical gloves (i.e., surgeon’s or patient examination gloves) when a potential exists for contacting blood, saliva, OPIM, mucous membranes or when handling sterile instruments for nonsurgical procedures.

5.4.4.2. 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 the environment.

5.4.4.3. Remove gloves that are torn, cut, or punctured as soon as feasible and wash hands before re-gloving.

5.4.4.4. Do not wash medical gloves before use or wash, disinfect, or sterilize gloves for reuse.

5.4.4.5. Ensure that appropriate gloves in the correct size are readily accessible.

5.4.4.6. Use appropriate gloves (e.g., puncture- and chemical-resistant utility gloves) when cleaning instruments and performing housekeeping tasks involving contact with blood or OPIM.

5.4.4.7. Consult with glove manufacturers regarding the chemical compatibility of glove material and dental materials used.

5.4.5. Sterile Surgeon’s Gloves and Double Gloving During Oral Surgical Procedures (see Chapter 9)

5.4.5.1. Wear sterile surgeon’s gloves when performing oral surgical procedures.

5.4.5.2. No recommendation is offered regarding the effectiveness of wearing two pairs of gloves to prevent disease transmission during oral surgical procedures. However, 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.

5.5. Storage and Laundry

5.5.1. Scrub suits that have not been exposed to spray and spatter-containing blood or OPIM are not considered to be contaminated laundry. Uncontaminated clothing may be stored in personal lockers or offices for short periods of time during work hours (e.g., lunch breaks).

5.5.2. Launder scrub suits and reusable PPE that are visibly soiled with blood or OPIM or have been exposed to contaminated spray and spatter (PPE is considered contaminated in such instances even if no visible evidence of contamination is evident) at the expense of the MTF.

5.5.3. Turn in soiled and contaminated linen (including scrubs and reusable PPE [i.e., lab coats when worn as PPE]) to be laundered at the end of the work period. Do not store contaminated clothing or PPE in personal clothing lockers or offices.
5.5.4. Place soiled and contaminated laundry in an appropriately marked container IAW MTF guidance.

5.5.4.1. Wear gloves and other appropriate PPE when handling contaminated laundry.

5.5.4.2. If soiled/contaminated laundry is wet, bags or containers must prevent leakage or soak-through.

5.5.4.3. Do not sort laundry in the clinic after it has been placed in containers for shipment to the laundry facility.

5.5.4.4. Disposable PPE that is not heavily contaminated with blood or OPIM is not considered by OSHA to be regulated medical waste. Disposal procedures may vary depending on local policy.
CHAPTER 6

INSTRUMENT PROCESSING (STERILIZATION) PROCEDURES

6.1. INTRODUCTION. Instrument processing requires multiple steps and is a complex process requiring specialized equipment, adequate space, qualified DHCP who are provided with initial and ongoing training and regular monitoring for quality assurance. Correct cleaning, disinfection, packaging, sterilizer loading procedures and sterilization methods are essential to ensure that instruments are adequately processed and safe for reuse on patients.

6.2. KEY TERMS

Autoclave: an instrument for sterilization that uses moist heat under pressure.

Biological indicator (BI): a device to monitor the sterilization process that consists of a standardized population of bacterial spores known to be resistant to the mode of sterilization being monitored. Biological indicators are intended to demonstrate whether conditions were adequate to achieve sterilization.

Chemical indicator (CI): a device to monitor the sterilization process that changes color or form when exposed to one or more of the physical conditions within the sterilizing chamber (e.g., temperature, steam). Chemical indicators are intended to detect potential sterilization failures that could result from incorrect packaging, incorrect loading of the sterilizer, or malfunctions of the sterilizer. A "pass" response does not verify that the items are sterile.

Chemical sterilant: chemicals used for the purpose of destroying all forms of microbial life including bacterial spores.

Cleaning: the removal of visible soil, organic and inorganic contamination from a device or surface, using either the physical action of scrubbing with a surfactant or detergent and water or an energy-based process (e.g., ultrasonic cleaners) with appropriate chemical agents.

Control biological indicator: a biological indicator from the same lot as a test indicator that is left unexposed to the sterilization cycle and then incubated to verify the viability of the test indicator. The control indicator should yield positive results for bacterial growth.

Critical: the category that describes medical devices or instruments that are introduced directly into the human body, either into or in contact with the bloodstream or normally sterile areas of the body (e.g., surgical scalpel). These items are so called because of the substantial risk of acquiring infection if the item is contaminated with microorganisms at the time of use.

Decontamination: a process that removes some microorganisms making medical devices, instruments and equipment safe for personnel to handle. The type and level of decontamination required is determined by many factors.

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). The EPA groups disinfectants on whether the product label claims it to be a “limited,” “general” or “hospital” disinfectant.

Disinfection: destruction of pathogenic and other kinds of microorganisms by physical or chemical means. Disinfection is less lethal than sterilization, because it destroys the majority of recognized pathogenic microorganisms, but not necessarily all microbial forms (e.g., bacterial spores). Disinfection does not ensure the degree of safety associated with sterilization processes.

Dry heat sterilizer: an instrument for sterilization that uses heated air.

Event-related packaging/shelf life: a storage practice that recognizes a package and its contents remain sterile until some event (e.g., the packaging becomes wet or torn) causes the item(s) to become contaminated.

Flash sterilization: see immediate use steam sterilization (IUSS)

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

Hospital disinfectant: a germicide that is registered by the EPA for use on inanimate objects in hospitals, clinics, dental offices, or any other medical-related facility. Efficacy has been demonstrated against Salmonella enterica, Staphylococcus aureus and Pseudomonas aeruginosa.

Implantable device: according to the FDA, a “device that is placed into a surgically or naturally formed cavity of the human body if it is intended to remain there for a period of 30 days or more” [21 CFR 812.3(d)].

Immediate-use steam sterilization (IUSS): a process designed for the steam sterilization of unwrapped patient-care items for immediate use. Currently, this is not an acceptable practice in the USAF Dental Service.

Intermediate-level disinfectant: for purposes of this document, a liquid chemical germicide registered by the EPA as hospital disinfectant with a label claim of potency as a tuberculocidal.

Low-level disinfectant: for purposes of this document, a liquid chemical germicide registered by the EPA as a hospital disinfectant.

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).

**Process Challenge Device (PCD):** a device used to assess the effectiveness of the sterilization process (also known as a test pack). It provides a challenge to the process that is equal to or greater than the challenge provided by the most difficult item to routinely process. A PCD may contain a BI alone, a BI and a Class 5 integrating chemical indicator, or a Class 5 integrating chemical indicator alone.

**Physical (mechanical) indicator:** devices (e.g., gauges, meter, display, printout) that display an element of the sterilization process (e.g., time, temperature and pressure).

**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.

**Spore test:** see biological indicator

**Sterile/sterility:** state of being free from all living microorganisms. In practice, it is usually described as a probability function, (e.g., the probability of a surviving microorganism being 1 in 1,000,000).

**Sterilization:** the use of a physical or chemical procedure to destroy all microorganisms, including large numbers of resistant bacterial spores.

**Ultrasonic cleaner:** a device that removes debris by a process called cavitation, in which waves of acoustic energy are propagated in aqueous solutions to disrupt the bonds that hold particulate matter to surfaces.

**Washer-disinfector:** an automatic unit designed to clean and thermally disinfect instruments. The unit uses a high-temperature cycle rather than a chemical bath.

### 6.3. General Recommendations

6.3.1. Provide initial and recurring (quarterly at a minimum) training to all individuals who reprocess instruments. Individuals processing dental/medical instruments must be able to demonstrate knowledge and have documented competence in all aspects of instrument processing. Use the most current standard work Instrument Processing Training document available at [http://www.airforcemedicine.af.mil/DECS](http://www.airforcemedicine.af.mil/DECS) to complete local training requirements.

6.3.2. Use only FDA-cleared medical devices for sterilization and follow the manufacturer’s IFU for correct use (e.g., cycle lengths, operating parameters).

6.3.2.1. The following methods of heat sterilization are acceptable in USAF dental clinics: steam sterilization (either gravity displacement or prevacuum) or dry heat sterilization (either static or forced air).

6.3.2.2. Select a sterilization method compatible with items and packaging materials to be sterilized.

6.3.2.3. Types of steam sterilizers

6.3.2.3.1. Gravity displacement cycles introduce air to the sterilization chamber through steam lines, a steam generator or self-generation of steam within the chamber. Unsaturated air within gravity sterilizers is forced out of/displaced from the chamber as steam fills the chamber. Errors in packaging items and overloading the sterilizer can allow cool air pockets within the chamber and prevent items from being sterilized.

6.3.2.3.2. Prevacuum cycles create a vacuum to ensure air is removed from the chamber before the chamber is pressurized with steam. This allows faster and more steam penetration throughout a load. Prevacuum sterilizers are tested daily IAW manufacturer’s IFU for adequate air removal. If a prevacuum sterilizer fails the air removal test do not continue to process the load. For air removal test failures, see manufacturers IFU.

6.3.2.3.3. Sterilizers vary in design and performance characteristics. A single sterilizer may run different types of sterilization cycles (i.e., prevacuum and gravity displacement cycles). The common sterilization cycles are gravity displacement cycles and dynamic air-removal (e.g., prevacuum) cycles.

6.3.2.4. If a steam sterilizer can run both gravity and prevacuum cycles, choose the prevacuum cycle unless the instrument IFU dictates otherwise. The prevacuum cycle is the cycle of choice because it is considered safe, fast and the most cost effective for healthcare facilities. Ensure a BI test (i.e. spore test) designed for prevacuum is used when running prevacuum cycles and that a BI test designed for gravity is used when running gravity cycles.

6.3.3. Assure that scheduled maintenance and calibration are performed and documented for all decontamination and sterilization equipment according to manufacturer written IFU and MTF guidance.

6.3.3.1. Clean and heat-sterilize critical and semicritical dental instruments according to manufacturer instructions before each use.
6.3.3.2. If heat-sensitive items must be used, FDA-cleared chemical sterilants/high-level disinfectants (e.g., hydrogen peroxide based products, peracetic acid) or an FDA-cleared low-temperature sterilization method (e.g., ethylene oxide) must be used. However, using heat-sensitive semicritical items that must be processed with chemical sterilants/high-level disinfectants is discouraged; heat-tolerant or disposable alternatives are available for the majority of such items. Chemical sterilants/high-level disinfectants can be used in non-dental instrument processing areas that have the proper equipment and ventilation.

6.3.3.3. Follow manufacturer’s written IFU for use of disinfectants (including contact time and proper PPE).

6.3.3.4. Do not use intermediate or low-level disinfectants intended for use on environmental surfaces to clean and disinfect dental instruments.

6.3.3.5. Ethylene oxide sterilization is acceptable for use on heat-sensitive dental instruments (excluding dental handpieces or other devices with narrow-bore lumens or lubricated parts) where this modality is available through the MTF Sterile Processing Department (SPD). Do not install ethylene oxide sterilization equipment in dental clinics.

6.3.4. Clean, lubricate and heat-sterilize all dental handpieces, including prophy angles (unless disposable) and motors between patients according to manufacturer’s written IFU. This includes sterilizable sonic and ultrasonic scalers.

6.3.5. Arrange packages loosely in the sterilization chamber; do not overload. Open and/or disassemble hinged or other complex instruments to permit exposure to sterilizing agents. Do not over pack paper-plastic pouches, this allows adequate space for steam penetration and drying.

6.3.6. To avoid contamination, allow packages to dry in the sterilizer before they are handled. Do not remove packages from the steam sterilizer if condensation is present. See standard work Instrument Processing Training document available at http://www.airforcemedicine.af.mil/DECS for information about unloading the sterilizer.

6.3.7. Single-use disposable instruments are acceptable alternatives if they are used only once and disposed of correctly. Do not reuse or reprocess single use disposable items.

6.3.8. Do not use chemical sterilants/high-level disinfectants for environmental surface disinfection or as holding solutions.

6.3.9. 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 with a tuberculocidal claim (i.e., intermediate-level).

6.3.10. Inform DHCP of all OSHA guidelines for exposure to chemical agents used for disinfection and sterilization.

6.3.11. Maintain instrument processing records (i.e., physical, chemical and biological) for a period dictated by local statutes and MTF policy or two years, whichever is longer.

6.4. Instrument Processing Center

6.4.1. Designate a central instrument processing center where instruments are cleaned, disinfected and sterilized. Divide the instrument processing area, physically or, at a minimum, spatially, into distinct areas for: receiving; cleaning and decontamination; preparation and packaging; sterilization and storage. Do not process instruments (including cleaning/disinfected and packaging) outside of the centralized instrument processing area (i.e., dental instrument processing center). Do not store sterile or clean instruments in an area where contaminated instruments are held or cleaned. If centralization of instrument processing activities cannot be accomplished, contact DECS for assistance in developing a program for centralized instrument processing.

6.4.2. Train DHCP to work using aseptic techniques and to use work practices that prevent contamination of clean areas.

6.4.3. Contact the Facility Design Consultant at DECS before beginning any renovations. The Facility Design Consultant helps ensure that your clinic design or update will meet current standards and regulations.

6.5. Receiving, Cleaning and Decontamination Work Area

6.5.1. Wear fluid resistant gown, facemask/shield and hair cover when working in decontamination areas.

6.5.2. The decontamination process should be physically separate from dental treatment areas and ideally from other instrument processing functions.

6.5.3. Wear puncture and chemical-resistant gloves (i.e., heavy utility gloves) for instrument cleaning and decontamination procedures. This includes manual cleaning, use of the ultrasonic cleaner and rinsing instruments after ultrasonic cleaning.
6.5.4. Pre-cleaning is the removal of gross bioburden. Clean all visible blood and other contamination from dental instruments and devices before sterilization or disinfection procedures (accomplished during the procedure when possible).

6.5.5. Use work-practice controls to minimize exposure potential when transporting instruments to the instrument processing area. Carry instruments in a puncture-resistant covered container that is red or labeled with the biohazard symbol. Decontaminate the outside of the container before transporting to the instrument processing area. For additional information on pre-cleaning, transportation and decontamination of instruments see standard work Instrument Processing Training document available at http://www.airforcemedicine.af.mil/DECS.

6.5.6. Keep instruments moist during transport, making the automated or manual cleaning step more efficient. Use a pretreatment product (e.g., enzymatic, presoak/pretreatment sprays, gels or foams) IAW the product’s IFU. Pretreatment solutions are designed to prevent residual blood and/or bodily fluids from drying on instruments before the cleaning and disinfection process begins.

6.5.7. Pretreatment solution IFU vary per product; therefore, read the IFU for each specific pretreatment product. Some solutions require rinsing before the cleaning process. It is important to rinse instruments when the IFU dictates, to ensure removal of residue that can corrode instruments if left beyond the maximum contact time (Note: pretreatment solutions may require limited exposure times to instruments). Do not allow instruments to soak at point of use. Never allow instruments to sit in a soaking solution during transport. Spray, gels or foams are acceptable in transport bins when used to cover the instruments, but not to soak the instruments resulting in excess solution at the bottom of the bin.

6.5.8. Use manual cleaning for items that cannot be cleaned using automated cleaning methods (i.e., ultrasonic washer and washer-disinfector). This method increases the potential for injury to the instrument processing technician (IPT). It is not as efficient as other cleaning methods, cannot be consistently reproduced and its effectiveness is not readily verified. Use PPE (i.e., puncture resistant gloves, head covers and long sleeve gown) and work-practice controls (e.g., long-handled brush) that minimize contact with sharp instruments if manual cleaning is necessary.

6.5.9. Use automated cleaning equipment (e.g., ultrasonic cleaner, instrument washer, washer-disinfector) to remove debris to improve cleaning effectiveness and decrease worker exposure to blood and OPIM. Follow manufacturer’s written IFU for routine testing (i.e., weekly) and operation of the washer/ultrasonic cleaner.

6.5.9.1. Ultrasonic washing is designed for fine cleaning to remove soil from joints, crevices, lumens and other areas that are difficult to clean (i.e., complex architecture of reusable dental burs).

6.5.9.2. Use PPE (i.e., puncture resistant gloves, head covers and long sleeve gown).

6.5.9.3. Test automated cleaning equipment (e.g., ultrasonic cleaners and washer disinfectors) upon initial installation, at least weekly during routine use and after major repairs. For ultrasonics, use a foil test method (see Box 1) or a commercial test product.

6.5.9.4. Maintain cleaning equipment test results with other instrument processing quality assurance documents (e.g., physical monitors [time and temperature], chemical indicator monitoring [external/internal indicators and air-removal test] and BI monitoring [spore test]).

**Box 1: Ultrasonic Cleaner Test Procedure**

The aluminum foil test is a simple and fast method to check for an even distribution of the cleaning power in an ultrasonic cleaner. In the absence of manufacturer’s recommendations, the following procedure can be used:

1. Using standard lightweight or regular household aluminum foil, cut a piece of foil to fit the width of the cleaner chamber. For example: A tank with dimensions of 9 inches long by 5 inches wide by 4 inches deep would require a foil sample measuring 9 inches by 5 inches.

2. Prepare a fresh solution of ultrasonic cleaning solution and fill the tank according to the manufacturer’s instructions. Do not turn the heater on for the test.

3. Insert the foil vertically into the cleaner chamber, with the length of the foil running the length of the chamber and the bottom of the foil about one inch above the bottom.

4. Holding the foil as steady as possible, turn on the ultrasonic cleaning unit for 20-60 seconds (if the unit is supplied with a high/low switch, it should be set in the high position).

5. With a properly functioning unit, the entire foil surface will be uniformly "peppered" (covered with a tiny pebbling effect). If areas greater than ½ inch square show no pebbling, the unit may require servicing.
6.6. Preparation and Packaging

6.6.1. Before sterilization of critical and semicritical instruments, inspect instruments for cleanliness then wrap or place them in packages (e.g., wrapped cassettes, paper-plastic pouches) designed to maintain sterility during storage. Annotate on the sterilization log that instruments have been visually inspected (to identify debris and/or damage) before sterilization. Replace or re-clean instruments if debris and/or damage is found. For additional information on preparation and packaging of instruments see standard work Instrument Processing Training document available at http://www.airforcemedicine.af.mil/DECS.

6.6.2. Use an FDA-cleared container system or wrapping compatible with the type of sterilization process used. Use special non-paper (nylon) sterilization pouches for dry heat sterilization of instruments, unless the sterilizer IFU contraindicates use.

6.6.3. Use an internal chemical indicator (CI) (i.e., for steam sterilization only use a Class 5 integrating indicator in each package. If the internal indicator cannot be seen from the outside of the package, also use an external CI (i.e., indicator tape). If an internal CI is built into the paper-plastic pouch, add an additional Class 5 integrating indicator in the pouch. The additional Class 5 integrating indicator will be more easily identified and detected.

6.6.4. Label packages with the following:

6.6.4.1. Sterilizer identification number
6.6.4.2. Operator’s initials
6.6.4.3. Load number
6.6.4.4. Sterilization date
6.6.4.5. Expiration date (when contents or packages contain an expiration date)

6.6.5. Use self-adhesive labels or tapes. Do not write on paper or cloth wrapping materials. Paper-plastic pouches may be labeled on the plastic portion or on the self-sealing tab (do not write on the paper side of the paper-plastic pouch). Markers used for labeling should be indelible, nonbleeding and nontoxic. Felt-tip ink pens or a very soft lead pencil may be used.

6.7. Sterilization of Unwrapped Instruments

6.7.1. Some tabletop sterilizers have “unwrapped” instrument cycles and some dry heat sterilization equipment cannot accommodate paper packaging materials. Use dry heat compatible packaging (e.g., nylon pouches) if not contraindicated by the dry heat sterilizer manufacturer. Unwrapped cycles should not be confused with immediate-use steam sterilization (IUSS, formerly known as flash sterilization) cycles, which are usually shorter in duration than the “unwrapped” cycles. Do not use IUSS cycles.

6.7.2. Clean and dry instruments before the unwrapped sterilization cycle.

6.7.3. Use physical monitoring and chemical indicator monitoring for each unwrapped sterilization cycle (i.e., place an internal CI among the instruments or items to be sterilized). Use a single variable (Class 3) CI for dry heat sterilizers.

6.7.4. To avoid contamination and thermal injury, allow unwrapped instruments to dry and cool in the sterilizer before they are handled.

6.7.5. Do not sterilize implantable devices unless the IFU states to do so. Dental implants should come from the manufacturer sterile.


6.9. Sterilization Monitoring

6.9.1. Use physical, chemical and biological (i.e., spore test) monitoring IAW manufacturer’s written IFU to ensure the effectiveness of the sterilization process. Chemical indicators (CI) must be specifically designed for the sterilization process utilized (i.e., steam, dry heat, chemical vapor). Class 5 integrating indicators are internal CIs for steam sterilization. They react to all three critical variables (time, temp and pressure). Class 3 single variable indicators are internal indicators for dry heat sterilization. Internal or external CIs must be visually inspected before the release of a load. Only use Class 5 integrating indicators for steam sterilization in USAF dental clinics.

6.9.2. Air-removal test monitoring (e.g., daily Bowie-Dick test or equivalent).

6.9.2.1. For prevacuum steam sterilizers only.
6.9.2.2. Perform daily in an empty chamber.

6.9.2.3. Manufacturers of particular sterilizers may require a weekly leak cycle test in addition to an air-removal test. Review sterilizer IFU.

6.9.2.4. Protocol for a failed air-removal test: repeat the test IAW the test IFU. Do not run a load if the daily air-removal test has not passed.

6.9.3. Physical (mechanical) monitoring of the sterilization cycle:

6.9.3.1. Verify the physical (mechanical) monitors (time and temperature recordings) of each load. Identify and examine the physical monitors using the sterilizer print-out, digital display, or other sterilizer gauges.

6.9.3.2. Accomplished for every load before instruments are removed from the sterilizer.

6.9.3.3. Record the sterilization cycle type, time and temperature for each load using the AFDS Sterilizer Load Release Document (see the most current standard work document Instrument Processing Training at http://www.airforcemedicine.af.mil/DECS). This creates a permanent record for documentation, surveillance and inspections.

6.9.3.4. At the end of a sterilization cycle, physical monitoring provides a real time assessment of the sterilization cycle. It detects real time malfunctions before the BI (i.e., spore test) results are available.

6.9.4. Chemical Indicators (CIs)

6.9.4.1. External and internal chemical indicator (CI) monitoring of packages:

6.9.4.1.1. Visual examination of chemical indicators can help differentiate packages that have been exposed to sterilization process from those that have not been.

6.9.4.1.2. Use an internal CI in each package (a Class 5 integrating indicator for steam sterilization and a Class 3 for dry heat sterilization). If the CI cannot be seen from the outside of the package, also use an external CI (i.e., chemical indicator tape).

6.9.4.1.3. When using paper-plastic pouches with built-in internal CIs, add a Class 5 integrating indicator to the pouch. This makes visual inspection and identifying the integrating indicator’s response to critical parameters (i.e., color change) easier to detect.

6.9.4.1.4. Place a Class 5 integrating indicator within a PCD for every load for steam sterilization. This creates a challenge test for each load.

6.9.4.1.5. Autoclave, chemical vapor and dry heat adhesive sterilization indicator tapes are acceptable for use only as external CIs. They only demonstrate that the package has been exposed to heat.

6.9.4.2. Chemical indicator monitoring is only one part of sterility assurance. Verification of CIs in addition to verification of physical and biological indicator monitoring (i.e., spore testing) assures sterility.

6.9.4.3. Chemical indicators help detect real time sterilization process failures immediately after cycle completion (i.e., incorrect packaging/loading or sterilizer malfunctions).

6.9.4.4. Visual examination of external CIs (i.e., CI tape) can help differentiate packages that have been exposed to heat from those that have not.

6.9.5. Biological indicator (BI) (i.e., spore test) monitoring of sterilizers:

6.9.5.1. The BI tests the sterilizer and provides information about the ability of the sterilizer to kill spores (the lethality of the sterilizer). BIs only give accurate information about the sterilizer’s lethality if used IAW IFU. Therefore, it is critical that the appropriate cycle type and temperature are selected IAW the BI IFU. If not, the BI results are invalid (e.g., if a BI made specifically for a gravity cycle is used in a prevacuum cycle the results are invalid).

6.9.5.2. Monitor steam sterilizers daily or as directed by MTF policy by using a BI (i.e., spore test) within a process challenge device/PCD with a matching control (i.e., biological indicator and control from same lot number). This includes sterilizers considered ready to use, but in a “back-up” mode. Follow BI and sterilizer manufacturer’s written IFU. The BIs for dry heat sterilizers are different than BIs required for steam sterilizers. Make sure the appropriate BI is being used in each cycle type (dry heat or steam sterilizers [prevacuum or gravity]) IAW manufacturer’s written IFU.

(Note: The dental clinic should test steam sterilizers on the same frequency as the MTF).

6.9.5.2.1. If the sterilizer is used for multiple types of cycles (e.g., a sterilizer that utilizes both prevacuum and gravity cycles), test each sterilization mode. Select a BI that is appropriate for each cycle type.
6.9.5.2.2. Use BIs containing *Geobacillus stearothermophilus* for steam or chemical vapor and BIs containing *Bacillus atrophaeus* for dry heat. Use BIs according to sterilizer manufacturer's written IFU (e.g., proper location in the sterilizer).

6.9.5.2.3. Sterilizers that are not being monitored with BIs should be tagged "NOT IN SERVICE" and cannot be used until they have provided three consecutive negative BI tests.

6.9.5.3. Do not run an individual BI alone in a paper plastic-pouch for steam sterilization because this is not a valid challenge of the sterilization cycle.

6.9.5.4. Ensure the BI test and control can be easily distinguished from one another after the sterilization process and before incubation (e.g., mark the control with a C).

6.9.5.5. Run the BI test in a full load (a sterilizer with instruments vs. an empty load) for routine testing.

6.9.5.6. Only use BI (i.e., spore tests) that contain spores. Items labeled with the statement "equivalent to biological indicators" (or similar wording), enzyme tablets, or integrating indicators that do not contain spores are not acceptable methods of biological monitoring in USAF facilities. Consult DECS if further information is required.

6.9.5.7. Allow BI (i.e., spore tests) to cool before removing from the sterilizer and incubating.

6.9.5.8. Results of the BI (i.e., spore tests) are determined after test and control are incubated for the specified time IAW the IFU. Then the results of the BI test are compared to the BI control.

6.9.5.9. Positive BIs are positive for the growth of bacterial spores after incubation and negative BIs are negative for the growth of bacterial spores after incubation. A negative BI does not prove that instruments in the load are sterile or that all instruments were exposed to adequate sterilization conditions. Physical and CI monitoring must be completed in addition to BI monitoring to ensure all instruments are properly sterilized.

6.9.5.10. Protocol for failed BIs (steam sterilization)

6.9.5.10.1. Notify the dental infection preventionist (IP) (IC OIC and/or IC NCOIC), biomedical equipment technician (BMET) and MTF IP per MTF policies. This notification should be followed by a written report that is submitted to the Dental Executive Function and MTF ICC/ICF.

6.9.5.10.2. Notification includes: time and date of cycle; description of load including the sterilizer and load number; results of physical monitoring; results of internal CIs and any other information that can help determine a valid failure vs. operator error.

6.9.5.10.3. Review sterilization procedures (e.g., work practices and use of physical monitors and chemical indicators) to determine if operator error could be responsible.

6.9.5.10.4. If the cause of failure is identified and involves only one load or one item: correct the cause of the failure, repackage instruments and reprocess load.

6.9.5.10.5. If the cause of the failure is not immediately identified, secure the sterilizer to prevent further use. Quarantine the load and recall all instruments since the last negative BI if possible. Remove the failing sterilizer from service. Reprocess all involved items.

6.9.5.10.6. Continue work to determine the cause of the failure including dental IC personnel, the sterilizer manufacturer and BMETs. Make corrective actions. If the cause of the failure is determined to be a sterilizer malfunction and major repair of the sterilizer is required, re-challenge the sterilizer using a BI (i.e., spore test) in three consecutive cycles (for floor size models run cycles in an empty chamber and for table top models run cycles in fully loaded chamber). If the sterilizer is a prevacuum (dynamic air removal), after the BI testing, run an air-removal test (i.e., Bowie-Dick test) in three consecutive empty cycles. Until the testing results are passing for the three BI tests and the Bowie-Dick test (if a prevacuum sterilizer is tested), do not rely on the performance of the sterilizer. If any one of the three consecutive BI tests or Bowie-Dick tests are positive, do not use the sterilizer.

6.9.5.10.7. When using dry heat BIs (i.e., spore test strips), a microbiology lab should identify the failed microorganism present in the failed (positive) BI, IAW the manufacturer's IFU. Also review the technique used when handling the BI after the sterilization process. Do not delay the recall during this process. When using dry heat, if the BI failed due to organisms other that *Bacillus atrophaeus*, the failure is not due to sterilizer malfunction.

6.9.5.11. Rapid-readout BIs that contain spores and have enzyme-based early readout capability (e.g., test results at 1 or 3 hours) are acceptable only when the following conditions are met:

6.9.5.11.1. Physical monitoring is performed using time and temperature indicators and chemical monitoring is performed using external and internal indicators (and air removal test for prevacuum).
6.9.5.11.2. Follow manufacturer or MTF policy regarding periodic verification of the early readout results. The periodic verification may be either continued incubation of the biological indicators (BI) with enzyme-based early-readout capability (IAW written IFU) or the use of a conventional BI. If conventional BI will be used in these instances, maintain a conventional incubator in the facility.

6.9.5.12. Maintain instrument processing records (i.e., physical, chemical and biological) for a period dictated by local statutes and MTF policy or two years, whichever is longer. Documentation ensures cycle parameters have been met, establishes accountability and assists in the event of a recall. Minimum documentation includes:

6.9.5.12.1. Date and time of test
6.9.5.12.2. Sterilizer identification number
6.9.5.12.3. Sterilizer identification number
6.9.5.12.4. Sterilizing conditions - temperature and exposure period (automated printout documentation is acceptable)
6.9.5.12.5. Load contents (e.g., type of instruments/kits [prophylaxis, operative, surgery])
6.9.5.12.6. Individual conducting the test
6.9.5.12.7. Results of the test and control.
6.9.5.12.8. Report BI testing results to the MTF ICC/ICF in the format and on a schedule dictated by MTF policy.
6.9.5.12.9. Nature and date of any malfunctions or repairs

6.10. Unloading the sterilizer and releasing loads

6.10.1. For steam sterilization, the instrument processing technician (IPT) does the following when the sterilizer completes the cycle:

6.10.1.1. Verify correct cycle completed
6.10.1.2. Verify physical monitors (time and temperature) from the sterilizer print-out by identifying the time and temperature of the entire sterilization phase
6.10.1.2.1. Highlight the entire sterilization phase on the print-out
6.10.1.2.2. After reviewing the entire sterilization phase, write the sterilization phase start and end time on the AFDS Sterilization Load Release Document
6.10.1.3. Initials print-out (this is the second time the print-out is initialed, the first time is when the cycle starts)
6.10.1.4. Records the total cycle (including drying and other phases) end time and the technician's name and initials on the AFDS Sterilization Load Release Document.

6.10.2. For dry heat sterilization, the instrument processing technician does the following when the sterilizer completes the cycle:

6.10.2.1. Verify correct cycle ran (e.g., time setting, 6 or 12 min cycle)
6.10.2.2. Verify physical monitors (time and temperature) from the sterilizer automated record (e.g., printout or electronic record)
6.10.2.2.1. Highlight (if using a printout) or identify (if using an electronic record the sterilization cycle)
6.10.2.2.2. After reviewing the entire sterilization phase of the cycle, document the sterilization phase start and end time on the AFDS Sterilization Load Release Document
6.10.2.3. Do not release sterilization loads without the following (see Sterilization Monitoring for more information):
6.10.2.3.1. Physical monitoring. Use a print out or electronic record of the cycle to verify the correct time and temperature were met.
6.10.2.3.2. Process Challenge Device (PCD) monitoring (for steam sterilization only). Verify the Class 5 integrating indicator within the PCD has passed.
6.10.2.3.3. Internal chemical indicator monitoring of packages. Verify the Class 5 integrating indicator in each package (when visible) has changed appropriately.
6.10.2.3.4 External chemical indicator monitoring of packages. Verify the external chemical indicators on each package have changed appropriately when the Class 5 integrating indicator is not visible.
6.10.2.3.5 Results of the BI test for the load (this is required for loads containing implantable devices and is optional for loads without implantable devices).

6.11. Storage Area for Sterile/Clean Dental Supplies and Transport


6.11.2. Examine wrapped packages of sterilized instruments before opening them to ensure the barrier wrap has not been compromised during storage. Examples of compromise include dropped, torn, yellowing, or wet packages.

6.11.3. Re-clean, repack and re-sterilize any instrument package that has been compromised (e.g., dropped, torn, yellowing, or wet). Once packages are opened in the Dental Treatment Room (DTR), even if instruments are not used, they are re-cleaned, re-packed and re-sterilized.

6.11.4. Store sterile items and dental supplies in clean, dry and dust/lint-free areas with limited access. Covered or closed cabinets are recommended. If sterile items are stored in a patient-care area (e.g., dental operatory), they must be in covered or closed cabinets.

6.11.5. Do not store sterile supplies or patient-care items under the sink (or any location where they may become wet), on the floor, windowsills, or any area other than designated shelving or cabinets.

6.11.6. Do not store sterile items with items not intended for clinical use (e.g., office supplies, cleaning supplies).

6.11.7. As a general rule, keep like items together (i.e., sterile with sterile and clean with clean). However, sterile and non-sterile patient treatment items may be stored in the same drawers or cabinets, as long as there is no possibility of similar nonsterile items being used inadvertently when sterility is required (e.g., sterile and nonsterile gauze sponges stored in the same drawer or cabinet). If using dividers or containers ensure they can be cleaned.

6.11.8. To allow for adequate air circulation, ease of cleaning and compliance with local fire codes, follow MTF guidelines when storing clean and sterile materials. In the absence of such guidance store these materials at least 8 inches above the floor, 18 inches below the ceiling and 2 inches from the outside walls.

6.11.9. Maintain stock rotation according to the principle “first in, first out” so that older items are used first, thus preventing waste due to expiration.

6.11.10. Do not stack wrapped kits. Stacking wrapped kits can compromise the integrity of the wrapping material caused by pressure due to weight.

6.11.11. Only handle packages when absolutely necessary. Inventory control should involve minimal handling of supplies.

6.11.12. Do not use shipping cartons/boxes to dispense sterile or clean patient treatment items in dental operatories, laboratories, instrument processing or supply areas.

6.11.13. When sterile items are transported on a cart, the cart should be covered/enclosed. If carts are used to transport sterile and nonsterile instruments/supplies, the cart should be decontaminated and dried prior to sterile transport.
CHAPTER 7
ENVIRONMENTAL INFECTION PREVENTION & CONTROL

7.1. INTRODUCTION: Environmental surfaces (i.e., a surface or equipment that does not contact patients directly) can become contaminated during patient care. Certain surfaces, especially ones touched frequently (e.g., light handles, unit switches and drawer knobs) can serve as reservoirs of microbial contamination, these surfaces are considered clinical contact surfaces. Transfer of microorganisms from contaminated environmental surfaces to patients occurs primarily through DHCP hand contact. When these surfaces are touched, microbial agents can be transferred to instruments, other environmental surfaces, or to the nose, mouth, or eyes of workers or patients. Although hand hygiene is key to minimizing this transferal, barrier protection and cleaning and disinfecting environmental surfaces also protects against healthcare-associated infections. The scientific evidence supports the use of low-level disinfectants if certain conditions are met (i.e., the product has both HIV- and HBV-label claims, the surface is not visibly contaminated with blood). However, for reasons of convenience, USAF dental clinics will continue to use products with a higher degree of potency (i.e., intermediate-level disinfectant products) on clinical contact surfaces to cover all situations. Environmental surfaces which are not likely to be touched by health care workers (e.g. floor, walls, windowsills) should be cleaned and disinfected daily with a low-level cleaner disinfectant as a part of routine housekeeping procedures. These surfaces are considered housekeeping surfaces.

7.2. KEY TERMS

Barrier material: material that prevents penetration of microorganisms, particulates and fluids.
Cleaning: see Key Terms in Chapter 6.
Clinical contact surface: a surface contaminated from patient materials either by direct spray or spatter generated during dental procedures or by contact with DHCP’s 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.
Critical: see Key Terms in Chapter 6.
Disinfectant: see Key Terms in Chapter 6.
Disinfection: see Key Terms in Chapter 6.
High-level disinfection: see Key Terms in Chapter 6.
Hospital disinfectant: see Key Terms in Chapter 6.
Intermediate-level disinfection: see Key Terms in Chapter 6.
Intermediate-level disinfectant: see Key Terms in Chapter 6.
Low-level disinfectant: see Key Terms in Chapter 6.
Noncritical: see Key Terms in Chapter 6.
Regulated waste: liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps and pathological and microbiological wastes containing blood or other potentially infectious materials. Definitions may vary by locality.
Semicritical: see Key Terms in Chapter 6.

7.3. General Recommendations

7.3.1. Consult the MTF ICC/ICF regarding cleaners and disinfectants used in the dental clinic. Do not use bleach as a primary hospital-grade environmental surface disinfectant in the dental clinic. It lacks detergent properties and may be corrosive to some surfaces.

7.3.2. Follow manufacturer’s written IFU for correct use of cleaning and EPA-registered hospital disinfecting products. Consult with dental product manufacturers for compatibility of cleaners and disinfectants with equipment surfaces.

7.3.3. Do not use chemical sterilants/high-level disinfectants (e.g., hydrogen peroxide based products, peracetic acid, glutaraldehydes) for disinfection of environmental surfaces (clinical contact or housekeeping).

7.3.4. Do not use low- or intermediate-level disinfectants on critical or semicritical dental instruments or materials unless the IFU specifically states to do so.

7.3.5. Avoid the use of spray bottles that generate mists or aerosols (e.g., use a dispenser that generates streams or droplets or hold a towel behind the “spray” of disinfectant to minimize the spray).

7.3.6. Do not immerse gauze in disinfectants or wrap items in disinfectant-soaked gauze because the cotton fibers may inactivate the active ingredients.

7.3.7. Use PPE, as appropriate, when cleaning and disinfecting environmental surfaces. Such equipment may include gloves (e.g., puncture- and chemical-resistant utility), protective clothing (e.g., gown, jacket, or lab coat), protective eyewear and mask. Refer to disinfectant product instructions, including IFU and SDS information, for specific precautions.
7.3.8. To facilitate daily cleaning, keep treatment areas free of unnecessary equipment and supplies.

7.4. Clinical Contact Surfaces

7.4.1. Use surface barriers to protect clinical contact surfaces (particularly those that are difficult to clean) and change barriers between patients.

7.4.1.1. Clean and disinfect surfaces between patients only when the integrity of physical barriers has been compromised or when the surface is visibly soiled.

7.4.1.2. Clean and disinfect surfaces that have been covered with barriers at the end of each clinical day.

7.4.2. Clean and disinfect clinical contact surfaces that are not barrier-protected using an EPA-registered hospital disinfectant with intermediate-level (i.e., tuberculocidal) activity, after each patient.

7.4.3. General cleaning and disinfection are recommended for clinical contact surfaces at the end of the daily work activity.

7.5. Housekeeping Surfaces

7.5.1. If housekeeping services are not available, clean housekeeping surfaces (e.g., floors, walls and windowsills) with an MTF approved EPA-registered hospital disinfectant on a routine basis. Clean walls, blinds and window curtains in patient-care areas when they are visibly dusty or soiled.

7.5.2. Laminate or use plastic document protectors or frames for posters and other information posted to treatment area walls to facilitate ease of cleaning when needed.

7.6. Spills of Blood and Body Substances

7.6.1. Clean spills of blood or OPIM and decontaminate surface with an EPA-registered hospital disinfectant with intermediate-level (i.e., tuberculocidal) activity. Use of a commercially available spill kit is recommended.

7.6.2. Don gloves and other appropriate PPE.

7.6.3. Visible organic material should be removed with absorbent material (e.g., disposable paper towels) and discarded in a leak-proof, appropriate container (e.g., color-coded or contains a biohazard label). If waste is saturated with blood, dispose of as regulated waste.

7.6.4. Nonporous surfaces should be cleaned and then decontaminated with an EPA-registered intermediate-level disinfectant.

7.7. Carpet and Cloth Furnishings. Avoid using carpeting and cloth-upholstered furnishings in patient-care (e.g., dental operatories), laboratory and instrument processing areas.

7.8. Regulated Medical Waste

7.8.1. General Recommendations

7.8.1.1. Follow federal, state and local regulations for disposal of regulated medical waste (definitions of regulated medical waste vary by locality).

7.8.1.2. Ensure that DHCP who handle and dispose of regulated medical waste are trained in appropriate handling and disposal methods and are informed of the possible health and safety hazards.

7.8.2. Management of Regulated Medical Waste in Dental Healthcare Facilities

7.8.2.1. Use a color-coded or biohazard-labeled container that prevents leakage (e.g., biohazard bag) to contain non sharp regulated medical waste.

7.8.2.2. Place sharp items (e.g., needles, scalpel blades, orthodontic bands, broken metal instruments and burs) in an appropriate sharps container (e.g., one that is puncture resistant, color-coded and leak-proof). Close the container immediately before removal or replacement to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.

7.8.2.3. Pour blood, suctioned fluids or other liquid waste carefully into a drain connected to a sanitary sewer system (preferably not handwashing sinks), if local sewage discharge requirements are met and the state has declared this an acceptable method of disposal. Wear appropriate PPE.
CHAPTER 8
DENTAL UNIT WATER QUALITY

8.1. INTRODUCTION: Dental unit waterlines contain a complex system of small bore tubing that is ideal for the formation of biofilm which will increase microflora expressed from the dental unit during dental treatment. It is recommended by the CDC and ADA that dental unit water be of potable quality (<500 CFU/mL microorganisms). In order to achieve this level of quality in dental unit water, interventions must be introduced into the dental unit to remove or control biofilm and remove contamination. Methods to control water quality may include using independent water reservoirs that may be used to introduce chemical treatments into the dental unit. Microbial filtration systems are also utilized. Dental unit manufacturers frequently recommend a compatible water treatment to maintain dental unit water quality on a routine basis.

8.2. KEY TERMS

**Biofilm:** a mass or layer of live microorganisms attached to a surface which produces a layer of protection that will resist environmental challenges. These microorganisms colonize and create adherent microbial aggregations.

**Boil-water advisory:** a public health announcement that the public should boil tap water before drinking it. When issued, the public should assume the water is unsafe to drink. Advisories can be issued after (1) failure of or substantial interruption in water treatment processes that result in increased turbidity levels or particle counts and mechanical or equipment failure; (2) positive test results for pathogens (e.g., Cryptosporidium, Giardia, or Shigella) in water; (3) violations of the total coliform rule or the turbidity standard of the surface water treatment rule; (4) circumstances that compromise the distribution system (e.g., water main break) coupled with an indication of a health hazard; or (5) a natural disaster (e.g., flood, hurricane, or earthquake).

**Colony-forming unit** (CFU): the minimum number of separable cells on the surface of or in semi-solid agar medium which gives rise to a visible colony. CFUs may consist of pairs, chains and clusters as well as single cells and are often expressed as colony-forming units per milliliter (CFU/mL).

**Dental treatment water**: nonsterile water used for dental therapeutic purposes, including irrigation of non-surgical operative sites and cooling of high speed rotary and ultrasonic instruments.

**Distilled water**: water heated to the boiling point, vaporized, cooled, condensed and collected so that no impurities are reintroduced.

**Heterotrophic bacteria**: those bacteria that require an organic carbon source for growth, (i.e., they derive energy and carbon from organic compounds). The modifier "mesophilic" describes bacteria that grow best within the middle ranges of environmental temperature.

**Independent water reservoir**: a container used to hold water or other solutions and supply it to handpieces and air/water syringes attached to a dental unit. The independent reservoir, which isolates the unit from the public water system, may be provided as original equipment or as a retrofit device on all dental units. When used with a periodic chemical treatment protocol, they have demonstrated safety and efficacy.

**Oral surgical procedure**: see Key Terms in Chapter 4.

**Potable (drinking) water**: water suitable for drinking per applicable public health standards.

**Retraction**: the entry of oral fluids and microorganisms into waterlines through negative water pressure.

**Sterile water**: water that is sterilized and contains no antimicrobial agents.

8.3. General Recommendations

**8.3.1.** Use water that meets EPA regulatory standards for drinking water (i.e., ≤500 CFU/mL of heterotrophic water bacteria) for routine (i.e., non-surgical) dental treatment output water.

**8.3.2.** 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).

**8.3.3.** Clean high-volume evacuator and low-volume suction lines and traps daily using an evacuation system cleaner. Follow manufacturer's written IFU.

8.4. Maintaining Water Quality

**8.4.1.** Consult the dental unit manufacturer for appropriate methods and equipment to maintain the recommended quality of dental water (i.e., ≤500 CFU/mL of heterotrophic water bacteria).

**8.4.1.1.** Consult DECS before using any commercial dental waterline treatment products (germicidal treatment) or devices not listed on the DECS website (http://www.airforcemedicine.af.mil/decs).

**8.4.1.2.** Use the dental unit and/or the water treatment manufacturer’s recommended shock treatment when possible.
8.4.1.3. Do not use sodium hypochlorite (i.e., bleach) to routinely clean dental unit waterlines unless the IFU states otherwise. Sodium hypochlorite may be used to clean/"shock" the lines in the event of a failure (i.e., ≥500 CFU/mL). Also consult the dental unit manufacturer for "shock treatments" they may recommend for their equipment. See Box 2.

8.4.2. Use of independent reservoirs without a germicidal treatment will result in increased biofilm formation. Follow the unit manufacturer’s recommended maintenance regimens to control biofilm formation (e.g., periodic or continuous use of a dental waterline treatment product, recommended source water [i.e., distilled water, reverse osmosis treated water, tap water]).

8.4.2.1. Handle the water reservoir with care to avoid cross contamination.

8.4.2.2. If using an independent water reservoir during surgical procedures, ensure the device can deliver sterile water (i.e., the reservoir and tubing are sterile single-use disposable or can tolerate heat sterilization).

8.5. Monitoring Dental Unit Water Quality

8.5.1. Follow recommendations for monitoring dental unit water quality provided by the manufacturer of the unit or waterline treatment product to assess compliance with recommended protocols and identify technique errors or noncompliance.

8.5.1.1. To obtain a representative sample, obtain water samples from all lines (i.e., air water syringe, handpieces and ultrasonic scaler), mix together and place in a sterile specimen cup.

8.5.1.2. Unless the manufacturer IFU state otherwise, when setting up new dental units, test dental unit water from each unit monthly for three months and if the unit meets standards during this period, then monitor water from the dental unit quarterly at a minimum. It is recommended to use a rotating schedule testing several units each month.

8.5.1.3. In the event that standards are not met, review work practices, waterline treatment protocols and waterline treatment and monitoring records. Correct any identified procedural problems, retreat the waterlines and retest. If the test remains positive, a “shock” treatment of the waterlines may be indicated (See Box 2). Contact DECS for guidance in the event that a unit consistently does not meet standards (i.e., ≥500 CFU/mL).

8.5.2. There is no need to identify specific organisms unless investigating a waterborne illness or a unit refractory to treatment. Testing should accurately detect a wide concentration range and type of aerobic, mesophilic, heterotrophic, waterborne bacteria within a reasonable incubation time at room temperature. Acceptable monitoring methods include:


8.5.2.2. Using an in-office self-contained system that is equivalent to method 9215.

8.5.3. Maintain waterline-monitoring records for a minimum of two years.

8.6. Boil-Water Advisories

8.6.1. The following apply while a boil-water advisory is in effect:

8.6.1.1. 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.

8.6.1.2. Do not use water from the public water system for dental treatment, patient rinsing, or handwashing.

8.6.1.3. 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.

8.6.2. The following apply when the boil-water advisory is cancelled:

8.6.2.1. Follow guidance given by the local water utility regarding adequate flushing of waterlines. If guidance is not provided, flush dental waterlines and faucets for 5 minutes before using for patient care.

8.6.2.2. Treatment of dental waterlines as recommended by the dental unit manufacturer.
Box 2: Dental Waterline “Shock” Protocol Using Sodium Hypochlorite (bleach).

1. Prepare a fresh bleach solution (1 part 6% household bleach to 10 parts water).
2. Remove water reservoir and discard residual water.
3. Replace water reservoir and air purge all waterlines.
4. Fill water reservoir to the top with bleach solution.
5. Run bleach through all lines capable of carrying water.
6. Allow bleach solution to stand for ten minutes.
7. Remove water reservoir and discard bleach (discard in sink and thoroughly rinse with water when done).
8. Replace water reservoir and air purge to remove residual bleach.
9. Flush all lines with 750 mL of clean† water, sterile§ water, or tap water with 1 drop of bleach.
10. Air purge and leave lines dry until next clinical use. Avoid touching the water tube with ungloved hands which may contaminate the system with skin or enteric bacteria.

† freshly boiled water or water prepared by heat distillation; store in containers that have been cleaned at least once per week
§ sterile bottled water

Note: Do not use sodium hypochlorite (i.e., bleach) to routinely clean dental unit waterlines unless the IFU states otherwise; use a commercially available product when possible.
CHAPTER 9
SPECIAL CONSIDERATIONS

9.1. INTRODUCTION: Many aspects of dentistry do not fit into other general categories, but must be discussed as part of an overall compliant program to maintain patient and staff safety from infectious agents. Subjects addressed in this chapter will include safe injection practices, latex allergies, Creutzfeldt-Jakob disease, oral surgery procedures, lasers, laboratory procedures and radiology along with other special considerations.

9.2. KEY TERMS

- **Allergic contact dermatitis**: a type IV or delayed-hypersensitivity reaction resulting from contact with a chemical allergen (e.g., poison ivy, certain components of patient care gloves), generally localized to the contact area. Reactions occur slowly over 12-48 hours.

- **Creutzfeldt-Jakob disease (CJD)**: a degenerative neurological disorder of humans thought to be transmitted by abnormal isoforms of neural proteins called prions. CJD is one of a group of related diseases known as transmissible spongiform encephalopathies (TSEs).

- **Hypersensitivity**: an immune reaction (allergy) in which the body has an exaggerated response to a specific antigen (e.g., food, pet dander, wasp venom). See allergic contact dermatitis, latex allergy.

- **Irritant contact dermatitis**: the development of dry, itchy, irritated areas on the skin, which can result from frequent handwashing and gloving as well as exposure to chemicals. This condition is not an allergic reaction.

- **Laser plume**: a release of particles, gases and tissue debris caused by the transfer of visible light spectrum electromagnetic energy into tissues.

- **Latex allergy**: a reaction to certain proteins found in natural rubber latex that can range from a mild reaction (i.e., redness or hives) to a type I or immediate anaphylactic hypersensitivity. After repeated exposures, a serious systemic reaction can occur effecting blood flow and breathing which may constitute an emergency in the dental office.

- **Latex**: a milky white fluid extracted from the rubber tree *Hevea brasiliensis* that contains the rubber material cis-1,4 polyisoprene.

- **N-95 respirator**: one of nine types of disposable particulate respirators. "95" refers to the percentage of particles filtered.

- **Oral surgical procedure**: see Key Terms in Chapter 4.

- **Prion**: a protein particle that lacks nucleic acid and has been implicated as the cause of various neurodegenerative diseases (e.g., scrapie, Creutzfeldt-Jakob disease and bovine spongiform encephalopathy). It is an abnormal form of a neural protein that is highly resistant to routine methods of sterilization and disinfection. Degradation involves chemicals or increased sterilization temperatures and times.

- **Single-use device**: also called a disposable device; designed to be used on one patient and then discarded, not reprocessed for use on another patient (i.e., cleaned, disinfected, or sterilized).

9.3 Safe Injection Practices

9.3.1. In accordance with (IAW) CDC *Summary of Infection Prevention Practices in Dental Setting: Basic Expectations for Safe Care—March 2016*, use of parenteral (e.g., intravenous or intramuscular injection) medications among dental providers most often occurs when administering local anesthetic utilizing a re-usable syringe, needle and anesthetic cartridge. The needle and cartridge is used for one patient only and the dental syringe is cleaned and heat sterilized between patients.

9.3.2. The safe practices described below primarily apply to parenteral medications used with fluid infusion systems (e.g., conscious sedation).

9.3.2.1. Prepare injections using aseptic technique in a clean area.

9.3.2.2. Disinfect the rubber septum on all medication vials with alcohol before piercing.

9.3.2.3. Do not reuse needles or syringes to enter a medication vial even when obtaining additional doses for the same patient (i.e., use a new needle/syringe assembly to draw each additional dose of medication).

9.3.2.4. Use single-dose vials for parenteral medications when possible.

9.3.2.5. Do not use single-dose (single-use) medication vials, ampules and bags of intravenous solution for more than one patient.

9.3.2.6. Do not combine the leftover contents of single-use vials for later use.

9.3.3. The following apply if multidose vials are used:

9.3.3.1. Dedicate multidose vials to a single patient whenever possible.

9.3.3.2. If multidose vials will be used for more than one patient, they should be kept in a centralized medication area and should not enter the immediate patient treatment area to prevent inadvertent contamination.
9.3.3.3. If a multidose vial enters the immediate patient treatment area dedicate it for single-patient use and discarded immediately after use.

9.3.3.4. Date multidose vials when first opened and discard within 28 days unless the manufacturer specifies a shorter or longer date for that opened vial.

9.3.4. Discard vials if sterility is compromised.

9.3.5. Follow manufacturer guidelines for storage, use and disposal of pharmaceuticals or MTF policies if more stringent.

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

9.4. Contact Dermatitis and Latex Hypersensitivity

9.4.1. Dental Healthcare Personnel (DHCP) should be educated regarding the signs, symptoms and diagnoses of skin reactions associated with frequent hand hygiene and glove use during facility orientation and annually thereafter.

9.4.2. All patients should be screened for latex allergy (e.g., take health history and refer for medical consultation when latex allergy is suspected).

9.4.3. If using latex gloves, use low protein latex gloves, to reduce exposure to latex allergens. Acceptable synthetic (i.e., nonlatex) alternatives include nitrile, neoprene, vinyl and thermoplastic elastomers. In December 2016, the FDA banned the use of powdered medical gloves (i.e., surgical and exam gloves).

9.4.4. Ensure a latex-safe environment for patients and DHCP with latex allergy.

9.4.4.1. A latex-safe environment reduces the possible exposure to latex by using latex alternative materials for procedures including gloves, rubber dams and other common materials. This practice also reduces the risk of becoming latex allergic.

9.4.4.2. Establish a written protocol for treating latex-allergic patients if latex products are available.

9.4.4.3. Have emergency treatment kits with latex-free products available at all times. Ensure the facility has a latex-free resuscitation kit or cart.

9.4.4.4. Develop policies and procedures for evaluation, diagnosis and management of DHCP with suspected or known occupational contact dermatitis if not addressed by PH.

9.4.4.5. 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.

9.5. Creutzfeldt-Jakob Disease (CJD) and Other Prion Diseases. Potential infectivity of oral tissues in CJD or variant CJD (vCJD) patients is an unresolved issue. Scientific data indicate the risk if any of sporadic CJD transmission during dental and surgical procedures is low to nil. Special precautions in addition to standard precautions are indicated when treating known or suspected CJD or vCJD patients; information about reprocessing instruments used on such patients can be found at https://www.cdc.gov/prions/cjd/infection-control.html.

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

9.6.1. Clean and heat-sterilize all handpieces and other intraoral instruments that can be removed from the air and waterlines of dental units between patients (this includes electric motors, air-driven slow speed motors, ultrasonic handpieces and scalers, etc.).

9.6.2. Follow the manufacturer’s IFU for cleaning, maintenance, lubrication and sterilization of handpieces and other intraoral instruments that can be removed from the air and waterlines of dental units.

9.6.3. Do not surface-disinfect (e.g., use intermediate-level disinfectant) handpieces and other intraoral instruments that can be removed from the air and waterlines of dental units unless specified by the manufacturer IFU.

9.6.4. If the manufacturer’s IFU indicates that chemical sterilants/high-level disinfectants can be used for these instruments, this is not referring to intermediate-level disinfectants that are used in USAF dental clinics for cleaning and disinfecting environmental surfaces and impressions.

9.6.5. If these instruments are reprocessed through the sterile processing department (SPD) in a hospital setting and proper equipment and ventilation is installed, chemical sterilants/high-level disinfectants can be used as recommended by the manufacturer.
9.6.6. Consider advising patients not to close their lips tightly around the tip of the saliva ejector when evacuating oral fluids due to the potential for backflow.

9.7. **Dental Laboratory**

9.7.1. Infection prevention measures are important in the lab to minimize the potential for infection and cross contamination. Follow hand-hygiene recommendations as described in Chapter 4.

9.7.2. Items delivered to the dental laboratory are free of bioburden, clean and disinfected. Remove bioburden (e.g., calculus, adhesive, blood, tissue, retraction cord, cotton), clean, disinfect and rinse all dental prostheses and prosthodontic materials (e.g., impressions, bite registrations, occlusal rims) using an EPA-registered hospital disinfectant having at least an intermediate-level (i.e., tuberculocidal) activity.

9.7.3. Accomplish sub-surface disinfection of acrylic item(s), place in a resealable plastic bag or container recommended by the manufacturer (i.e., glass beaker), filled with an intermediate-level disinfectant and place in an ultrasonic bath IAW manufacturer’s written Instructions for Use (IFU).

9.7.4. Include specific information on the DD Form 2322 or other mechanism, such as an impression tag, regarding disinfection techniques (e.g., solution used and duration), when laboratory cases are sent to the lab and when cases are returned to the provider.

9.7.5. Consult IFU regarding compatibility of disinfectants and impression materials, prostheses and appliances. Consider the stability of specific materials (e.g., impression materials) when disinfectants are used and biocompatibility of disinfectants with prostheses and appliances.

9.7.6. When items leave the laboratory, disinfectant solutions must be completely removed in order to prevent the risk of adverse tissue responses. Never store, ship, or transport items in disinfectant solutions.

9.7.7. Use PPE when handling contaminated laboratory items. Use appropriate PPE (e.g., mask, protective eyewear) for protection from projectile and particulate hazards when lathes and other rotary instruments are used.

9.7.8. When using ultrasonic cleaners, place the item (e.g., denture, temporary restoration) in a sealed, disposable plastic bag or container recommended by the manufacturer (i.e., glass beaker) filled with cleaning solution. Place the bag or container into the ultrasonic machine and process. Following removal from the ultrasonic cleaner, dispose of the cleaning solution, disinfect and rinse the item before returning to the patient.

9.7.9. Prior to reuse, clean and disinfect items (e.g., rag wheels, polishing points, burs, lathes) used on appliances previously worn by the patient, even if the appliance was cleaned and disinfected before the adjustment/repair. Review IFU for cleaning and sterilization procedures.

9.7.10. If rotary instruments or laboratory items (e.g., burs, polishing points, rag wheels, laboratory knives) are used on contaminated or potentially contaminated appliances, prostheses, or other materials, they should be cleaned and heat-sterilized between cases. Review and follow IFU for cleaning and sterilization procedures.

9.7.11. When using pumice, mix with clean water and 1:10 bleach or other appropriate disinfectant and change daily at a minimum.

9.7.12. At a minimum, clean and disinfect or sterilize the lathe and lathe attachment (e.g., rag wheels, polishing points, burs, lathes), IAW manufacturer IFU daily.

9.7.13. Clean and disinfect case pans and articulators when visibly soiled and after each case is completed using an EPA-registered hospital disinfectant having at least an intermediate-level (i.e., tuberculocidal) activity.

9.7.14. At a minimum, clean and disinfect countertops and lab benches when visibly soiled and at the end of daily work activities using an EPA-registered hospital disinfectant having at least an intermediate-level (i.e., tuberculocidal) activity.

9.7.15. When working with contaminated prostheses and appliances (e.g., items that were try-ins, worn by patients or otherwise contaminated):

9.7.15.1. Use disposable rotary attachments (e.g., rag wheels, polishing points, burs for lathes) or sterilize attachments between cases. Review and follow IFU for cleaning and sterilization procedures.

9.7.15.2. Clean and surface disinfect lathes between each case using an EPA-registered hospital disinfectant having at least intermediate-level (i.e., tuberculocidal) activity.

9.7.15.3. In between each case, clean and disinfect countertops and lab benches using an EPA-registered hospital disinfectant having at least an intermediate-level (i.e., tuberculocidal) activity.

9.7.15.4. Return items used in the mouth (e.g., metal impression trays, face-bow forks) to instrument processing for cleaning and heat sterilization.
9.7.16. Consumption of food and/or drinks in the dental laboratory is prohibited. These items should be consumed outside the dental laboratory, preferably in a designated break room.

9.8. Dental Radiography

9.8.1. Follow hand-hygiene recommendations as described in Chapter 4.

9.8.2. Wear gloves when exposing radiographs and handling contaminated items and devices. Use other PPE (e.g., protective eyewear, mask and gown) as appropriate if spattering of blood or other body fluids is likely.

9.8.3. Use surface barriers to protect clinical contact surfaces (e.g., x-ray tube head, control panels) and change surface barriers between patients (see Chapter 7).

9.8.3.1. Clean and disinfect surfaces between patients only when the integrity of the barrier has been compromised or when visibly soiled.

9.8.3.2. Clean and disinfect environmental surfaces that have been covered with barriers at the end of each clinical day.

9.8.4. Use heat-tolerant or disposable intraoral devices whenever possible (e.g., sensor-holding and positioning devices). Clean and heat-sterilize heat-tolerant devices between patients.

9.8.5. Digital radiography sensors/plates and other high-technology instruments (e.g., intraoral camera, electronic periodontal probe, occlusal analyzers and lasers) come into contact with mucous membranes and are considered semicritical devices. They should be cleaned and ideally heat-sterilized or high-level disinfected between patients. However, these items vary by manufacturer or type of device in their ability to be sterilized or high-level disinfected. The following apply for digital radiography sensors/plates:

9.8.5.1. Use FDA-cleared barriers and clean and disinfect sensors/plates between patients, each time the barriers are removed.

9.8.5.2. To minimize the potential for device-associated infections, after removing the barrier, clean and disinfect using an EPA-registered hospital disinfectant with an intermediate-level (i.e., tuberculocidal) activity after each patient.

9.8.5.3. Follow manufacturer written IFU for cleaning and disinfecting computer equipment. Use surface barriers if the equipment (i.e., computer keyboard, mouse) is likely to be contacted or contaminated during patient-care activities.

9.9. Handling of Biopsy Specimens

9.9.1. During transport, place biopsy specimens in a sturdy, leak-proof container labeled with the biohazard symbol.

9.9.2. 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.

9.10. Handling of Extracted Teeth

9.10.1. Dispose of extracted teeth as regulated medical waste, unless returned to the patient.


9.10.3. The following apply when using extracted teeth in educational settings:

9.10.3.1. Clean and place extracted teeth in a leak-proof container labeled with a biohazard symbol.

9.10.3.2. Place amalgam-free teeth in a heat-resistant glass container.

9.10.3.3. Fill the container no more than half-way with deionized or distilled water or saline and loosely cover.

9.10.3.4. Process through a steam sterilizer at 121°C (250°F) for 40 minutes using a fluid or liquid cycle. At the end of the cycle, remove the container slowly without shaking to avoid the boiling over of the fluid.

9.10.3.5. If using extracted teeth containing amalgam, immerse in 10% formalin for two weeks before use in an educational setting.

9.11. Laser/Electrosurgery Plumes/Surgical Smoke

9.11.1. The CDC Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care—March 2016 does not offer a formal recommendation regarding practices to reduce DHCP exposure to laser
plumes/surgical smoke when using lasers in dentistry; however, other organizations have established 
guidelines.

9.11.2. Follow manufacturer's written IFU regarding use and safety precautions.

9.11.3. Use standard precautions when working in the laser environment.

9.11.4. Wear appropriate PPE IAW the laser manufacturer IFU and the MTF policy, which may include N-95 or N-100 
respirators to minimize exposure to laser plumes.

9.11.5. Wear protective laser eyewear.

9.11.6. Implement local exhaust ventilation controls IAW the laser manufacturer IFU. This may include, but is not 
limited to wall suction units with in-line filters and smoke evacuation units.

9.12. Mycobacterium tuberculosis

9.12.1. General Recommendations

9.12.1.1. Follow MTF guidance and current CDC recommendations (www.cdc.gov/tb/) for: developing, maintaining 
and implementing a written TB infection-control plan; managing a patient with suspected or active TB; 
completing a community risk-assessment to guide employee tuberculin skin tests (TST) and follow-up and 
managing DHCP with TB disease.

9.12.1.2. Ensure DHCP, who might have contact with persons with suspected or confirmed active TB, have had a 
baseline TST according to MTF policy. Coordinate with PH.

9.12.1.3. Educate all DHCP regarding the recognition of signs, symptoms and transmission of TB.

9.12.1.4. Assess each patient for a history of TB as well as symptoms indicative of TB and document on the medical 
history form.

9.12.2. Follow MTF guidelines for patients known or suspected to have active TB. In general:

9.12.2.1. 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 the mouth and nose when coughing or sneezing.

9.12.2.2. Defer elective dental treatment until the patient is noninfectious.

9.12.2.3. Follow MTF guidance when emergency dental treatment is performed on a patient with active or suspected 
TB (e.g., wear a fit-tested, disposable N-95 respirator).

9.13. Oral Surgical Procedures

9.13.1. The following apply when performing oral surgical procedures:

9.13.1.1. Perform surgical hand antisepsis using an antimicrobial product (e.g., antimicrobial soap and water, or 
plain soap and water followed by alcohol-based hand scrub with persistent activity) before donning sterile 
surgeon’s gloves.

9.13.1.2. Use sterile surgeon’s gloves.

9.13.1.3. 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).

9.13.1.4. Use sterile irrigating solutions for one patient and dispose of them appropriately. Do not date or save for 
later use, even on the same patient.

9.14. Preprocedural Mouthrinses. The use of preprocedural antimicrobial mouth rinses (iodine) is optional, but should 
be considered to reduce the level of oral microorganisms in aerosols and spatter generated during routine dental 
procedures. The scientific evidence is inconclusive that using these rinses prevents clinical infections among DHCP 
or patients.

9.15. Single-Use (Disposable) Devices. Use single-use devices for one patient only and dispose of them appropriately. 

Single use/disposable symbol: 🛠
CHAPTER 10
PROGRAM EVALUATION

10.1. INTRODUCTION. A successful infection prevention and control program will have valid means to measure its effectiveness. The following methods should be used for this purpose: instrument processing monitoring, scheduled and unscheduled inspections, waterline monitoring and healthcare-associated infection (HAI) surveillance.

10.2. KEY TERMS

**Healthcare-associated infection (HAI):** a localized or symptomatic condition resulting from an adverse reaction to the presence of an infectious agent or its toxins not present or incubating at the time of the initial appointment (e.g., medical, dental, surgical). The term “healthcare-associated infection” includes both nosocomial (i.e., hospital associated) and clinic acquired (i.e., clinic or outpatient associated) infections.

**Surveillance:** a comprehensive method of measuring outcomes and related processes of care, collecting and analyzing data and providing timely feedback to the staff to assist in improving those outcomes. Surveillance is an essential component of infection prevention and control programs to reduce the frequency of adverse events such as infection or injury.

10.3. Instrument Processing (Sterilization) Monitoring. Implement an instrument processing (sterilization) monitoring program as described in Chapter 6.

10.4. Inspections. Conduct and document routine scheduled or unscheduled inspections of dental treatment rooms (DTRs), dental laboratory, radiography and instrument processing areas.

10.5. Waterline Monitoring. Implement a waterline-monitoring program as described in Chapter 8.

10.6. Healthcare-associated infections (HAI)

10.6.1. Surveillance for HAI provides data useful for identifying infected patients, determining the site of infection and identifying the factors that contribute to HAI. Information containing patient identifiers or patient care staff should be carefully handled. Data should not be used for punitive purposes, but should be viewed as an opportunity to improve patient/employee/process outcome. Surveillance goals should include: providing objective assessment of dental HAI rates, reducing morbidity and cost, establishing baseline infection rates based on well-defined case definition criteria, educating DHCP concerning data relevant to their practices, evaluating control measures designed to reduce infection rates, complying with accreditation standards, defending malpractice claims through implementation of an active surveillance program and providing data useful in clinical research.

10.6.2. Implement a HAI surveillance program (See Box 3 for examples of surveillance methods)

10.6.3. Establish criteria for definitions, methods of surveillance and reporting in conjunction with the local MTF ICC/ICF. (See Table 2 or most current information from CDC and The National Healthcare Safety Network [NHSN])

10.6.4. Develop surveillance systems based on evaluation of the populations of interest to assess the effectiveness of the dental infection prevention and control program. Such assessment is critical so that resources can be targeted at populations who are at risk for the outcomes of greatest importance.

10.6.4.1. Generally, a combination of surveillance methods should be used. Do not use self-reporting as a sole means of surveillance. (Box 3)

10.6.4.2. Rates may have to be calculated quarterly, semiannually, or annually, depending on the size of the denominator and on the type of services provided.

10.6.5. Results of HAI surveillance will be reported to the MTF ICC/ICF in the format and on a schedule required by local policy.
**Table 2: Healthcare-associated Infections (HAI)**

The following criteria (slightly modified from CDC/NHSN* definitions) can be used to make the determination of a HAI following either oral surgical† or non-surgical dental procedures.

<table>
<thead>
<tr>
<th>Oral Surgical Procedures†</th>
<th>Non-surgical dental procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Infection occurs within 30 days (or within one year if an implant is in place) after the procedure and the infection appears to be related to the procedure (i.e., the patient was not exhibiting signs/symptoms at the time of the initial appointment) <strong>AND at least one of the following:</strong></td>
<td>Must meet at least one of the following criteria:</td>
</tr>
<tr>
<td>- purulent drainage/discharge from the surgical site</td>
<td>1. Organisms cultured from purulent material from tissues or the oral cavity.</td>
</tr>
<tr>
<td>- at least one of the following signs or symptoms: fever (&gt;38ºC or 100.4°F) or localized pain or tenderness</td>
<td>2. Abscess or other evidence of infection on direct exam, during re-operation, histologic exam or radiographic exam.</td>
</tr>
<tr>
<td>- an abscess or other evidence of infection that is found on direct examination, during reoperation, or by histopathologic or radiologic examination</td>
<td>3. At least one of the following: (with no other recognized cause) abscess, ulceration, raised white patches on inflamed mucosa or plaques on oral mucosa <strong>AND at least one of the following:</strong></td>
</tr>
<tr>
<td>- physician/dentist diagnosis of infection with or without treatment with antibiotic therapy.</td>
<td>- organisms seen on a Gram Stain</td>
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<td></td>
<td>- positive fungal potassium hydroxide stain</td>
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<td></td>
<td>- multinucleated giant cells seen on microscopic exam</td>
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<tr>
<td></td>
<td>- positive antigen test on oral fluid/material</td>
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<tr>
<td></td>
<td>- diagnostic single antibody tier (IgM) or fourfold increase in a paired sera (IgG) for pathogen</td>
</tr>
<tr>
<td></td>
<td>- physician/dentist diagnosis of infection with or without topical/oral antifungal therapy or with or without antibiotic therapy.</td>
</tr>
</tbody>
</table>

* The National Healthcare Safety Network (NHSN) is a secure, Internet-based surveillance system that integrates patient and healthcare personnel safety surveillance systems managed by the Division of Healthcare Quality Promotion (DHQP) at CDC. NHSN provides analysis tools that generate reports using the aggregated data (reports about infection rates, national and local comparisons, etc.). NHSN enables healthcare facilities to participate in a voluntary national surveillance system and to make use of recent advances in information technology.

† Oral surgical procedures involve the incision, excision, or reflection of tissue that exposes the normally sterile areas of the oral cavity. Examples include biopsy, periodontal surgery, apical surgery, implant surgery and surgical extractions of teeth (e.g., removal of erupted or non-erupted tooth, requiring elevation of mucoperiosteal flap, removal of bone and/or section of tooth and suturing if needed).

**Conditions which are not considered HAI include the following:**
- Colonization, which is the presence of microorganisms (on skin, mucous membranes, in open wounds, or in excretions or secretions) that are not causing adverse clinical signs or symptoms,
- Inflammation, which is a condition that results from tissue response to injury or stimulation by noninfectious agents, such as chemicals;
- Post extraction alveolar osteitis;
- Suture abscesses;
- Periapical inflammation flare-ups; and
- Recurrent herpes infections.

**Wound Classification**

Invasive procedures (e.g., surgical procedures) can be categorized using a scheme adopted by the CDC.
- **Class I/Clean.** Uninfected operative wounds in which no inflammation is encountered and not involving the oral cavity. *(definition not applicable to dentistry)*
- **Class II/Clean-Contaminated.** Operative wounds in which oral cavity (oropharynx) is entered under controlled conditions and without unusual contamination, provided no evidence of infection or major break in technique is encountered. *(applies to most oral surgical procedures)*
- **Class III/Contaminated.** Open, fresh, accidental wounds, operations with major breaks in sterile technique and incisions in which acute, nonpurulent inflammation is encountered.
- **Class IV/Dirty-Infected.** Old traumatic wounds with retained devitalized tissue and those that involve existing clinical infection. This definition suggests that the organisms causing postoperative infection were present in the operative field before the operation.

**Box 3: Examples of Surveillance Methods for Dental Healthcare-associated Infections (HAI)**
Chart Review
- Generally, more invasive procedures are targeted (e.g., extractions of impacted third molars/periodontal surgeries using conscious sedation vs. single tooth extractions with local anesthesia) during chart reviews.
- Using the dental service report, identify patients who had the specific type of procedure performed that you are targeting (e.g., extraction of third molars, patients receiving conscious sedation, periodontal surgeries) during a specified time period (e.g., 60 days prior to dental treatment).
- Review the records for conditions meeting the HAI criteria.
- Complete a HAI work sheet (Box 4) if a possible infection is found. The medical infection preventionist may be consulted for final determination before reporting the infection to the ICC/ICF.

Antibiotic Usage Audit
- Request a printout from the pharmacy for antibiotic prescriptions written for dental patients during a specified time period (e.g., 60 days prior to dental treatment).
- Review the records for conditions meeting the HAI criteria.
- During this review, appropriateness of antibiotic use can also be reviewed.
- Complete a HAI work sheet (Box 4) if a possible infection is found. The medical infection preventionist may be consulted for final determination before reporting the infection to the ICC/ICF.

Unscheduled Post-Operative/Surgical Return Visits
- Have a HAI work sheet (Box 4) available in the sick call area for staff members to complete when they identify a potential HAI during an unscheduled post-operative/surgical return visit.
- The form is given to the dental infection preventionist for further investigation. The medical infection preventionist may be consulted for final determination before reporting the infection to the ICC/ICF.

Self-Reporting
- Staff members should complete the HAI work sheet (Box 4) for every patient with a potential HAI.
- The form is given to the dental infection preventionist for further investigation. The medical infection preventionist may be consulted for final determination before reporting the infection to the ICC/ICF.

Box 4: Sample Healthcare-associated Infection (HAI) Work Sheet

<table>
<thead>
<tr>
<th>Healthcare-associated Infection (HAI) Work Sheet</th>
</tr>
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<tbody>
<tr>
<td>PATIENT NAME: ___________________________   RANK/STATUS:________</td>
</tr>
<tr>
<td>SOCIAL SECURITY #: ______________________ PHONE #:_______________</td>
</tr>
<tr>
<td>ORGANIZATION/ADDRESS: _________________________________________________________________________________</td>
</tr>
<tr>
<td>PATIENT AGE: ______</td>
</tr>
<tr>
<td>DATE OF PROCEDURE: __________________</td>
</tr>
<tr>
<td>TYPE OF PROCEDURE: ___________________</td>
</tr>
<tr>
<td>WOUND CLASSIFICATION: _________________</td>
</tr>
<tr>
<td>PROVIDER(S): _________________________________________________</td>
</tr>
<tr>
<td>DATE INFECTION DIAGNOSED: _____________</td>
</tr>
<tr>
<td>DESCRIPTION OF THE INFECTION: ____________________________</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>CULTURE OBTAINED: yes or no</td>
</tr>
<tr>
<td>CULTURE RESULTS (if applicable): ________________</td>
</tr>
<tr>
<td>TREATMENT RENDERED (including any antibiotic prescriptions):</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>REPORTED BY: ________________________   DATE REPORTED: __________</td>
</tr>
<tr>
<td>FOLLOW-UP: ____________________________________________</td>
</tr>
</tbody>
</table>

A Medical QA Document. Do Not Disclose Without Approval of the MTF Commander
ADA Council on Scientific Affairs, Statement on Dental Unit Waterlines. Adopted by the ADA Board of Trustees, December 13, 1995.


CDC. Updated U.S. Public Health Service guidelines for the management of occupational exposures to HBV, HCV and HIV and recommendations for postexposure prophylaxis. MMWR 2001;50(No. RR-11).


*CDC. Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care. Atlanta, GA; US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Oral Health: March 2016

†Cottone’s Practical Infection Control in Dentistry, 3rd Ed. Molinari JA, Harte JA. Lippincott Williams & Wilkins, Baltimore, MD. 2009.


US Department of Labor, Occupational Safety and Health Administration. OSHA instruction: enforcement procedures for the occupational exposure to bloodborne pathogens. Washington, DC: US Department of Labor, Occupational Safety and Health Administration, 2001; directive no. CPL 2-2.69.


* Maintain the most current edition in the dental clinic infection prevention and control notebook.
† Recommended to obtain the most current edition for the dental clinic library.

ACKNOWLEDGEMENTS

The guidelines were written in consultation with the Air Force Medical Operations Agency, San Antonio, TX. For a complete list of acknowledgements please contact DECS.
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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADA</td>
<td>American Dental Association</td>
</tr>
<tr>
<td>AFI</td>
<td>Air Force Instruction</td>
</tr>
<tr>
<td>BI</td>
<td>Biological Indicator</td>
</tr>
<tr>
<td>CDC</td>
<td>Centers for Disease Control and Prevention</td>
</tr>
<tr>
<td>CI</td>
<td>Chemical Indicator</td>
</tr>
<tr>
<td>DECS</td>
<td>USAF Dental Evaluation &amp; Consultation Service</td>
</tr>
<tr>
<td>DHCP</td>
<td>Dental Health Care Personnel</td>
</tr>
<tr>
<td>DRMO</td>
<td>Defense Reutilization and Marketing Office</td>
</tr>
<tr>
<td>EPA</td>
<td>U.S. Environmental Protection Agency</td>
</tr>
<tr>
<td>FDA</td>
<td>U.S. Food and Drug Administration</td>
</tr>
<tr>
<td>HAI</td>
<td>Healthcare-Associated Infection</td>
</tr>
<tr>
<td>HBV</td>
<td>Hepatitis B Virus</td>
</tr>
<tr>
<td>HCP</td>
<td>Health-Care Personnel</td>
</tr>
<tr>
<td>HICPAC</td>
<td>Healthcare Infection Control Practice Advisory Committee</td>
</tr>
<tr>
<td>IAW</td>
<td>In Accordance With</td>
</tr>
<tr>
<td>ICC</td>
<td>Infection Control Committee</td>
</tr>
<tr>
<td>ICF</td>
<td>Infection Control Function</td>
</tr>
<tr>
<td>IPT</td>
<td>Instrument Processing Technician</td>
</tr>
<tr>
<td>SDS</td>
<td>Safety Data Sheet</td>
</tr>
<tr>
<td>MTF</td>
<td>Medical Treatment Facility</td>
</tr>
<tr>
<td>NCOIC</td>
<td>Noncommissioned Officer-in-Charge</td>
</tr>
<tr>
<td>OI</td>
<td>Operating Instruction</td>
</tr>
<tr>
<td>OPIM</td>
<td>Other Potentially Infectious Materials</td>
</tr>
<tr>
<td>OSAP</td>
<td>Organization for Safety Asepsis and Prevention</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
</tr>
<tr>
<td>PH</td>
<td>Public Health</td>
</tr>
<tr>
<td>PCD</td>
<td>Process Challenge Device</td>
</tr>
<tr>
<td>USPHS</td>
<td>United States Public Health Service</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>TSE</td>
<td>Transmissible Spongiform Encephalopathies</td>
</tr>
<tr>
<td>TST</td>
<td>Tuberculin Skin Test</td>
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