

**AMERICAN ASSOCIATION OF DENTAL EXAMINERS
GUIDELINES FOR
INFECTION CONTROL AND DISEASE BARRIER TECHNIQUES
IN CLINICAL EXAMINATIONS***

INTRODUCTION:

Recent scientific information has raised concern in the profession and among the public regarding transmission of blood-and-saliva-borne diseases. Risks of acquiring communicable diseases by dental health care workers are directly related to the degree of contact with blood or other body fluids, including saliva. All documented cases of disease transmission in the dental care setting have been directly correlated to contact of ungloved hands of a dental health care worker with the oral mucous membranes and/or fluids of patients. While the severity of the risk of AIDS transmission has not been determined, dental personnel do have a higher incidence of hepatitis B, herpes and other infectious diseases. There have been many articles in recent years detailing the study of disease transmission and control in the dental profession. Guidelines of the U.S. Department of Health and Human Services (reprint of MMWR April 18, 1986 Vol. 35, No. 15 pp. 237-242) have, in effect, become the standard of dental practice for legal purposes. In terms of liability, it is insufficient to be "considering" or "working towards" the standard. State Boards of Dentistry are charged with the responsibility of establishing and enforcing standards of practice for the profession. Since clinical examinations are designed to measure competency against standards of practice, it is important for Boards to incorporate standards of disease control into testing procedures and, as examiners, lead by example.

The guidelines which follow this introduction represent an outline of procedures to be routinely implemented by all personnel while administering or participating in a clinical examination. While the guidelines do not encompass all aspects of asepsis and infection control within dentistry, they are intended to address the specific issues relating to disease transmission which are inherent in the examination setting. The guidelines are followed by a conclusion which outlines implementation problems Boards should consider when preparing to incorporate infection control procedures into their examination requirements.

Throughout this document, the terms "testing agency" and "testing site" appear frequently. As used herein, a State Board of Dentistry is considered a testing agency only if it conducts its own clinical examination. If a State Board belongs to a regional clinical service, this regional agency is the testing agency, although each State Board of Dentistry retains ultimate responsibility for the quality of the clinical examination it uses. The testing site is the clinical facility in which the examination is conducted. Such sites may be dental or dental hygiene schools, or clinics in public institutions. A testing site generally has its own administrative system with which a testing agency must coordinate arrangements for a clinical examination.

As health professionals, dental personnel have an obligation to protect themselves, their families and the public. These guidelines are designed to facilitate that responsibility in the clinical examination setting.

**AMERICAN ASSOCIATION OF DENTAL EXAMINERS
GUIDELINES FOR
INFECTION CONTROL AND DISEASE BARRIER TECHNIQUES
IN CLINICAL EXAMINATIONS**

I. IMMUNIZATION:

1. The immunization of personnel in contact with body fluids can significantly reduce their susceptibility to the transmission of infectious diseases. Boards should encourage their examiners, as well as other dental personnel under their influence, to utilize available immunization procedures such as hepatitis B vaccine.

II. PATIENT SCREENING AND MANAGEMENT:

1. A complete general history should be required for every patient presented for treatment in the examination. This history should include questions about medications, current illnesses, hepatitis, unintentional weight-loss, soft tissue lesions, etc. It should be reviewed by an examiner prior to the start of any treatment procedures. Medical consultation prior to treatment or special treatment management may be indicated when a history of active infection or communicable disease is present.
2. It must be recognized that many patients are either unaware or unwilling to reveal known infectious disease states to dental personnel. A patient's negative responses should not be interpreted to mean there is freedom from infectious disease. There should be no relaxation of control procedures even though the health history indicates there is no risk of infection.
3. In accordance with the advice from the U.S. Center for Disease Control and the ADA, all patients during the examination should be managed as if their body fluids were infected with hepatitis B, HTLV-III (AIDS), herpes or other infectious microorganisms. These infection-control procedures have been shown to be effective in minimizing transmission of hepatitis B because of the nature of the infectivity and transmissibility of the virus.

III. DISEASE BARRIER TECHNIQUES:

1. Disease barrier techniques can significantly reduce the possibility of cross-contamination of blood and saliva between patients, candidates or examiners. These techniques must be in use for any portion of the examination where there is the potential for blood/saliva contamination.
2. The candidates should be responsible for ensuring that their auxiliaries adhere to infection control procedures.

3. **Gloves** - all examiners, candidates and auxiliaries **must** wear clean, protective gloves for each and every patient contact.
 - a. All work must be completed on one patient and the hands washed and regloved prior to any other new patient contact.
 - b. A lightweight, unfitted glove **may be acceptable** for examiners.
 - c. Gloves **should** be worn by all dental personnel when handling contaminated instruments, equipment, intra-oral appliances (dentures, impression trays) or disinfectant solutions.
 - d. Any glove which is torn punctured or cut, **must** be removed immediately, the hands thoroughly washed, and regloving accomplished before completing the dental procedure.
 - e. All examiners, candidates and auxiliaries **must** wash after removing gloves and prior to regloving for any new patient contact. It must be recognized that all gloves have the potential for perforation. The use of plain soap **may** be adequate for examiners, candidates and auxiliaries with no surgical contact. The use of an antimicrobial scrub is indicated for surgical procedures.
4. **Masks** - All examiners, candidates and auxiliaries **must** wear surgical masks or chin-length plastic shields during any patient contact involving the following:
 - a. Wherever a spattering of blood and/or saliva is likely to occur.
 - b. Wherever an aerosol or air spray is likely to occur. The same mask may continue to be worn until wet, soiled or perforated.
5. **Eyewear** - All examiners, candidates, auxiliaries and patients **must** wear protective eyewear (or chin-length plastic shields) during the following procedures:
 - a. Wherever a spattering of blood/saliva is likely to occur.
 - b. Wherever an air spray or aerosol may be created.
 - c. Wherever there is risk of missile injury.
 - d. During instrument and surface decontamination.
 - e. When performing laboratory procedures.
6. **Rubber Dam** - All clinical procedures involving the use of high speed or low speed handpieces **should** be done under rubber dam, where possible, to reduce the formation of aerosols, droplets and spatters.
7. **Gowns** - All examiners, candidates and auxiliaries **should** wear gowns or uniforms during clinical or laboratory procedures. These should be changed daily or when visibly soiled with blood.

IV. MANAGEMENT OF SUPPLIES, INSTRUMENTS, ENVIRONMENTAL SURFACES AND WASTE MATERIALS:

1. Supplies and Instruments

- a. Candidates are primarily responsible for the sterilization and disinfection procedures applicable to their supplies, instruments and equipment. Detailed information on these definitive procedures are available in the CDC guidelines (MMWR April 18, 1986) and the ADA Guide to Disinfectant and Sterilant Chemical Agents (attached).
- b. Single-use disposable items should be used wherever appropriate.
- c. Needles and syringes used in local anesthesia are a frequent source of contamination resulting from accidental pricks with the needle. The CDC Guidelines suggest several specific methods of management. Candidates should be specifically advised about how syringes are to be managed during treatment and procedures for disposing of them.
- d. All contaminated re-usable items which can be sterilized should be properly and verifiably heat-sterilized before use in treating each patient.
- e. All contaminated re-usable items which cannot be sterilized should be thoroughly cleaned and either treated with a U.S. EPA registered chemical sterilant or a U.S. registered mycobactericidal disinfectant (see attached chart) in accordance with the product manufacturer's instructions regarding concentration and exposure time.
- f. Appliances, impressions or other intra-oral materials which have been contaminated should be placed in puncture resistant, sealed plastic bags.

2. Environmental Surfaces and Waste Material

- a. Surface covers should be used by candidates wherever possible. These covers should be changed between each new patient contact.
- b. Impervious-backed paper, aluminum foil or clear plastic wrap may be used to cover surfaces (light handles) which may be contaminated and are difficult or impossible to disinfect. These covers should be changed between each patient.
- c. If contaminated with patient body fluids, chairs, unit equipment and countertops must be appropriately decontaminated between each patient use. (Example: sodium hypochlorite - 1:10-1:100 dilution range) [See attached table].
- d. The use of 70% alcohol, quaternary ammonium compounds or other "low activity level" agents are considered inadequate by the ADA and CDC for surface disinfection.
- e. All sharp objects should be placed in puncture-resistant containers prior to disposal.
- f. All contaminated or soiled waste material should be put in heavy duty plastic trash bags prior to disposal. Candidates and auxiliaries should wear gloves while handling contaminated material.

C O N C L U S I O N

IMPLEMENTATION OF GUIDELINES CONSIDERATIONS FOR TESTING AGENCIES

1. In preparing to implement infection control guidelines for examinations, a testing agency may wish to consult with its legal counsel to clearly understand its scope of responsibility and implications for legal liability.
2. The testing agency should carefully review its proposed guidelines and ascertain that specific requirements are clearly stated. It should be determined exactly what material must be distributed and to whom, so that all personnel involved in the examination are apprised of the requirements.
3. The testing agency should confer with the administration of its testing site(s) to organize an orderly implementation of the guidelines. Issues that should be reviewed include:
 - a. The site's sterilization procedures should be in compliance with CDC guidelines. The need for any special instructions to candidate or examiners relative to sterilization procedures should be determined.
 - b. Supplies related to sterilization, disinfection and disease barrier techniques can probably be provided most efficiently by the testing site for all candidates, examiners and auxiliaries. The logistics of providing and distributing such supplies needs to be coordinated with the site.
 - (1) The efficient distribution of gloves, in particular, and masks must be planned. Masks and gloves (in various sizes) should be readily available at multiple sites in the clinic. More than a dozen pairs of gloves may be used while a candidate is treating, and the examiners evaluating, one patient. That number may increase depending on the number of patient contacts that are designed into the exam administration.
 - (2) Disinfectant and sterilant chemical agents should be readily available throughout the clinic. These agents should be consistent with the ADA Guide to Disinfectant and Sterilant Chemical Agents and should be an integral part of the infection-control guidelines. (See attached Guide).
 - c. The test site should be responsible for the management and disposal of waste material. These procedures should be reviewed and defined. The testing agency might also wish to review local state and institutional guidelines for the disposal of infectious material.
 - d. The cost for disease barrier supplies may be substantial. Fees should be arranged to underwrite the additional costs to the testing site for provision of supplies.

4. Examiners and candidates should provide their own protective eyewear.
5. The testing agency should carefully review and project the impact that disease barrier procedures might be expected to have on their examination and the way it is administered. Any problems that can be anticipated should be eliminated in advance. Seemingly inconsequential things, such as examiners carrying pens in their pockets from patient to patient as they record grades, can disrupt a carefully prepared chain of contamination control.
6. All candidates, examiners and administrators of testing sites should be given copies of infection control guidelines and other appropriate publications (i.e., CDC reprint from MMWR 4-18-86) for more detailed information. The guidelines should be incorporated into any candidate and examiner orientations provided prior to the test. Appropriate information should also be provided to test site staff or examiner assistants who are involved in the administration of the examination.
7. The testing agency should review its examination scoring system and determine appropriate methods for grading the candidate's adherence to infection control procedures.
8. Methods should be considered to ensure the compliance of examiners with the guidelines. It would be preferable to have no requirements at all than to promulgate guidelines which are not enforced.
9. The testing agency should routinely update infection control guidelines to incorporate new findings which can enhance the blockage of disease transmission. Such updates or reviews should be made available to the schools, test site(s) and candidates within the jurisdiction.
10. It should be recognized that infection control guidelines which are appropriate for the examination environment are not all encompassing or completely applicable to other clinical settings. Further documented resource publications which may be useful to the testing agency or test sites are:
 - a. Guidelines for Handwashing and Hospital Environmental Control, 1985 PB 85-923404/LL.
 - b. Guidelines for Infection Control in Hospital Personnel, 1983 PB 85-923402/LL.
 - c. Guidelines for Prevention of Surgical Wound Infections, 1985 PB 85-923403/LL.
 - d. Favero, Ms., Sterilization, Disinfection, and Antisepsis in the Hospital. Manual on Clinical Microbiology, 1985; 129-137.

ASSOCIATION REPORTS

(American Dental Association)

Table 1 ■ Guide to disinfectant and sterilant chemical agents.

Example of products	Chemical classification	Disinfectant	Sterilant
Banicide Sterill Wavicide-01	Glutaraldehyde 2% acidic potentiated with nonionic ethoxylates of linear alcohols	Full strength, 10 minutes at room temperature	Full strength, 1 hour at 60 C 4 hours at 40 to 50 C 10 hours at room temperature
Cidex-7 ProCide-28 Centra-28 Omnicide	Glutaraldehyde 2% alkaline	Full strength, 10 minutes at room temperature	Full strength, 10 hours at room temperature
Sporicidin	Glutaraldehyde 2% alkaline with phenolic buffer	Diluted 1 in 16 10 minutes at room temperature	Full strength, 6½ hours at room temperature
Glutarex	Glutaraldehyde 2% neutral	Full strength, 10 minutes at room temperature	Full strength, 10 hours at room temperature
Omni II	o-phenylphenol, 9.0% and o-benzyl-p- chlorophenol, 1.0%	Diluted 1 in 32 10 minutes at room temperature	...
Wescodyne	Iodophors, 1% available iodine	Diluted according to manufacturer's instruc- tions, ≥ 30 minutes	...
Household bleach	Sodium hypo- chlorite	Diluted 1:5-1:100, 10 to 30 minutes	...

ASSOCIATION REPORTS
(American Dental Association)

Table 2 ■ Sterilization and disinfection of dental instruments, materials, and some commonly used items.

	Steam autoclave	Dry heat oven	Chemical vapor	Ethylene oxide	Chemical disinfection/ sterilization	Other methods and comments
Angle attachments	+	+	+	++	+	
	(Confirm with manufacturer)	(Confirm with manufacturer)				
Burs						
Carbon steel	-	++	++	++	-	
Steel	+	++	++	++	+	
Tungsten-carbide	+	++	+	++	+	Hot salt-endodontic sterilizer 15-30 sec, 475 F (248 C) not for carbide burs
Condensers	++	++	++	++	+	
Dapen dishes	++	+	+	++	+	
Endodontic instruments (broaches, files, reamers)						
Stainless steel handles	++	++	++	++	+	
Nonstainless, metal handles	--	++	++	++	--	
Stainless with plastic handles	-	-	-	++	+	
Fluoride gel trays						
Heat-resistant plastic	++	--	-	++	-	
Nonheat-resistant plastic	--	--	-	++	-	Consider discard
Glass slabs	++	++	++	++	+	
Hand instruments						
Carbon steel	-	++	++	++	-	
	With chemical protection (dep. 1% sodium nitrate)					
Stainless steel	++	++	++	++	+	
Handpieces						
Autoclavable	++	-	-	++	--	
Contra-angles	-	-	-	++	+	Iodophore scrub (-)
Nonautoclavable	-	-	-	++	+	Iodophore scrub (-)
Prophylaxis angles	+	+	+	+	+	
Impression trays						
Aluminum metal:						
Chrome-plated	++	++	++	++	+	
Custom acrylic resin	--	--	--	++	+	
Plastic	--	--	--	++	+	Discard; preferred
Instruments in packs	++	+	++	++	--	
		Small packs		Small packs		
Instrument tray setups						
Restorative or surgical	+	+	+	++	--	
	Size limit		Size limit	Size limit		
Mirrors	-	++	++	--	+	
Needles						
Disposable	--	--	--	--	--	Discard (+ +), do not reuse
Orthodontic pliers						
High quality stainless	++	++	++	++	+	
Low quality stainless	-	++	++	++	-	
With plastic parts	--	--	--	++	+	
Pluggers	++	++	++	++	+	
Polishing wheels and disks						
Garnet and cuttle	--	-	-	+	--	
Rag	++	-	+	++	--	
Rubber	+	-	-	++	+	
Prostheses, removable	-	-	-	+	+	
Rubber dam equipment						
Carbon steel clamps	-	++	++	++	-	
Metal frames	++	++	++	++	+	
Plastic frames	-	-	-	++	+	
Punches	-	++	++	++	+	
Stainless steel clamps	++	++	++	++	+	
Rubber items						
Prophylaxis cups	+	-	-	++	+	
Saliva evacuators, ejectors						
Low melting plastic	-	-	-	++	+	Discard (+ +)
High melting plastic	++	+	+	+-	+	
Stones						
Diamond	+	++	++	++	+	
Polishing	++	+	++	++	-	
Sharpening	+++	++	++	-	-	
Surgical instruments						
Stainless steel	++	++	++	++	+	
Ultrasonic scaling tips	+	--	--	+	+	
X-ray equipment						
Plastic film holders	-	-	-	+-	+	
Collimating devices	-	--	--	+-	+	

Adapted from Accepted Dental Therapeutics and Dentists' Desk Reference: Materials, Instruments, and Equipment.
 ++ Effective and preferred method; - effective method, but risk of damage to materials.
 + Effective and acceptable method; -- ineffective method with risk of damage to materials.

Recommended Infection-Control Practices for Dentistry

Dental personnel may be exposed to a wide variety of microorganisms in the blood and saliva of patients they treat in the dental operator. These include *Mycobacterium tuberculosis*, hepatitis B virus, staphylococci, streptococci, cytomegalovirus, herpes simplex virus types I and II, human T-lymphotropic virus type III/lymphadenopathy-associated virus (HTLV-III/LAV), and a number of viruses that infect the upper respiratory tract. Infections may be transmitted in dental practice by blood or saliva through direct contact, droplets, or aerosols. Although not documented, indirect contact transmission of infection by contaminated instruments is possible. Patients and dental health-care workers (DHCWs) have the potential of transmitting infections to each other (1).

A common set of infection-control strategies should be effective for preventing hepatitis B, acquired immunodeficiency syndrome, and other infectious diseases caused by bloodborne viruses (2-4). The ability of hepatitis B virus to survive in the environment (5) and the high titers of virus in blood (6) make this virus a good model for infection-control practices to prevent transmission of a large number of other infectious agents by blood or saliva. Because all infected patients cannot be identified by history, physical examination, or readily available laboratory tests (3), the following recommendations should be used routinely in the care of all patients in dental practices.

MEDICAL HISTORY

Always obtain a thorough medical history. Include specific questions about medications, current illnesses, hepatitis, recurrent illnesses, unintentional weight loss, lymphadenopathy, oral soft tissue lesions, or other infections. Medical consultation may be indicated when a history of active infection or systemic disease is elicited.

USE OF PROTECTIVE ATTIRE AND BARRIER TECHNIQUES

1. For protection of personnel and patients, gloves must always be worn when touching blood, saliva, or mucous membranes (7-10). Gloves must be worn by DHCWs when touching blood-soiled items, body fluids, or secretions, as well as surfaces contaminated with them. Gloves must be worn when examining all oral lesions. All work must be completed on one patient, where possible, and the hands must be washed and regloved before performing procedures on another patient. Repeated use of a single pair of gloves is not recommended, since such use is likely to produce defects in the glove material, which will diminish its value as an effective barrier.
2. Surgical masks and protective eyewear or chin-length plastic face shields must be worn when splashing or spattering of blood or other body fluids is likely, as is common in dentistry (11,12).
3. Reusable or disposable gowns, laboratory coats, or uniforms must be worn when clothing is likely to be soiled with blood or other body fluids. If reusable gowns are worn, they may be washed, using a normal laundry cycle. Gowns should be changed at least daily or when visibly soiled with blood (13).
4. Impervious-backed paper, aluminum foil, or clear plastic wrap may be used to cover surfaces (e.g., light handles or x-ray unit heads) that may be contaminated by blood or saliva and that are difficult or impossible to disinfect. The coverings should be removed (while DHCWs are gloved), discarded, and then replaced (after ungloving) with clean material between patients.
5. All procedures and manipulations of potentially infective materials should be performed carefully to minimize the formation of droplets, spatters, and aerosols, where possible. Use of rubber dams, where appropriate, high-speed evacuation, and proper patient positioning should facilitate this process.

HANDWASHING AND CARE OF HANDS

Hands must always be washed between patient treatment contacts (following removal of gloves), after touching inanimate objects likely to be contaminated by blood or saliva from other patients, and before leaving the operatory. The rationale for handwashing after gloves have been worn is that gloves become perforated, knowingly or unknowingly, during use and allow bacteria to enter beneath the glove material and multiply rapidly. For many routine dental procedures, such as examinations and nonsurgical techniques, handwashing with plain soap appears to be adequate, since soap and water will remove transient microorganisms acquired directly or indirectly from patient contact (13). For surgical procedures, an antimicrobial surgical handscrub should be used (14). Extraordinary care must be used to avoid hand injuries during procedures. However, when gloves are torn, cut, or punctured, they must be removed immediately, hands thoroughly washed, and regloving accomplished before completion of the dental procedure. DHCWs who have exudative lesions or weeping dermatitis should refrain from all direct patient care and from handling dental patient-care equipment until the condition resolves (15).

USE AND CARE OF SHARP INSTRUMENTS AND NEEDLES

1. Sharp items (needles, scalpel blades, and other sharp instruments) should be considered as potentially infective and must be handled with extraordinary care to prevent unintentional injuries.

2. Disposable syringes and needles, scalpel blades, and other sharp items must be placed into puncture-resistant containers located as close as practical to the area in which they were used. To prevent needlestick injuries, disposable needles should not be recapped; purposefully bent or broken; removed from disposable syringes; or otherwise manipulated by hand after use.

3. Recapping of a needle increases the risk of unintentional needlestick injury. There is no evidence to suggest that reusable aspirating-type syringes used in dentistry should be handled differently from other syringes. Needles of these devices should not be recapped, bent, or broken before disposal.

4. Because certain dental procedures on an individual patient may require multiple injections of anesthetic or other medications from a single syringe, it would be more prudent to place the unsheathed needle into a "sterile field" between injections rather than to recap the needle between injections. A new (sterile) syringe and a fresh solution should be used for each patient.

INDICATIONS FOR HIGH-LEVEL DISINFECTION OR STERILIZATION OF INSTRUMENTS

Surgical and other instruments that normally penetrate soft tissue and/or bone (e.g., forceps, scalpels, bone chisels, scalars, and surgical burs) should be sterilized after each use. Instruments that are not intended to penetrate oral soft tissues or bone (e.g., amalgam condensers, plastic instruments, and burs) but that may come into contact with oral tissues should also be sterilized after each use, if possible; however, if sterilization is not feasible, the latter instruments should receive high-level disinfection (3, 13, 16).

METHODS FOR HIGH-LEVEL DISINFECTION OR STERILIZATION

Before high-level disinfection or sterilization, instruments should be cleaned to remove debris. Cleaning may be accomplished by a thorough scrubbing with soap and water or a detergent, or by using a mechanical device (e.g., an ultrasonic cleaner). Persons involved in cleaning and decontaminating instruments should wear heavy-duty rubber gloves to prevent hand injuries. Metal and heat-stable dental instruments should be routinely sterilized between use by steam under pressure (autoclaving), dry heat, or chemical vapor. The adequacy of sterilization cycles should be verified by the periodic use of spore-testing devices (e.g., weekly for most dental practices) (13). Heat- and steam-sensitive chemical indicators may be used on the outside of each pack to assure it has been exposed to a sterilizing cycle. Heat-sensitive instruments may require up to 10 hours' exposure in a liquid chemical agent registered by the U.S. Environmental Protection Agency (EPA) as a disinfectant/sterilant; this should be followed by rinsing with sterile water. High-level disinfection may be accomplished by immersion in either boiling water for at least 10 minutes or an EPA-registered disinfectant/sterilant chemical for the exposure time recommended by the chemical's manufacturer.

DECONTAMINATION OF ENVIRONMENTAL SURFACES

At the completion of work activities, countertops and surfaces that may have become contaminated with blood or saliva should be wiped with absorbent toweling to remove extraneous organic material, then disinfected with a suitable chemical germicide. A solution of sodium hypochlorite (household bleach) prepared fresh daily is an inexpensive and very effective germicide. Concentrations ranging from 5,000 ppm (a 1:10 dilution of household bleach) to 500 ppm (a 1:100 dilution) sodium hypochlorite are effective, depending on the amount of organic material (e.g., blood, mucus, etc.) present on the surface to be cleaned and disinfected. Caution should be exercised, since sodium hypochlorite is corrosive to metals, especially aluminum.

DECONTAMINATION OF LABORATORY SUPPLIES AND MATERIALS

Blood and saliva should be thoroughly and carefully cleaned from laboratory supplies and materials that have been used in the mouth (e.g., impression materials, bite registration), especially before polishing and grinding intra-oral devices. Materials, impressions, and intra-oral appliances should be cleaned and disinfected before being handled, adjusted, or sent to a dental laboratory (17). These items should also be cleaned and disinfected when returned from the dental laboratory and before placement in the patient's mouth. *Because of the ever-increasing variety of dental materials used intra-orally, DHCWs are advised to consult with manufacturers as to the stability of specific materials relative to disinfection procedures.* A chemical germicide that is registered with the EPA as a "hospital disinfectant" and that has a label claim for mycobactericidal (e.g., tuberculocidal) activity is preferred, because mycobacteria represent one of the most resistant groups of microorganisms; therefore, germicides that are effective against mycobacteria are also effective against other bacterial and viral pathogens (15). Communication between a dental office and a dental laboratory with regard to handling and decontamination of supplies and materials is of the utmost importance.

USE AND CARE OF ULTRASONIC SCALERS, HANDPIECES, AND DENTAL UNITS

1. Routine sterilization of handpieces between patients is desirable; however, not all handpieces can be sterilized. The present physical configurations of most handpieces do not readily lend them to high-level disinfection of both external and internal surfaces (see 2 below); therefore, when using handpieces that cannot be sterilized, the following cleaning and disinfection procedures should be completed between each patient: After use, the handpiece should be flushed (see 2 below), then thoroughly scrubbed with a detergent and water to remove adherent material. It should then be thoroughly wiped with absorbent material saturated with a chemical germicide that is registered with the EPA as a "hospital disinfectant" and is mycobactericidal at use-dilution (15). The disinfecting solution should remain in contact with the handpiece for a time specified by the disinfectant's manufacturer. Ultrasonic scalers and air/water syringes should be treated in a similar manner between patients. Following disinfection, any chemical residue should be removed by rinsing with sterile water.

2. Because water retraction valves within the dental units may aspirate infective materials back into the handpiece and water line, check valves should be installed to reduce the risk of transfer of infective material (18). While the magnitude of this risk is not known, it is prudent for water-cooled handpieces to be run and to discharge water into a sink or container for 20-30 seconds after completing care on each patient. This is intended to physically flush out patient material that may have been aspirated into the handpiece or water line. Additionally, there is some evidence that overnight bacterial accumulation can be significantly reduced by allowing water-cooled handpieces to run and to discharge water into a sink or container for several minutes at the beginning of the clinic day (19). Sterile saline or sterile water should be used as a coolant/irrigator when performing surgical procedures involving the cutting of soft tissue or bone.

HANDLING OF BIOPSY SPECIMENS

In general, each specimen should be put in a sturdy container with a secure lid to prevent leaking during transport. Care should be taken when collecting specimens to avoid contamination of the outside of the container. If the outside of the container is visibly contaminated, it should be cleaned and disinfected, or placed in an impervious bag (20).

DISPOSAL OF WASTE MATERIALS

All sharp items (especially needles), tissues, or blood should be considered potentially infective and should be handled and disposed of with special precautions. Disposable needles, scalpels, or other sharp items should be placed intact into puncture-resistant containers before disposal. Blood, suctioned fluids, or other liquid waste may be carefully poured into a drain connected to a sanitary sewer system. Other solid waste contaminated with blood or other body fluids should be placed in sealed, sturdy impervious bags to prevent leakage of the contained items. Such contained solid wastes can then be disposed of according to requirements established by local or state environmental regulatory agencies and published recommendations (13,20).

Developed by Dental Disease Prevention Activity, Center for Prevention Svcs, Hospital Infections Program, Center for Infectious Diseases, CDC.

Editorial Note: All DHCWs must be made aware of sources and methods of transmission of infectious diseases. The above recommendations for infection control in dental practices incorporate procedures that should be effective in preventing the transmission of infectious agents from dental patients to DHCWs and vice versa. Assessment of quantifiable risks to dental personnel and patients for specific diseases requires further research. There is no current documentation of patient-to-patient blood- or saliva-borne disease transmission from procedures performed in dental practice. While few in number, reported outbreaks of dentist-to-patient transmission of hepatitis B have resulted in serious and even fatal consequences (9). Herpes simplex virus has been transmitted to over 20 patients from the fingers of a DHCW (10). Serologic markers for hepatitis B in dentists have increased dramatically in the United States over the past several years, which suggests current infection-control practices have been insufficient to prevent the transmission of this infectious agent in the dental operator. While vaccination for hepatitis B is strongly recommended for dental personnel (21), vaccination alone is not cause for relaxation of strict adherence to accepted methods of asepsis, disinfection, and sterilization.

Various infection-control guidelines exist for hospitals and other clinical settings. Dental facilities located in hospitals and other institutional settings have generally utilized existing guidelines for institutional practice. These recommendations are offered as guidance to DHCWs in noninstitutional settings for enhancing infection-control practices in dentistry; they may be useful in institutional settings also.

References

1. Ahtone J, Goodman RA. Hepatitis B and dental personnel: transmission to patients and prevention issues. *J Am Dent Assoc* 1983;106:219-22.
2. Crawford JJ. State-of-the-art: practical infection control in dentistry. *J Am Dent Assoc* 1985;110:629-33.
3. Cottone JA, Mitchell EW, Baker CH, et al. Proceedings of the National Symposium on Hepatitis B and the Dental Profession. *J Am Dent Assoc* 1985;110:614-49.
4. CDC. Acquired immunodeficiency syndrome (AIDS): precautions for health-care workers and allied professionals. *MMWR* 1983;32:450-1.
5. Bond WW, Favero MS, Petersen NJ, Gravelle CR, Ebert JW, Maynard JE. Survival of hepatitis B virus after drying and storage for one week [Letter]. *Lancet* 1981;:550-1.
6. Shikata T, Karasawa T, Abe K, et al. Hepatitis B e antigen and infectivity of hepatitis B virus. *J Infect Dis* 1977;136:571-6.
7. Hadler SC, Sorley DL, Acree KH, et al. An outbreak of hepatitis B in a dental practice. *Ann Intern Med* 1981;95:133-8.
8. Occupational Safety and Health Administration. Risk of hepatitis B infection for workers in the health care delivery system and suggested methods for risk reduction. U.S. Department of Labor 1983; (CPL 2-2.36).
9. CDC. Hepatitis B among dental patients—Indiana. *MMWR* 1985;34:73-5.
10. Manzella JP, McConville JH, Valenti W, Menegus MA, Swierkosz EM, Arens M. An outbreak of herpes simplex virus type 1 gingivostomatitis in a dental hygiene practice. *JAMA* 1984;252:2019-22.
11. Petersen NJ, Bond WW, Favero MS. Air sampling for hepatitis B surface antigen in a dental operator. *J Am Dent Assoc* 1979;99:465-7.
12. Bond WW, Petersen NJ, Favero MS, Ebert JW, Maynard JE. Transmission of type B viral hepatitis B via eye inoculation of a chimpanzee. *J Clin Microbiol* 1982;15:533-4.

13. Garner JS, Favero MS. Guideline for handwashing and hospital environmental control, 1985. Atlanta, Georgia: Centers for Disease Control, 1985; publication no. 99-1117.
14. Garner JS. Guideline for prevention of surgical wound infections, 1985. Atlanta, Georgia: Centers for Disease Control, 1985; publication no. 99-2381.
15. CDC. Recommendations for preventing transmission of infection with human T-lymphotropic virus type III/lymphadenopathy-associated virus in the workplace. MMWR 1985;34:682-6, 691-5.
16. Favero MS. Sterilization, disinfection, and antisepsis in the hospital. In: Lennette EH, Salows A, Hauslen WJ, Shadomy HJ. Manual of clinical microbiology. Washington, D.C.: American Society of Microbiology, 1985:129-37.
17. Council on Dental Therapeutics and Council on Prosthetic Services and Dental Laboratory Relations, American Dental Association. Guidelines for infection control in the dental office and the commercial laboratory. J Am Dent Assoc 1985;110:969-72.
18. Bagga BSR, Murphy RA, Anderson AW, Punwani I. Contamination of dental unit cooling water with oral microorganisms and its prevention. J Am Dent Assoc 1984;109:712-6.
19. Scheid RC, Kim CK, Bright JS, Whitely MS, Rosen S. Reduction of microbes in handpieces by flushing before use. J Am Dent Assoc 1982;105:658-60.
20. Garner JS, Simmons BP. CDC guideline for isolation precautions in hospitals. Atlanta, Georgia: Centers for Disease Control, 1983; HHS publication no. (CDC) 83-8314.
21. ACIP. Inactivated hepatitis B virus vaccine. MMWR 1982;31:317-22, 327-8.

