

# ទ្វាយបាល ការពេជ្រវិបត្រិក ប្រចាំសប្តាហ៍

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ឱ្យដោនាំការគុណការគិតខៅ 257

សោរបៀបព័ត៌មាន 262  
Healthy Living; Everyone  
a Winner

រាយការកន្លាស្តីប្រយោជន៍ 265

ខែវិច្ឆិក 2528

សាការសំនួរ 268

### អត្ថបន្ទ

#### Recommended Infection-Control Practices for Dentistry

(ឱ្យដោនាំការគុណការគិតខៅសោរបៀបព័ត៌មាន)

Dental personnel may be exposed to a wide variety of microorganisms in the blood and saliva of patients they treat in the dental operatory. 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 (7,3).

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, scalers, 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

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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 operatory. 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.

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