Infection Control Compliance Issues and Questions

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ABSTRACT

This article uses the 2003 CDC infection control guidelines for dentistry as a framework for discussing representative questions and issues that continue to be raised by dental health care workers. Where applicable, additional supporting evidence will be incorporated to provide appropriate, useful information, to assist in understanding and complying with updated recommendations.

The most recent guidelines and recommendations for infection control in dentistry were published by the Centers for Disease Control and Prevention in December 2003.[1] The format of the document was modified from previous publications to include an extended introductory section which reviewed the published science related to dental infection control. Inclusion of this information was designed to assist dentists, dental hygienists, dental assistants, and laboratory technicians in better understanding the "why" as well as the "what" of appropriate precautionary measures. This evidence-based approach was utilized in response to requests from clinicians, educators, and scientists responsible for training and managing dental professionals in a variety of patient care settings.

The historical acceptance and application of multiple protocols, practices, and procedures have substantially reduced occupational infectious disease risks in clinical facilities. When taken together, the health care workers' adaptation and adoption of effective aseptic procedures, personal protective barriers, automated instrument decontamination devices, efficient heat sterilization equipment, single-use disposable items, environmental surface barriers and disinfectants, and rational waste management procedures, have created a much safer occupational environment for both health professionals and their patients.[2] While the application of many measures was required to achieve the current level of safety, one related, often unmentioned topic remains an essential component of any infection control program — compliance. A number of published dental and medical surveys have suggested that, although adherence to science- and clinical-based recommended procedures, practices, and products are effective in limiting the potential for accidental occupational exposures, routine compliance by patient care providers continues to be an ongoing issue.[3-7]

While a number of previously unresolved concerns have been addressed by documented scientific and clinical studies, new challenges to established infection control precautions continue to arise as infectious

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disease knowledge expands along with development of more efficient prevention strategies. In addition, misperceptions still occur regarding concerns ranging from perceived procedure and/or product ineffectiveness to unnecessary overkill with redundant practices and protocols. What is unfortunately inherent in these statements is the misplaced belief that each infection control procedure or product is supposed to provide an absolute safeguard against cross-infection.

The following article will use the 2003 CDC infection control guideline for dentistry as a framework for discussing representative questions and issues which continue to be raised by dental health care workers. Where applicable, additional supporting evidence will be incorporated to provide appropriate, useful information, to assist in understanding and complying with updated recommendations.

When I read articles updating infection control information, I now see the term "standard precautions" in place of what I learned as universal precautions. What is the difference?

The rationale for universal precautions is familiar to virtually every health care worker who currently provides patient care. This concept of infection control, introduced in 1985,[8] assumed that any patient is potentially infectious for a number of blood-borne pathogens, such as hepatitis B virus, human immunodeficiency virus, and hepatitis C virus. A key application for dental professionals was inclusion of a statement to consider blood and other body fluids, including saliva, as potentially infectious for occupational pathogens. In 1987, a body substance isolation system was introduced to focus on the reduction of transmission of infectious material from any moist body substance. These included blood, feces, urine, sputum, saliva, wound exudates, and other body fluids.[9,10] Body substance isolation precautions were designed to address procedures that involved all moist, potentially infectious, body substances regardless of their suspected or unsuspected infection status. Unfortunately, many health care workers were confused concerning differences between universal precautions and body substance isolation and so the CDC developed a new set of guidelines for isolation precautions in hospitals, termed standard precautions.[11]

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These are similar to universal precautions in that they are intended to reduce occupational infection risks during the treatment of all patients. In addition, they expand previous recommendations for health care workers' protection by including such measures as immunizations for vaccine-preventable diseases, management of health care workers' exposures from infected persons, and work restrictions for exposed or infected health care workers.[12] The integration and expansion of the universal precautions components into the current standard precautions recommendations have been incorporated in the 2003 CDC dental infection control guideline.[1]

There is a table in the December 2003 CDC document titled "Immunizations Strongly Recommended for Health Care Personnel." Are dental personnel now supposed to be vaccinated against diseases other than hepatitis B?

Medical and dental health care workers' occupational risks from microbial pathogens include exposures to many vaccine-preventable diseases. The major accomplishments of widespread immunization protecting the general population against diseases such as smallpox, poliomyelitis, measles, mumps, rubella, influenza, tetanus, diphtheria, hepatitis B, and varicella-zoster virus infection (chickenpox), have expanded the rationale for clinical vaccination as an attractive, effective alternative to the widespread use of antimicrobial chemotherapy. Since health care workers have an increased risk for acquiring or transmitting hepatitis B, influenza, measles, mumps, rubella, and varicella-zoster virus infection, immunizations against these vaccine-preventable conditions now comprise an essential component of a complete infection control program.[1,13,14]

Are my prescription glasses sufficient protection for treating patients?

While any form of eyewear will provide some level of protection against the splash/spray of blood or body fluids, the style of many of today's frames are quite small and do not afford appropriate ocular protection. Disposable side shields, which are designed to fit all types of frames, provide a certain degree of additional protection.

However, if they are not placed correctly on the arm of the prescription glasses or they are not flush against the side of the lenses, the opportunity

remains for splash/spray to reach the eye. Therefore, specifically designed protective eyewear with solid side shields, or a face shield worn in conjunction with prescription glasses, or a disposable mask with face shield will provide the greatest barrier against aerosols and debris. Protective eyewear should be cleaned and decontaminated between patients.

Do I need to wear a clinic gown over my scrubs or street clothes?

Protective clothing, such as a clinic gown or lab coat, should be worn by the dental health care worker to prevent contamination of clothing and to protect skin during activities which pose a risk of exposure to blood, saliva or other body fluids. Occupational Safety and Health Administration blood-borne pathogen standards require the protective clothing to have long sleeves and a high, closed collar. Ultimately, however, the anticipated degree of exposure will dictate the type of protective clothing needed. Clinic gowns or lab coats made from cotton or a cotton blend should be changed when visibly soiled or as soon as possible if blood or other potentially infective body fluid penetrates the garment. Such attire should be laundered in the dental office/clinic or by a service capable of handling contaminated clothing. Disposable gowns must be discarded daily or when visibly soiled. All protective clothing should be removed prior to leaving the treatment area.

Why is it necessary to wash my hands before and after treating a patient if I was wearing gloves?

Maintaining effective hand hygiene is considered the most crucial measure in reducing the risk of transmitting pathogens between health care workers and their patients.[15] The need for diligent hand hygiene is not eliminated with the use of examination or surgical gloves.

Appropriate performance of hand hygiene also do not diminish the necessity to wear gloves. Human skin harbors both resident and transient bacteria. Resident microorganisms which normally colonize the skin are more difficult to remove but generally are not virulent. Transient microflora, on the other hand, are acquired by health care workers through direct contact with patients and contaminated surfaces. Although they are more easily removed by routine hand hygiene practices, transient microorganisms provide the highest risk of cross-contamination. However, a number of investigations have demonstrated that implementation of proper hand hygiene practices can significantly increase health care workers' compliance and reduce the potential for transmission of such microorganisms.[15,16]

In order to reduce the dental health care workers' exposure to contamination, proper hand hygiene should be performed when hands are visibly soiled, when they have been in contact with a patient's skin, saliva, or other body fluid, immediately prior to donning gloves and again immediately after removal. Donning gloves without adequate cleansing of the hands allows for the remaining transient microflora to flourish in the warm, moist environment created underneath the gloves. Additionally, minute defects or tears in the gloves which are not visible to the

naked eye, can increase the likelihood of microbial transmission during dental procedures.

The type of procedure to be performed, the degree of anticipated contamination, and the extent of persistence of antimicrobial action on the skin dictates the method of hand hygiene indicated (**Table 1**).[1] Routine dental examinations and other nonsurgical procedures require handwashing prior to gloving with either plain or antimicrobial soap and water, or an alcohol-based handrub if the hands are not visibly soiled. However, prior to performing surgical techniques, surgical hand antisepsis is required to eliminate transient microflora and reduce resident microflora. Therefore, an antimicrobial soap or alcohol-based hand rub which contain antiseptics such as chlorhexidine, triclosan, or quaternary ammonium compounds to extend persistent activity should be used preoperatively.

Table 1

Hand Hygiene Methods and Indications

Method	Agent	Purpose	Duration of Action	Indication
Routine handwash	Water and plain nonantimicrobial soap	Remove soil and transient bacteria	15 seconds	Before donning gloves; following removal of gloves; following barehanded contact with contaminated objects; prior to leaving the dental operatory or laboratory; when visibly soiled; before regloving after removing torn, cut or punctured gloves
Antiseptic handwash	Water and antimicrobial soap (chlorhexidine, iodine, iodophors, chloroxylenol, triclosan)	Remove or destroy transient microflora; reduce resident microflora	15 seconds	Before donning gloves; following removal of gloves; following barehanded contact with contaminated objects; prior to leaving the dental operatory or laboratory; when visibly soiled; before regloving after removing torn, cut or punctured gloves
Antiseptic handrub	Alcohol-based handrub	Remove or destroy transient microflora; reduce resident microflora	Rub hands until dry	Before donning gloves; following removal of gloves; following barehanded contact with contaminated objects; prior to leaving the dental operatory or laboratory; when visibly soiled; before regloving after removing torn, cut or punctured gloves
Surgical antisepsis	Water with antimicrobial soap (chlorhexidine, iodine, iodophors, chloroxylenol, triclosan)	Remove or destroy transient microflora; reduce resident microflora (persistent effect)	2-6 minutes	Before donning sterile surgical gloves
	Water and non-antimicrobial soap followed by an alcohol-based hand scrub product with persistent activity		Follow manufacturer instructions for surgical hand scrub products with persistent activity	

Adapted from (1)

Table 2

Glove Types and Indications

Type of Glove	Indication	Comment
Patient examination	Patient care; examinations, nonsurgical procedures involving contact with blood/body fluids, and laboratory procedures	Food and Drug Administration regulated as medical device Nonsterile and sterile; single use
Surgical	Surgical procedures	Food and Drug Administration regulated as medical device Sterile; single use
Nonmedical (utility, general purpose)	Handling contaminated instruments; housekeeping procedures (cleaning/ disinfecting work area)	Not regulated by the Food and Drug Administration as a medical device Puncture-resistant and/or chemical-resistant, depending on the procedure Disinfect after use.

Adapted from (1)

Additional factors which must be considered when choosing a hand hygiene product are accessibility, efficacy, and acceptance of the product. The efficacy of hand hygiene products increases from the use of plain soap and water to antimicrobial soap and water to alcohol-based hand rubs.[17] For most routine procedures, the use of plain soap and water is adequate. However, when conducting more invasive procedures, an antimicrobial soap should be used. Alcohol-based hand rubs have been shown to be most beneficial, due to their rapid and effective antimicrobial action, accessibility for use, reduced time required for appropriate antisepsis, and overall improved skin condition with prolonged use.

How do I know what gloves to wear when treating a patient?

Glove selection should be based on the type of procedure to be performed (**Table 2**).[1] Patient examination gloves are indicated for routine patient care, examinations, nonsurgical and laboratory procedures. As the name implies, surgical gloves are indicated for surgical procedures and therefore are manufactured to meet specific FDA standards for assurance of sterility. Nonmedical or utility gloves are indicated for handling contaminated instruments or for cleaning and disinfecting operatory surfaces and instruments. These gloves are often made of heavier materials which are puncture and chemical resistant. Unlike examination and surgical gloves, nonmedical gloves are not regulated by the FDA and are not meant for use with patient treatment. Patient examination and surgical gloves are to be used for only one patient and then discarded while nonmedical gloves can be disinfected and used repeatedly as long the integrity of the material is not compromised.

In addition, it is necessary to be aware that even when using the appropriate glove, exposure to chemicals/ materials used in the practice of dentistry (bonding agents, restorative resins, impression materials and disinfectants), or mechanical insult as a result of long fingernails or jewelry, can compromise the integrity of the gloves. This holds true whether the composition of the glove is latex, vinyl, nitrile or some other synthetic material. Risk of exposure can be reduced by being familiar with the manufacturers' recommendations regarding the compatibility of their product with specific dental materials, maintaining short fingernails, eliminating hand jewelry, and establishing controls to prevent injuries from sharps. CDA

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