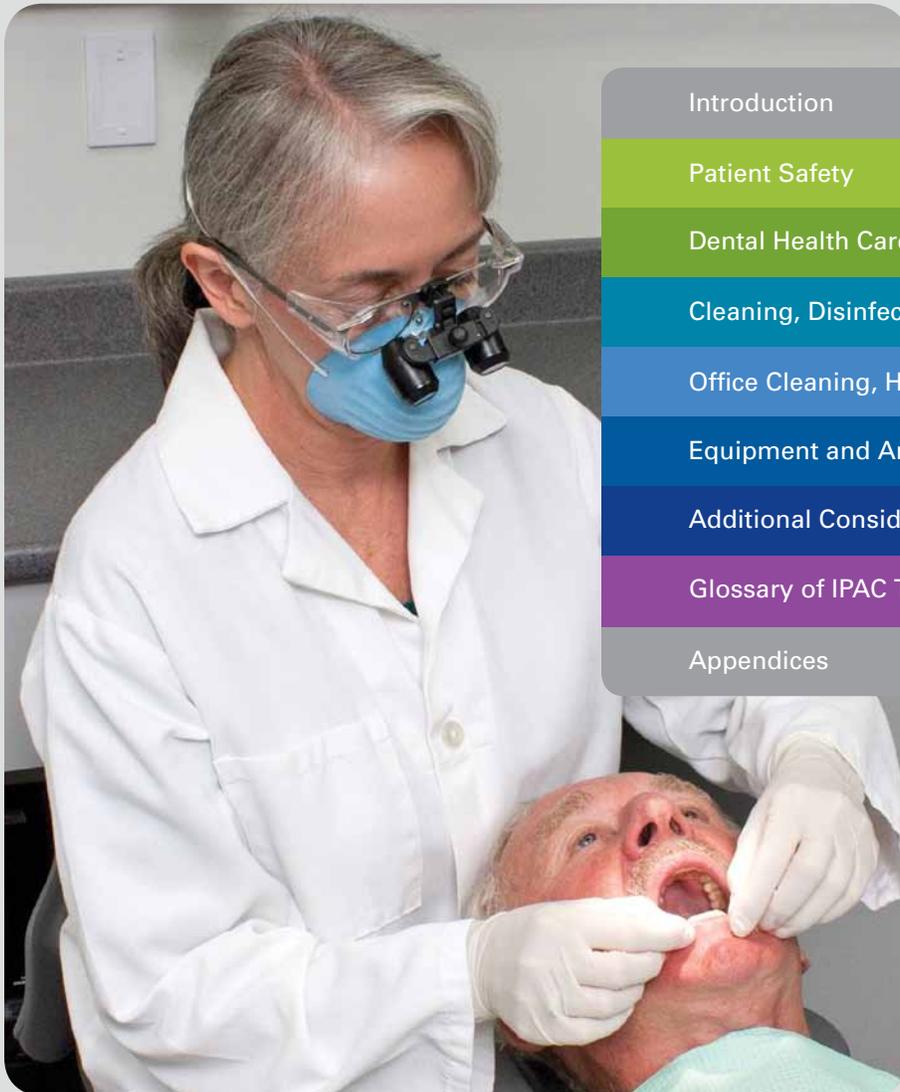




College of Dental Hygienists  
of British Columbia

# Infection Prevention and Control Guidelines

July 2012



Introduction

Patient Safety

Dental Health Care Providers' Responsibilities and Safety

Cleaning, Disinfection and Sterilization of Patient Care Items

Office Cleaning, Housekeeping and Management of Waste

Equipment and Area Specific Practice Guidelines

Additional Considerations for Alternative Practice Settings

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Appendices

Developed in collaboration with the College of Dental Surgeons of BC and based on: **Guidelines on Infection Control in the Dental Office** (revised – February 2010) published by the Royal College of Dental Surgeons of Ontario.

## Development of Infection Prevention and Control Guidelines for B.C. Dental Professionals

The development of the *Infection Prevention and Control Guidelines* has been a collaborative project between the College of Dental Hygienists of BC and the College of Dental Surgeons of BC. The intent of the project was to develop a document that will serve as a practice resource for all dental assistants, dentists and dental hygienists in British Columbia. In addition, this project is in accordance with the mandate of public protection that is common to both Colleges.

A consultative working group was established in order to include the infection control perspectives of dental professionals in diverse areas of practice including private practice, residential care, research and education. Staff from both Colleges reviewed a number of credible resources on infection prevention and control, including infection control documents currently in use in other jurisdictions. Many resources were utilized in the development of these guidelines, most significantly *Guidelines on Infection Prevention and Control in the Dental Office* published by the Royal College of Dental Surgeons of Ontario.

This document is intended to serve as a “living document” that will be updated over time to reflect changes called for as a result of research and developments in the field of infection prevention and control. As a result, static referenced-to specific publications are not provided. However, Appendix 2 provides a listing of additional resources available online.

The content contained in these *Infection Prevention and Control Guidelines* is the same in the version that has been published by each of the two Colleges. The context is framed from the perspective of each regulatory College, as the target audience is different oral health professionals. Each College commits to the ongoing collaborative nature of this document and will undertake future revisions with input and consultation with the other College.

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# Introduction

Infection prevention and control is an important part of safe patient care. Concerns about the possible spread of blood-borne diseases, and the impact of emerging, highly contagious respiratory and other illnesses, require practitioners to establish, evaluate, continually update and monitor their infection prevention and control strategies and protocols.

These Guidelines are significantly broader than previous documents, and they reflect current knowledge of the transmission of infection, and how to prevent and control it.

## **IMPORTANT**

*In this document, the following assumptions have been made:*

- *The terms “dental health care provider” (DHCP) and “staff” are used interchangeably. “Staff” encompasses all persons conducting activities within, or associated with, dental offices and includes dentists, dental hygienists, dental assistants, anaesthetists and other support persons.*
- *The term “dental office” includes any facility in which oral health care is provided, such as traditional dental practices, dental hygiene practices, community and school-based dental clinics, and residential care centres and other institutional settings.*
- *These Guidelines contain practice parameters and standards, but respect the autonomy of each dental office. Guidelines, by definition, are directing principles, and indications or outlines of policy and conduct.*
- *Dental hygienists are trained to take precautions in order to protect patients and staff. In addition to previous instruction, it is important that all dental hygienists receive office-specific training in infection prevention and control as part of their orientation, and whenever new tasks, procedures or equipment are introduced. It is recommended that one staff person be appointed to manage the dental office’s infection prevention and control program and ensure that it remains current. While infection prevention and control is the responsibility of all dental hygienists, implementation and oversight rests with the principal practice owner(s).*

# Purpose of the Document

This document is not a step-by-step manual on how to implement specific infection control practices or procedures, nor does it endorse the use of specific infection control products or manufacturers. Rather, it is intended to provide all DHCPs with the knowledge of principles and standards to inform and properly implement necessary infection prevention and control measures in a safe and effective manner, including standards of practice that **must** be met. These are reflected throughout the body of the document by the use of “must” statements rather than “should” statements.

This document consolidates published recommendations from government and other agencies, regulatory bodies and professional associations.

**The words “must” and “should” are used throughout this document:**

- **“Must” indicates the minimum standards that are mandatory.**
- **“Should” indicates a recommendation that is not mandatory.**

Wherever possible, recommendations are based on data from well-designed scientific studies. However, some infection prevention and control practices routinely used by health care practitioners cannot be rigorously examined for ethical or logistical reasons. In the absence of scientific evidence for such practices, certain recommendations are based on strong theoretical rationale, suggestive evidence or opinions of respected authorities. In addition, some recommendations are derived from provincial and federal regulations.

Accordingly, this document presents “best practices,” reflecting the best evidence and expert opinion available at the time of writing.

## Professional and Regulatory Considerations

Practice owners have an obligation to maintain the standards of practice of the profession and, accordingly, **must** ensure that recommended infection prevention and control procedures are carried out in their offices.

Dental hygienists **must** maintain current knowledge of infection prevention and control procedures, and apply and maintain them appropriately and consistently. To this end, it is the practice owner's responsibility to ensure that staff are adequately trained in infection

prevention and control procedures, and that the necessary supplies and equipment are available, fully operational, up-to-date and routinely monitored for efficacy.

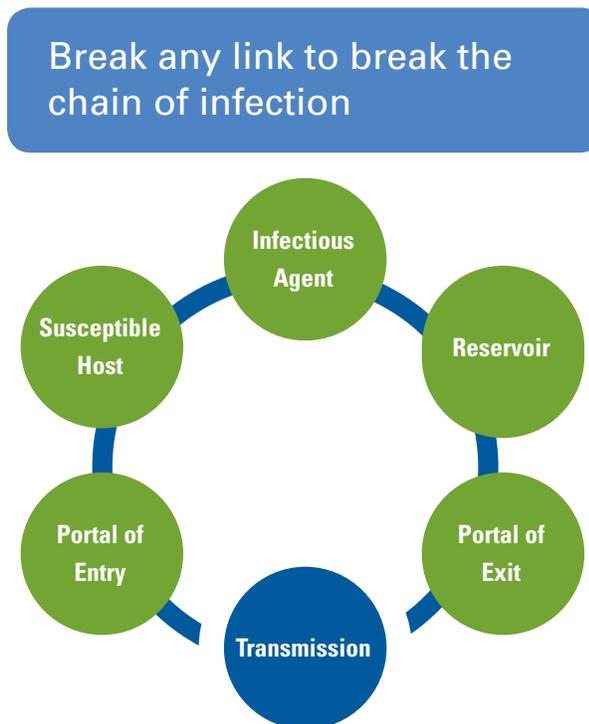
In addition to professional obligations, practice owners also have an ethical duty to maintain a safe and healthy office environment for both patients and staff, and to adhere to all rules and regulations related to the operation of a dental practice, including workplace health and safety, and environmental protection.

## Transmission of Microorganisms and Principles of Infection Prevention and Control (IPAC)

In order to transmit an organism or infection, three elements must be present:

1. A microorganism
2. A susceptible host
3. A way for the microorganism to be transmitted

Understanding the modes of transmission of infection is necessary for designing and implementing effective infection prevention and control strategies. Dental patients and DHCPs can be exposed to pathogenic microorganisms, including viruses (e.g. HBV, HCV, HIV, human herpes viruses, human papillomavirus), bacteria (e.g. Mycobacterium tuberculosis, staphylococci, streptococci) and other microbes that colonize or infect the oral cavity and respiratory tract.



In the dental office, the main modes of transmission of microorganisms are:

- direct transmission – direct physical contact with blood, oral fluids or other materials
- indirect transmission – contact with an intermediate contaminated object, such as a dental instrument, equipment or an environmental surface
- droplet – contact of oral, nasal or conjunctival mucosa with droplets, spatter or spray containing microorganisms generated from an infected person, such as by coughing, sneezing or talking
- aerosol – particles of respirable size (<10µm) generated by both humans and environmental sources that can remain viable and airborne for extended periods in the indoor environment. In dentistry, aerosols are commonly generated by the use of handpieces, ultrasonic scalers and air/water syringes.

The risk of infection as a result of a dental procedure is extremely low, but it represents an important patient safety consideration. By understanding how diseases are transmitted, and applying infection prevention and control (IPAC) principles, dental hygienists can develop strategies to interrupt the transmission of microorganisms among patients and dental hygienists, and from dental instruments, handpieces, devices and equipment.

IPAC principles include:

- patient assessment;
- following Routine Practices;
- using barrier techniques to protect both patients and dental hygienists;
- applying the principles of cleaning, disinfection, sterilization and storage of dental instruments;
- environmental cleaning;
- care of the overall office setting;
- safe handling and disposal of wastes.

An overall IPAC program should focus on strategies to reduce the risk of transmission.

These strategies include:

- a) identifying, communicating and implementing standards and guidelines by setting specific policies and procedures;
- b) effective occupational health and safety programs for all dental hygienists, such as written procedures for the workplace and guidance on immunization;
- c) educating dental hygienists, as well as patients and their families, about everyone's role in infection prevention;
- d) ongoing review of policies and procedures, and evaluation of the IPAC program.

**KEY PRINCIPLE: Dental hygienists must maintain current knowledge of best practices in infection prevention and control, and apply it appropriately and consistently to ensure protection of staff and patients.**

# Part A: Patient Safety

## 1. Screening of Patients

From time to time, patients who are unwell may attend at a dental office. Their health condition may relate to a dental problem, such as an oral infection or a postoperative complication, but it may also relate to a non-dental problem, such as a severe respiratory illness (e.g. influenza) or simply a bad cold.

In order to protect other patients and dental hygienists from the spread of microorganisms, patients who appear to be ill should be rescheduled if at all possible. If their dental condition is of an urgent nature, every effort should be made to separate them from other patients by seating them in a secluded operatory as soon as possible. In this way, the spread of microorganisms by direct or droplet transmission can be minimized.

Another opportunity to screen for ill patients is when confirming dental appointments in advance. If staff learn that a particular patient has a fever or cough, dental appointments should be rescheduled.

## 2. Routine Practices

Health Canada uses the term “Routine Practices” to describe basic standards of infection prevention and control that are required for safe patient care. A similar term, “Standard Precautions,” is used by the Centers for Disease Control and Prevention in the United States. Routine Practices synthesize the major principles of “universal precautions,” which are designed to reduce the risk of transmitting pathogens that are blood-borne, and those of “body substance precautions,” which are designed to reduce the risk of transmitting pathogens from moist body substances.

Routine Practices are based on the concept that all patients are potentially infective, even when asymptomatic, and that the same safe standards of practice should routinely apply to contact with blood, body fluids and secretions (e.g. saliva), mucous membranes and non-intact skin. In addition, instruments in direct contact with these fluids and tissues are potentially contaminated with infectious agents.

Adherence to Routine Practices protects both dental hygienists and patients.

There are four principles that are inherent in Routine Practices:

1. risk assessment
2. hand hygiene
3. use of personal protective equipment
4. safe handling and disposal of sharps and contaminated waste

### 3. Risk Assessment

The first step in the effective use of Routine Practices is to perform a risk assessment.

This **must** be done before each interaction with the patient in order to determine the interventions that are required to prevent the transmission of infection.

**The risk of transmission of microorganisms will vary, depending on the type of dental procedure to be performed and the likelihood of exposure to blood, body fluids and secretions, mucous membranes and non-intact skin. Additional factors to consider include:**

- the health status of the patient;
- the characteristics of the patient, such as level of cooperativeness;
- the physical environment and resources available;
- the immune status of the dental hygienist.

Procedures involving exposure to blood, body fluids and secretions, mucous membranes and non-intact skin require the use of appropriate personal protective equipment. On the other hand, procedures involving no anticipated exposure may require fewer precautions.

#### IMPORTANT

*Perform a risk assessment before each interaction with the patient in order to determine the interventions that are required to prevent the transmission of infection.*

### 4. Hand Hygiene

Hand hygiene is the single most important measure for preventing the transmission of microorganisms. The term “hand hygiene” has replaced handwashing and includes the use of plain or antimicrobial soap with running water, as well as alcohol-based hand rub.

***When should hand hygiene occur and with what type of product?***

**Hand hygiene should be performed by washing with plain or antimicrobial soap and running water, or by using a 70-90% alcohol-based hand rub. Both methods are equally effective, unless hands are visibly soiled (including with powder from gloves) or contaminated with body fluids, in which case hands should be washed with soap and water. Hand hygiene should be performed:**

- following personal body functions (e.g. blowing nose or using washroom);
- before and after direct contact with individual patients;
- before putting on and after removing gloves;
- after contact with environmental surfaces, instruments or other equipment in the dental operatory;
- after contact with dental laboratory materials or equipment;
- before and after eating or drinking.

#### IMPORTANT

*Contamination may involve areas beyond the hands (e.g. forearms). Use professional judgment regarding the extent of contamination and ensure affected areas are decontaminated appropriately. If you think your hands or other skin surfaces have become contaminated with body fluids, wash with soap and water to remove organic matter.*

Liquid soap should be provided in disposable pump dispensers. Bar soap should not be used. Hand lotion to prevent dry or cracked skin also should be available in disposable pump dispensers. Petroleum-based hand lotions should not be used because they can affect glove integrity. To avoid contamination, disposable pump dispensers of liquid products should be discarded when empty and not “topped-up” or refilled. Reports have been documented in the scientific literature of disposable soap dispensers becoming contaminated with gram-negative bacterial species.

Despite perceptions to the contrary, alcohol-based hand rubs have been shown to be less irritating to skin than soap and water. Select a product that contains emollients.

### IMPORTANT

*There is sufficient evidence that alcohol-based hand rubs are equally effective as washing with soap and water, except in cases where the hands are visibly soiled or contaminated with body fluids. In this case, handwashing with soap and water is necessary to remove organic matter.*

#### **How should hand hygiene be done?**

##### **When using soap and water for routine care:**

- Wet hands with warm, not hot, water.
- Apply adequate amount of soap to achieve lather.
- Rub vigorously for a minimum of 15 seconds, covering all surfaces of hands and fingers. Pay particular attention to fingertips, between fingers, backs of hands and base of thumbs, which are the most commonly missed areas.
- Rinse well with running water.
- Dry thoroughly with a disposable paper towel. Turn off taps with towel and discard towel in a bin.

### IMPORTANT

*Avoid the use of hand jewellery and artificial nails. Jewellery interferes with proper hand hygiene, can make donning gloves more difficult and increases the risk of gloves tearing. Artificial nails have been implicated in hospital outbreaks involving fungal and bacterial infections.*

##### **When using antimicrobial soap and water for surgical procedures:**

- Remove all hand and wrist jewellery.
- Clean under nails. A disposable manicure stick may be used, but nailbrushes are **not** recommended, as they can become contaminated and damage the skin around the nails. Nails should be short enough to allow thorough cleaning underneath and not cause glove tears.
- Wash hands and forearms to the elbows thoroughly for the length of time recommended by the manufacturer (usually two to five minutes).
- Rinse off soap and dry hands thoroughly before donning sterile gloves.

##### **When using an alcohol-based hand rub for routine care:**

- Apply the product to one palm and rub both hands together for at least the minimum time interval indicated by the manufacturer, covering all surfaces of hands and fingers, until they are dry.

**When using an alcohol-based surgical hand rub for surgical procedures:**

- Remove all hand and wrist jewellery.
- Ensure that the alcohol-based hand rub selected has been approved for surgical hand disinfection.
- Apply the product to dry hands only and follow the manufacturer's instructions.
- Allow hands to dry thoroughly before donning sterile gloves.

**Hand hygiene facilities should be located as close as possible to all dental operatories and preferably in clear sight of patients. If they are out of sight, patients should be made aware that hand hygiene is taking or has taken place.**

**In addition:**

- Soap dispensers should be placed at every sink.
- Alcohol-based hand rub dispensers should be strategically located for ease of use.
- Disposable towels should be readily available at each facility.
- Taps should be turned off with the aid of a paper towel to avoid recontamination of hands. If renovating, consider installing hands-free faucets.
- A hand wash sink should not be used for any other purpose.

**IMPORTANT**

*The use of gloves does not preclude the need for careful hand hygiene.*

## 5. Personal Protective Equipment for Patients

### General considerations

Dental hygienists wear personal protective equipment (PPE) to shield their own tissues from exposure to potentially infectious material. This also protects patients by preventing the dental hygienist from becoming a vector for the transmission of microorganisms from patient to patient.

Additional protective barriers and techniques should be employed to shield patients from potentially infectious material.

### Protective eyewear

Large particle droplets of water, saliva, blood, microorganisms and other debris are created by the use of dental handpieces, ultrasonic instruments and air/water syringes.

This visible spray typically travels only a short distance and settles out quickly, landing on nearby surfaces, including the operatory countertops and equipment, as well as the dental hygienist and patient.

Patients should be provided with protective eyewear to shield their eyes from spatter and debris created during dental procedures. Protective eyewear should be worn throughout the dental appointment, then cleaned and disinfected after use and whenever visibly contaminated.

### Protective draping

Single-use bibs or drapes should be used to protect the patient's clothing, and reduce their exposure to spatter and debris created during dental procedures. Single-use strips may be used to secure bibs and drapes, in place of reusable daisy chains.

### Use of rubber dam and high-volume suction

Appropriate efforts should be made to minimize the spread of droplets, spatter and spray created during dental procedures. Accordingly, a rubber dam should be used whenever feasible, and high-volume suction should be used whenever the creation of droplets, spatter and spray is possible.

The use of rubber dam and high-volume suction also minimizes the ingestion or inhalation of contaminated material and debris.

### Latex sensitivity and allergies

Dental patients with true latex allergy may react to common dental products, such as gloves, rubber dams, prophylaxis cups, orthodontic elastics and some medication vials. As part of taking the medical history, patients should be asked questions relating to possible latex allergy. This includes asking whether true latex allergy has been diagnosed. Additional questions should probe for a history of common predisposing conditions for latex allergy, such as other allergies (e.g. avocados, kiwis, hazelnuts, bananas) or early latex exposure related to medical treatment (e.g. spina bifida, urogenital anomalies).

Patients with true latex allergy should be treated in an environment where contact with latex proteins, either directly or airborne, is kept as low as reasonably achievable. When performing hand hygiene, alcohol-based sanitizers are not sufficient for removing latex particles; therefore, hands should be thoroughly washed with soap and water prior to contact with latex-sensitive patients.

All latex-containing materials or devices should be removed from the operatory or adequately covered and isolated.

### IMPORTANT

*Check labels of dental products for latex content. Many items are available in latex-free forms.*

## 6. Safe Handling and Disposal of Sharps

Extreme care **must** be taken at all times to ensure patients are protected from injuries involving sharp objects. Sharps should be kept out of the reach of patients and safely collected in a clearly labelled puncture-resistant container. These sharps containers should be placed immediately adjacent to the point of use. Sharps should be disposed of immediately following use at the end of the procedure. (See “Exposure Prevention” on p. 18 for more about sharps handling.)

## 7. Additional Precautions

Routine Practices may not be sufficient for patients who are infected or colonized with certain microorganisms that pose special problems in blocking their transmission. The term “Additional Precautions” is used to describe measures that are taken *in addition to* Routine Practices in order to interrupt the transmission of such microorganisms. They include the physical separation of infected or colonized patients from other individuals and the use of protective barriers (e.g. gowns, gloves, masks) to prevent or limit the transmission of the infectious agent.

These Additional Precautions are of particular relevance in health care institutions, where they may be determined by local infection prevention and control committees and monitors. For example, in an institutional setting, patients may be at increased risk of becoming infected or colonized with methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant enterococcus (VRE) or respiratory tract viruses (e.g. influenza).

In an ambulatory setting, such as a dental office, Additional Precautions are required for patients who are known or suspected of having an infection that can be transmitted by large respiratory droplets. Examples of microorganisms that can be transmitted in this fashion include respiratory tract viruses, rubella, mumps and *Bordetella pertussis*.

Patients who are known or suspected of having an infection that can be transmitted by large respiratory droplets should be offered a mask and hand hygiene upon presentation, maintain a two-metre separation from other persons, and be removed from the reception/waiting area and seated in a secluded operatory as soon as possible. In this way, the spread of such microorganisms by droplet transmission can be minimized.

**KEY PRINCIPLE: Dental hygienists must ensure that recommended infection prevention and control procedures, including Routine Practices, are applied in all aspects of their practice.**

## 8. Human Rights and Confidentiality

The BC Human Rights Code (the Code) provides for equal rights and opportunities, and freedom from discrimination. It prohibits discrimination based on race, ancestry, place of origin, colour, religion, sex, sexual orientation, age (19 and over), criminal conviction (in employment only), marital status, family status, political belief (in employment only), lawful source of income (in employment only) or mental or physical disability (including HIV or AIDS).

Dental hygienists are prohibited from discriminating against patients. This includes using extraordinary and unnecessary infection control or other measures that are not used for other patients. Dental hygienists may require modifications to Routine Practices based on the risks associated with certain dental procedures, provided that they are employed for all patients undergoing the same procedures.

The information contained in patient records is confidential and **must not** be released to anyone without the consent of the patient, or his/her authorized representative, or as required or allowed by law. Therefore, it is important to remember that patient records should be stored securely and not left unattended or in public areas of the office.

Sensitive medical information should not be recorded on the front of the patient's chart, where it could easily be seen by others. A medical alert should be coded in such a way that only staff recognize the significance of the information, while the exact nature of the condition should be documented within the patient's chart.

If patient records are computerized, login and password protection should be used to prevent unauthorized access. In addition, screen savers and other measures should be employed to ensure information on computer screens is not visible to other patients in the office.

It is the practice owner's responsibility to ensure that all staff are knowledgeable about and take appropriate steps to protect patient confidentiality.

# Part B: Dental Health Care Providers' Responsibilities and Safety

## 1. Education and Training

Dental hygienists are more likely to comply with infection prevention and control protocols if they understand the rationale for them. It is important that all dental hygienists receive office-specific training in infection prevention and control as part of their orientation, and whenever new tasks, procedures or equipment are introduced. This training should be supplemented whenever necessary and reviewed at least annually by means of staff meetings, attendance at continuing education courses and through self-learning programs.

All dental hygienists should receive training that includes information about their exposure risks, infection prevention and control strategies specific to their occupational tasks, and the management of any work-related illness or injury.

It is also recommended that this document, as well as key reference materials identified in it, form part of an in-office infection prevention and control manual.

## 2. Immunization

Immunizations substantially reduce the number of dental hygienists susceptible to infectious diseases, as well as the potential for disease transmission to other staff and patients. Therefore, immunizations are an essential part of infection prevention and control programs.

**All dental hygienists should be adequately immunized against the following diseases:**

- hepatitis B
- measles
- mumps
- rubella
- varicella
- influenza
- diphtheria
- pertussis
- tetanus
- polio

It is important that all dental hygienists know their personal immunization status and ensure that it is up to date. In this regard, dental hygienists should consult with their family physician about the need for immunizations, as well as baseline and annual tuberculosis skin testing. In addition, the Canadian Immunization Guide sets out recommendations and schedules for adults, including those engaged in the provision of health care.

Hepatitis B is the most important vaccine-preventable infectious disease for all workers engaged in health care. The risk of being infected is a consequence of the prevalence of virus carriers in the population receiving care, the frequency of exposure to blood and other body fluids, and the contagiousness of hepatitis B virus (HBV). Therefore, immunization against HBV is strongly recommended for all dental hygienists who may be exposed to blood, body fluids or injury involving sharps.

Serological testing for anti-HBs should be conducted 1 to 2 months after completion of the 3-dose vaccination series to establish antibody response. Dental hygienists who fail to develop an adequate antibody response should complete a second vaccination series, followed by retesting for anti-HBs. Dental hygienists who fail to respond to the second vaccination series should be tested for HBsAg.

Non-responders to vaccination who are HBsAg-negative should be counselled regarding precautions to prevent HBV infection and the need to obtain immunoglobulin prophylaxis for any known or probable parenteral exposure to HBsAg-positive blood.

Dental hygienists who are HBsAg-positive should seek guidance from CDHBC regarding necessary and reasonable steps to prevent HBV transmission to others and the need for medical evaluation. In particular, dental hygienists who might perform exposure-prone procedures should be assessed on a case-by-case basis regarding the need for possible work restrictions.

**KEY PRINCIPLE: Dental hygienists who might perform exposure-prone procedures have an ethical obligation to know their serologic status. If infected, dental hygienists must seek guidance from the College with respect to the potential for transmission of their infection to their patients.**

### 3. Illness and Work Restrictions

Dental hygienists are usually concerned about contracting illnesses in the dental office.

Such occurrences can be minimized by practising the principles discussed in this document, including:

- ensuring adequate and appropriate immunization of all dental hygienists;
- triaging patients and rescheduling those who are ill;
- adhering to Routine Practices, including effective hand hygiene before and after each patient contact.

As already noted, hand hygiene is the single most important measure for preventing the transmission of microorganisms, protecting both dental hygienists and patients. Please refer to Part A: Patient Safety for detailed information regarding recommended hand hygiene procedures.

#### **Unique situations that might warrant particular attention by a dental hygienist include:**

- Dermatitis – When the protective skin barrier is broken, as occurs with chapped hands or eczema, the dental hygienist is at increased risk of acquiring and transmitting infection through the exposed area. Good skin care should always be practised. Any areas of dermatitis should be covered with bandages, in addition to wearing gloves.
- Immunocompromised staff – These dental hygienists are at increased risk of becoming infected and may suffer more severe consequences. They might also be at risk of shedding viruses (e.g. influenza) for prolonged periods. Where feasible, job functions and associated exposure risks should be considered.

Dental hygienists who have an upper respiratory illness (e.g. common cold) should take the necessary precautions to prevent the transmission of microorganisms to patients and other staff. This includes practicing respiratory etiquette by covering their coughs and sneezes with their elbow or a tissue rather than with their hands, and discarding used tissues immediately. Additionally, continuous diligent hand hygiene is especially important. Dental hygienists who have a severe respiratory illness with fever (e.g. influenza), acute viral gastroenteritis with vomiting and/or diarrhea, or acute conjunctivitis should stay at home until their symptoms have subsided.

Dental hygienists who have oral and/or nasal herpes simplex infections (i.e. cold sores) should pay particular attention to hand hygiene and not touch the affected area. In this situation, the use of a mask might help to remind the worker not to touch the lesions.

## 4. Exposure Prevention

The primary method of preventing the transmission of blood-borne pathogens (e.g. HBV, HCV and HIV) to dental hygienists is by avoiding occupational exposures to blood, saliva and other bodily fluids. In the dental office, exposure may occur through percutaneous injuries (e.g. needle-sticks or cuts with sharp objects), by contact with the mucous membranes of the eyes, nose and mouth, or by contact with non-intact skin (e.g. exposed skin that is abraded, chapped or has signs of dermatitis).

The majority of exposures are preventable by following Routine Practices, which include the use of personal protective equipment (PPE), such as gloves, protective eyewear, masks, closed-toe shoes and protective clothing, and safe work habits for the handling and disposal of sharps.

PPE should be used consistently during the treatment of patients, as well as the care of instruments and equipment. Cuts, abrasions or dermatitis constitute a breach in the skin's protective barrier. During work, non-intact skin should be covered with a waterproof bandage or protective dressing (e.g. Opsite, Tegaderm), which should be changed as needed. Large cuts might require medical assessment and re-evaluation of work duties.

**Percutaneous injuries pose the greatest risk of transmission of blood-borne pathogens to dental hygienists. Best practices to prevent such injuries include the following:**

- Always use extreme caution when passing sharps during four-handed dentistry. Consider the use of a "safe zone" for transferring instruments rather than passing instruments hand to hand.
- Needles should remain capped prior to use.
- Needles should not be bent, recapped or otherwise manipulated by using both hands.
- Following use, needles should be recapped as soon as possible by using a one-handed scoop technique or a commercial recapping device.
- When suturing, tissues should be retracted using appropriate instruments (e.g. retractor, dental mirror), rather than fingers.
- Remove burs from handpieces immediately following the procedure.
- Identify and remove all sharps from trays before processing instruments.
- Used sharps **must** be collected in a clearly labelled puncture-resistant container which should be located at the point of use.
- When removing debris from contaminated instruments by hand, heavy-duty utility gloves, appropriate clothing and long-handled brushes should be used.

### IMPORTANT

*Where a syringe and needle are being used multiple times on the same patient, safe recapping of a needle is preferred to prolonged exposure to an unprotected needle.*

## Safety-Engineered Needles

Some instruments and equipment have been designed to increase safety, such as self-sheathing anaesthetic needles\* (also known as safety-engineered syringes) and dental units that shield burs in handpieces. WorkSafeBC's Occupational Health and Safety Regulation (OHSR G6.36) currently stipulates that safety-engineered hollow bore needles must be used for the administration of medications or fluids, unless the use of such a required device is not clinically appropriate in the particular circumstances. Research concluded that **additional design modifications are required prior to recommending universal use of currently available models of safety-engineered syringes/needles**. However, they can be considered for optional use and safer versions of sharp devices should be considered as they become available in the dental marketplace.

*\*For further information, see Appendix 2 for a link to "WorkSafeBC Preventing Needle-stick Injuries and the Use of Dental Safety Syringes."*

## 5. Personal Protective Equipment for Dental Hygienists

### General considerations

Personal protective equipment (PPE) is worn to shield the exposed tissues of dental hygienists from exposure to potentially infectious material. PPE serves as a barrier to protect the skin of the hands and arms from exposure to splashing, spraying or spatter of blood, saliva or other body fluids, and from introducing microorganisms into deeper tissues by traumatic injuries. Such equipment also protects the conjunctival mucosa of the eyes, as well as the lining mucosa of the respiratory tract.

Primary barriers include gloves, protective eyewear, masks and protective clothing. Protective clothing

should not be worn outside of the office. Single-use barriers, such as gloves and masks, should be discarded immediately after use.

### IMPORTANT

*Gloves, protective eyewear and masks should be task- and patient-specific and discarded immediately after use.*

### Gloves

Gloves are worn to protect the hands of the dental hygienist from contamination. Since gloves are not completely free from leaks and may tear, their use does not replace the need for hand hygiene. Therefore, effective hand hygiene protocols should be followed before donning gloves and after removing them.

### In the dental office:

- Gloves **must** be worn when contact with mucous membranes, non-intact skin or body fluids is anticipated.
- The same pair of gloves **must not** be used for more than one patient.
- Gloves should be put on immediately before the activity for which they are indicated.
- Gloves **must** be removed and discarded immediately after the activity for which they were used, and hand hygiene must be performed.
- Gloves should not be worn outside any room or area where they are required for personal protection.
- Gloves **must not** be washed and reused.
- Double-gloving may be utilized for some specific procedures, which may involve the handling of multiple sharp instruments or during longer appointments.
- The issue of protocol for double-gloving is unresolved as the body of evidence for this practice is small. Professional judgment should be used when assessing the risk of a procedure and whether double-gloving may be appropriate.

### Protective eyewear

The conjunctival mucosa of dental hygienists should be protected from spatter and debris created during dental procedures by wearing appropriate eyewear or face shields. Protective eyewear should be cleaned and disinfected between patients and whenever it becomes noticeably contaminated. An eye-wash station should be available in the dental office for both dental hygienists and patients to aid in managing contact with any body fluid or dental chemical/solvent.

### Masks

Appropriate masks that cover the nose and mouth should be worn during dental procedures to protect the respiratory mucosa of dental hygienists from contact with potentially contaminated droplet material. Masks lose efficiency over time, as they become moist from the dental hygienist's breathing. Accordingly, masks should be changed between each patient or sooner if they become visibly soiled. Face shields are not an appropriate substitute for masks.

### Protective clothing

Spatter or spray from dental procedures can contaminate fabric of long-sleeved garments and lead to cloth-borne transmission of pathogens. Provided that the skin of a dental hygienist's forearms is unbroken and intact, short-sleeved scrubs should be worn to prevent cross-contamination between patients and when exposed to spatter or spray, forearms should be washed with soap and water. Long sleeved garments are intended to be patient-specific items of protective clothing and should be removed prior to seeing the next patient. This includes gowns and lab coats. If the skin of the dental hygienist's forearms is not intact, long-sleeved garments are recommended. This includes gowns and lab coats, which are meant to be worn over regular clinic clothing, such as uniforms, scrubs or street clothing.

It is the practice owner's responsibility to develop a policy that uniforms and scrubs worn during patient care procedures should **not** be worn outside the dental office.

### Latex sensitivity and allergies

Latex is commonly used in the manufacture of gloves and in dental products, including rubber dams, prophylaxis cups, orthodontic elastics and some medication vials. Skin irritations can be confused with true allergy to latex. The vast majority of skin reactions involving gloves are, in fact, irritant contact dermatitis, and not allergic reactions to latex.

#### **Adverse reactions involving latex gloves range from mild to serious and can include:**

- irritant contact dermatitis;
- delayed hypersensitivity reactions (allergic contact dermatitis);
- immediate allergic reactions.

Mild contact dermatitis can be managed by changing the types or brands of soap, towels or gloves, rinsing hands thoroughly after washing, use of lotions, and performing proper hand hygiene.

Delayed hypersensitivity reactions require referral to a medical dermatologist, and using washed (powderless) low-protein latex gloves or non-latex gloves.

Powder-free gloves reduce the lifetime exposure risk to latex allergy for patients and practitioners, and are therefore preferred. Immediate allergic reactions necessitate emergency medical care and subsequent referral to a medical dermatologist, as well as using only non-latex, powder-free gloves and avoiding all latex products in the workplace and at home.

## 6. Minimizing Droplet Spatter

By their very nature, the provision of dental services can involve the creation of droplets, spatter and spray contaminated with blood, saliva, other body fluids and debris.

As previously noted, a rubber dam should be used whenever feasible, and high-volume suction should be used whenever the creation of droplets, spatter and spray is possible.

## 7. Exposure Management

Blood-borne pathogens, such as HBV, HCV and HIV, can be transmitted to dental hygienists through occupational exposures to blood, saliva and other body fluids. Significant exposures **must** be handled in a prompt and organized fashion. For this reason, an exposure management protocol is an important component of an in-office infection prevention and control manual.

### IMPORTANT

*All dental practices **must** have an exposure management protocol in place. It should be reviewed periodically to ensure it is familiar to all dental hygienists. WorkSafeBC has resources available to assist with developing an exposure management protocol.*

Significant exposures include percutaneous injuries with contaminated needles, burs or other sharp instruments, as well as accidents in which blood, saliva or other body fluids are splashed onto non-intact skin or the mucosa of the eyes, nose or mouth. However, percutaneous injuries pose the greatest risk of transmission of blood-borne pathogens to dental hygienists.

### In the event of a significant exposure, immediate first-aid measures should be instituted:

- For percutaneous injuries, allow the wound to bleed briefly and freely. Then, gently wash the wound with soap and water, and bandage as needed.
- For exposures involving the eyes, nose or mouth, flush the area with copious amounts of water.
- For exposures involving non-intact skin, wash the site with soap and water.

Any kind of occupational injury should be reported to the owner of the practice or designate. However, in all cases involving a significant exposure, the practice owner should assess the source patient's status and risk for blood-borne illnesses by reviewing the medical history and, if necessary, asking her/him additional questions.

If the patient's HBV, HCV or HIV status is unknown, or if the patient presents with known risk factors, then her/his co-operation should be sought to clarify such information. Every reasonable effort should be made to obtain the patient's informed consent to be tested for HBV, HCV and HIV. This can be accomplished by referring the patient to her/his family physician for consultation, assessment of risk factors and any blood tests that are considered necessary.

At the same time, the injured dental hygienist should be immediately referred to her/his family physician, an infectious disease specialist or hospital emergency department for counselling, baseline blood tests and, if deemed necessary, post-exposure prophylaxis.

If necessary, post-exposure prophylaxis should be administered as soon as possible. For example, in the event of a high-risk exposure to HIV infection, antiretroviral drugs should be administered within hours.

**All cases involving a significant exposure should be documented, including:**

- name of the exposed dental hygienist and details regarding her/his vaccination status;
- date and time of the exposure;
- nature of the exposure, including the dental procedure being performed, extent of the exposure and the immediate action taken;
- name of the source and details regarding known or suspected status related to blood-borne pathogens;
- follow-up counselling and post-exposure management.

## 8. Occupational Health and Safety Requirements and Workplace Hazardous Materials Information System (WHMIS)

**Under Occupational Health and Safety Regulation, there is a general duty for an employer to establish written procedures for the health and safety of employees. These procedures may include, but are not limited to, the following:**

- safe work practices and working conditions;
- proper hygiene practices and the use of hygiene facilities;
- control of infections.

Employees **must** work in compliance with the legislation, and use or wear any equipment, protective devices or clothing required by the employer.

**WHMIS is a national communication standard that deals with hazardous materials in the workplace. Any workplace, including a dental office that uses materials classified as controlled products under federal legislation, is required to:**

- supply labels for all controlled products that do not have them;
- ensure material safety data sheets (MSDS) are available for these products;
- educate and train workers about hazardous materials in the workplace.

Employers are obligated to uphold WHMIS standards in their workplace; accordingly, every practice owner should be familiar with the legislation.

## 9. Prohibition of Eating and Drinking in Non-Designated Areas

The consumption of all foods and beverages should be restricted to designated areas (e.g. lunch area, staff lounge) or outside the dental office.

Eating and drinking in operatories, instrument processing areas and in-office dental laboratories should be prohibited.

**KEY PRINCIPLE: Dental hygienists must continually update their knowledge and education about exposure prevention and management in order to preserve their personal health and safety and that of their patients and colleagues.**

# Part C: Cleaning, Disinfection and Sterilization of Patient Care Items

## 1. General Considerations

The goals of safe processing of reusable patient care items (dental instruments, hand pieces, devices and equipment) include:

- preventing transmission of microorganisms to dental hygienists and patients;
- minimizing damage to patient care items from foreign material or inappropriate handling;
- safe handling of chemical disinfectants.

Contaminated instruments should be handled carefully at all times to prevent percutaneous injuries.

All instruments **must** be properly cleaned, rinsed and dried prior to either disinfection or sterilization.

**Cleaning\*** entails the removal of debris (e.g. organic and inorganic matter). This is achieved either by scrubbing with a surfactant, detergent and water, or by an automated process (e.g. ultrasonic cleaner or washer with a cleaning solution). This step is essential, as residual organic debris will compromise the disinfection and sterilization process. After cleaning, instruments should be rinsed with water to remove detergent residue and visually inspected to ensure all debris has been removed.

Patient care items are categorized as critical, semi-critical or non-critical, depending on the potential risk for infection associated with their intended use. This classification determines their processing requirements.

### Risk Classification Table (see glossary for additional examples)

Category	Definition	Processing
Critical Items	Items that penetrate soft tissue or bone, enter into or contact normally sterile tissue or the bloodstream (e.g. surgical instruments and surgical burs, implantable devices, periodontal instruments)	Cleaning* followed by sterilization
Semi-critical items	Items that contact mucous membranes or non-intact skin (e.g. mouth mirrors, amalgam condensers, facebow forks, reusable impression trays, X-ray film holders)	Cleaning* followed by sterilization or high-level disinfection (as a minimum). Sterilization is the preferred method.†
Non-critical items	Items that contact intact skin, but not mucous membranes, or do not directly contact the patient (e.g. radiograph head/cone, blood pressure cuff, pulse oximeter, patient safety glasses)	Cleaning* followed by low- or intermediate-level disinfection

† The majority of semi-critical items used in dentistry are heat-tolerant and should always be heat-sterilized between uses. If a semi-critical item is heat-sensitive, at a minimum it should be processed using high-level disinfection

If a product is received from the manufacturer who has guaranteed the instrument's sterility, it need not be sterilized prior to initial use. Newly purchased non-sterile critical and semi-critical items must be inspected and processed according to manufacturer's instructions prior to use. Any product that comes in a clean state that the manufacturer indicates is ready for use does not need to be sterilized provided that it is used directly from the new package.

## Sterilization

The sterilization section of the processing area should include the sterilizer and related supplies, with adequate space for loading, unloading and cool down. The area may also include biological indicators and incubators for conducting spore tests, as well as enclosed storage for sterile and single-use disposable items. Heat-tolerant instruments are usually sterilized by steam under pressure (i.e. autoclaving), which is dependable and economical. Other means include dry heat or \*unsaturated chemical vapor. All sterilization should be performed by using medical sterilization equipment registered with Health Canada. Sterilization times, temperatures and other operating parameters recommended by the manufacturer of the equipment used, as well as instructions for correct use of containers, wraps, and chemical or biological indicators, should always be followed.

**\* Excerpt from Best Practice Guidelines for Cleaning, Disinfection and Sterilization of Critical and Semi-Critical Medical Devices in BC Health Authorities (Dec 2011)**

### Air Quality

**The Occupational Health and Safety Regulation respecting control of exposure to biological and chemical agents made under the Workers Compensation Act provides occupational exposure limits such as ceiling exposure value (CEV) for chemical agents (e.g. gluteraldehyde). A CEV is the maximum airborne concentration of a**

**chemical agent to which a worker is exposed at any time. If control measures are not available during reprocessing involving a chemical agent, air sampling shall be required to ensure that the regulated limit has not been exceeded for the chemical being used.**

**The health care setting should have air changes; temperature and humidity appropriate to the process/product being used (refer to CSA standards and manufacturer's recommendations for products).**

## 2. Processing of Critical and Semi-Critical Items

Instrument sterilization requires multiple steps. Sterilization is a complex process requiring specialized equipment, adequate space, qualified staff and regular monitoring for quality assurance. Correct sorting, cleaning, drying, packaging, sterilizer loading procedures and sterilization methods should be followed to ensure that all instruments are adequately processed and safe for reuse on patients. Processing of specialized instruments (e.g. channelled or bored instruments) should be completed according to the manufacturer's instructions.

**All instruments should be processed in a central area of the dental office that is designed to facilitate quality control and ensure safety. The instrument processing area should have clear separation of clean and dirty areas with separate sections for:**

- receiving, cleaning and decontamination;
- preparation and packaging;
- sterilization;
- drying/cooling;
- storage.

Care **must** be taken to avoid cross-contamination when using sterilizer equipment (e.g. controls, buttons, cassette handles, exterior surfaces).

### Receiving, cleaning and decontamination

To prevent percutaneous injuries, contaminated instruments should be placed in a puncture-resistant container at the point of use and then transported to the instrument processing area. Reusable instruments should be received, sorted, cleaned and rinsed in one section of the processing area.

The use of automated cleaning equipment can increase productivity, improve cleaning effectiveness and decrease worker exposure to blood and body fluids provided that the manufacturer's instructions are strictly followed. Thus, using automated equipment can be safer and more efficient than manually cleaning contaminated instruments.

Gross debris should be removed from instruments prior to placement in an ultrasonic cleaner. In addition, ultrasonic cleaning solutions should be changed daily, and more frequently if they become visibly soiled. Automated washers do not require presoaking or scrubbing of most instruments.

If cleaning cannot be performed immediately, instruments should be placed in a puncture-resistant holding container and soaked with a detergent or an enzymatic cleaner to prevent drying of organic material. This makes subsequent cleaning easier and less time-consuming. Liquid chemical sterilants or high-level disinfectants (e.g. glutaraldehyde, ortho-phthalaldehyde) should **not** be used

as holding solutions, due to the fixative nature of these chemicals making surfaces more difficult to clean, as well as their general toxicity.

### To avoid injury from sharp instruments, the following precautions should be taken:

- Wear puncture-resistant, heavy-duty utility gloves when handling or manually cleaning contaminated instruments.
- **Do not** reach into trays or containers holding sharp instruments that cannot be seen (e.g. sinks filled with soapy water in which sharp instruments have been placed). Instead, use a strainer-type basket to hold instruments, as well as forceps to remove them.
- Wear a mask, protective eyewear or face shield, and gown or jacket to protect from splashing.

### Preparation and packaging

In another section of the processing area, cleaned instruments should be inspected, assembled into sets or trays, and packaged for sterilization. Critical and semi-critical instruments (refer to p. 24) should be processed in a manner that will maintain sterility during storage. Suitable packaging materials include wrapped perforated instrument cassettes, peel pouches of plastic or paper, and woven or nonwoven sterilization wraps. Packaging materials should be designed for the type of sterilization process being used. Hinged instruments should be processed open and unlocked.

**In the event of a positive BI (i.e. failed spore test):**

- Remove the sterilizer from service.
- Review all records of mechanical and chemical indicators since the last negative BI, as well as sterilization procedures to determine whether operator error could be responsible. In the absence of a mechanical failure, common reasons for a positive BI include overloading, failing to provide adequate package separation and using incorrect or excessive packaging material.
- Repeat the spore test immediately. This should be done after addressing any procedural problems and correctly loading the sterilizer, and by using the same cycle that produced the failure. While waiting for the repeat test results, the sterilizer should remain out of service. If the dental office does not have a second sterilizer, a colleague may be able to assist or a dental supply company may lend one.
- If the repeat spore test is negative, and mechanical and chemical indicators demonstrate adequate processing, then the sterilizer may be put back into service.
- If the repeat spore test is positive, and all sterilization procedures have been performed correctly, then the sterilizer should remain out of service until it has been inspected, repaired and successfully re-challenged with BI tests in three consecutive empty chamber sterilization cycles. In addition, all items from suspect loads dating back to the last negative BI should be recalled, *to the extent possible*, and reprocessed.

**Storage**

Sterile and single-use disposable items should be stored in an enclosed space, such as closed or covered cabinets. They should not be stored under sinks or in other locations where they might become wet and contaminated.

Storage practices for packaged sterilized instruments may be either date- or event-related. Dating assists in the recall of instruments should concerns arise with the results of sterilization tests. Some healthcare facilities date every sterilized package and use shelf-life practices (e.g. “first in, first out”). Others use event-related practices. The latter approach recognizes that the packaged instruments should remain sterile indefinitely, unless an event causes them to become contaminated (e.g. torn or wet packaging).

Packages containing sterile instruments should be inspected before use to verify barrier integrity and dryness. If packaging is compromised, the instruments **must** be cleaned, packaged and sterilized again.

**IMPORTANT**

*Critical instruments **must** be processed in a manner that will maintain sterility during storage. This includes ensuring that the integrity of the package is maintained.*

### 3. Sterilization of Unpackaged Instruments

An unpackaged cycle (sometimes called flash sterilization) is a method for sterilizing patient care items for urgent or unplanned use. Flash sterilization should be used only under certain conditions as outlined in the Best Practice Guidelines for Cleaning, Disinfection and Sterilization of Critical and Semi-critical Medical Devices in BC Health Authorities (Dec. 2011):

- thorough cleaning and drying of instruments precedes the unpackaged cycle;
- mechanical parameters are checked and an internal chemical indicator is used for each cycle;
- care is taken to avoid thermal injury to staff or patients;
- items are transported aseptically to the point of use to maintain sterility.

When sterile items are left open to the air, they can quickly become contaminated. Therefore, critical instruments that are sterilized unpackaged should be used immediately and not stored. Sufficient inventories of critical instruments should be maintained to avoid the need for flash sterilization.

Semi-critical instruments that are sterilized unpackaged on a tray or in a container system **must** be used immediately or within a short time. Storage, even temporary, of unpackaged semi-critical instruments **is not acceptable** because it permits exposure to dust, airborne organisms and other unnecessary contamination before use on patients.

All implantable devices should be quarantined after sterilization until the results of biological monitoring are known. Accordingly, unpackaged or flash sterilization of implantable items is inadequate and **must not** be used. Flash sterilization should not be routinely used in the dental office or healthcare settings.

#### IMPORTANT

*Historically, bead sterilizers have been used in dentistry to treat small metallic instruments, such as endodontic files. These devices cannot assure sterility, creating the risk of cross-contamination if instruments are used between patients. Therefore, the use of bead sterilizers is not an acceptable method of sterilization.*

### 4. Processing of Heat-Sensitive Items

The majority of semi-critical items (refer to p. 23) used in dentistry are available in heat-tolerant or disposable alternatives. If the use of a heat-sensitive semi-critical item is unavoidable, then such items should be cleaned and then receive high-level disinfection, which may be achieved by immersion in a liquid chemical germicide (e.g. 2% glutaraldehyde, 7% accelerated hydrogen peroxide, 6% hydrogen peroxide, 0.2% peracetic acid and 0.55% ortho-phthalaldehyde).

Liquid chemical germicides are highly toxic and their effectiveness cannot be verified with biological indicators. Accordingly, the manufacturer's instructions regarding dilution, instrument preparation, immersion time, temperature and the changing of solutions should be followed carefully. In addition, appropriate precautions should be taken to safeguard staff, including the use of closed containers to limit vapour release, adequate ventilation and chemically resistant gloves, aprons, goggles and face shields. Following liquid immersion, instruments should be thoroughly rinsed with sterile water to remove toxic or irritating residues and then dried with clean towels. Liquid chemical germicides should not be used for applications other than those indicated in their label instructions, and they should **not** be used as an environmental surface disinfectant or instrument-holding solution.

**NOTE:** When using liquid chemical germicides, the use of liquid germicide test strips should be used to confirm that the minimum effective concentration is within the potency range present to achieve sterilization.

## 5. Processing of Non-Critical Items

Non-critical items (refer to p. 23) pose the least risk of transmission of infection, as they either have no contact with the patient or contact only intact skin, which serves as an effective barrier to microorganisms. Non-critical items should be cleaned after use or, if contaminated, cleaned and then disinfected with an appropriate low-level disinfectant (e.g. chlorine-based products, 0.5% accelerated hydrogen peroxide, 3% hydrogen peroxide, 60 to 95% alcohols, iodophors, phenolics and quaternary ammonium compounds).

Cleaning and disinfection of some non-critical items may be difficult or could damage surfaces. It may be preferable to use disposable barriers to protect these surfaces.

## 6. Equipment Use and Preventive Maintenance

Tabletop sterilizers undergo frequent use, and wear and tear. The manufacturer's recommendations should be consulted for guidance on a preventive maintenance program, including regular inspection of gaskets and seals.

### IMPORTANT

*The information in this section of the Guidelines represents best practices for the monitoring of sterilization in the dental office.*

**1. Mechanical indicators** are the gauges or displays on the sterilizer for cycle time, temperature and pressure. Some tabletop sterilizers have recording devices that print out these parameters, which is preferred. All new sterilizers should have this feature.

Mechanical indicators should be checked and recorded for each load, *to the extent possible*.

**2. Chemical indicators** (i.e. internal and external) use sensitive chemicals to assess physical conditions during the sterilization process. For example, heat-sensitive tape, applied to the outside of a package, changes colour rapidly when a given temperature is reached. This signifies that the package has undergone a sterilization cycle, although it does not ensure that sterilization has been achieved.

A sterilizing agent has more difficulty penetrating a hollow object, such as a handpiece, than it does a solid object, such as a dental mirror. Air that is trapped inside these hollow areas cannot be easily removed, thus hindering the sterilizing agent's contact with the internal surface of the instrument.

In addition, when items are packaged, the sterilizing agent takes longer to penetrate to the instruments. The packaging envelops the instruments, creating a hollow area into which the sterilizing agent must be drawn or forced in.

For these reasons, each package **must** have external chemical indicators. In addition, it is recommended that both internal and external chemical indicators be used to detect penetration into the package. Please refer to the Glossary for further information on chemical indicator classifications.

**NOTE:** Mechanical and chemical indicators do not ensure that sterilization has been achieved. They merely offer verification that the necessary conditions have been met. However, they can also provide an early warning of a problem. If either mechanical or chemical indicators demonstrate inadequate processing, then none of the items in the load should be used until they are reprocessed.

**3. Biological indicators** (BIs or spore tests) are the most accepted means for monitoring sterilization because they directly assess the procedure's effectiveness in killing the most resistant microorganisms. The spores used are more resistant and present in greater numbers than the common microbial contaminants found on patient care items. Therefore, an inactivated BI signifies that other potential pathogens in the load have been killed. **BIs must be used at least once a week for each sterilizer used.**

Spore tests may be conducted using an in-office system available through most dental suppliers or by submitting the indicator to a testing facility.

In addition, if a load contains implantable devices, it **must** be monitored with a BI, and these items should be quarantined until the test results are known. Follow the manufacturer's directions concerning the appropriate placement of the BI in the sterilizer.

### IMPORTANT

*The daily operation of every sterilizer **must** be reviewed and documented. A record **must** be kept for this purpose indicating "operating as required", or noting any malfunctions and follow-up action taken.*

# Part D: Office Cleaning, Housekeeping and Management of Waste

## 1. General Considerations

Generally speaking, environmental surfaces in the dental operatory do not come into contact with the patient and do not pose a direct risk to their safety. However, surfaces such as light handles and drawer knobs can become contaminated during patient care, acting as reservoirs of microorganisms. Transmission usually occurs through hand contact or by touching the surface with a contaminated instrument. When this happens, microorganisms can be transferred to other instruments, other environmental surfaces, or to the hands, nose, mouth and eyes of patients and dental hygienists.

Proper hand hygiene and the use of personal protective equipment are essential to minimizing the transfer of microorganisms. In addition, the use of barriers or cleaning and disinfection of environmental surfaces will guard against such transferral.

Dental hygienists should take particular care in the handling of patient's charts to ensure that they do not become vehicles for cross-contamination. This is particularly important because paper charts are transported by staff members to numerous areas in an office and are difficult to effectively clean and disinfect.

Environmental surfaces are divided into **clinical contact surfaces and housekeeping surfaces**.

## 2. Clinical Contact Surfaces

**Clinical contact surfaces are frequently touched in the course of patient care. They can become contaminated by direct spray or spatter generated during dental procedures, or by contact with a dental hygienist's gloved hands or contaminated instruments. Examples of clinical contact surfaces include:**

- chair controls and switches
- drawer and faucet handles
- light handles and switches
- countertops
- radiography equipment
- pens
- chairside computers
- keyboards and monitors
- telephones
- doorknobs
- reusable containers of dental materials

Clinical contact surfaces should be cleaned and disinfected between patients and at the end of the workday using an appropriate low-level disinfectant. To facilitate this, treatment areas should be well-organized and kept free of unnecessary equipment and supplies, especially on countertops. Staff should take appropriate precautions, including wearing gloves, while cleaning and disinfecting surfaces to prevent occupational exposure to infectious agents and hazardous chemicals.

**Alternatively, clinical contact surfaces and equipment can be protected from contamination by the use of barriers. Barriers are particularly effective for those surfaces that are difficult to clean and disinfect, due to their shape, surface or material characteristics.**

**Suitable barrier materials include:**

- clear plastic wrap
- plastic tubing
- plastic bags
- plastic-backed paper
- plastic sheets
- other moisture-proof materials
- overgloves

Since barriers can become contaminated during dental procedures, they should be discarded (using gloves) on a routine basis (e.g. between patients) and when visibly soiled or damaged. At a minimum, following barrier removal, the underlying surfaces should be examined to ensure they did not inadvertently become contaminated. Those that did should be cleaned and disinfected. Otherwise, clean barriers should be placed prior to the next patient.

### 3. Housekeeping Surfaces

Housekeeping surfaces, such as floors and walls, have a limited risk of disease transmission. Accordingly, these surfaces usually require only periodic cleaning with dilute detergents. If a surface is suspected to have become contaminated with blood, saliva or other bodily fluids, it should be cleaned first and then disinfected with an appropriate low-level disinfectant (e.g. household bleach diluted 1:50 or accelerated hydrogen peroxide). Dental hygienists should take appropriate precautions, including wearing gloves, for this purpose.

From a general housekeeping point of view, floors should be cleaned regularly and spills should be cleaned up promptly. Cleaning tools, such as mop heads, should be rinsed after use and allowed to dry before they are used. Fresh cleaning solutions should be made each day, discarding any that remain and allowing the container to dry between uses. In this way, the risk of these solutions becoming reservoirs for microorganisms can be minimized.

#### IMPORTANT

*Carpeting and cloth furnishings are difficult to clean and cannot be reliably disinfected. They should not be used in patient treatment or instrument preparation areas.*

### 4. Management of Waste

For the purposes of infection control, waste from dental offices can be divided into two categories: **biomedical waste** and **general office waste**. B.C. legislation dictates that biomedical waste **must** be handled and disposed of in a manner that avoids transmission of potential infections. Therefore, it is necessary to understand the differences between these types of waste, so that they can be separated, stored and disposed of in an appropriate manner.

## Biomedical Waste

**Biomedical waste is classified as hazardous waste and must not be disposed with regular garbage. It must be handled safely to protect human health and the environment. In general, all biomedical waste must be:**

- stored in colour-coded containers that are marked with the universal biohazard symbol;
- released to an approved biomedical waste carrier for disposal.

Biomedical waste can be further divided into anatomical and non-anatomical waste.

### i) Anatomical waste (i.e. human tissue)

The generation of anatomical waste is normally limited to oral surgeons and periodontists, such as in the course of harvesting human tissue for treatment. Anatomical waste must be separated and collected in a **red** liner bag that is labelled with the universal biohazard symbol. This waste must then be stored in an enclosed storage area, such as a stand-alone refrigeration/freezer unit, that is marked "Biomedical Waste Storage Area" and displays the universal biohazard symbol. This storage area must be separate from other supply areas, locked and maintained at a temperature at or below 4 degrees Celsius. Once accumulated, anatomical waste must only be released to an approved biomedical waste carrier for disposal.

**NOTE:** Extracted teeth are not classified as biomedical waste and should be handled differently. Please refer to the section on p. 33.

### ii) Non-anatomical waste (i.e. sharps and blood-soaked materials)

Sharps (e.g. needles, syringes with needles, scalpel blades, clinical glass) must be separated and collected in a **yellow** puncture-resistant, leak-proof container that is specifically designed for their management and labelled with the universal biohazard symbol. Once the container has reached the designated capacity, it must only be released to an approved biomedical waste carrier for disposal.

Non-anatomical waste includes blood-soaked materials that release liquid or semi-liquid blood if compressed. It must be separated and collected in a **yellow** liner bag that is labelled with the universal biohazard symbol. If blood-soaked materials are to remain on site for more than four days, they must be stored like anatomical waste in a refrigerated storage area that is marked "Biomedical Waste Storage Area" and displays the universal biohazard symbol. Once accumulated, blood-soaked materials must only be released to an approved biomedical waste carrier for disposal.

In most instances, items such as gauze, cotton rolls and examination gloves that have come in contact with blood, saliva or other bodily fluids are **not** classified as biomedical waste. Provided that the item does not release liquid or semi-liquid blood if compressed, it should be considered as general office waste.

## General Office Waste

**General office waste is no more infective than residential waste. Therefore, the majority of soiled items generated in dental offices do not require any special disposal methods, other than careful containment and removal.**

**Recommendations for all types of general office waste include:**

- Ensure all garbage containers are waterproof and have tight-fitting lids, preferably operated by a foot pedal. Open wastebaskets might be dangerous if children are around them.
- Use plastic bags to line the garbage containers. The use of double-bagging is not necessary, unless the integrity of the bag is jeopardized or the outside is visibly soiled.
- Do not overfill garbage containers.
- Do not place sharp, hard or heavy objects into plastic bags that could cause them to burst.

Certain types of waste generated in dental offices can be detrimental to the environment if not properly handled, and their disposal is subject to provincial regulations and municipal bylaws. In addition to biomedical waste, this includes waste that contains mercury, silver, lead and other chemicals. For further information regarding the disposal of these types of waste, refer to the requirements or bylaws in your area.

## Handling of extracted teeth

Extracted teeth may be returned to the patient without any special considerations for infection prevention and control, other than simple cleaning of visible blood and gross debris.

If being discarded, extracted teeth without amalgam fillings may be disposed as general office waste. Extracted teeth with amalgam fillings should be treated as mercury-containing waste and disposed accordingly. Patients should be advised that extracted teeth with amalgam fillings may be returned to the dental office for appropriate disposal.

If being sent to a dental laboratory for shade or size comparisons, extracted teeth should be cleaned and surface disinfected with an appropriate low-level disinfectant. Extracted teeth being collected for use in pre-clinical education training should be cleaned of visible blood and gross debris, and maintained in a hydrated state in a closed container during transportation.

# Part E: Equipment and Area Specific Practice Guidelines

## 1. Dental Unit Waterlines

Dental unit waterlines are made of narrow-bore plastic tubing that carry water to handpieces, ultrasonic instruments and air/water syringes. They can become heavily colonized with waterborne microorganisms, including bacteria, fungi and protozoa, which form a biofilm on the interior surface of the waterline. However, they are not a supportive environment for bacteria commonly found in the oral cavity.

High numbers of these opportunistic microorganisms are not necessarily dangerous to the general population, unless the patient or dental hygienist is a susceptible host. This includes persons who are immunocompromised (e.g. persons living with HIV, persons undergoing oncology treatment or organ transplantation procedures) and those with cystic fibrosis, chronic bronchitis and bronchiectasis.

The use of monitoring systems can help to ensure dental waterline quality. The potential risk of infection from dental unit waterline microorganisms can be effectively reduced to counts similar to those in potable water standards by following regular waterline maintenance procedures.

### For offices using communal water supplies:

- Waterline heaters should not be used, as the heat encourages the growth of microorganisms.
- All waterlines should be purged at the beginning of each workday by flushing them thoroughly with water for at least two to three minutes. Before purging is carried out, handpieces, air/water syringe tips and ultrasonic tips should be removed from the waterlines.

- Handpieces using water coolant should be run for 20 to 30 seconds after patient care in order to purge all potentially contaminated air and water. The handpiece should then be removed and, following cleaning and disinfection of clinical contact surfaces, another sterilized handpiece may be attached for use with the next patient.

**NOTE:** Sterile water or sterile saline delivered through a sterilized device should be used when irrigating open surgical sites and whenever bone is cut during invasive surgical procedures. Appropriate devices, such as bulb syringes or single-use disposable products, should be used to deliver sterile irrigation solutions since general waterline sterility cannot be ensured.

### For offices using closed or other water delivery systems:

- The manufacturer's instructions related to dental units and equipment should be followed for daily and weekly maintenance.

### Backflow Prevention Valves

Many areas within B.C. now have requirements that backflow prevention valves be installed to prevent a backflow of water and potential contamination in the event of a disruption of the office water supply. For further information on this, refer to the municipal requirements or bylaws in your area.

## 2. Dental Handpieces and Other Intraoral Devices

Several dental devices that contact mucous membranes are attached to the air or waterlines of the dental unit, including:

- high- and low-speed handpieces;
- prophylaxis angles;
- ultrasonic and sonic instruments;
- air abrasion devices;
- air/water syringe tips.

These devices have the potential of becoming contaminated by retracting oral fluids into their internal compartments. Such fluids can then be expelled into the oral cavity of another patient during subsequent use. In order to flush out any patient material that might have entered the turbine or air and waterlines, these devices should be activated to discharge air and water for a minimum of 20 to 30 seconds after each patient use.

Dental handpieces and other intraoral devices that are attached to air or waterlines **must** be sterilized after each patient use. The manufacturer's instructions for cleaning, lubricating and sterilizing these devices should be strictly followed.

Some instrument components are permanently attached to dental unit waterlines (e.g. electric handpiece motors, handles for ultrasonic devices, and attachments for saliva ejectors, high-volume suction and air/water syringes). Such components should be covered with barriers that are changed after each patient use. If the item is contaminated or suspected to have been contaminated, it **must** be cleaned and disinfected with an appropriate low-level disinfectant, or barriers placed, before the next patient is seated in the operatory.

## 3. Saliva Ejectors

Backflow from a low-volume saliva ejector can occur when a patient closes his or her lips around the tip, forming a seal that creates a partial vacuum. This backflow can result in microorganisms from the suction lines entering the patient's mouth, a potential source of cross-contamination. **Therefore, dental hygienists should not allow patients to close their mouths over the saliva ejector tip.** In addition, specially designed saliva ejectors exist that do not allow a negative pressure to form around the tip.

Suction lines should be purged between patients by aspirating water or an appropriate cleaning solution, thereby removing loosely adherent debris and microorganisms. At least once per week, suction lines should be flushed out with an enzymatic cleaner or appropriate cleaning solution.

## 4. Single-Use Devices

Single-use (i.e. disposable) devices are designed to be used on one patient and then discarded and not to be reprocessed and used on another patient. Examples include syringe needles, prophylaxis cups and brushes, and certain orthodontic brackets. Some items, such as prophylaxis angles, high-volume suction tips and air/water syringe tips are commonly available in single-use forms.

Single-use devices are usually not heat-tolerant and cannot be reliably cleaned or disinfected. Therefore, they should be disposed of appropriately after use.

## 5. Dental Radiography Equipment

When taking radiographs, appropriate steps should be taken to prevent cross-contamination of equipment and environmental surfaces with blood or saliva. This includes the use of gloves when taking radiographs and handling contaminated film packets. Accessories for taking intraoral radiographs (e.g. film-holders and positioning devices) **must** be sterilized between patients. Care should be taken to avoid placing or removing a lead apron with contaminated gloves. The use of overgloves or degloving followed by hand hygiene is recommended.

Radiography equipment (e.g. tube heads and control panels) should be protected with surface barriers that are changed after each patient use. If barriers are not used, equipment that has come into contact with the dental hygienist's gloved hands or contaminated film packets should be cleaned and disinfected after each patient use.

After a radiograph is exposed, the film packet should be dried with disposable gauze or a paper towel to remove blood or excess saliva and then placed in a container, such as a disposable cup, for transport to the developing area.

The film packet may be disinfected with an appropriate low-level disinfectant before opening to develop the film. Alternatively, a contaminated film packet may be opened using gloves. The film should be dropped onto a clean surface without touching it and the empty packet should be discarded, being careful to avoid contamination. Gloves should then be removed before developing the film.

Another option is to use a barrier pouch to prevent contamination of the film packet. If used, the film packet should be carefully removed from the pouch to avoid contamination and then placed in a container for transport to the developing area.

Care should be taken to avoid contamination of the developing equipment. Protective barriers should be used or, alternatively, any surfaces that become contaminated should be cleaned and disinfected with an appropriate low-level disinfectant.

## 6. Digital Radiography Sensors and Intraoral Cameras

Digital radiography sensors and intraoral cameras come into contact with mucous membranes. Accordingly, these devices should be cleaned and disinfected between patients. Manufacturer's instructions should be followed for the disinfection of phosphor plates. Alternatively, digital radiography sensors and intraoral cameras should be protected with barriers to reduce gross contamination. However, following barrier removal, the underlying surfaces should be examined and if found contaminated, they should be cleaned and disinfected.

As with other dental equipment, the manufacturer's instructions should be followed regarding the use of appropriate barriers and recommended sterilization and disinfection procedures for these devices.

## 7. Lasers and Electrosurgery Equipment

During surgical procedures, the use of lasers and electrosurgery equipment causes thermal destruction of tissues, creating a smoke by-product that may contain viable microorganisms. In addition, lasers transfer electromagnetic energy into the tissues, resulting in the release of a heated plume that includes particles, gases, tissue debris, viruses and offensive odours.

**Dental hygienists should take appropriate precautions to avoid inhaling or otherwise coming into contact with laser plumes and electrosurgery smoke, including the use of:**

- Routine Practices (e.g. appropriate masks and face shields);
- central room suction units with in-line filters to collect particulate matter;
- dedicated mechanical smoke exhaust systems with a high-efficiency filter to remove substantial amounts of laser plume particles.

## 8. Dental Laboratory Asepsis

Dental prostheses and appliances, as well as items used in their fabrication (e.g. impressions, occlusion rims, bite registrations), are potential sources for cross-contamination. They should be handled in a manner that prevents exposure of patients, dental hygienists or the office environment to infectious agents.

**Effective communication and coordination between the dental office and the commercial dental laboratory will ensure that:**

- appropriate cleaning and disinfection procedures are performed in the dental office or the commercial dental laboratory;
- materials are not damaged or distorted because of overexposure to disinfectants;
- disinfection procedures are not unnecessarily duplicated.

Impressions, prostheses or appliances should be cleaned and disinfected as soon as possible after removal from the patient's mouth, before drying of blood or other organic debris. The manufacturer's instructions regarding the stability of specific materials during disinfection should be consulted. Wet impressions or appliances should be placed in an impervious bag prior to transportation to a commercial dental laboratory.

Heat-tolerant semi-critical items used in the mouth, such as impression trays or facebow forks, should be sterilized after each patient use. Other items that do not normally come in contact with the patient, but frequently become contaminated, such as articulators and case pans, should be cleaned and disinfected according to the manufacturer's instructions. Items used in the typical in-office dental laboratory, such as burs, polishing points, rag wheels, laboratory knives and dental lathes, frequently become contaminated during adjustments to prostheses and appliances. These items should be sterilized, cleaned and disinfected or discarded after use.

Finished prostheses and appliances delivered to the patient should be free of contamination. This can be accomplished with an appropriate low-level disinfectant by either the commercial dental laboratory or dental office.

## 9. Handling of Biopsy Specimens

To protect persons handling and transporting biopsy specimens, they **must** be placed in a sturdy, leak-proof container that has a secure lid and is clearly labelled with the universal biohazard symbol. Care should be taken when collecting the specimen to avoid contaminating the outside of the container. If the outside of the container is suspected to be or has been contaminated, it should be cleaned and disinfected or placed in an impervious bag prior to transportation.

## 10. General and Surgical Aseptic Technique

The mouth is considered a clean-contaminated environment and the patient's own defenses (e.g. antibacterial enzymes in saliva and immune responses) play a large role in healing and preventing infection after a dental procedure. Infection is usually the result of the patient's own oral flora.

Aseptic technique is a term used to describe practices that prevent microbial contamination. These practices include environmental cleaning, effective hand hygiene, wearing appropriate clinical attire (e.g. gloves, protective eyewear, masks, gowns), proper handling of clean instruments, wrapping and sterilization, proper handling of sterile instruments as they are unwrapped, preventing sterile instruments from being contaminated from environmental sources, and properly administering medicines.

Surgical aseptic technique refers to practices that render and maintain objects and the surrounding area maximally free of microorganisms, prevent contamination of a wound, isolate the operative site from the surrounding unsterile physical environment, and create a sterile field in order to perform surgery as safely as possible (e.g. draping where appropriate).

For minor dental procedures, hand hygiene is performed, sterile instruments are placed at a clean chair-side area and care is taken to avoid placing unsterile equipment near sterile items. Depending on the complexity of the procedure, the chair-side area is separated into clean or sterile versus contaminated areas. Once the procedure begins, items are no longer sterile due to contamination with organisms from the patient's mouth, but the goal is to keep the tray and instruments as clean as possible, and to avoid contamination from other sources. When hands or gloves contact certain surfaces that are frequently touched by others, microorganisms can be transferred to instruments or other environmental surfaces, and to the eyes, nose or mouth.

For major dental procedures (similar to other surgical procedures), the patient is prepared, hand hygiene is performed, sterile gloves are worn, and all items that go onto the sterile field are kept sterile, including instruments, materials and supplies that come in contact with the surgical site. Every item handled by the operator should be sterile or have a protective sterile covering.

**In addition to following routine practices, and performing appropriate disinfection and sterilization of dental instruments and devices, dental hygienists reduce the risk of transferring bacteria from the environment to patients by adhering to some basic steps:**

1. Prepare and organize work procedures so that all of the required equipment is gathered for the task.
2. Sterile instruments and devices should be stored in an enclosed space, such as closed or covered cabinets. They should remain wrapped until ready for use.
3. Spatially separate work areas and equipment into clean versus contaminated, sterile versus unsterile.
4. Use protective covers and barriers according to approved office-specific work procedures.
5. If an item is needed for a procedure, but not on the procedure tray, it should only be retrieved using transfer forceps or by first ensuring that the dental hygienist's hands are clean.
6. Gloves should be put on immediately before initiating the procedure for the patient.
7. If you observe or suspect that gloves have become torn or perforated, remove them, perform hand hygiene and re-glove where appropriate.

Maintaining aseptic technique is a co-operative responsibility of the entire dental team. Each member must develop a professional conscience for infection prevention and control, as well as a willingness to supervise and be supervised by others regarding aseptic technique.

## IMPORTANT

*If an item is needed for a procedure, but not on the procedure tray, it should only be retrieved using transfer forceps or by first ensuring that the dental hygienist's hands are clean. Transfer forceps should be readily available at all times.*

**KEY PRINCIPLE: Dental hygienists must utilize appropriate equipment and employ routine cleaning, disinfection and sterilization techniques to prevent disease transmission and ensure patient safety.**

## Part F: Additional Considerations for Alternative Practice Settings

Alternative practice settings include any setting where dental or dental hygiene services may be provided that are not confined to a conventional clinical operatory. These settings may include, but are not limited to, the following:

- Group homes
- Long term care/residential care facilities
- Rehabilitation facilities
- Private residences
- Community centres
- Educational facilities
- Hospitals

Due to the lack of standardized dental equipment and patient care equipment (dental units, dedicated waterlines and suction, etc) available in many of these settings, dental hygienists **must** take appropriate measures to ensure that infection control protocols are followed and patient safety is maintained. It is the responsibility of the dental hygienist to check with any alternative practice setting/institution to review sterilizing policy before practice begins.

The following topics should be carefully considered when providing oral care in alternative care settings:

### Disposal of biomedical waste

Biomedical waste is classified as hazardous waste and must not be disposed with regular garbage. It must be handled safely to protect human health and the environment. In general, all biomedical waste **must** be:

- stored in colour-coded containers that are marked with the universal biohazard symbol;
- released to an approved biomedical waste carrier for disposal.

Biomedical waste can be further divided into anatomical and non-anatomical waste. Refer to “Management of Waste” section (p. 31) for instructions on disposal of biomedical waste items.

### Disposal of environmentally hazardous waste

Certain types of waste generated in dental offices can be detrimental to the environment if not properly handled, and their disposal is subject to federal and provincial regulations and municipal bylaws. In addition to biomedical waste, this includes waste that contains mercury, silver, lead and other chemicals. Mercury-containing items should be treated as hazardous materials and should not be thrown in the garbage and liquid mercury should never be poured down the drain.

### Disposal of sharps

Sharps (e.g. needles, syringes with needles, scalpel blades, clinical glass) **must** be separated and collected in a puncture-resistant, leak-proof container that is specifically designed for their management and labelled with the universal biohazard symbol. Once the container has reached the designated capacity, it **must** only be released to an approved biomedical waste carrier for disposal.

### Transportation of contaminated and sterile equipment

When transporting instruments between practice settings, contaminated instruments **must** be packaged in sealed, sturdy, leak-proof containers to prevent cross-contamination. Similarly, sterile instruments **must** be transported in sealed packages to maintain sterility until opened for use on site. Disposable sharps such as needles and blades should be removed and disposed of in an appropriate puncture-resistant sharps container at point of use, prior to transportation. Soiled instruments **must** be handled in a manner that reduces the risk of exposure and/or injury to personnel and clients/patients/residents, or contamination of environmental surfaces. A process should be in place to ensure that instruments that have been reprocessed (sterilized) can be differentiated from those that have not been reprocessed (e.g. colour coding).

# Part G: Glossary of Infection Prevention and Control Terms

**Additional precautions:** A term used to describe infection prevention and control interventions that are taken in addition to Routine Precautions for certain pathogens or clinical presentations, based on the method of transmission (e.g. contact, droplet, airborne).

**Aerosol:** Particles of respirable size (<10µm) generated by both humans and environmental sources that can remain viable and airborne for extended periods; commonly generated in dentistry during use of hand pieces, ultrasonic scalers, and air/water syringes.

**Asepsis:** The absence of pathogenic (i.e. disease-producing) microorganisms.

**Aseptic technique:** A term used to describe practices that prevent microbial contamination.

**Biological indicator (BI):** A device that is used to monitor the sterilization process, which consists of a standardized population of bacterial spores known to be resistant to the mode of sterilization being monitored. BIs indicate that all the parameters necessary for sterilization were present.

**Chemical indicator (CI):** A monitoring device that is designed to respond with a chemical or physical change to one or more of the sterilization process parameters. CIs do not verify sterility, but they do assist in the detection of potential sterilization failures, which could result from incorrect packaging, incorrect loading of the sterilizer or equipment malfunction. There are several classes of CIs:

*Process indicator (Class 1):* An external indicator that is used to demonstrate that an item has been exposed to a sterilization process, and to distinguish between processed and non-processed items. Class 1 CIs are usually applied to or visible

on the outside of packages (e.g. sterilization tape or packaging printed with colour-changing inks). Class 1 CIs are directly exposed to the sterilization environment, so they usually fail only when there is a gross malfunction of the sterilizer.

*Specialty indicator (Class 2):* An indicator that is designed for use in specific test procedures in special sterilizers (e.g. dynamic air-removal sterilizers). Examples of Class 2 CIs include Bowie Dick and Dart products, which are used for steam sterilizers.

*Single-parameter indicator (Class 3):* An internal indicator that responds to only one critical parameter of the sterilization process, usually time or temperature. It is important to note that the sterilization process has more than one critical parameter, and all of them must be reached for sterilization to occur.

*Multi-parameter indicator (Class 4):* An internal indicator that responds to two or more critical parameters of the sterilization process.

*Integrating indicator (Class 5):* An internal indicator that responds to all critical parameters of the sterilization process. Class 5 CIs are correlated to the performance of biological indicators (BIs).

**Cleaning:** The physical removal of foreign material (i.e. organic and inorganic matter) from an object or item using water and mechanical action, with or without detergents. Cleaning removes rather than kills microorganisms. Cleaning and then rinsing is performed before further processing.

**Decontamination:** A process of cleaning, followed by inactivation of pathogenic microorganisms from objects to render them safe to handle.

**DHCP:** Dental health care provider.

**Disinfection:** A process that kills most pathogenic microorganisms, but rarely kills all bacterial spores. Disinfection is achieved through pasteurization or the use of some chemical agents (i.e. disinfectants). The term falls between physical cleaning and sterilization. There are various levels of disinfection:

*High-level disinfection (HLD):* A process capable of killing vegetative bacteria, mycobacteria (including *Mycobacterium tuberculosis*), fungi, and enveloped and non-enveloped viruses, as well as some, but not necessarily all, bacterial spores. HLD is considered to be the minimum level of decontamination required for semi-critical patient care items. HLD is performed after items are thoroughly cleaned and rinsed. HLDs include 2% glutaraldehyde, 7% accelerated hydrogen peroxide, 6% hydrogen peroxide, 0.2% peracetic acid and 0.55% orthophthalaldehyde.

*Intermediate Level Disinfection (ILD):* A process that kills all microbial pathogens, except bacterial endospores, when used according to labelling. ILDs include ethyl alcohol or isopropyl alcohol, hypochlorites, iodine and iodophors.

*Low-level disinfection (LLD):* A process capable of killing most vegetative bacteria, as well as some fungi and enveloped viruses. LLD is the minimum level of decontamination required for non-critical patient care items and some environmental surfaces. LLD is performed after items are thoroughly cleaned and rinsed. LLDs include chlorine-based products (e.g. diluted household bleach), 0.5% accelerated hydrogen peroxide, 3% hydrogen peroxide, 60 to 95% alcohols, iodophors, phenolics and quaternary ammonium compounds.

**Droplets:** Small particles of moisture (e.g. spatter) generated when a person coughs or sneezes, or when water is converted to a fine mist by an aerator or shower head. Intermediate in size between drops and droplet nuclei, these particles, although they may still contain infectious microorganisms, tend to quickly settle out from the air so that any

risk of disease transmission is generally limited to persons and surfaces in close proximity to the droplet source.

**Exposure-prone procedures:** A term used for the purpose of managing the risk of transmitting blood-borne pathogens. They are procedures during which transmission of HBV, HCV or HIV from a health care worker to patients is most likely to occur. Exposure-prone procedures include:

- digital palpation of a needle tip in a body cavity, or the simultaneous presence of the health care worker's fingers and a needle or other sharp object in a blind or highly confined anatomic site;
- repair of major traumatic injuries;
- major cutting or removal of any oral or perioral tissue, including tooth structures.

**Implantable devices:** Implantable devices that have been prepared and packaged by the manufacturer and are received pre-sterilized do not require re-sterilization. Implantable devices are not intended for reuse. If an implantable device has been used in a patient's mouth it **must** not be reused.

**Personal protective equipment (PPE):** Specialized clothing or equipment worn by staff and patients for protection against hazards.

**Reusable device:** A device that has been designed by the manufacturer, through the selection of materials and/or components, to be reused.

**Risk class:** The class assigned to patient care items based on the potential risk for infection associated with their intended use. The risk class determines the processing requirements of an item. The risk classes are as follows:

**Critical items:** Items that penetrate soft tissue or bone, enter into or contact normally sterile tissue or the bloodstream. Critical items present a high risk of infection if the item is contaminated with any type of microorganism, including bacterial spores.

Processing of critical items involves meticulous cleaning followed by sterilization.

Examples of instruments that are considered critical include (note this is not an exhaustive list):

- Air/water syringe tips
- Anesthetic syringes
- Endodontic instruments, including files, reamers, broaches
- Handpieces
- Metal matrix bands
- Periodontal instruments including ultrasonic tips
- Polishing cups, points and mandrels
- Restorative and operative instruments
- Rotary burs and diamonds
- Rubber dam clamps
- Stainless steel crowns
- Surgical suction tips

**Semi-critical items:** Items that contact mucous membranes or non-intact skin, but ordinarily do not penetrate them. Processing of semi-critical items involves meticulous cleaning followed by sterilization (preferred) or high-level disinfection (minimum). Semi-critical instruments or devices that have been exposed to blood or have the potential to be exposed to blood must be treated as critical. Dental hygienists must use their professional judgment for every instrument, device and surface for their specific practices to ensure that these Guidelines are being met.

Examples of instruments that are considered semi-critical include (note this is not an exhaustive list):

- Articulating paper holders
- Crown removing instruments
- Impression trays
- Lab burs
- Mixing spatulas

- Nasal hoods (e.g. for use with nitrous oxide)
- Orthodontic pliers
- Rubber dam frame and clamp forceps
- Suction tips other than for surgery (does not include single-use saliva ejectors)

**Non-critical items:** Items that contact intact skin, but not mucous membranes, or do not directly contact the patient. Processing of non-critical items involves cleaning followed by low-level disinfection.

Examples of instruments that are considered non-critical include (note this is not an exhaustive list):

- Curing lights
- Laboratory knives and spatulas
- Rubber dam punch
- Shade guides

**Routine practices:** A term used to describe basic standards of infection prevention and control that are required for safe patient care. Routine Practices are based on the concept that all patients are potentially infective, even when asymptomatic, and that the same safe standards of practice should routinely apply to contact with blood, body fluids and secretions (e.g. saliva), mucous membranes and non-intact skin.

**Single-use/disposable device:** A device that has been designed by the manufacturer for single-use only.

**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.

**Sterilization:** A validated process that kills all pathogenic microorganisms, including bacteria, fungi, viruses and spores.

**Ultrasonic cleaner:** A machine that cleans patient care items by the cavitations produced by ultrasound waves.

# Appendix 1

## Methods for Cleaning, Disinfection and Sterilization of Patient Care Items and Environmental Surfaces

Process	Result	Examples for Dentistry	Specific Indications	Comments
Sterilization	Kills all forms of pathogenic microorganisms, including bacteria, fungi, viruses and spores	Steam Dry Heat	Critical and semi-critical items	Steam sterilization is the preferred method. Sterilization process must be audited and monitored with mechanical, chemical and biological indicators.
High-level disinfection (HLD) All disinfectants must have a Drug Identification Number (DIN) from Health Canada	Kills vegetative bacteria, mycobacteria, fungi, enveloped and non-enveloped viruses, but not necessarily bacterial spores.	2% glutaraldehyde 7% accelerated hydrogen peroxide, 6% hydrogen peroxide 0.2% peracetic acid  0.55% ortho-phthalaldehyde	Heat-sensitive, semi-critical items	<b>Not for use on environmental surfaces.</b> Follow manufacturer's instructions regarding dilution, instrument preparation, immersion time, temperature and changing of solutions.  Glutaraldehyde is non-corrosive to metals and compatible with most materials. Extremely irritating to skin and mucous membranes. Use in well-ventilated areas.  Hydrogen peroxide is active in presence of organic matter, but is corrosive to aluminum, brass, copper and zinc.
Low-level disinfection (LLD) All disinfectants (except household bleach) must have a Drug Identification Number (DIN) from Health Canada	Kills most vegetative bacteria, as well as some fungi and enveloped viruses. <b>Cannot</b> be relied on to kill mycobacteria, including Mycobacterium tuberculosis or bacterial spores.	Chlorine-based products (e.g. diluted sodium hypochlorite or household bleach – 1:50 or 1000 PPM)  0.5% accelerated hydrogen peroxide, 3% hydrogen peroxide 60 to 95% alcohols  Some iodophors, phenolics and quaternary ammonium compounds	Non-critical items and environmental surfaces	Follow manufacturer's instructions regarding concentration and contact time.  Diluted household bleach is inexpensive and readily available, but must be prepared daily. Items and surfaces must be cleaned first, as chlorine-based products are inactivated by organic material. Corrosive to metals and may destroy fabrics.  Hydrogen peroxide is active in presence of organic matter, but is corrosive to aluminum, brass, copper and zinc.  Alcohols are fast-acting, but are flammable and evaporate quickly. Items and surfaces must be cleaned first, as alcohols are inactivated by organic material. May harden plastic and rubber.  Quaternary ammonium compounds are used for disinfecting non-critical equipment and environmental surfaces, but not instruments. They require careful dilution, as they may support microbial growth.
Cleaning	Physical removal of soil, dust and foreign material.	Soap and water, detergents and enzymatic cleaners 0.5% accelerated hydrogen peroxide Quaternary ammonium compounds	All reusable items	Follow manufacturer's instructions regarding concentration and contact time.

## Appendix 2

## Additional Resources and Reference Materials

Note: URLs are provided for convenience only and were correct at the time of printing.

***Dental Wastes Best Management Practices in Ontario, 2003***

Royal College of Dental Surgeons of Ontario

[www.rcdso.org/pubs\\_resources/practice\\_resources/amalgam\\_waste.html](http://www.rcdso.org/pubs_resources/practice_resources/amalgam_waste.html)

***Best Practice Guidelines for Cleaning, Disinfection, and Sterilization of Critical and Semi-critical Medical Devices in BC Health Authorities, 2011***

[www.health.gov.bc.ca/library/publications/year/2011/Best-practice-guidelines-cleaning.pdf](http://www.health.gov.bc.ca/library/publications/year/2011/Best-practice-guidelines-cleaning.pdf)

***Best Practices for Hand Hygiene in All Health Care Settings, 2009***

Provincial Infection Diseases Advisory Committee

Ontario Ministry of Health and Long-Term Care

[www.ontla.on.ca/library/repository/mon/25009/312519.pdf](http://www.ontla.on.ca/library/repository/mon/25009/312519.pdf)

***Canadian Immunization Guide for 2006***

Public Health Agency of Canada

[www.phac-aspc.gc.ca/publicat/cig-gci/pdf/cig-gci-2006\\_e.pdf](http://www.phac-aspc.gc.ca/publicat/cig-gci/pdf/cig-gci-2006_e.pdf)

***Decontamination of Reusable Medical Devices (CSA Z314.8-08), 2008***

Canadian Standards Association

<http://shop.csa.ca/en/canada/sterilization/canrsa-z3148-08/inv/27010632008/>

***Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008***

Centers for Disease Control and Prevention

[www.cdc.gov/hicpac/pdf/guidelines/Disinfection\\_Nov\\_2008.pdf](http://www.cdc.gov/hicpac/pdf/guidelines/Disinfection_Nov_2008.pdf)

***Guidelines for Infection Control in Dental Health-Care Settings, 2003***

Centers for Disease Control and Prevention

[www.cdc.gov/mmwr/PDF/rr/rr5217.pdf](http://www.cdc.gov/mmwr/PDF/rr/rr5217.pdf)

***Infection Control in the Physician's Office, 2004***

College of Physicians and Surgeons of Ontario

[www.cpso.on.ca/uploadedFiles/policies/guidelines/office/Infection\\_Controlv2.pdf](http://www.cpso.on.ca/uploadedFiles/policies/guidelines/office/Infection_Controlv2.pdf)

***Routine Practices and Additional Precautions in All Health Care Settings, 2009***

Provincial Infection Diseases Advisory Committee

Ontario Ministry of Health and Long-Term Care

[www.oahpp.ca/resources/documents/pidac/Routine%20Practices%20and%20Additional%20Precautions.pdf](http://www.oahpp.ca/resources/documents/pidac/Routine%20Practices%20and%20Additional%20Precautions.pdf)

***Workplace Hazardous Material Information System (WHMIS): A Guide to the Legislation, 2008***

Ontario Ministry of Labour

[www.labour.gov.on.ca/english/hs/pdf/whmis.pdf](http://www.labour.gov.on.ca/english/hs/pdf/whmis.pdf)

***Preventing Needle-stick Injuries and the Use of Dental Safety Syringes, 2010***

WorkSafeBC

[www.worksafebc.com/contact\\_us/research/research\\_results/res\\_60\\_10\\_1080.asp](http://www.worksafebc.com/contact_us/research/research_results/res_60_10_1080.asp)





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