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CrystalGenics was designed to meet local and international health authorities' guidelines for infection control safety. As science and technology improved, so did the guidelines for proper cleaning and use of dental products. Not only do we provide an air/water syringe system that exceeds performance requirements, we also created a system that makes compliance easy. Our Integrated Cross Infection Control requires dental staff to use only single-use tips while ensuring each patient is treated with a freshly sterilized air/water syringe. Our goal is to provide a solution to a system that currently does not meet health authority guidelines.

To help dental staff understand what their local guidelines require, we have highlighted specific guideline sections to help clarify. These guidelines are put in place by your local and government level guideline sections to help clarify. These guidelines are put in place by your local and government level agencies to help ensure the dental office is safe for its staff and patients. The highlighted sections in each document provide clarity as to what is considered safe for a semi critical device.

College of Dental Surgeons of Alberta (CDSA)
Standard of Practice: Infection Prevention and Control Standards and Risk Management for Dentistry, January 2023

British Columbia College of Oral Health Professionals (BCCOHP)
Suggested Infection Prevention & Control Measures for Denturists, August 2019

New Brunswick Dental Society
Infection Prevention and Control Guidelines, Revised 2020

Provincial Dental Board of Nova Scotia
Standard of Practice: Infection Prevention and Control, December 2022

Royal College of Dental Surgeons of Ontario
Standard of Practice: Infection Prevention and Control in the Dental Office, November 2018

Table of contents

Click on a section to go directly to that page. To view full article, click on blue hyperlink.

College of Dental Surgeons of Alberta (CDSA): Standard of Practice: Infection Prevention and Control Standards and Risk Management for Dentistry, January 2023

14 Cleaning
Note: Critical and semi-critical devices shall be cleaned using an automated process whenever possible

16 Semi-Critical Medical Devices
Note: High level disinfection to be used between patients

16 Sterilization of Resuable Dental Instruments and Devices
Note: Semi-critical dental devices should be steam sterilized between each patient use

27 Aerosol
Note: Particles of respirable size commonly generated using an air/water syringe

33 Semi-Critical Medical Device
Note: A medical device that comes into contact with mucous membranes or non-intact skin but does not penetrate.

36 Spaulding Classification: Critical
Note: Items that are not single-use disposable must be sterilized and stored wrapped until point of use.

36 Spaulding Classification: Semi-Critical
Note: Items that are not single-use disposable, must be sterilized.

View Full CDSA Recommendation: College of Dental Surgeons of Alberta. Standards of Practice. Infection Prevention and Control Standards and Risk Management for Dentstry Jan 2023. 2003

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British Columbia College of Oral Health Professionals: Suggested Infection Prevention & Control Measures for Denturists, August 2019

10 Semi-Critical Items
Note: Items that come in contact with mucous membranes or non-intact skin. Should be heat-sterilized between patients.

14 Processing Heat-Sensitive Items
Note: Avoid the use of heat-sensitive semi-critical items that must be processed with liquid high-level disinfectants.

17 Dental Hand Pieces and Other Intra-Oral Devices
Note: Avoid the use of heat-sensitive semi-critical items that must be processed with liquid high-level disinfectants.

View Full BCCOHP Recommendation: British Columbia College of Oral Health Professionals. Suggested Infection Prevention & Control Measures for Denturists. V2. Aug 2019

New Brunswick Dental Society: Infection Prevention and Control Guidelines, Revised 2020

18 Semi-Critical Items
Note: Items that contact mucous membranes or non-intact skin. Sterilizations are preferred cleaning method.

29 Dental Handpieces and Other Intra-Oral Devices
Note: Retract oral fluids into internal compartments

30 Dental Handpieces and Other Intra-Oral Devices
Note: Dental handpieces and intra-oral devices attached to air/water lines must be sterilized after each use.

36 Critical Items
Note: Air/water syringe tips are considered critical items

37 Semi-Critical Items
Note: Items that contact mucous membranes or non-intact skin. Sterilization preferred.

View Full NBDS Recommendation: New Brunswick Dental Society. Infection Prevention and Control Guidelines. Revised 2020

Royal College of Dental Surgeons of Ontario: Standards of Practice: Infection Prevention and Control in the Dental Office, 2018

19 Cleaning, Disinfection and Steriliztion of Patient-Care Items
Note: Semi-critical resusable instruments need to cleaned and heat-sterilized between patients.

31 Dental Handpieces and Other Intra-Oral Devices
Note: Retract oral fluids into their internal compartments, which can be expelled into another patient.

38 Appendix 1: Methods for Cleaning, Disinfection and Sterilization
Note: All critical and semi-critical instruments should be steam sterilized.

View Full RCDSO Recommendation: Royal College of Dental Surgeons of Ontario. Standards of Practice. Infection Prevention and Control in the Dental Offices. Nov 2018

Provincial Dental Board of Nova Scotia: Standard of Practice: Infection Prevention and Control in the Dental Office, December 2022

20 General Considerations: Semi-Critical Items
Note: Semi-critical devices must be sterilized. High-level disinfectants is not appropriate sterilization method.

25 Reprocessing Semi-Critical Items
Note: As the majority of semi-critical patient care items are heat-tolerant; all heat-tolerant semi-critical items must be sterilized.

35 Dental Handpieces and Other Devices
Note: Retract fluids into internal compartments of the device. Can be expelled into another patient's oral cavity.

47 Risk Class: Critical and Semi-Critical
Note: Both critical and semi-critical devices should be steam sterilized.

48 Appendix 1: Critical and Semi-Critical
Note: Both critical and semi-critical devices should be steam sterilized.

View Full PDBNS Recommendation: Provincial Dental Board of Nova Scotia: Standard of Practice. Infection Prevention and Control in the Dental Office. Dec 2022.

College of Dental Surgeons of Alberta

Standard of Practice: Infection Prevention and Control Standards and Risk Management for Dentistry

January 2023

The Alberta Dental Association and College is now operating under the name College of Dental Surgeons of Alberta. This name will become official when Alberta's *Health Professions Act* is amended.

Table of Contents

Introduction 5

1.0 Written Policies and Procedures 5

2.0 Patient Evaluation 6

3.0 Hand Hygiene 6

4.0 Personal Protective Equipment (PPE) 7

5.0 Laundering for Onsite Linens and Reusable PPE 8

- Handling of Soiled Linens 8
- Washing Soiled Linen 8
- Handling and Storing Clean Linen 9

6.0 Purchasing and Assessing Dental Instruments and Devices and Products for Disinfection or Sterilization Processes 9

7.0 Selection of Products and Processes for Reprocessing 11

8.0 Environmental and Structural Requirements for a Medical Device Reprocessing (MDR) Area 11

9.0 Pre-Cleaning, Transportation and Handling of Contaminated Dental Instruments and Devices 12

10.0 Preparation and Cleaning Reusable Dental Instruments and Devices 13

- Sorting and Disassembly 14
- Cleaning 14
- Manual Cleaning 14
- Automated Cleaning 14
- Rinsing and Drying 14
- Reassembly 15
- Inspection 15

11.0 Disinfection of Reusable Dental Instruments and Devices 15

- Non-Critical Devices 16
- Semi-Critical Medical Devices 16
- Liquid Chemical High Level Disinfection 16

12.0 Sterilization of Reusable Dental Instruments and Devices 17

- Qualification and Requalification of Sterilization Equipment 17
- Packages and Labels 18
- Loading and Unloading 18
- Mechanical Monitoring 19
- Chemical Indicator 19
- Air Removal Test 19

Biologic Indicators 19
Immediate-Use Steam Sterilization 20
13.0 Storage and Use of Reprocessed Dental Instruments and Devices 21
14.0 Education and Training 21
15.0 Environmental Infection Prevention and Control Practices 21
16.0 Dental Unit Waterlines 22
17.0 Single-Use Instruments and Devices 22
18.0 Occupational Health and Safety Requirements 23
19.0 Ethical Responsibilities 24
20.0 Quality Management 24
Documentation 25
Definitions 27
Charts 36
Spaulding Classification and Managing Contaminated Surfaces 36
Patient Care Items – Modified Spaulding Classification 36
Environmental Surfaces 37
References 38

Introduction

Since January 1, 2011, the College of Dental Surgeons of Alberta (CDSA) has required that Infection Prevention and Control (IPC) Standards must be fully implemented in all dental offices. The principles and procedures in this document, *Standard of Practice, Infection Prevention and Control Standards and Risk Management for Dentistry* must be followed by dentists in Alberta. Failure to do so may constitute unprofessional conduct under the *Health Professions Act* (HPA) and may result in disciplinary action by the CDSA.

The goals of this Standard of Practice are to:

- control and prevent the transmission of microorganisms to patients, personnel, the public, and the environment;
- minimize the risk of harm to patients and personnel;
- promote the safe use of single-use medical devices; and
- support health profession regulatory colleges, health care professionals, and other personnel who use or reprocess medical devices.

The standards set out in this document were developed using the Alberta Health, Government of Alberta *Reusable & Single-Use Medical Devices Standards*, and the *CSA Z314-18 Canadian Medical Device Reprocessing* standards prepared by the Canadian Standards Association (CSA). These Standards are consistent with recommendations and guidelines from Alberta Health, Alberta Health Services (AHS), Health Canada, the Public Health Agency of Canada (PHAC), and the Spaulding Classification System.

This standard applies to all clinical, laboratory and medical device reprocessing area settings.

All sterilizers used in dental clinics must come equipped with either a printer or an electronic data recorder that records cycle parameters. Sterilizers without this capability must be adapted or replaced by January 1, 2023.

Numerous terms in this Standard of Practice are defined in the Definitions (see page 26). Readers are advised to consult the definitions when reviewing this Standard.

1.0 Written Policies and Procedures

1.1 The dental office or clinic must have written IPC policies and procedures. These policies and procedures must include but are not limited to:

1.1.1 The reporting structure of individuals who have authorization, responsibility, and accountability to develop, approve, monitor, and maintain all IPC and risk management policies and procedures;

1.1.2 A hand hygiene policy and procedure must be developed by each dental office/clinic that includes the following:

- Indications for hand hygiene;
- Selection of hand hygiene agent;
- Management of soap containers and Alcohol-Based Hand Rub (ABHR);
- Hand lotion use;
- Use of ABHRs; and
- Hand hygiene monitoring and compliance audits.

1.1.3 The selection, acquisition, transportation, receiving, handling, processing, and disposal of new, loaned, shared, and leased dental instruments and devices;

1.1.4 Manufacturer's Instructions for Use (MIFU) regarding maintenance and reprocessing;

1.1.5 Sterilization processes following IPC principles as set out in the CDSA Standards; and

1.1.6 The protection and safety of personnel in accordance with the Alberta *Occupational Health and Safety Act* (OHS).

1.2 The dentist must ensure that the Dental Health Care Personnel (DHCP) employed by the dentist are aware and comply with the documentation required for IPC and OHS purposes.

1.3 The dental clinic owner and dentists working in each facility must review all policies annually to ensure policies are kept up-to-date with all current CDSA Standards of Practice.

1.3.1 IPC training and continuing education must be in accordance with the CDSA Standards of Practice.

2.0 Patient Evaluation

2.1 It is the dentist's responsibility to assess/perform a medical history for every patient. This must include a point-of-care risk assessment with each patient interaction for all patients at all times to determine which, if any, IPC measures beyond routine practice need to be used.

2.2 Dentists must be vigilant with respect to the signs, symptoms and epidemiology of various communicable diseases when presented, including blood-borne pathogens, Methicillin Resistant Staphylococcus aureus (MRSA), Pseudomembranous colitis (*Clostridium difficile* infection), Severe acute respiratory syndrome (SARS-CoV-1) and COVID-19 (SARS-CoV-2) and other influenza-like illnesses, Tuberculosis (patients with active TB should have their treatment delayed, if at all possible, until they are no longer infectious, or they should be referred to a more controlled environment for treatment) and Vancomycin Resistant Enterococcus (VRE).

Additional (transmission-based) Precautions:
Additional (transmission-based) precautions are taken while ensuring routine practices are maintained in the following situations.

2.2.1 Airborne Precautions must be used in addition to Routine Practices for patients with influenza-like illnesses or tuberculosis.

2.2.2 Contact Precautions (including gowns for example) must be used in addition to Routine Practices for patients with known or suspected MRSA, Clostridium difficile or VRE colonization or infection.

2.3 Dental offices must have a respiratory protection plan in place, which takes into consideration the chemical, biological, or environmental hazard determined in a point-of-care risk assessment performed prior to each clinical, laboratory, or reprocessing task.

3.0 Hand Hygiene

3.1 Proper hand hygiene must be performed by the dentist and all DHCP:

3.1.1 Before and after contact with any patient, their body substances or items contaminated by them and after handling soiled equipment.

3.1.2 Before and after performing invasive procedures.

3.1.3 Before preparing, handling, serving, or eating food.

3.1.4 After assisting patients with personal care (providing oral hygiene or oral hygiene instruction).

3.1.5 Before putting on (Donning) and after taking off (Doffing) gloves and any personal protective equipment (PPE).

3.1.6 After performing personal functions (e.g., using the toilet, blowing nose).

3.1.7 When hands come into contact with secretions, excretions, blood or bodily fluids.

3.1.8 Before handling clean supplies and setting up.

3.2 The hands of the DHCP must be washed using appropriate soap, water, and disposable towel combination at the beginning of the workday, after eating, after using the washroom or whenever the hands become contaminated with blood, saliva, or other bodily fluid, or have been in contact with contaminated instruments or devices. Although a separate sink for hand hygiene is desirable, sinks that have been used by patients to expectorate in or sinks that have been used to decontaminate instruments must be cleaned, disinfected, and identified before being used by DHCP for hand washing.

3.3 The hands of the DHCP must undergo antisepsis, using either appropriate soap, water, disposable towel combination or an appropriate ABHR containing 60-90% alcohol with products that have a Health Canada Drug Identification Number (DIN) or Natural Product Number (NPN) prior to beginning patient treatment before donning gloves, between patients after removing gloves or whenever gloves are changed during a patient visit. ABHRs are to be used only if the hands are not visibly soiled.

3.4 Soap and ABHR dispensers must be used (including pump assemblies), if not single-use, must be cleaned and dried prior to refilling. A cartridge system that cannot be topped up is preferred.

3.5 DHCP must not wear hand jewellery, other than smooth metal band rings, when performing hand hygiene or during clinical treatment. All hand jewellery must be removed when invasive dental procedures are performed.

3.6 DHCP must not wear artificial nails, nail enhancements or long nails. Fingernails shall be kept short (less than 3-4mm). The nail shall not show past the end of the finger.

3.6.1 DHCP must not have chipped nail polish on their fingers. Only nail polish that is fresh and free of all cracks or chips is acceptable.

3.7 DHCP must not use a standing basin of water to rinse hands.

3.8 DHCP must use disposable hand towels to dry hands after hand hygiene.

3.9 DHCP must not use non-alcohol based waterless antiseptic agents for hand hygiene.

4.0 Personal Protective Equipment (PPE)

4.1 DHCP must wear new single-use exam gloves for patient care, whenever the hands might be contaminated with blood, saliva, or other bodily fluid, or will be in contact with contaminated instruments or devices.

4.1.1 DHCP must wear sterile gloves whenever invasive surgical procedures are performed. This includes:

- Whenever intentional gingival, mucosal, or dermal flaps are raised; and
- Whenever the cutting or sectioning of bone is anticipated; and whenever a simple procedure becomes a surgical procedure (e.g., a tooth breaking that then requires surgical extraction).

4.1.2 DHCP must wear chemical resistant, puncture proof utility gloves when reprocessing instruments. Selection and use of PPE, including gloves, must provide proper

protection and be appropriate to the task considering necessary dexterity for cleaning.

4.2 DHCP must wear a surgical mask that covers the nose and mouth during dental procedures whenever splashes, sprays or spatter of blood, saliva, other body fluids, or water contaminated with blood, saliva or other body fluids may be produced. The mask must be changed whenever it becomes contaminated or wet or according to MIFU.

4.3 DHCP must wear protective eyewear (e.g., safety glasses, safety googles or face shields as determined by a point-of-care risk assessment) during dental procedures whenever splashes, sprays or spatter of blood, saliva, other body fluids, or water contaminated with blood, saliva or other body fluids may be produced.

4.4 All PPE must be removed prior to leaving the patient care area.

4.5 All PPE (utility gloves, gowns, protective eyewear, and masks) must be worn by DHCP during instrument decontamination and removed when completed.

4.6 A face shield does not replace a mask.

5.0 Laundering for Onsite Linens and Reusable PPE

5.1 Laundry in a dental office may include gowns/lab coats, uniforms/scrubs, contaminated textiles, and fabrics often contain high numbers of microorganisms from body substances, including blood other body tissues and fluids. Laundry services for dental offices are provided either onsite or by off-site commercial laundries. To minimize transmission of infectious disease while handling linen, general good hygiene measures and consistent use of appropriate personal protective equipment is recommended. When laundry services are possible onsite, utilize the following guidelines.

At home laundry of contaminated PPE must not be performed.

If using an off-site laundry service, there must be written documentation that the service meets or exceeds with the requirements of this section.

Handling of Soiled Linens

5.1.1 Appropriate PPE (e.g., gloves and long sleeve gowns) shall be worn while sorting soiled laundry or linens when there is a risk of clothing being contaminated by blood and bodily fluids.

5.1.2 Remove PPE including gloves once soiled laundry has been placed in the laundry bag/covered hamper.

- Handle soiled laundry with minimum agitation before placing it in a laundry bag at point-of-care to avoid contamination of environmental surfaces and people.

5.1.3 Perform hand hygiene following taking off PPE.

- Gloves are not needed to transport the laundry bag/ covered hamper to the soiled laundry room.

Washing Soiled Linen

5.1.4 Wash and dry linen according to routine standards and laundering practices of the dental office.

5.1.5 Avoid overloading the machine.

5.1.6 Follow detergent instructions for load size and load soiling.

5.1.7 Follow manufacturer written instructions regarding amount of detergent and water

temperature.

- Use complete wash, rinse, and dry cycles.
- Hot-water laundry cycles, wash with detergent or disinfectant in water at 70°C (160°F) for at least 25 minutes.
- If low-temperature (i.e., < 70°C; < 160°F) laundry cycles are used, choose a chemical that is suitable for low-temperature washing when used at the proper concentration.
- A disinfectant can be used to enhance the overall disinfection of the laundry process when there is heavy soiling. Use as per MIFU.

5.1.8 Run empty washer with 1 chlorine disinfectant tablet (equivalent to 1 cup of chlorine bleach) and water between loads ONLY after heavily soiled loads of linen or if patient is on Additional Precautions.

- Chlorine bleach tablets must be stored securely and used in a manner that follows the product's posted safety data sheet.

5.1.9 After loading the washer with soiled linen, clean and disinfect all high touch surfaces of the washer (washer surfaces, knobs, door pulls, buttons/switches etc.) to avoid re-soiling when it is unloaded. All washers and dryers must be left empty at the end of the operating day.

5.1.10 Wash hands with soap and water after handling soiled linen.

5.1.11 Follow manufacturer recommendations for the maintenance and cleaning of the washing machine and dryer. Keep a log these activities.

Handling and Storing Clean Linen

5.1.12 Dry linen promptly. Laundered items shall be taken out of the washer as soon as feasible to reduce the risk of contaminating the washer and formation of biofilm.

5.1.13 Perform hand hygiene before removing clean linen from the washing machine.

5.1.14 Fold linen on a clean surface with clean hands.

5.1.15 Store clean linen in a clean dry place such as a dedicated clean linen storage room or clean linen shelf/cart (constructed from plastic, stainless steel or suitable non-porous) material that is cleanable.

5.1.16 Avoid storing linen in patient care rooms. Unused linen left after patient discharge is considered contaminated. Any linen that enters a patient room shall only exit that room in a soiled linen laundry bag.

6.0 Purchasing and Assessing Dental Instruments and Devices and Products for Disinfection or Sterilization Processes

The decision to purchase a reusable medical device requires many considerations including the capacity of the organization's MDR resources to safely reprocess the medical device for re-use.

6.1 Dentists must ensure that all instruments, medical devices and chemical products are licensed by Government of Canada's *Medical Devices Regulations* and are used within these licensing parameters. Dental suction units are considered to be medical devices and as such must have a license issued by Health Canada Medical Devices Bureau in accordance with the Medical Devices Regulations, Section 36. Reusable dental instruments and devices that cannot be reprocessed according to the manufacturer's instructions and

CDSA standards must not be used.

6.1.1 The dentist shall not purchase or trial a reusable medical device that does not have a valid medical device licence.

6.2 Instrument manufacturers are required to identify at least one method of sterilization in their instructions for use. Both pre-vacuum and steam flush pressure pulse (SFPP) are recognized as standard dynamic air removal cycles. However, many instrument manufacturers recommend processing with a standard pre-vacuum cycle in their instructions for use and end users may be uncertain if the SFPP cycle can be substituted.

6.2.1 Since both pre-vacuum and SFPP cycles are considered of the dynamic air removal type, if an instrument manufacturer's instructions for use state that a pre-vacuum cycle with sterilize time of 4 minutes 270F° (132°C) or 3 minutes 275°F (135°C) shall be used for processing, the SFPP cycle with a sterilize time of 4 or 3 minutes, respectively, may be substituted.

6.3 DHCP must comply with *Occupational Health and Safety Act* (OHS) requirements.

6.4 The dental clinic must have available from the manufacturer of all reusable dental devices:

6.4.1 Information about the design of the dental device; manuals/direction for use;

6.4.2 Dental device-specific recommendations for cleaning and reprocessing of device;

6.4.3 Personnel training materials on the use, cleaning, and the correct reprocessing of all dental devices; and

6.4.4 Recommendations for monitoring the procedures required for reprocessing of the device.

6.5 Newly purchased non-sterile critical and semi-critical dental instruments and devices must be inspected and processed according to MIFU prior to use. Examples would include, but not be limited to burs, endodontic files, implant parts, etc.

6.6 Surgical instruments that are used on low risk neurological tissue (e.g., dental pulp tissue) from patients at high risk for Creutzfeldt-Jakob Disease (CJD) must be disposed of, or decontaminated in accordance with Health Canada and the Public Health Agency of Canada's *Infection Control Guidelines: Classic Creutzfeldt-Jakob Disease in Canada - Quick Reference Guide*

6.7 Non-critical medical devices intended for use between patients shall be purchased with validated MIFU for reprocessing when available, and when not available, a standard operating procedure (SOP) shall be developed in consultation with IPC and MDR personnel.

Note: *Dentists may need to go outside their organization to find the appropriate IPC and MDR expertise to develop reprocessing SOP for non-critical medical devices.*

6.8 Prior to purchasing or trialing a reusable critical or semi-critical medical device, the dentist shall confirm that there is written confirmation that the MIFU for reprocessing have been validated according to Health Canada's requirements.

6.8.1 The dentist shall not purchase or trial a reusable critical or semi-critical medical device if there is no written confirmation that the MIFU for reprocessing have been validated.

6.9 Prior to purchasing or trialing a reusable critical or semi-critical medical device, personnel accountable for MDR shall review the written, validated MIFU to determine:

6.9.1 That the recommended reprocessing procedures are specific to the dental or medical device and the instructions are clear, complete, adequate, and in accordance with the level of reprocessing required for the dental or medical device's

intended use.

6.9.2 That there are instructions for disassembly, cleaning, type of sterilization or level of disinfection required, cycle parameters, and maintenance.

6.9.3 If there is a limit to the number of times the dental or medical device can be reprocessed (i.e., if the dental device is a reposable device) or if reprocessing will contribute to degradation of the dental or medical device; and

6.9.4 That the recommended reprocessing procedures can be achieved, given the dentist's reprocessing resources.

6.10 In the event that the MIFU does not contain the information required in 6.9.1, 6.9.2, and 6.9.3, the dentist shall contact the manufacturer for clarification or additional information.

Note: Dental offices that are not able to obtain the relevant information should report this to Health Canada at:

a) mdpr-dimm@hc-sc.gc.ca; or

b) https://www.canada.ca/en/health-canada/services/drugs-health-products/medeffect-canada/adverse-reaction-reporting/mandatory-medical-device-problem-reporting-form-industry-adverse-reaction-reporting.html

6.11 Before purchasing reprocessing equipment, the dentist shall:

6.11.1 Obtain technical and safety data, specifications, and other information specific to the equipment for required utilities and connections (e.g., electrical, steam, water, plumbing, air supply, and ventilation); and

6.11.2 Ensure the minimum service space requirements set out by the manufacturer can be met.

7.0 Selection of Products and Processes for Reprocessing

7.1 All reusable dental instruments and devices must have written device-specific manufacturer's cleaning, decontamination, disinfection, wrapping and sterilization instructions.

7.1.1 The processes and products used for reprocessing must be compatible with each other and the device.

7.1.2 The reprocessing processes and products used in the reprocessing of a dental instrument or device must be determined by the intended use of the device in accordance with the Spaulding Classification.

7.1.3 If disassembly or reassembly is required, responsible DHCP must ensure that MIFU used includes detailed instructions and diagrams.

7.2 The dentist is ultimately responsible for the selection of products and processes for reprocessing. The delegation of this responsibility must only be to an individual whose competency in the area of instrument reprocessing has been demonstrated to the dentist.

7.2.1 Staff training must be provided on disassembly, reassembly and reprocessing before the dental instrument or device is placed into use.

8.0 Environmental and Structural Requirements for a Medical Device Reprocessing (MDR) Area

8.1 The MDR area shall be a designated area, separate from clinical care areas, and activity in the area shall be restricted to the reprocessing of reusable dental or medical devices.

8.2 The reprocessing space must:

8.2.1 Have adequate space for the cleaning process and storage of necessary equipment and supplies;

8.2.2 Have physically or spatially separate decontamination areas from areas where clean, disinfected, or sterile dental instruments and devices are handled or stored;

8.2.3 Have easy access to hand hygiene facilities;

8.2.4 Have surfaces that can be easily cleaned;

8.2.4.1 All work surfaces and surrounding area shall be intact, cut-resistant, and seamless, and shall be composed of non-porous, non-shedding material capable of withstanding frequent cleaning.

8.2.5 Have one-way movement of instruments through the reprocessing process, from dirty to sterile;

8.2.5.1 In existing facilities where physical separation (i.e., with walls or partitions) of reprocessing areas is not possible, spatial separation and a one-way workflow pattern must be established to limit cross-contamination.

8.2.6 Have air changes, temperature, and humidity appropriate to the process and product being used as set out by MIFU;

8.2.7 Have adequate lighting for the tasks being performed in all work locations;

8.2.8 New construction, office renovation or relocation must consider environmental, structural and ventilation considerations, including a separate room for reprocessing with one-way instrument and personnel flow; and

8.2.9 In existing facilities or settings where two adjacent sinks dedicated for equipment cleaning and rinsing are not possible have a dedicated basin for rinsing equipment.

Note: *In any new construction, future renovation, or relocation of the MDR area should comply with this Standard. (Have at least two adjacent sinks, large enough to immerse the largest piece of equipment, to clean and rinse soiled items). Notwithstanding 8.2.9, in facilities or settings where two adjacent sinks dedicated for equipment cleaning and rinsing are not possible, a dedicated basin for rinsing equipment.*

8.3 The dental clinic must use a water supply which is tested for and free of contaminants, such as a monitored municipal water supply.

8.3.1 Sterile water or sterile saline must be used for irrigation during surgery where there are open vascular sites or whenever bone is cut.

8.4 Forward venting handpieces are NOT to be used for surgical or invasive procedures. It is important to understand and recognize issues like air embolisms that may occur.

8.5 The dental clinic must have written contingency plans for loss of potable water, boil water advisories and other situations where the water supply becomes compromised.

8.6 DHCP must not touch non-barrier protected environmental surfaces (e.g., doorknobs, cupboards, pens, computer keyboard or mouse, clipboards, etc.) with contaminated gloves during or after patient treatment.

8.7 The dental office premises must be kept neat, clean, and free of exposed waste material.

9.0 Pre-Cleaning, Transportation and Handling of Contaminated Dental Instruments

and Devices

9.1 Disposable sharps must be removed and disposed of in an approved sharps container at the point of use, or immediately following transportation to the reprocessing area. Sharps containers must be labeled and disposed of according to local municipal regulations.

9.2 DHCP must be aware of the handling and proper disposal of biomedical waste and hazardous materials from a clinical office or clinic. The *Guide for Best Practice Management of Dental Office Waste* document has detailed instruction on best practice management in dental wastes.

9.2.1 Gauze which is heavily saturated with blood (i.e., dripping) or removed tissue must be disposed of in properly identified biohazardous containers and transported for final disposal according to local municipal regulations.

9.3 Personnel shall pre-clean used reusable dental or medical devices immediately after use and prior to transportation and further manual or automated cleaning.

9.3.1 At the point of use, single-use sharps shall be removed from reusable dental or medical devices and disposed of in a puncture-resistant sharps container.

9.3.2 Organic matter shall not be allowed to dry on reusable dental or medical devices. Reusable dental or medical devices shall be kept moist by using foam, spray, or gel specifically intended for this use, or by using a towel moistened with water, and in accordance with the MIFU.

9.4 All personnel who handle contaminated dental instruments and devices must handle those devices in a manner which reduces the risk of:

9.4.1 Exposure and/or injury to self, other personnel, and patients; and

9.4.2 Contamination of environmental surfaces.

9.5 From the point of use, contaminated critical and semi-critical dental instruments and devices must be taken directly to the area designated for handling contaminated devices and if required, initial disassembly completed.

9.6 Contaminated items shall be transported in covered, fully enclosed, leak-proof containers or closed carts that are designed to prevent the spill of liquids, protect reusable dental or medical devices from damage, and allow for effective decontamination after each use.

9.6.1 Sterile or clean reusable dental or medical devices and soiled reusable dental or medical devices shall be transported in a manner that prevents cross-contamination (i.e., in separate containers and carts).

9.7 Contaminated dental instruments and devices which have not been reprocessed must be clearly identified as not reprocessed by use of a labeling system such as colour coding or tagging.

9.8 Intra-operative sharpening of hand and dental hygiene instruments using a sterile stone is permitted with the following conditions:

9.8.1 Stones are sterilized according to validated MIFU written instructions; and

9.8.2 After sharpening, instruments must be wiped.

10.0 Preparation and Cleaning Reusable Dental Instruments and Devices

10.1 Reusable dental instruments and devices must be cleaned of all debris, including dental materials and bioburden before disinfection or sterilization.

10.2 The cleaning process must include sorting and disassembly (if required), cleaning, manual cleaning, automated cleaning, rinsing, and drying, reassembly, and inspection.

Sorting and Disassembly

10.3 All contaminated medical devices shall be inspected and sorted before reprocessing to ensure that the appropriate cleaning agents and procedures are applied to the correct devices.

10.4 All medical devices consisting of multiple components (e.g., minimally invasive surgical medical devices) shall be disassembled in accordance with the MIFU.

Cleaning

10.5 Each medical device shall be thoroughly cleaned prior to disinfection or sterilization.

10.6 Cleaning methods shall be consistent with the medical device's MIFU and appropriate for the type of medical device and the amount of soil to be removed.

10.7 While cleaning may be done by either a manual or automated process, critical and semi-critical medical devices shall be cleaned using an automated process whenever possible.

Manual Cleaning

Table of Contents Next Recommendation

10.8 If manual cleaning is required, the dental or medical device's MIFU for reprocessing shall be followed, including any specifications for detergent type, water type, or water temperature and cleaning methods.

10.9 Immersible dental or medical devices shall be completely submerged during cleaning to prevent the generation of aerosols and non- dental or medical devices shall be cleaned according to the MIFU.

Automated Cleaning

10.10 Automated washers and ultrasonic cleaners used for cleaning shall be used in accordance with the MIFU.

10.10.1 The performance of the automated cleaning system (e.g., automated washers) shall be tested according to specific MIFU each day that it is in use, using commercially available indicators or test kits. The results of the test shall be documented in a logbook.

10.10.2 Ultrasonic cleaners shall be tested for sonication performance (e.g., commercial methods or the foil test) weekly. The results of the weekly test results shall be documented in a logbook.

10.10.3 The ultrasonic detergent solution shall be changed at least daily or more frequently when visibly soiled or if the ultrasonic cleaner or solution MIFU specifies more frequent changes (e.g., with every cycle).

10.11 The dental or medical device's MIFU shall be followed to ensure dental or medical devices are compatible with the automated washer's process conditions (e.g., moisture, temperature, chemicals, water quality, and pressure).

Rinsing and Drying

10.12 Chemical residues and loosened soil shall be completely rinsed from the dental or medical device prior to disinfection or sterilization. Rinsing may be included as a final step in an automated cleaning process. If not, the dental or medical device shall be rinsed manually.

10.13 Reusable dental or medical devices shall be dried prior to disinfection or sterilization, as directed by the MIFU.

10.13.1 Unless dried using an automated process, the exterior surfaces of dental or medical devices shall be manually dried with a clean, lint-free, or low-lint soft-

absorbent towel.

Note: Drying of non-critical devices may be done by air-drying, or in accordance with the MIFU.

Reassembly

10.14 Decontaminated dental or medical devices shall be reassembled according to the MIFU. Reassembly shall take place in a clean and dry area.

- Corrosion reduction and/or lubrication shall be applied if required by the MIFU.

Inspection

10.15 Dental or Medical devices shall be visually inspected for cleanliness, damage, integrity, and functionality prior to disinfection, sterilization, or subsequent use.

10.15.1 Cleaned dental or medical devices that are visibly soiled shall be cleaned again.

10.15.2 Dental or medical devices that are damaged or in poor working condition shall be removed from service, labelled, and segregated from usable dental or medical devices. Such dental or medical devices shall either be repaired or disposed of in accordance with the documented SOPs.

10.16 In contrast to critical and semi-critical items, most non-critical reusable items may be decontaminated where they are used and do not need to be transported to a central MDR area. Low-level disinfectant (LLD) must be used as per MIFU for cleaning then disinfecting non-critical patient care items.

10.17 Reusable dental instruments must be cleaned with an instrument detergent or enzymatic product that is utilized according to MIFU and is discarded after each use.

10.18 Automated cleaning equipment (e.g., ultrasonic cleaners, instrument washers) must be operated and maintained according to MIFU and this must be documented.

10.19 Cleaning accessories (e.g., long-handled brushes) must be disposable or thoroughly cleaned and high-level disinfected or sterilized between uses.

10.19.1 Cleaning accessories shall be inspected before use to ensure they are not damaged. Damaged cleaning accessories shall not be used.

10.19.2 Reusable cleaning accessories shall be reprocessed after use in accordance with the MIFU, inspected for damage, and stored in a clean, dry place.

10.19.3 Single-use cleaning accessories shall be discarded following use.

10.20 Reusable dental or medical devices that come from an opened or compromised package shall be reprocessed prior to use.

11.0 Disinfection of Reusable Dental Instruments and Devices

11.1 Heat sensitive semi-critical dental instruments or devices must be disinfected as per MIFU using high-level disinfection or a pasteurization process.

11.1.1 X-Ray film packets are a single-use item and must be disinfected with a LLD prior to developing to avoid contamination of the radiograph processor. Digital X-Ray sensors must be barrier protected and, if contaminated, disinfected between patient use.

11.2 Disinfection of reusable dental or medical devices shall take place in accordance with the MIFU of the device and shall also follow the MIFU for the disinfection process, equipment, and products.

11.3 Only chemical disinfectants that have a Health Canada drug identification number (DIN) or a medical device licence (MDL) issued by Health Canada, shall be used in dental offices for the disinfection of reusable dental or medical devices.

11.4 A liquid chemical disinfectant shall not be used beyond its:

a) expiry date; and
b) in-use shelf life.

11.5 Reusable liquid chemical disinfectant solutions shall:

11.5.1 Be clearly identified and include the expiry date;

11.5.2 Be stored in containers that are cleaned, disinfected, and dried prior to changing the solution; and

11.5.3 Be kept covered with a tight-fitting lid, except when introducing or removing a dental or medical device to or from the solution.

Non-Critical Devices

Note: In most cases, non-critical reusable dental or medical devices can be disinfected at the point of use.

11.6 Non-critical reusable dental or medical devices shall be disinfected between patient use using an intermediate-level disinfectant (ILD) or LLD.

11.6.1 ILD or LLD wipes shall be moist enough to thoroughly wet the surface for the indicated contact time and a new wipe shall be used if the area to be disinfected cannot be completely wetted with a single wipe.

Semi-Critical Medical Devices

11.7 If a reusable semi-critical device cannot be sterilized, then it shall, at a minimum, be high level disinfected between patient use.

Liquid Chemical High Level Disinfection

11.8 The minimum effective concentration (MEC) of a reusable HLD shall be tested and recorded, according to the MIFU of the disinfectant.

11.8.1 MEC testing shall be performed at the beginning of each day that the solution is used for manual HLD (or more frequently if specified in the MIFU of the HLD) and in each cycle for automated HLD.

11.8.2 Quality assurance testing of test strips used to test MEC shall be followed in accordance with test strip MIFU.

11.8.3 Test strips used to test MEC shall not be used beyond the test strip's expiry date or the manufacturer's in-use shelf life.

11.8.4 An HLD shall not be used beyond a failed MEC test.

11.9 When performing manual disinfection of a semi-critical medical device:

11.9.1 All parts of the dental or medical device shall be in complete contact with the HLD, and all air bubbles shall be removed; and

11.9.2 The contact time and temperature shall be measured from the point at which the semi-critical dental or medical device achieves complete contact with the HLD and there are no trapped air bubbles.

11.10 Automated disinfection systems shall provide a record that critical cycle parameters (e.g., disinfectant temperature, concentration, contact time) have been met.

Table of Contents Previous Recommendation Next Recommendation

11.11 Following chemical HLD, each semi-critical dental or medical device shall be thoroughly rinsed with sterile or bacteria-free water (e.g., achieved by submicron filtration).

11.11.1 If rinsing is done manually, it shall include at least three separate rinses unless otherwise specified by the HLD manufacturer.

11.12 After HLD and rinsing, the semi-critical dental or medical device shall be dried in accordance with the MIFU.

11.13 At a minimum, the DHCP shall document and maintain records on:

11.13.1 HLD solution (including product name, lot number, expiry date, in-use shelf life, date of solution change, and initials of staff preparing the solution and documenting the process);

11.13.2 HLD test strips (including name of test strip, lot number, expiry date, in-use shelf life, quality control test results for each time a new test strip bottle is opened, and the initials of staff doing the testing and documentation);

11.13.3 Results of MEC testing;

11.13.4 Contact time and temperature during HLD;

11.13.5 Cycle parameters; and

11.13.6 Dental or medical device name or type documentation.

11.14 Devices not easily disinfected, and not routinely used in dentistry, such as endoscopes, must be cleaned and disinfected/sterilized according to the MIFU.

12.0 Sterilization of Reusable Dental Instruments and Devices

12.1 A reusable critical dental or medical device shall be sterilized between each patient use.

12.2 Semi-critical dental or medical devices that are compatible with heat and moisture shall be steam sterilized between each patient use.

Table of Contents Previous Recommendation Next Recommendation

12.3 Sterilization of reusable dental or medical devices shall take place in accordance with:

12.3.1 The MIFU of the device; and

12.3.2 The MIFU for the sterilization process, equipment, and products.

12.4 The following processes must not be used for sterilization of dental instruments or devices:

12.4.1 Boiling;

12.4.2 Ultraviolet light;

12.4.3 Glass bead sterilization;

12.4.4 Ovens designed for food preparation; or

12.4.5 Microwave ovens.

Qualification and Requalification of Sterilization Equipment

12.5 Installation qualification of sterilization equipment (including large chamber and tabletop steam sterilizers) shall be performed and documented according to the MIFU.

12.6 Operational qualification of sterilization equipment (including large chamber and tabletop steam sterilizers) shall be performed at installation.

12.7 Operational requalification shall take place at least annually and following a major sterilizer repair, sterilizer relocation, an unexplained sterility failure, and, for steam sterilizers, following any disruption to steam supply or change to steam pressures and documented according to MIFU.

12.8 Operational qualification and requalification testing shall include a verification of each cycle used by the dental office, according to the MIFU for testing.

12.9 Operational qualification and requalification testing shall be conducted by:

12.9.1 Running three consecutive cycles in an empty chamber using Process Challenge Device (PCD) with biological indicators. For table-top steam sterilizers, testing will take place in a fully loaded chamber.

12.9.2 Additionally, in dynamic air removal sterilizers that use pre-vacuum cycles, ensuring that the sterilizer:

a) Meets the requirements of an air removal test and leak-rate test; and

b) Is tested with three consecutive air removal tests (e.g., Bowie-Dick/Dart) in an otherwise empty sterilizer.

12.9.3 The above shall be documented.

12.10 Performance qualification shall be performed to ensure setting-specific packages and loads can be sterilized with the equipment and processes used in the dental office.

12.10.1 Performance qualification shall use products (e.g., instrument sets) and sterilizer loads used by the dental office. The products and loads shall:

a) Be assembled according to the sterilizer MIFU; and

b) Adhere to any limitations of validated dental or medical devices, materials, and weights.

12.10.2 In addition, performance qualification shall be performed when there are new materials, processes, or conditions that could affect sterilization.

Packages and Labels

12.11 Packaging of reusable dental or medical devices for sterilization shall take place in accordance with the MIFU of the device, the sterilization equipment, and the sterilization packaging manufacturer, and when packaging is required, it shall be done using a validated sterile barrier system (e.g., pouches, wrappers, or rigid sterilization container systems).

12.12 Packages shall be labelled with sterilizer load identification information, including the sterilizer number, the load number in that sterilizer, and the sterilization date.

12.12.1 Labelling systems shall be validated for the sterilization process.

12.12.2 For pouches, a label shall be placed on the transparent portion of the packaging.

12.12.3 For wrapped packages, writing shall be on the closure tape, not directly on the wrappers.

Loading and Unloading

12.13 Packages shall be placed in the sterilizer chamber (following sterilizer MIFU) in a manner that facilitates air removal, sterilizing agent penetration, sterilant evacuation, and, in the case of steam sterilization.

12.13.1 Wrapped items shall not contact the interior walls of the sterilizer chamber, as contact can damage the wrapper.

12.13.2 Pouches and wrapped packages shall not be stacked or compressed.

12.13.3 Between packages there shall be adequate space to ensure effective sterilizing agent penetration, evacuation, and drying.

12.14 Sterile pouches and packages shall be cooled to room temperature before handling.

12.15 During unloading, pouches and packages shall be inspected for:

a) Package integrity;
b) Dryness;
c) Presence of a label;
d) The correct change in an external chemical indicator;
e) An intact seal, if used; and
f) Evidence of potential contamination.

If a pouch or package does not meet the inspection criteria, the contents shall not be used.

Mechanical Monitoring

All sterilizers used in dental clinics must come equipped with either a printer or an electronic data recorder that records cycle parameters. Sterilizers without this capability must be adapted or replaced by January 1, 2023.

Mechanical or electronic failure alarms for time, temperature, and pressure must be in place, and their correct functioning recorded for each cycle; integrated printouts or data retrieval devices recording these parameters.

12.16 All sterilization processes must follow the MIFU for installation, operation, preventative maintenance, and quality assurance monitoring of the equipment and must be documented.

12.17 The sterilization process must be tested, monitored, documented, and audited for all sterilizers; the following must be completed to ensure that effective sterilization has been achieved:

Chemical Indicator

12.18 Both internal and external chemical indicators shall be included with each package prepared for sterilization. Each instrument pack or cassette must have an external Type 1 process indicator applied to, or visible from, the exterior of the package, and an internal chemical indicator. Type 5 or Type 6 chemical indicator must be used inside the material and/or instrument package.

Air Removal Test

12.19 For dynamic air removal-type sterilizers (pre-vacuum cycles), an air removal test shall be performed every day the sterilizer is used (i.e., Bowie-Dick/Dart).

Biologic Indicators

12.20 A biological indicator contained within a PCD shall be used to test the sterilizer for each type of cycle used (e.g., dynamic air removal, gravity, and steam flush pressure pulse) and at the shortest exposure time, within a full load. This test shall be done at least daily when the sterilizer is in use.

Note: A PCD should present a challenge to the process that is equal to or greater than the challenge posed by the most difficult item that is routinely sterilized. A biological test pack is an example of a PCD. A PCD can be commercially manufactured or prepared in-house following the PCD MIFU.

An in-house PCD can be made with a cassette or bag that includes metal instruments, a BI and a Type 5 CI.

12.20.1 If a steam sterilizer will be used for multiple types of cycles, each type of cycle used shall be tested daily.

12.21 Implantable Devices

12.21.1 Every load containing implantable devices shall be monitored using a biological indicator PCD.

12.21.2 A biologic indicator must be used with each load of surgical instruments if implantable devices (for example, dental implants, bone grafting screws, temporary anchorage devices, bone plates, etc.) are being placed. These instrument packs and implantable devices or materials must not be used until the results of the biologic indicator test are known, and must be tracked for date, load and sterilizer used, and this information must be recorded in the patient's record at the time of placement.

12.21.3 Implantable devices shall be quarantined until the results of the biological indicator test are available.

12.21.4 Early release of implantable devices shall not be used to compensate for inventory shortages or scheduling problems.

12.21.5 Early release of implantable devices shall only be done in situations where there is an urgent, unplanned need (e.g., trauma-related devices) and if an implantable device must be released before the biological indicator test results are available, the following apply:

- Evaluation of a Type 5 or Type 6 chemical indicator in the biological indicator PCD, the specific cycle physical parameters, and any visible chemical indicators shall be assessed, and the results documented in the patient's record at the time of placement.

12.22 Documentation of sterility assurance shall include a printout or electronic cycle parameter record, a load control label, a load contents record, and associated chemical or biological indicator test results for each cycle.

12.23 In the event of a failed indicator test or any other issue noted upon inspection, the dentist shall have processes in place to recall and reprocess the affected dental or medical devices.

Immediate-Use Steam Sterilization

12.24 Immediate-use steam sterilization (IUSS) shall be used only for situations where there is an urgent, unplanned need, with no other options available, or the dental or medical device can only be sterilized with an immediate-use cycle.

12.24.1 Further to 12.24, IUSS shall not be used for reasons of convenience, to save time, to compensate for inventory shortages, or to address scheduling problems.

Note: *Practical measures that should be taken by the dentist to avoid the need for IUSS include:*

a) Maintaining adequate inventories of dental or medical devices; and

b) Coordinating dental or medical device reprocessing with surgical schedules so that properly reprocessed devices are available when needed.

12.25 Other than for the unavoidable, emergency situations described in 12.24, IUSS shall not be used to sterilize implantable devices.

12.26 Dental or medical devices that have been sterilized using IUSS shall be used immediately and shall not be stored.

Note: *It is important that critical dental or medical devices are maintained as sterile until point of use. Prior to and upon opening a package containing a critical dental or medical device at the point of use, the user should inspect the integrity of the*

packaging (including reviewing the results of the internal and external chemical indicators) and the reprocessed dental or medical device itself, to ensure no obvious contamination or damage exists.

12.27 In the event of a failure in the sterilization process (failure of the sterilizer, failure of chemical indicators or the failure of the biological indicator) there must be a process in place to investigate the cause of the event, document actions taken, and recall sterilization loads if necessary.

12.28 All loaned or shared dental instruments and devices received by the office/facility must be reprocessed according to MIFU by the receiving office/facility on site prior to patient use.

13.0 Storage and Use of Reprocessed Dental Instruments and Devices

13.1 Packages containing the sterile dental instruments or devices must be clearly labeled with the sterilizer number, load number of that sterilizer and sterilization date that they were reprocessed.

13.2 Sterile dental instruments or devices must be maintained as sterile until the point of use. If the integrity of the package or container has been compromised (e.g., wet, torn, visibly soiled) the contents must not be used, and the devices must be reprocessed.

13.3 Areas where clean, disinfected, and sterile dental or medical devices are stored shall:

13.3.1 Be dedicated to the storage of clean, disinfected, and sterile items;

13.3.2 Be designed to have adequate space to prevent crushing or damage to packaging;

13.3.3 Have sufficient lighting to allow easy reading of labels and to determine the condition of packaging; and

13.3.4 Be cleaned following an established schedule.

13.4 Reprocessed critical and semi-critical dental or medical devices shall be protected from contamination by:

a) Rotating stock via first-in, first-out; and

a) Ensuring they are not stored on the floor or a window sill, under sinks or near water sources, or in the same area as hazardous materials.

13.5 Reprocessed dental instruments or devices must be inspected for integrity upon opening the instrument or device pack or cassette at the point of use. The results of the internal chemical indicator must be validated prior to the use of the dental instruments or devices.

14.0 Education and Training

14.1 The dentist shall ensure all personnel involved in the reprocessing of critical and semi-critical dental devices are appropriately educated and trained for the reprocessing duties/tasks that they perform.

14.2 The dentist shall document and maintain records of education, training, orientation, and competency assessments of personnel who reprocess critical and semi-critical dental devices.

15.0 Environmental Infection Prevention and Control Practices

15.1 All finishes in the clinical, laboratory and reprocessing setting must be cleanable and intact (i.e., chair covers, flooring, counter tops, and dental unit).

15.2 All clinical contact surfaces must be cleaned and disinfected between patients.

15.3 If surfaces covers are used:

15.3.1 They must cover the entire surface including the edges;

15.3.2 They must be moisture impervious;

15.3.3 They must be applied with clean hands (hands that have recently had hand hygiene performed on them) or clean gloves; and

15.3.4 They must be removed and discarded, using single-use protective gloves, between patients. Following their removal, all surfaces must be inspected for evidence of contamination and cleaned and disinfected if contaminated.

15.4 If surface covers are not used:

15.4.1 All surfaces must be cleaned and disinfected between each patient; and

15.4.2 A hospital–grade LLD that is labeled, stored, prepared, and applied according to MIFU must be used to clean and disinfect clinical contact surfaces.

15.5 Components of dental devices that are permanently attached to the dental unit water lines (i.e., electric handpiece motors, handles for ultrasonic devices attachments for saliva ejectors, high-speed air evacuators, etc.) must be disinfected after each use.

15.6 Radiographic equipment (e.g., tube heads and control panel) must be cleaned and disinfected between patients.

16.0 Dental Unit Waterlines

16.1 All waterlines must be purged at the beginning of each workday by flushing the lines thoroughly with water for a minimum of two minutes.

16.2 Waterlines must be purged for a minimum of twenty seconds after patient care.

16.3 MIFU of the dental units and dental equipment must be followed for daily and weekly maintenance whenever closed water systems or other special water delivery systems are utilized.

16.4 Suction lines must be aspirated with water or disinfectant solution (that is compatible with the evacuation system according to MIFU) between patients to reduce likelihood of infectious material backflow.

16.5 Suction lines must be cleaned once a week with an enzymatic cleaner (that is compatible with the evacuation system according to MIFU).

17.0 Single-Use Instruments and Devices

17.1 Single-use dental instruments or devices that are labeled by the manufacturer as single-use must not be reused on any other patient. Single-use dental devices must only be used on an individual patient for a single procedure and then must be discarded.

17.1.1 Any item marked with the symbol below is considered single-use, and would include, but is not limited to syringe needles, disposable syringes, prophylaxis cups and brushes, implant parts, temporary anchorage devices, bone grafting materials and some orthodontic brackets and wires.

17.1.2 Packaged bone grafting materials are single-use, and must only be used on a single patient, on a single day and then must be discarded.

17.1.3 Single-use dental devices are single-use, and must only be used on a single patient, on a single day and then must be discarded.

17.1.4 A single-use dental or medical device shall not be used beyond the expiry date specified by the manufacturer.

17.1.5 A sterile critical single-use dental or medical device shall be maintained as sterile until point of use.

17.1.6 Opened but unused single-use dental or medical devices must be discarded, unless the manufacturer provides validated MIFU for reprocessing (e.g., dental implant/screws).

17.1.7 Prior to using a single-use dental device that was purchased in a non-sterile state, that single-use dental device shall be inspected and processed according to the validated MIFU (e.g., dental burs, endodontic files, and dental implant/screws).

17.2 Dentists administering medications using multi-use vials (such as for intravenous sedation) must use a new single-use disposable needle and a new single-use disposable syringe for each entry into a multi-dose vial and follow proper aseptic technique when administering the medication.

17.2.1 Multi-dose vials must be dated upon opening and discarded prior to the expiry date listed on the label.

17.2.2 Multi-dose vials have a manufacturer recommended discard date of 28 days after opening, refer to product specific MIFU.

17.2.3 The vial septum must be cleaned with a new disinfectant swab prior to each entry.

17.2.4 A new needle and a new syringe must be used for each entry into a vial.

17.2.5 Drugs must never be delivered to more than one patient, or IV system attached to the patient from a common syringe or IV bag.

17.2.6 Multi dose vials must be inspected prior to use and discarded if they appear to be contaminated.

18.0 Occupational Health and Safety Requirements

18.1 The dental clinic must comply with the Alberta *Occupational Health and Safety Act, Regulation and Code*.

18.1.1 A written hazard assessment must be completed to identify physical, biological, chemical and radiation risks in the dental clinic, according to *Alberta Safe Workplaces Employment and Immigration Standards*.

18.1.2 The reprocessing area must be limited to reprocessing activities only and all other activities are prohibited, including eating or drinking, storage of food, smoking, application of cosmetics, or handling of contact lenses.

18.1.3 Air handling systems must be adequate to protect personnel from toxic vapours.

18.1.4 Chemicals must be stored according to MIFU, and SDS documentation must be available, as required by the Government of Canada's *Workplace Hazardous Material Information System* (WHMIS).

18.1.5 DHCP handling contaminated dental instruments or devices must wear PPE.

18.1.6 All DHCP must comply with immunizations required in a clinical dental setting.

18.1.6.1 All clinical DHCP and reprocessing personnel must be assessed regarding their immunity to Hepatitis B and, if not adequately protected, provided Hepatitis B immunization, if required.

18.1.7 A first aid plan, equipment and services must be in place.

18.1.7.1 All Alberta dental offices must have a working Automated External Defibrillator (AED) on their premise. Must be serviced according to the MIFU.

18.1.8 All DHCP must be aware of the signs of possible latex adverse reactions and have a plan in place to deal with such reactions.

18.1.9 The dental clinic must have written policies regarding Work Practice Controls to prevent exposure to blood and body fluids, exposure to chemicals, and injuries from sharp objects.

18.1.10 The dental clinic must have written policy protocol for sharps, syringes and safety engineered syringes (SES).

18.1.11 Policies and procedures must be in place for immediate response to worker exposure to chemicals.

18.1.12 Policies and procedures must be in place for immediate response and post-exposure management of workers exposed to blood and body fluids.

18.1.13 An eye-wash station or commercial eye-wash bottle with proper eyepieces must be available and immediately accessible.

18.1.14 Policies and procedures must be in place for immediate response to worker exposure to sharp objects.

18.1.15 The dental clinic must ensure that ventilation is in place to remove toxic vapours generated by, or emitted from, cleaning or disinfecting agents.

19.0 Ethical Responsibilities

19.1 DHCP must not refuse oral health care to individuals based solely on the patient's seropositivity status to any blood-borne pathogen (including Human Immunodeficiency Virus [HIV], Hepatitis B Virus [HBV] and Hepatitis C Virus [HCV]).

19.2 If a dentist has a blood borne infection (HBV, HCV and/or HIV), the dentist must immediately inform the CDSA.

19.3 If a dentist knows of or has reason to suspect the existence of a nuisance or a threat that is or may be injurious or dangerous to the public heath, the dentist has a legal obligation to immediately notify the Medical Officer of Health of the appropriate regional health region by the fastest means possible, according to the *Health Professions Act* (HPA). Contact information can be obtained from Alberta Health and Alberta Health Services (AHS).

19.4 These Standards must be followed by dentists in Alberta. Failure to do so may constitute unprofessional conduct under the *Health Professions Act* (HPA) and may result in disciplinary action by the CSDA.

20.0 Quality Management

20.1 The dentist shall have clear accountability and lines of responsibility for:

20.1.1 All aspects of MDR, wherever MDR takes place in the dental office; and

20.1.2 The appropriate use of single-use dental and medical devices.

20.2 The dentist shall have written policies and SOPs in place that meet or exceed appropriate provincial and national standards and guide the dentist through all aspects of MDR.

20.2.1 All steps in the reprocessing of reusable dental or medical devices, based on MIFU;

20.2.2 The installation, operational, and performance qualification and requalification requirements of reprocessing equipment and products, based on MIFU;

20.2.3 Regular inspection and preventative maintenance requirements for reusable medical devices and equipment, based on MIFU;

20.2.4 Actions to be taken following a failed sterility indicator or unexplained parameter change, based on MIFU;

20.2.5 Management of limited use (reposable) devices, if used, based on MIFU;

20.2.6 Recall procedures; and

20.2.7 Management of loaned, reusable dental or medical devices, if applicable.

20.3 The dentist shall have a written policy regarding single-use dental and medical devices that is consistent with section 17 of these standards.

20.3.1 The dentist shall make sure that its policies related to single-use dental or medical devices are available to all users and shall provide awareness training as required.

20.4 The dentist shall have policies and/or SOPs in place that include but are not limited to:

20.4.1 The required occupational health and safety activities, including use of appropriate personal protective equipment when performing MDR and when using single-use dental or medical devices;

20.4.2 IPC routine practices;

20.4.3 The storage (including environmental conditions and requirements related to identification and labelling), transportation, and distribution of single-use and reusable devices and products;

20.4.4 The practices and procedures required to maintain the sterility of packages and sterile dental or medical devices, over time and until point of use, based on MIFU; and

20.4.5 Contingency plans for emergency situations that include but are not limited to:

a) Loss of staff;

b) Loss of or decrease in supply chain or inventory;

c) Loss of utilities including potable water;

d) Loss of reprocessing equipment;

e) Loss of or damage to sterile storage and/or laundry areas; and

f) Spills of hazardous substances.

20.5 The dentist shall conduct a regularly scheduled review of all written policies and SOPs.

20.5.1 The dentist shall review, and revise policies and SOPs related to improvements or corrective actions as required (e.g., following a review of an accident, error, or event related to the function); and

20.5.2 The development and subsequent review and update of policies and SOPs shall be performed by an individual experienced in medical device reprocessing who has the authority to make the necessary changes to ensure conformance with current or new requirements and/or changes in practice.

Documentation

20.6 Dentists shall retain records of reprocessing according to the health care facility or setting's policy and applicable legislation or as long as medico-legally prudent. These records shall include, but not be limited to, the following:

20.6.1 Preventative maintenance of reusable dental or medical devices and equipment;

20.6.2 Results of installation, operational, performance qualification and requalification, and routine testing of reprocessing equipment and products; and

20.6.3 Management and handling of loaned, shared, and leased dental or medical devices.

20.7 The MIFU for dental or medical devices, equipment, and supplies shall be received and maintained in printed form (e.g., in binders, manuals, or monographs) or in electronic format and be readily accessible to those needing access and shall be updated as required.

20.8 If reprocessing of reusable dental or medical devices is being performed by an external or internal subcontractor, the subcontractor shall comply with these Standards.

20.9 Dentists that provide services involving contact with high-risk tissues from patients suspected or known to have Creutzfeldt-Jakob Disease or prion-related disease shall develop policies to manage dental or medical devices in accordance with Government of Canada, Health Canada and the Public Health Agency of Canada's *Infection Control Guidelines: Classic Creutzfeldt-Jakob Disease in Canada – Quick Reference Guide*.

20.10 The dentist shall review and monitor personnel compliance with these standards in accordance with its written policy on monitoring and reporting, and results of such monitoring shall be documented.

Definitions

Accountability: a state of being accountable, answerable, or liable. Regarding IPC Standards, the dentist is accountable to the Alberta Dental Association and College.

Additional Precautions: practices used to prevent transmission of infectious agents that are spread by direct or indirect contact with the client or client's environment that are necessary in addition to Routine Practices for certain pathogens or clinical presentations. These precautions are based on the method of transmission of the infectious agent, and include Contact Precautions, Droplet Precautions, and Airborne Precautions.

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

Table of Contents Previous Recommendation Next Recommendation

Airborne Transmission: a means of spreading infection in which airborne droplet nuclei (< 5 microns) are inhaled by the susceptible host.

Alcohol-Based Hand Rub (ABHR): a liquid, gel of foam formulation of alcohol (e.g., ethanol, isopropanol) which is used to reduce the number of microorganisms on hands in clinical situations when the hands are not visibly soiled. ABHRs contain emollients to reduce skin irritation and are less time-consuming to use than washing with soap and water.

Anaphylaxis (immediate anaphylactic hypersensitivity): a severe and sometimes fatal Type 1 reaction in a susceptible person after a second exposure to a specific antigen (e.g., food, pollen, proteins in latex gloves, or penicillin) after previous sensitization. Anaphylaxis is characterized commonly by respiratory symptoms, itching, hives, and rarely by shock and death (anaphylactic shock).

Antiseptic: a germicide that is used on skin or living tissue for the purpose of inhibiting or destroying microorganisms. Examples include alcohols, chlorhexidine, chlorine, hexachlorophene, iodine, chloroxylenol (PCMX), quaternary ammonium compounds and triclosan.

Aseptic Technique: specific practices aimed at preventing the introduction of or reducing the number of microorganisms in an area of the body or preventing the spread of microorganisms in the dental office or clinic. Aseptic technique is also designed to prevent exposure of workers to blood, body fluids, tissue and other potentially infectious materials or surfaces during health care procedures. Aseptic techniques would include but are not limited to removing or killing microorganisms on hands and objects, using only sterile instruments in order to reduce patients' risk of exposure to microorganisms that cannot be removed. Both medical and surgical aseptic techniques (defined below) are employed in dental settings, depending on a number of factors and the resultant degree of sterility required for proper IPC.

Automated Instrument Washer: an automatic unit specifically designed to clean and thermally disinfect medical or dental devices and instruments. The unit uses a high-temperature cycle rather than a chemical bath.

Bead Sterilizer (endodontic dry heat sterilizer): a device that used small glass beads (1.2–1.5 mm diameter) and high temperature (217–232°C) for brief exposures (e.g., 45 seconds) to inactivate microorganisms. The term is a misnomer because these devices are not cleared as sterilizers by CSA or Health Canada.

Bioburden: the microbiological load (e.g., number of viable organisms in or on the object or surface) or organic material on a surface or object prior to decontamination, or sterilization, also known as "bioload" or "microbial load."

Biological Indicator (BI): a test system containing viable bacterial spores providing a defined resistance to a specified sterilization process.

Biological Monitoring: a monitoring process used to validate and audit sterilization process. Biological monitoring uses Biological Indicators.

Biomedical Waste: waste in health care facilities is divided into three categories: general, biological, and pathological. In Canada, biomedical waste does not include domestic waste. Legislation requires that biomedical waste be handled and disposed of in such a way as to avoid transmission of potential infections. The most obvious biomedical wastes in dental offices or clinics are disposable single-use sharps and gauze soaked with blood. Non-anatomical waste, such as liquid blood or body fluid drainage (e.g., IV tubing filled with blood) must also be disposed of as biological waste. Anatomical waste such as body parts (not including teeth) are classified as pathological waste and must be disposed of according to the regulations for handling pathological waste. All other waste such as general office waste, used gloves or non-sharp medical equipment, may be disposed of in regular waste and requires no special handling other than containment during disposal and removal.

Canadian Standards Association (CSA): a not-for-profit, non-statutory, voluntary membership association, engaged in standards development and certification activities. CSA standards reflect a national consensus of producers and users – including manufacturers, consumers, retailers, unions and professional organizations, and government agencies.

Chemical Indicator (CI): a test system that reveals a change in one or more predefined process variables based on a chemical or physical change resulting from exposure to the process.

Chemical Sterilant: chemicals used for the purpose of destroying all forms of microbial life including bacterial spores. High-Level Disinfectants (HLD) can be chemical sterilants but require different contact times.

Clean Hands: hands that have had appropriate hand hygiene.

Cleaning: the removal of contamination from an item to render it visually free of soil and quantified as below specified levels of the substance to be measured.

Clostridium difficile (C. difficile or "C. diff"): a bacterium that can cause symptoms (can also be asymptomatic and colonized) ranging from diarrhoea to life-threatening inflammation of the colon (Pseudomembraneous colitis). Illness from C. difficile most commonly affects older adults in hospitals or in long-term care facilities and typically occurs after use of antibiotic medications.

Competent: in relation to a person, means adequately qualified, suitably trained, and with sufficient experience to safely perform work without supervision or with only a minimal degree of supervision.

Contact Precautions: a type of Additional Precautions used in addition to Routine Practices to prevent transmission of infectious agents that are spread by direct or indirect contact with an infectious person or an infectious person's environment. Contact Precautions also apply where the presence of uncontained wound drainage, fecal incontinence or other discharges from the body suggest an increased potential transmission risk of pathogens by this route.

Contaminated: affected by the presence of a harmful substance on workers or at the work site in a quantity sufficient to pose a risk to health. As used in health care, the term generally refers to the presence of microorganisms on inanimate or animate objects that could be capable of producing disease or infection that could be transported on body surfaces such as hands, or in substances (e.g., food, water, milk).

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

Critical: part of the Spaulding Classification. Critical medical or dental devices or instruments are introduced directly into the human body, either into or in contact with the bloodstream or normally sterile areas of the body. These devices or instruments may be single-use disposable or may be designed to be reprocessed by sterilization. Examples of critical medical or dental devices include, but are not limited to, needles, syringes, scalpels and invasive/surgical instruments, all implantable devices, biopsy forceps and dental handpieces. These items create a substantial risk of acquiring infection if the item is contaminated with microorganisms at the time of use.

Critical Medical Device: a medical device that enters sterile tissues, including the vascular system.

Decontamination/Decontaminated: the process of cleaning, by use of physical and/or chemical means, to remove, inactivate, or destroy pathogenic micro-organism, in order to render an object safe for handling.

Dental Offices: any clinic, dental clinic, place, practice, office, health service, institution, including research and teaching settings, where a dentist provides dental services to patients.

Dental Health Care Personnel (DHCP): the variety of paid and unpaid personnel in the dental health-care setting who might be exposed to infectious materials, including body substances (blood, saliva, etc.) and contaminated supplies, equipment, environmental surfaces, water, or air. DHCP includes dentists, dental hygienists, dental assistants, dental laboratory technicians (in-office and commercial), nurses, students and trainees, contractual personnel, as well as other personnel that may not be directly involved in patient care but may be potentially exposed to infectious agents (e.g., administrative, clerical, housekeeping, maintenance, or volunteer personnel).

Dentist: a person who is a regulated member of the Alberta Dental Association and College. Under the Health Professions Act, all dentists are responsible for meeting the CDSA IPC Standards as a practitioner in their practice, as a dental facility owner in their office or mobile practice, as a dental operator in a Dental Surgical Facility, and as an employer when Dental Owner/operator of the. Dentists are health practitioners under the Health Professions Act.

Detergents: compounds that possess a cleaning action and have hydrophilic and lipophilic parts. Although products used for hand washing or antiseptic hand wash in a health-care setting represent various types of detergents, the term "soap" is commonly used to refer to such detergents in this context.

Direct Contact Transmission: physical transfer of microorganisms between an infected or colonized person and a susceptible host.

Disinfectant: chemical(s) used for disinfection, including high-level disinfectant (HLD), intermediate-level disinfectant (ILD), and low-level disinfectant (LLD).

Disinfection/Disinfect/Disinfected: the process to inactivate viable micro-organisms to a level previously specified as being appropriate for a defined purpose. (See definitions for high-level disinfection, intermediate-level disinfection, and low-level disinfection).

Drug Identification Number (DIN): a drug identification number (DIN) is an eight (8) digit numerical code assigned to each drug product marketed under the *Food and Drugs Act* and *Regulations*. A DIN identifies the following product characteristics: manufacturer, brand name, medicinal ingredients(s); strength of medicinal ingredient(s), pharmaceutical form, and route of administration.

Hand Hygiene: hand washing, hand antisepsis or other actions taken to maintain healthy hands and fingernails.

Hand Washing: a process for the removal of visible soil/organic material and transient microorganisms from the hands by washing with soap (plain or antiseptic) and water.

Hazard: a situation, condition or thing that may be dangerous to the safety or health of workers.

Hazard Assessment: an employer must assess a work site and identify existing and potential hazards before work begins at the work site. An employer must prepare a report of the results of a hazard assessment and the methods used to control or eliminate the hazards identified. An employer must ensure that the date on which the hazard assessment is prepared or revised is recorded on it. An employer must ensure that the hazard assessment is repeated at reasonably practical intervals when a new work process is introduced or when a work process changes.

Health Care Facility or Setting: a facility or setting in which a client receives health services including, but not limited to, the following: hospitals; ambulatory care clinics; urgent care services; non-hospital surgical facilities; mobile treatment centres; public health clinics; hospices; addiction and mental health clinics and facilities; private clinics delivering health services in community settings; settings where dental and dental hygiene services are provided; diagnostic imaging centres; laboratories; supportive living facilities (including but not limited to designated-supportive living); long-term care facilities (nursing homes and auxiliary hospitals); educational institutions; correctional centres; and private dwellings, when health services are provided in the client's home or another private dwelling such as a home-based business.

Hepatitis B Immune Globulin (HBIg): a product available for prophylaxis against hepatitis B virus infection. HBIg is prepared from plasma containing high titres of anti-HBs and provides short-term protection (3–6 months).

High Efficiency Particulate Air (HEPA) Filter: an air filter with an efficiency of 99.97% in the removal of airborne particles 0.3μm or larger in diameter.

High-Level Disinfectant (HLD): a chemical agent capable of killing bacterial spores when used in sufficient concentration under suitable conditions. Common high-level disinfectant solutions include glutaraldehydes, glutaraldehydes with phenols, high-concentration hydrogen peroxide, and hydrogen peroxide with peracetic acid.

High-Level Disinfection: a process capable of killing vegetative bacteria, mycobacteria (including *Mycobacterium tuberculosis*), fungi, and lipid and nonlipid viruses, as well as some, but not necessarily high numbers of, bacterial spores.

Immediate Use Steam Sterilization (IUSS): *a steam sterilization process designed and used for the sterilization of surgical devices when routine sterilization processes cannot be used.*

Immunity: protection against a disease using a person's immune system. Immunity is indicated by the presence of antibodies in the blood and can usually be determined with a laboratory test.

Immunization: the process by which a person becomes immune, or protected, against a disease either actively by vaccine or passively via administration of immune globulin. This term is often used interchangeably with vaccination or inoculation. However, the term "vaccination" is defined as the injection of a killed or weakened infectious organism in order to prevent the disease. Thus, vaccination, by inoculation with a vaccine, does not always result in immunity.

Implantable Device: a device or material that is placed into a surgically or naturally formed cavity of the human body that is intended to remain there for a period of 30 days or more.

In-use Shelf Life: The term "shelf life" of a drug slightly differs from a drug's "expiration date." The shelf life generally relates to a drug's quality over a specified period of time (i.e., once opened or diluted), whereas the expiration date relates to both quality and safety of a medication at a specific point in time. (i.e., the absolute date beyond which an unopened product must not be used).

Infection Prevention and Control (IPC): the discipline concerned with preventing health care associated infection.

Intermediate-Level Disinfectant (ILD): a liquid chemical germicide with a MDL from Health Canada, with a label claim of potency as a tuberculocidal.

Intermediate-Level Disinfection: a process capable of killing vegetative bacteria, mycobacteria (including *Mycobacterium tuberculosis*), fungi, and lipid and nonlipid viruses.

Installation Qualification/Installation: the process of obtaining and documenting evidence that equipment has been provided and installed according to its specification.

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

Low-Level Disinfectant (LLD): a liquid chemical germicide with a MDL from Health Canada, which has a label claim for potency against HIV and HBV if used for disinfecting clinical contact surfaces.

Low-Level Disinfection: a process capable of killing most vegetative bacteria and some fungi, as well as enveloped (lipid) viruses (e.g., influenza, hepatitis B and C, and HIV). Low level disinfection does not kill mycobacteria, non-enveloped viruses, or bacterial spores.

Manufacturer: a person (partnership, firm or association) who sells a medical device under their own name, or under a trade-mark, design, trade name or other name or mark owned or controlled by the person and with the respect to the medical device, is a responsible for the following: designing; manufacturing; assembling; processing labelling; packaging; refurbishing; modifying; assigning the medical device an intended purpose; or depending upon the class of the medical device, providing validated MIFU for reprocessing; whether those tasks are performed by that person or on their behalf. A manufacturer may also be a person or department who develops or modifies a medical device for use within the organization (but not for resale).

Manufacturer's Instruction for Use (MIFU): the validated, written directions provided by the manufacturer or distributor of a medical device or product, that contains the necessary information for the safe and effective use of the medical device or product.

Note: The term MIFU may also be used to refer to written instructions for use developed internally or by a commercial reprocessor, that have been validated by an approved laboratory.

Medical Device: any instrument, apparatus, appliance, material, or other article, whether used alone or in combination, including the software necessary for its proper application, intended by the manufacturer to be used for a human being for any of the following purpose of: diagnosis, prevention, monitoring, treatment, surgery or alleviation of disease; diagnosis, monitoring, treatment, or alleviation of, or compensation for, an injury or handicap; investigation, replacement or modification of the anatomy, or of a physiologic process; or control of conception, and that does not achieve its principal intended purpose in or on the human body by pharmacological, immunological, or metabolic means, but that can be assisted in its function by such means.

Notes:

1. *For the purpose of clarity and in alignment with the definitions of (medical) devices in the federal Food and Drugs Act and the Medical Devices Regulations, dental devices are considered medical devices.*
2. *For the purposes of these Standards, foot care devices are considered medical devices.*
3. *Under the Medical Devices Regulations, Health Canada licenses high-level disinfectants and sterilants used in the reprocessing of medical devices as medical devices. However, in the context of these Standards, the term "medical device" does not include high-level disinfectants and sterilants.*

Medical Device License (MDL): a license issued to a manufacturer by Health Canada, for a specific medical device.

Medical Device Reprocessing (MDR) Area: an area where the reprocessing of reusable critical and semi-critical dental or medical devices occurs. This includes centralized MDR departments, or any

area where reprocessing of reusable critical and semi-critical dental or medical devices takes place.

Methicillin Resistant Staphylococcus Aureus (MRSA): Staphylococcus aureus is a bacterium that may commonly live on the skin or in the noses of healthy people. MRSA is the term for Staphylococcus aureus that have become resistant to semi-synthetic penicillins, such as cloxacillin and methicillin. Clinically, MRSA infections generally start as small red bumps that resemble pimples, boils or spider bites. These can quickly turn into deep, painful abscesses that require surgical draining. Sometimes the bacteria remain confined to the skin, but they can also penetrate into the body, causing potentially life-threatening infections in bones, joints, surgical wounds, the bloodstream, heart valves and lungs.

Minimum Effective Concentration (MEC): the lowest concentration of a liquid chemical sterilant or disinfectant that achieves the claimed microbial activity.

Monitor: to observe, record, or detect an operation or condition with instruments or devices that have no effect upon the operation or condition. For IPC purposes, it also means to oversee, supervise or regulate (as does the CDSA). It also means to watch closely for purposes of control or surveillance.

Natural Product Number (NPN): a Health Canada NPN is assigned after Health Canada finishes assessing the product to ensure safety, efficacy, and quality. This 8-digit identifier number must appear on the principal panel of the NHP label. It indicates that Health Canada has reviewed and approved the health product for sale in the Canadian market.

Non-Critical Medical Device: a medical device, which either touches only intact skin but not mucous membranes or does not touch the client.

Occupational Health and Safety (OHS): a cross-disciplinary field that is concerned with protecting the physical, psychological, and social health and safety of people at work, preventing worker injury and illness, and considers both the worker and the work environment.

One-Way Workflow: the practice of ensuring that reprocessing workflows in one direction from the dirtiest to the cleanest.

Operational Qualification (OQ): the process of obtaining and documenting evidence that installed equipment operates within predetermined limits when used in accordance with its operational procedures.

Organization: an entity responsible for the management of a health care facility or setting.

Packaging: (verb) – a step in the sterilization process in which a medical device is enclosed in materials or a container designed to allow the penetration and removal of the sterilant during sterilization; and protect the medical device from contamination and other damage following sterilization and until the time of use.

Pasteurization: is a process that kills the pathogenic bacteria by heating to a certain temperature for a set period of time.

Performance Qualification (PQ): the process of obtaining and documenting evidence that the equipment, as installed and operated according to operational procedures, consistently performs according to predetermined criteria, and thereby yields product meeting its specification.

Personal Protective Equipment (PPE): equipment or clothing worn by a person for protection from health or safety hazards associated with conditions at a work site.

Policy: a document outlining an organization's plan or course of action.

Point-of-Care Risk Assessment: is a systematic process of reviewing work activities, evaluating the possible hazards/risks and implementing suitable control measures to eliminate, reduce or minimize the possible hazards/risks.

Potable (drinking) Water: water suitable for drinking, according to applicable public health standards.

Process Challenge Device (PCD): an item providing a defined resistance to a cleaning, disinfection, or sterilization process and used to assess performance of the process. A PCD should present a challenge to the process that is equal to or greater than the challenge posed by the most difficult item that is routinely sterilized. A biological test pack is an example of a PCD. A PCD can be commercially manufactured or prepared in-house following the PCD MIFU. An in-house PCD can be made with a cassette or bag that includes metal instruments, a BI and a Type 5 CI.

Prion: a protein particle that lacks nucleic acid and has been implicated as the cause of various neurodegenerative diseases (e.g., Creutzfeldt-Jakob disease, bovine spongiform encephalopathy, etc.). It is a pathogenic form of a neural protein that is both less soluble and more resistant to enzyme degradation than the normal form.

Pseudomembraneous colitis: a severe infection from C. difficile (see Clostridium difficile).

Reposable Medical Device: a medical device designated for a specific and limited number of uses by the manufacturer.

Reprocessing/Reprocess/Reprocessed: the cleaning, disinfection, and/or sterilization of a potentially contaminated dental instrument or device so that it is safe and effective for use on a patient.

Reusable Medical Device: a device that has been designed by the manufacturer, through the selection of materials and/or components, to be reprocessed and reused.

Routine Practices: the approach to infection control used to minimize or prevent exposure to microorganisms in health care facilities and settings, i.e., blood and body fluid, secretions, and excretions from all clients. Examples of routine practices include hand hygiene, point-of-care risk assessment, use of personal protective equipment, environmental cleaning, and waste and sharps handling.

Safety Data Sheet (SDS): a document that contains specified, required information about a hazardous product, including information related to the hazards associated with any use, handling or storage of the hazardous product in a workplace.

Semi-Critical Medical Device: a medical device that comes into contact with mucous membranes or non-intact skin but does not penetrate them.

Table of Contents Previous Recommendation Next Recommendation

Sharps: needles, knives, scalpels, blades, scissors, and other items that can cut or puncture a person, that may also be contaminated with a biohazardous material.

Single-Use/Disposable Medical Device: critical and semi-critical medical devices labelled by their manufacturers to be used only once. The manufacturer may use terms, including but not limited to the following, to designate a device for single-use only: disposable; consumable; not for re-use or do not re-use; discard after single-use; do not use twice; or by a symbol such as:

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.

Spaulding Classification: a system for sterilization or disinfection of inanimate objects and surfaces based on the degree of risk involved in their use. The three categories are critical, semi-critical, or non-critical. The system also established three levels of germicidal activity for disinfection (high, intermediate and low).

Standard Operating Procedure (SOP): a thorough, step-by-step documentation of a procedure.

Note: The objectives of an SOP are to:

a) *define the system of information and control;*
b) *minimize the risk of misinterpretation and error inherent in oral or casually written communication;*
c) *provide unambiguous procedures to be followed and the order in which they should be performed; and*
d) *provide confirmation that process parameters have been achieved.*

Sterilant: a liquid chemical germicide or high-level disinfectant that destroys all forms of microbiological life, including high numbers of resistant bacterial spores.

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

Sterile Water: water that is sterilized and is free from viable micro-organisms. (Distilled water is not necessarily sterile or pyrogen-free).

Sterilization/Sterilize/Sterilized: the validated process used to render a product free from viable microorganisms.

Substantive: a products ability to shift microbial baseline levels on the hands progressively downwards when the product is used repeatedly over time. This property results from product adherence to the stratum corneum layer of the skin, inhibiting microbial recolonization.

Surfactants: surface-active agents that reduce surface tension. Surfactants help cleaning by loosening, emulsifying, and holding soil or bioburden in suspension, which can then be more readily rinsed away.

Transmissible Spongiform Encephalopathies (TSEs): a group of rapidly progressive, invariably fatal, degenerative neurological disorders affecting both humans and animals that are caused by infection with prions (see Creutzfeldt-Jakob disease and prion).

Transmission: the transfer of microorganisms from source to host in the infection chain. Transmission of infection during the provision of health care requires three elements: a source of infecting microorganisms in sufficient quantities and sufficient virulence to cause infection, a susceptible host, and a means of transmission for the microorganism.

Ultrasonic Cleaner: a device that uses waves of acoustic energy (a process known as "cavitation") to loosen and break up debris on instruments.

Validation/Validated: a confirmation process, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled.

Notes:

1. *The objective evidence needed for validation is the result of a test or other form of determination such as performing alternative calculations or reviewing documents.*
2. *The term "validated" is used to designate the corresponding status.*
3. *The use conditions for validation can be real or simulated.*

Ventilation: the process of supplying and removing air by natural or mechanical means to and from any space; such air may be conditioned.

Workplace Hazardous Materials Information System (WHMIS): Canada's national hazard communication standard. The key elements of the system are cautionary labeling of containers of WHMIS "controlled products", the provision of Safety Data Sheet (SDS), (formerly referred to as Material Safety Data Sheet [MSDS]) and worker education and training programs. WHMIS requirements place an onus on employers to ensure that controlled products used, stored, handled

or disposed of in the workplace are properly labeled, SDS are made available to workers, and workers receive education and training to ensure the safe storage, handling and use of controlled products in the workplace.

Work Practice Controls: practices or behaviours incorporated into the everyday work routine that reduce the likelihood of exposure by altering the manner in which a task is performed in order to reduce the likelihood of injury (e.g., identifying contaminated sharps prior to clean up, not recapping needles by a two-handed technique, not passing contaminated sharps during four-handed dentistry, etc.

Charts
Spaulding Classification and Managing Contaminated Surfaces

Patient Care Items – Modified Spaulding Classification

Spaulding's description	Type of contact	Risk of infection	Reprocessing level required	Management	Examples
Critical	Penetrates soft tissue or bone	High	Sterilization	Items that are not single- use disposable must be sterilized and stored wrapped until point of use. Single-use disposable items must not be re-processed.	Air/water syringe tips Anaesthetic syringes Endodontic instruments, including files (hand and rotary), reamers, and broaches Handpieces Instrument trays Metal Matrix Bands Mouth mirrors (when used during a procedure where tissue is cut or manipulated) Orthodontic Bands Periodontal instruments including ultrasonic tips Polishing cups, points and mandrels Restorative / operative instruments Rotary burs and diamonds Rubber dam clamps Scalers Stainless Steel Crowns Surgical instruments Surgical suction tips
Semi-Critical	Touches intact mucous membrane or non-intact skin	Moderate	High-level Disinfection (HLD)	Items that are not single-use disposable, must be sterilized, may be stored unwrapped in a clean, dry, covered area and handled with clean hands or forceps. Single-use disposable items must not be re-processed. Heat-sensitive items must receive high-level disinfection between patient use.	Articulating ribbon holder Cotton rolls Crown removing instruments Impression trays Lab burs Mouth mirrors (when used for examination only) Mixing spatula Nasal hoods Orthodontic pliers Rubber dam frame Rubber dam and rubber dam clamp forceps Suction tips other than for surgery Wedges
Non-Critical	Contacts intact skin only	Low	Intermediate- or Low-level Disinfection (LLD)	Items must be disinfected between uses.	Blood pressure cuffs Curing lights Face bows Intra-oral camera and radiograph sensors Laboratory knives and spatulas Rubber dam punch Shade guides

Table of Contents Previous Recommendation Next Recommendation

Environmental Surfaces

Category	Description	Management	Examples
Clinical Contact Surfaces	Direct contact with DHCP hands, patient-care items or patient skin	Protect with barriers, or clean then tuberculocidal low-level disinfection if contaminated.	Dental chairs Dental units and countertops Doorknobs Drawer and cupboard handles Light handles Radiograph equipment
Housekeeping Surfaces	Inadvertent contact with DHCP hands, patient-care items or dental appliances	Periodic cleaning, or clean and low-level disinfection if blood/saliva spills, splashes or otherwise contaminated.	Floors Sinks Walls

Note: The examples given are for illustration only and these lists are not to be considered exhaustive. 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. DHCPs must use professional judgment for every instrument, device, and surface for their specific practices to ensure that the Standards are being met.

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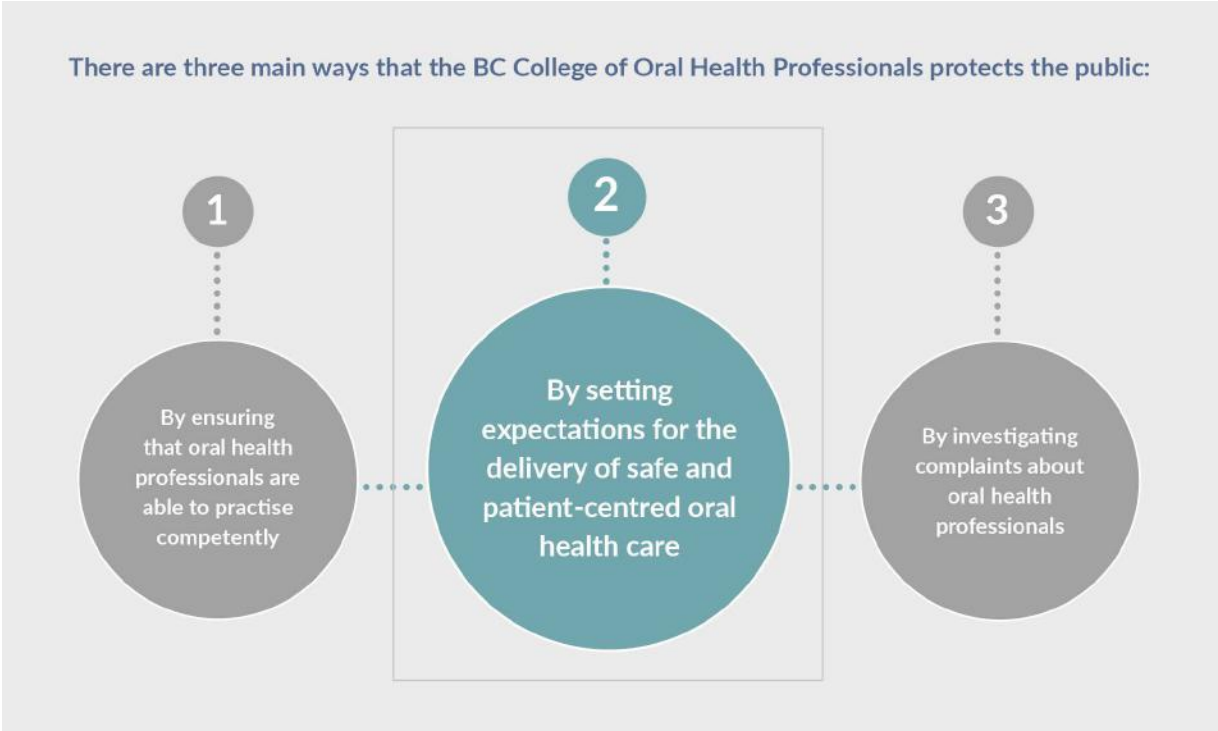
Expectations for clinical and ethical practice

SUGGESTED INFECTION PREVENTION & CONTROL MEASURES FOR DENTURISTS

Applies to Denturists



The British Columbia College of Oral Health Professionals (BCCOHP) was created on September 1, 2022 through the amalgamation of four health regulatory colleges: the College of Dental Hygienists of BC, the College of Dental Surgeons of BC, the College of Dental Technicians of BC, and the College of Denturists of BC. All current requirements for standards of clinical and ethical practice issued by the four colleges remain in place upon amalgamation. This document was created by the College of Denturists of BC and will be updated to reflect the amalgamation.

SUGGESTED INFECTION PREVENTION & CONTROL MEASURES FOR DENTURISTS

V.2 – APPROVED AUG. 8/9, 2019

Developed by The Denturist Association of Canada

Table of Contents

Disclaimer....3
Introduction....3
Standard Precautions....5
Hand Hygiene....5
Protective Equipment (PPE)....6
Protective Draping....6
Eye Wear....6
Gloves....6
Latex sensitivity and allergies....7
Masking....7
Immunization....7
Respiratory Hygiene/Cough Etiquette....9
Reprocessing Room/Area....9
Cleaning, Disinfecting and Sterilization of Patient Care Items....9
General Considerations....10
Processing of Critical and Semi-Critical Items....11
Receiving, Cleaning and Disinfecting....11
Preparation and Packaging....11
Sterilization....12
Storage....13
Sterilization and Unpackaged Items....13
Storing of Products/Materials....14
Processing Heat-sensitive Items....14
Processing Non-Critical Items....14
Equipment Use and Preventative Maintenance....14
General Considerations....14
Clinical Contact Surfaces....15
Housekeeping Surfaces....16
General Office Waste....16
Properly Using a sharps container....16
Dental Unit Water Lines....16
Dental Hand pieces and Other Intra-Oral Devices....17
Single-Use Devices....17
Dental Laboratory Asepsis....17
General Aseptic Technique....18
Education and Training....19
Illness and Work Restrictions....19
Glossary of Terms....20
Citations:....22

The Denturist Association of Canada
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Suggested Infection Prevention and Control Measures for Denturists V.2., Approved August 8/9, 2019

Disclaimer

The sample documents below of the **Suggested Infection Prevention and Control Measures for Denturists** are provided for general information purposes only. Your use of any of these documents is at your own risk, and you should not use any of these documents, without first researching the protocols set out by your governing bodies in your province.

Introduction

Denturists 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.

Denturists must maintain current knowledge of infection prevention and control procedures and apply and maintain them appropriately and consistently. To this end, it is the Denturist's responsibility to ensure that staff are adequately trained in infection prevention and control procedures, and that the necessary supplies are available, fully operational, up to date and routinely monitored for efficacy.

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

The goal of an infection control program is to prevent the transfer of pathogens between contaminated items and between contaminated items and individuals.

Key Administrative Recommendations for Denturist Practices:

1. Develop and maintain infection prevention and occupational health and safety programs.
2. Provide supplies and training necessary for adherence to standard precautions (e.g. hand hygiene products, safer devices to reduce percutaneous injuries, personal protective equipment).
3. Assign at least one individual trained in infection prevention and control responsibility for coordinating the program.
4. Develop and maintain written infection prevention and control policies and procedures appropriate for services provided by the practice and based on evidence-based guidelines, regulations, or standards.

All Oral Health Care Professionals hold the responsibility of infection control. Historically, the profession of dentistry has been at the forefront of developments in infection control in ambulatory health care settings. Due to the biologic and microflora realities of the oral environment, creating a medical surgical operating room level of sterility is not necessary. Furthermore, it is virtually impossible to provide dental care in a completely sterile environment but it is necessary to strive to efficiently create an environment which is as pathogen free as possible.

Transmission of infections among patients in denture clinic settings is rare. However, from 2005 to 2015, transmission in dental settings, including patient to patient transmissions has been documented. In most cases, investigators failed to link a specific lapse of infection prevention and control with a particular transmission.

However, reported breakdowns in basic infection procedures included failure to heat sterilize dental hand pieces between patients and failure to monitor autoclaves (eg. Conduct spore testing).

Transmission of Micro-organisms

Understanding the modes of transportation of infection is necessary for designing and implementing effective infection prevention and control strategies.

Denture patients and Denturists can be exposed to pathogenic micro-organisms including viruses (e.g. HBV, HCV, HIV, human herpes group of viruses, human papilloma virus), bacteria (e.g. mycobacterium, tuberculosis, staphylococci, streptococci) and other microbes that colonize or infect the oral cavity and respiratory tract.

In the Denturist office, the three main modes of transmission of micro-organisms are;

Direct Transmission – direct physical contact with blood, oral fluids or other materials.

Indirect Transmission – contact with an intermediate contaminated object such as dental instrument, equipment or an environmental surface.

Droplet Transmission – contact of oral, nasal or conjunctival mucosa with droplets, spatter or spray containing micro-organisms generated from an infected person, such as by coughing, sneezing or talking.

Standard Precautions

Standard precautions are the minimum infection prevention practices that apply to all patient care, regardless of suspected or confirmed infection status of the patient, in any setting where health care is delivered. These practices are designed both to protect the Denturist and prevent oral health care providers from spreading infections between patients.

Standard precautions include;

- Hand Hygiene
- Use of personal protective equipment (PPE) (e.g. Gloves, masks)
- Immunizations
- Respiratory hygiene/cough etiquette
- Sterile instruments and devices
- Clean and disinfected environmental surfaces

Each element of standard precautions is described in the following sections.

Note: When standard precautions alone cannot prevent transmission, they are supplemented with Transmission Based Precautions. This second tier of infection prevention is used when patients have diseases that can spread through contact, droplet or airborne routes (skin contact, sneezing or coughing) and are always used in addition to standard precautions.

Hand Hygiene

Hand hygiene is the single most important measure to prevent the spread of infections among patients and Denturists.

For routine examinations and procedures, use water and plain handwashing soap or antimicrobial soap specific for health care settings or use an alcohol-base hand rub. Although alcohol-based hand rubs are effective for hand hygiene in health care settings, soap and water should be used when hands are visibly soiled. For all types of hand hygiene products, follow the manufacturer's instructions. If hands are not visibly soiled, the use of 70 – 90% alcohol-based hand rub is the preferred method to perform hand hygiene.

This includes;

- Before and after direct contact with individual patients;
- After contact with environmental surfaces, instruments or other equipment,
- After contact with laboratory materials or equipment,
- Before eating or drinking,
- After personal body functions.

Liquid soap should be provided in disposable pump dispensers. Bar soap should **NOT** be used. Hand lotions to prevent dry or cracked skin should also be available in disposable dispensers. Petroleum based hand lotions should **NOT** be used because they can affect glove integrity. To avoid contamination, disposable pump dispensers should be discarded and **NOT** refilled.

Despite perceptions to the contrary, alcohol-based hand rubs have been shown to be less irritating than soap and water.

Hand Hygiene facilities should be located as close as possible to operatories and preferably in sight of the patient.

- Soap dispensers should be placed at every sink.
- Alcohol-based hand rub should be strategically placed for ease of use.
- Disposable towels should be readily available at each location.
- A hand-sink should **NOT** be used for any other purpose. Do **NOT** clean equipment or discard waste in the hand sink. Always keep equipment away from the sink to avoid contamination.

Protective Equipment (PPE)

Denturists wear personal protective equipment to help protect themselves from exposure to potentially infectious material. This also protects patients by preventing the Denturist from becoming a vector for the transmission of micro-organisms from patient to patient.

Protective Draping

Single use bibs or drapes should be used to protect patients clothing and reduce their exposure to spatter and debris during oral procedures. Single use strips may be used to secure bibs and drapes, in place of reusable daisy chaining.

Eye Wear

Large particle droplets of water, saliva, blood, micro-organisms and debris are created by the use of dental hand pieces, 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 countertop and equipment, as well as the Denturist and patient (and patient representative, if present).

The face of the Denturist should be protected from spatter and debris during treatment procedures, in the laboratory and in the sterilization and disinfection area when mixing and pouring chemicals.

- Protective eyewear must be made of high-impact plastic and designed to provide complete coverage over and around the eyes, including solid (not vented) side shields.
- Face shields are recommended if side shields are not used.
- Protective eyewear is placed before patient treatment and removed with gloves in place after treatment.
- The eyewear can remain in place but should not be touched with ungloved hands.
- Protective eyewear should be disinfected after use.
- Protective eyewear should be made available upon request to each patient and disinfected after use.

Gloves

Gloves are worn to protect the Denturist's hands 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.

- Gloves must be worn when contact with mucous membranes, non-intact skin or bodily fluids is anticipated.
- The same pair of gloves should 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 then hand hygiene must be used.
- Gloves should not be worn outside any room or area where they are required for personal protection.
- Gloves must **NOT** be washed and re-used.

- Double gloves may be utilized for some specific procedures which may involve the handling of multiple instruments or during longer appointments. However, if used, double gloving should be procedure specific not patient specific.

Latex sensitivity and allergies

In addition to being the appropriate size, gloves must not be irritating to the skin. Some individuals might have sensitivity to or even allergies to chemicals used in glove manufacturing, the powder used inside the glove, or to the naturally occurring latex proteins in latex gloves.

Reactions may range from irritant contact dermatitis to an actual allergic response. Not all reactions are due to latex exposure. It is important to have any reaction definitively diagnosed.

Not only gloves, but other dental products may contain latex, such as dental dams and the straps on face masks. It is important to identify all latex containing products so they can be replaced with non-latex materials or avoided when a patient or staff is allergic.

Masking

The use of an approved face mask will protect the Denturist from micro-organisms during various dental and laboratory procedures. It prevents them from inhaling and exhaling potentially infectious materials to and from the patient. The mask is an effective barrier until it becomes wet. The mask changes when soaked with moisture, reducing its filtration ability and may actually draw moisture to them.

- The best masks are those that have bacterial filtration efficiency (BFE) of at least 95% of small particles that directly contact the mask.
- A proper fit is required for both comfort and barrier efficiency.
- Masks should be changed with each patient or when they become wet. There are no recommended timeframes for mask changing, however, by using logic in considering the patient situation, you may then judge when a mask needs to be changed. If a plastic face shield is worn, the appropriate face mask should be worn.
- The mask should be donned before the gloves for ease of placement.
- The mask is adjusted to facial configurations for proper adaptation.
- A mask should not be allowed to hang below the Denturist's chin after use; complete removal of the mask is recommended.

Immunization

Immunizations substantially reduce the Denturist's susceptibility to infectious disease, 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.

It is generally accepted that the Denturist is far more at risk from Hepatitis B virus, or HBV, than from the human immunodeficiency virus (HIV) that causes AIDS. However, because of increasing acceptance of the HBV vaccine among practicing Denturists in recent years, the risk of HBV infection is generally limited to those who have not been vaccinated. Patients with Hepatitis or who are HBV carriers can be treated safely or with minimal risk of transmission of disease in the Denturist's clinic when infection control procedures are used. HIV appears to be much more difficult to transmit than HBV but there is confidence that the same procedures will prevent transmission of HIV in the Denturist's clinic.

All Denturists should be adequately immunized against the following diseases;

- Hepatitis B
- Measles
- Mumps
- Rubella
- Varicella
- Influenza
- Diphtheria
- Pertussis
- Tetanus
- Polio

It is important that all Denturists know their personal immunization status and ensure that it is up to date. All Denturists should consult with their family physician about the need for immunizations, as well as tuberculous skin testing. In addition, the Canadian Immunization Guide sets out recommendations and schedules for adults, including those in the provision of oral 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 of blood and other bodily fluids, and the contagiousness of Hepatitis B Virus (HBV). Therefore, immunization against HBV is strongly recommended for all Denturists who may be exposed to blood or bodily fluids.

Management of Exposure Includes:

- General wound care and cleaning;
- Counselling of the exposed worker regarding blood borne pathogens;
- Source patient testing, if possible, for HBV, HCV and HIV (of course the consent of the source patient is required);
- Documentation of the incident with a review of the cause to determine if such exposures can be prevented in the future;
- Post-exposure assessment and prophylaxis for the worker, if indicated;
- Baseline and follow-up serology of the worker, if indicated.

A person who is competent in the management of exposure to blood borne pathogens should carry out the post-exposure assessment. Transmission of Hepatitis B carries the greatest risk for the non-immune worker. Those that have not been immunized should begin a vaccine series at the first assessment. Hepatitis B immune globulin (HBIG) should be given within 72 hours if the source patient is positive for Hepatitis B surface antigen. Workers who have completed the vaccine series and who have not been documented to have mounted an adequate antibody response should be tested following an exposure to ensure they are immune. Those that have responded to the vaccine can be considered immune. Workers exposed to Hepatitis B that do not have immunity at the time of the exposure and who have not previously displayed a response to Hepatitis B immunization should receive a dose of HBIG and another series of the vaccine.

Exposure to HIV infected blood is uncommon in the Denturist setting and the risk of transmission is low. However, issues surrounding transmission of this pathogen tend to result in the greatest anxiety following exposure to blood. Exposure is considered significant if it involves blood or other body fluids. HIV does **NOT** transgress intact skin. Thus, blood or body fluids must penetrate the skin or come into contact with the mucous membranes or broken skin. The risk of transmission increases with depth of exposure, degree of contamination of the penetrating device and level of virus in the source blood.

Antiviral prophylaxis for one month following workplace exposure to HIV provides a 5-fold reduction in the risk of transmission. Drug toxicity generally limits the use of this approach to incidents in which the source patient is known to be positive or is at high risk of infection.

Antiviral drugs should be initiated within 2 hours of exposure, if possible. Rapid screening (within 24 hours) of the source patient is possible in most populated areas. Workers with documented exposure to HIV require 6 months of follow-up to rule out infection.

Unfortunately, no vaccines or prophylactic drug treatments prevent the transmission of Hepatitis C. For those who have had significant exposure, baseline liver enzymes should be recorded and Hepatitis C serology should be carried out with repeat testing at 6 weeks, 3 months and 6 months. People whose liver enzymes become elevated or have a positive antibody test should be urgently referred to a specialist in managing Hepatitis C.

Respiratory Hygiene/Cough Etiquette

Respiratory hygiene/cough etiquette infection prevention measures are designed to limit the transmission of respiratory pathogens spread by droplet or airborne routes. The strategies target primarily patients and individuals accompanying patients to the Denturist office who might have undiagnosed transmissible respiratory infection, but also apply to anyone (including all Oral Health Care Providers) with signs of illness including cough, congestion, runny nose or increased production of respiratory secretions.

Staff should be educated on preventing the spread of respiratory pathogens when in contact with symptomatic persons. Respiratory hygiene and cough etiquette were added to Standard Precautions in 2007.

Key Recommendations

- Implement measures to contain respiratory secretions in patients and accompanying individuals who have signs and symptoms of a respiratory infection, beginning at the point of entry and continuing throughout the visit.
- Provide tissues and no-touch receptacles for disposal of tissues.
- Provide area for performing hand hygiene in or near waiting areas.
- Offer masks to coughing patients and other symptomatic persons when they enter the Denturist setting.
- Provide space and encourage persons with symptoms of respiratory infection to sit as far away from others as possible.
- Educate all staff on the importance of infection prevention measures to contain respiratory pathogens when examining caring for patients with signs and symptoms of respiratory infection.

Reprocessing Room/Area

The reprocessing room/area must have designated clean and dirty areas with enough space to clean the instruments and tools as well as to lay the clean instruments and tools out once they have been cleaned and sterilized. The floors in your reprocessing room must also have slip proof flooring that can be cleaned and mopped with hospital grade disinfection products. Your reprocessing room must also follow the hand hygiene protocols which include a sink for washing hands, an easily accessible liquid hand soap dispenser and either an alcohol-based hand sanitizer dispenser or a hand sanitizer bottle for hand disinfection. Disposable towels should also be readily available for the staff to dry their hands with.

Cleaning, Disinfecting and Sterilization of Patient Care Items

Instrument processing requires multiple steps using specialized equipment. Each practice should have policies and procedures in place for containing, transporting and handling instruments and equipment that may be contaminated with blood or body fluids. Manufacturers' instructions for reprocessing re-useable instruments and equipment should be readily available – ideally in or near the reprocessing area. Most single-use devices

are labelled by the manufacturer for only a single use and do not have reprocessing instructions. Use single-use devices for one patient only and dispose of appropriately.

Cleaning, disinfection and sterilization of dental equipment should be assigned to staff with training in the required processing steps to ensure processing results in a device that can be safely used with a patient. Training should also include the appropriate use of personal protective equipment necessary for safe handling of contaminated equipment.

General Considerations

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

- Preventing transmission of micro-organisms to Denturists, staff 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 should be properly cleaned, rinsed and dried prior to either disinfection or sterilization. This step is essential as residual organic debris will compromise the sterilization or disinfection process.

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.

Critical items such as surgical instruments and periodontal scalers are those used to penetrate soft tissue or bone. They have the greatest risk of transmitting infection and should always be sterilized using heat.

Semi – Critical items (e.g. mouth mirrors, amalgam condensers, and reusable dental impression trays) are those that come in contact with mucous membranes or non-intact skin (e.g. exposed skin that is chapped, abraded, or has dermatitis). These items have a lower risk of transmission. Because the majority of these semi-critical items are heat tolerant, they should also be sterilized using heat. If a semi-critical item is heat sensitive, it should be replaced with a heat-tolerant or disposable alternative. If none are available, it should, at a minimum be processed using high level disinfection.

Table of Contents Previous Recommendation Next Recommendation

Dental hand pieces and associated attachments, including low speed motors and reusable prophylaxis angles, should always be heat sterilized between patients; not with high-level or surface disinfectant. Although these items are considered semi-critical, studies have shown that their internal surfaces can become contaminated with patient materials during use. If these devices are not properly cleaned and heat sterilized, the next patient may be exposed to potentially infectious materials.

Non-critical patient care items that only contact intact skin pose the least risk of transmission of infection. In the majority of cases, cleaning, or if visibly soiled, cleaning followed by a low-level disinfectant is adequate. Protecting these surfaces with disposable barrier might be a preferred alternative.

Cleaning to remove debris and organic contamination from instruments should always occur before disinfection or sterilization. If blood, saliva and other contamination are not removed, these materials can shield micro-organisms and potentially compromise the disinfection or sterilization process. Automated cleaning equipment (e.g. ultra-sonic cleaner, washer-disinfector) should be used to remove debris to improve cleaning effectiveness and decrease worker exposure.

Processing of Critical and Semi-Critical Items

To achieve sterilization, the processing of instruments 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 re-use on patients.

All instruments should be processed in a central area 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;
- Storage.

Receiving, Cleaning and Disinfecting

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.

Cleaning involves the removal of debris (organic and inorganic matter). This is achieved by scrubbing with a surfactant, detergent and water, or by an automated process (e.g. ultrasonic cleaner or washer with a cleaning solution). After cleaning, instruments should be rinsed with water to remove detergent residue and visually inspected to ensure all debris have been removed.

The use of automated cleaning equipment can increase productivity, improve cleaning effectiveness and decrease worker exposure to blood and body fluids. 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 or more often if they become visibly soiled. Automated washers do not require pre-soaking or scrubbing of most instruments. If cleaning cannot be performed immediately, instruments should be placed in a puncture-proof container and soaked with a detergent or enzymatic cleaner to prevent the drying of organic material and make subsequent cleaning easier and less time consuming. Liquid chemical sterilant or high-level disinfectants 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.

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 should be processed in a manner that will maintain sterility during storage. Suitable packaging materials include wrapped perforated instrument cassette, peel pouches of plastic or paper, and woven or non-woven sterilization wraps. Packaging materials should be designed for the type of sterilization process being used. Hinged instruments should be processed open and unlocked.

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 steamed under pressure (i.e. autoclaving) which is dependable and economical. 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 used.

Instrument packs should be allowed to dry inside the sterilization chamber before removing and handling, in order to avoid wicking of moisture and hence, contamination with bacteria of hands.

Monitoring of sterilization must be conducted through a combination of mechanical, chemical and biological means, which evaluate both the sterilization conditions and the procedures effectiveness.

The information in this section represents best practices and is consistent with the recommendations of Infection Prevention and Control Canada (IPAC) and the Canadian Standards Association (CDA).

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. If your current sterilizer does not have this ability, it is recommended that you upgrade your current sterilizer or purchase a new one.

2. Chemical indicators are sensitive chemicals used to assess physical conditions during the sterilization process. For example, heat-sensitive tape applied to the outside of a package changes color 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 sterilization agent has more difficulty penetrating a hollow object, such as a hand piece, 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 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 of the package.

3. Biological indicators (BI or spore test) are the most accepted means for monitoring sterilization because it directly assesses the procedures effectiveness in killing the most resistant micro-organisms. 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.

Include a BI each day a sterilizer is used. 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.

In the event of a positive BI (e.g. 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 mechanical failure, common reasons for a positive BI include overloading, failure to provide adequate package separation, and using incorrect or excessive packaging material.
- Repeat the spore test immediately. This should be done after addressing 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 repeat spore test is negative, and mechanical and chemical indicators demonstrate adequate processing, then the sterilizer can be brought back into service following three consecutive negative tests.
- If the repeat spore test is positive and all stabilization 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 the 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 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 should be cleaned, packaged and sterilized again.

Sterilization and Unpackaged Items

An unpackaged cycle (sometimes called flash sterilization) is a method for sterilizing patient care items for immediate use. Unpackaged sterilization should only be used under certain conditions;

- Thorough cleaning and drying of instruments preceded 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 be 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 should be used immediately or within a short time. Storage, even temporary, of unpackaged semi-critical instruments is discouraged 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 the biological monitoring are known. Accordingly, unpackaged or flash sterilization of implantable items is inadequate and must **NOT** be used.

Storing of Products/Materials

Offices/Clinics should have two separate refrigerators: one for storing of products/materials and one for storing food such as lunches. If the office/clinic is too small to accommodate two refrigerators, the products/materials must be stored separately (such as the crispers) from the food and must be clearly labelled as to what it is.

Processing Heat-sensitive Items

Semi-critical items that are heat-sensitive should be cleaned and then receive high-level disinfection, which may be achieved by immersion in liquid chemical germicide.

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 vapor release, adequate ventilation, chemically resistant gloves, aprons, goggles and face shields.

Following liquid immersion, instruments should be thoroughly rinsed with tap or distilled water to remove toxic or irritating residues then dried with lint-free, clean towels. Liquid chemical germicides should NOT be used for application other than indicated in their label instructions, and they should **NOT** be used as an environmental surface disinfectant or instrument holding solution.

The majority of semi-critical items used in dentistry are available in heat – tolerant or disposable alternatives. Avoid the use of heat-sensitive semi-critical items that must be processed with liquid high-level disinfectant.

Table of Contents Previous Recommendation Next Recommendation

Processing Non-Critical Items

Non-critical items 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 micro-organisms. Non-critical items should be cleaned after use, or if contaminated, cleaned and then disinfected with an appropriate low-level disinfectant.

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

Equipment Use and Preventative Maintenance

Tabletop sterilizers undergo frequent use, wear and tear. The manufacturers' recommendations should be consulted for guidance on a preventative maintenance program, including regular inspections of gaskets and seals.

General Considerations

Policies and procedures for routine cleaning and disinfection of environmental surfaces should be included as part of the infection prevention plan.

Cleaning removes large numbers of micro-organisms from surfaces and should always precede disinfection. Disinfection is generally a less lethal process of microbial inactivation (compared with sterilization) that eliminates virtually all recognized pathogenic micro-organisms but not necessarily all microbial forms (e.g. bacterial spores).

Emphasis for cleaning and disinfection should be placed on surfaces that are most likely to become contaminated with pathogens, including clinical contact surfaces (light handles, bracket trays, switches on dental units, computer equipment), in the patient care area. When these surfaces are touched, micro-organisms

can be transferred to other surfaces, instruments or to the nose, mouth or eyes of the Denturist or patient. Although hand hygiene is the key to minimizing the spread of microorganisms, clinical contact surfaces should be barrier protected or cleaned and disinfected between patients. Disinfectant products should **NOT** be used as cleaner unless the manufacturer's label indicates the product is suitable for such use. Manufacturers' recommendations should always be followed when using products selected for cleaning and disinfection.

Housekeeping surfaces (e.g. floors, walls, sinks) carry less risk of disease transmission than clinical contact surfaces and can be cleaned with soap and water or cleaned and disinfected if the area is visibly contaminated with blood.

Environmental surfaces are divided into clinical contact surfaces and housekeeping surfaces;

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 procedures or by contact with the Denturist's gloved hands or contaminated instruments.

Examples of clinical contact surfaces are;

- Chair controls and switches
- Light handles and switches
- Chairside computers, monitors and keyboards
- Reusable containers of materials
- Drawer and faucet handles
- Countertops
- Pens
- Telephones
- Door knobs

Clinical contact surfaces should be cleaned and disinfected between patients and at the end of the work day using an appropriate low-level disinfectant. To facilitate this, treatment areas should be well organized and kept clear 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 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 barriers include:

- Clear plastic wrap
- Plastic bags
- Plastic sheets
- Plastic tubing
- Plastic baked paper
- Other moisture-proof materials

Since barriers can become contaminated during procedures, they should be removed and discarded between patients. 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 replaced prior to the next patient.

Housekeeping Surfaces

Housekeeping surfaces, such as floors and walls have a limited risk of disease transmission. Accordingly, these surfaces usually only require periodic cleaning with diluted detergents. If a surface is suspected of becoming contaminated with blood, saliva or other bodily fluids, it should be cleaned first and then disinfected with appropriate low-level disinfectant. Gloves should be worn for this procedure.

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 reused. 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 micro-organisms can be minimized.

Carpeting and cloth furnishings are difficult to clean and cannot be reliably disinfected. They should not be used in patient treatment or instrument processing areas; however, plastic hard liners overtop of carpet would be acceptable.

General Office Waste

General office waste is no more infective than residential waste. Therefore, the majority of soiled items generated in Denturists' offices do not require any special disposal methods, other than careful containment and removal. Some recommendations for all types of general office waste include;

- Ensure that all garbage containers are water-proof and have tight-fitting lids, preferably operated by a foot pedal. Open waste baskets may 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 of the bag is visibly soiled.
- Do not overfill garbage containers.
- Do not place sharp, hard or heavy objects in plastic bags that could cause them to burst.

Properly Using a sharps container

Sharps Containers are a puncture resistant container that are designed for the use of properly disposing of syringes and needles, scalpel blades and all other sharp items. Health Canada - cleared sharps disposal containers are made from rigid plastic and come marked with a line that indicates when the container should be considered full, which means it's time to dispose of the container. Sharps containers should be placed as close as possible to the area where these items will be used. Sharps containers should be disposed of according to your provincial and local regulated medical waste rules.

Key Recommendations

- Any sharp items that have been contaminated with patient blood and/or saliva are considered potentially infected.
- Do not recap any used needles.

Place the used disposable syringes, needles, scalpel blades or any other sharp items in the appropriate puncture-resistant container.

Dental Unit Water Lines

Dental unit water lines are made of narrow-bore plastic tubing that can carry water to hand pieces, ultra-sonic instruments and air/water syringes. They become heavily colonized with water-borne micro-organisms,

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 micro-organisms are not necessarily dangerous to the general population unless the patient or the Denturist is a susceptible host. This includes persons who are immunocompromised (e.g. persons living with HIV, persons undergoing oncology treatment or organ transplant procedures), and those with cystic fibrosis, chronic bronchitis and bronchiectasis.

The potential risk of infection from dental unit water lines can be effectively reduced to counts similar to those in potable water standards by following regular water line maintenance procedures.

Dental Hand pieces and Other Intra-Oral Devices

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

- High and low speed hand pieces;
- Prophylaxis angles;
- Ultrasonic and sonic instruments;
- Air abrasion devices;
- Air/water syringe tips

These devices have the potential of retracting oral fluids into their internal compartments, which 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 water lines, these devices should be activated to discharge air and water for a minimum of 20 to 30 seconds after each patient use.

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

Single-Use Devices

Single-use (i.e. disposable) are designed to be used on one patient and then discarded and not to be reprocessed and used on another patient (examples include prophylaxis cups and brushes). 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 not usually heat-tolerant and cannot be reliably cleaned or disinfected. Therefore, they should be disposed of appropriately after use.

Table of Contents Previous Recommendation Next Recommendation

Dental Laboratory Asepsis

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

Effective communication and co-ordination between the Denturist and the commercial laboratory will ensure that:

- Appropriate cleaning and disinfection procedures are performed in the office or the laboratory;
- Materials are not damaged or distorted because of over-exposure to disinfectants;
- Disinfection procedures are not unnecessarily duplicated.

Impressions, prosthesis and 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 manufacturers' 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 transport to a commercial laboratory and / or in-house laboratory.

Heat tolerant items used in the mouth, such as impression trays or face bow 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.

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 lab or the dental office.
Items used in the typical in-office 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.

General 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 procedure. Infection is usually the result of the patient's own 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 sterilized instruments as they are unwrapped and preventing sterile instruments from being contaminated from environmental sources.

For minor dental procedures, hand hygiene is performed, sterile instruments are placed on a clean chair-side area and care is taken to avoid placing unsterilized items near sterilized items. Once the procedure begins, the 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 avoid contamination from other sources. When hands or gloves contact clean surfaces that are frequently touched by others, micro-organisms can be transferred to instruments or other environmental surfaces, and to the eyes, nose and mouth.

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

1. Prepare and organize work procedures so that all the required equipment is gathered for the task.
2. Sterilized 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 office-specific 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 ensuring the Denturist's hands are clean.
6. Gloves should be applied just 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 cooperative responsibility of the entire team. Each member must develop a professional conscience for infection prevention and control, as well as the willingness to supervise and be supervised by others regarding aseptic technique.

Education and Training

Ongoing education and training of all Oral Health Care Providers are critical for ensuring that infection prevention policies and procedures are understood and followed.

Education around basic principles and practices for preventing the spread of infections should be provided to all staff.
Training should include both staff safety and patient safety. Education and training should be provided during orientation to the specific setting, when new tasks are introduced, and, at a minimum, annually.

Key Recommendations

- Provide job or task specific infection prevention education and training to all Oral Health Care Providers. This must include those employed by outside agencies, contract staff, or those volunteering at the facility.
- Provide training on principles for both staff and patient safety.
- Provide training at orientation and at regular intervals (e.g. annually).
- Maintain training records according to provincial and national requirements.

Illness and Work Restrictions

Oral Health Care Providers can minimize the occurrence of contracting illness by practicing the following principle:

- Ensuring adequate and appropriate immunization of all Oral Health Care Workers;
- Rescheduling patients known to be ill;
- Adhering to routine practices, including hand hygiene before and after each patient contact.

As previously noted, hand hygiene is the single most important measure for preventing the transmission of micro-organisms, protecting both staff and patients.

Unique situations that might warrant particular attention by the Denturist include:

- Dermatitis – when the protective skin layer is broken, as happens with chapped hands or eczema, the Denturist is at an increased risk of acquiring and transmitting infection through the exposed area. Good skin care should always be practiced. Any areas of dermatitis should be covered with a bandage, in addition to wearing gloves.
- Immunocompromised staff are at increased risk of becoming infected and may suffer severe consequences. They may also be at risk of shedding viruses (e.g. influenza) for prolonged periods. Where feasible, job functions and associated exposure risks should be evaluated.
- Staff with an upper respiratory illness (e.g. common cold) should take the necessary precautions to prevent the transmission of micro-organisms to patients and other staff. In this case, good hand hygiene is imperative.

Glossary of Terms

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

Airborne Transmission: A means of spreading infection in which airborne droplet nuclei are inhaled by the susceptible host.

Asepsis: The absence of pathogenic (i.e. disease –producing) micro-organisms.

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 standardized population of bacterial spores known to be resistant to the mode of sterilization being monitored. BIs indicate that 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 failure, 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 color 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 a sterilization process, usually time or temperature. It is important to note that the sterilization process has more than one critical parameter; 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 the Biological Indicators (BI's).

Blood borne Pathogens: Disease producing micro-organisms spread by contact with blood or other body fluids contaminated with blood from an infected person.

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

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 micro-organisms. Cleaning and then rinsing is performed before further processing.

Contamination: State of having been in contact with micro-organisms. In health care, it generally refers to micro-organisms capable of producing infection or disease.

Decontamination: A process of cleaning, followed by inactivation of pathogenic micro-organisms from objects to render them safe to handle.

Direct Contact Transmission: Physical transfer of micro-organisms between a susceptible host and an infected or colonized person.

Disinfection: A process that kills most pathogenic micro-organisms but rarely kills all bacteria 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 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.

Low-level Disinfection (LLD): A process capable of killing most vegetative bacteria, as well as some fungi and enveloped viruses. LLD is the level of decontamination required for non-critical patient care items and environmental surfaces. LLD is performed after items are thoroughly cleaned and rinsed.

In-direct Contact Transmission: Contact of a susceptible host with a contaminated, intermediate object.

Irritant Contact Dermatitis: The development of dry itchy, irritated areas on the skin which can result from frequent handwashing and gloving as well as exposure to chemicals. This condition is not an allergic response.

Occupational Exposure: A reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

Opportunistic Infection: An infection caused by a micro-organism that does not ordinarily cause disease but is capable of doing so under certain host conditions (e.g., impaired immune response).

Percutaneous Injury: An injury that penetrates the skin (e.g., cut with a sharp object).

Personal Protective Equipment (PPE): Specialized clothing or equipment worn by staff for protection against hazards.

Re-usable Device: A device that has been designed by the manufacturer, through the selection of materials and /or components to be re-used.

Sterilant: Liquid chemical germicide that destroys all forms of micro-biological life, including high numbers of resistant spores.

Surfactants: Active agents that reduce surface tension. They assist in cleaning by loosening, emulsifying and holding soil in suspension, which can then be more readily rinsed away.

Ultra-sonic Cleaner: A device that uses waves of acoustic energy to loosen or break-up debris on instruments.

Washer-Disinfector: An automatic unit used to clean and thermally disinfect instruments. The unit uses a high temperature cycle rather than a chemical bath.

Wicking: Is the absorption of a liquid by capillary action along a thread or through material.

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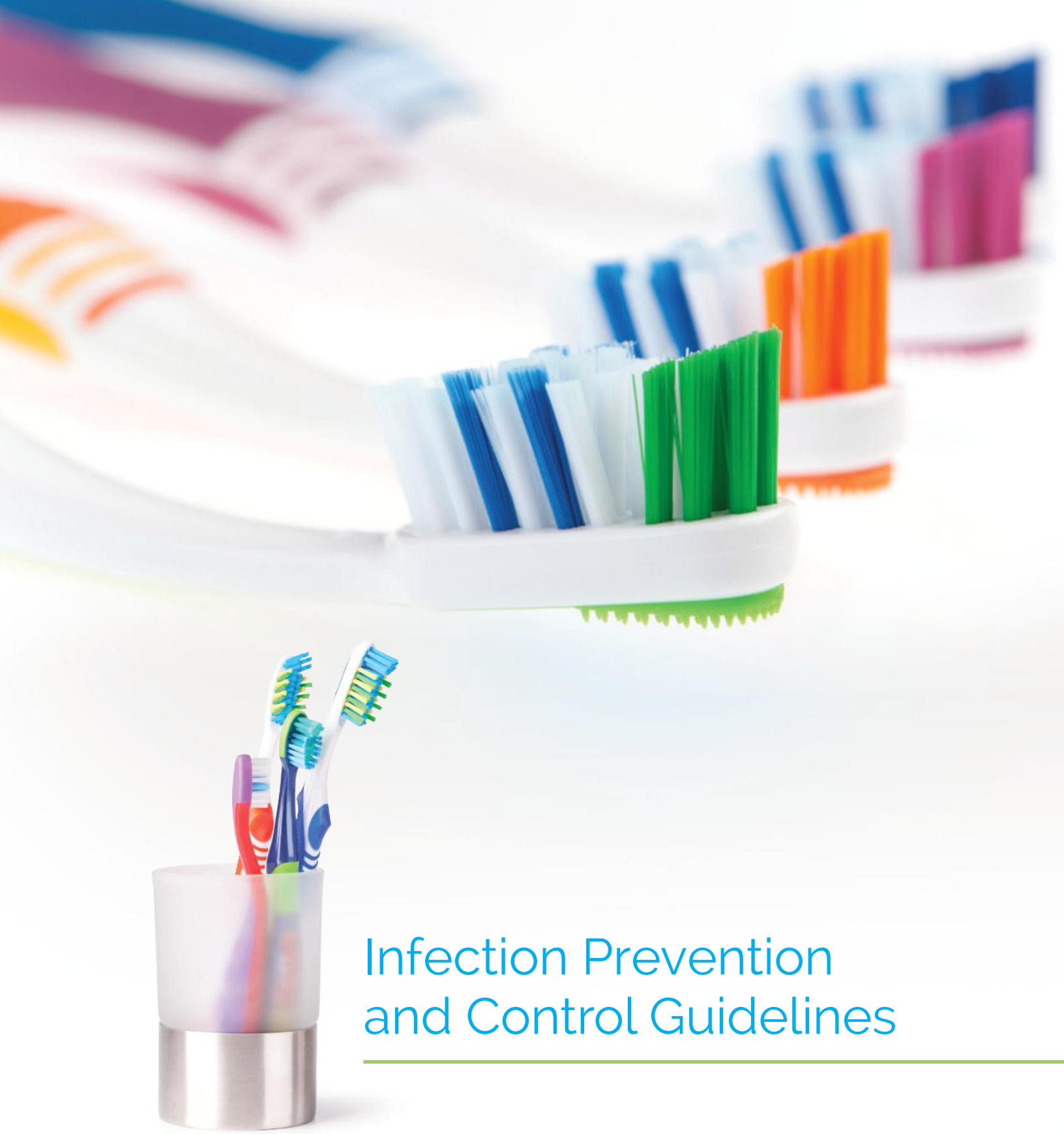


Infection Prevention and Control Guidelines

New Brunswick Dental Society
Société Dentaire du Nouveau-Brunswick

NEW BRUNSWICK COLLEGE OF DENTAL HYGIENISTS
ORDRE DES HYGIÉNISTES DENTAIRES DU NOUVEAU-BRUNSWICK

This document was produced by the New Brunswick Dental Society's Peer Review Committee in collaboration with the New Brunswick College of Dental Hygienists. The Peer Review Committee wishes to thank the Nova Scotia Dental Association for sharing their final product, as well as the College of Dental Surgeons of British Columbia and the Royal College of Dental Surgeons of Ontario for the building blocks behind the guidelines. The Committee wishes to acknowledge the New Brunswick College of Dental Hygienists who provided valuable comment and insight as partners in the delivery of safe oral care to the public.

Introduction 5
Purpose of the Document 6
Professional and Regulatory Considerations 6
Transmission of Microorganisms and Principles of Infection Prevention and Control (IPAC) 7

Part A: Patient Safety

1. Screening of Patients 9
2. Routine Practices 9
3. Risk Assessment 9
4. Hand Hygiene 10
5. Personal Protective Equipment for Patients 11
   - General considerations
   - Protective eyewear
   - Protective draping
   - Use of rubber dam and high-volume suction
   - Latex sensitivity and allergies
6. Safe Handling and Disposal of Sharps 12
7. Additional Precautions 12
8. Human Rights and Confidentiality 13

Part B: Dental Health Care Providers' Responsibilities and Safety

1. Education and Training 14
2. Immunization 14
3. Illness and Work Restrictions 15
4. Exposure Prevention 15
5. Personal Protective Equipment for DHCPs 16
   - General considerations
   - Gloves
   - Protective eyewear
   - Masks
   - Protective clothing
   - Latex sensitivity and allergies
6. Minimizing Droplet Spatter 18
7. Exposure Management 18
8. Occupational Health & Safety Requirements and WHMIS 19
9. Prohibition of Eating & Drinking in Non-Designated Areas 19

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

1. General Considerations 20
    - Sterilization
2. Processing of Critical and Semi-Critical Items 21
    - Receiving, cleaning and decontamination
    - Preparation and packaging
    - Storage
3. Sterilization of Unpackaged Instruments 22
4. Processing of Heat-Sensitive Items 23
5. Processing of Non-Critical Items 23
6. Equipment Use and Preventive Maintenance 24
7. Monitoring of Sterilization in the dental office 24

Part D: Environmental Infection Control and Waste Management

1. General Considerations 26
2. Clinical Contact Surfaces 26
3. Housekeeping Surfaces 27
4. Management of Waste 27
    - Biomedical waste
    - General office waste
    - Handling of extracted teeth

Part E: Equipment and Area-Specific Practice Guidelines

1. Dental Unit Waterlines 29
2. Dental Handpieces and Other Intraoral Devices 29
3. Saliva Ejectors 30
4. Single-Use Devices 30
5. Dental Radiography Equipment 30
6. Digital Radiography Sensors and Intraoral Cameras 31
7. Lasers and Electrosurgery Equipment 31
8. Dental Laboratory Asepsis 31
9. Handling of Biopsy Specimens 32
10. General and Surgical Aseptic Technique 32

Part F: Additional Considerations for Alternative Practice Settings 34

Part G: Glossary of Infection Prevention and Control Terms 35

Appendixes 38

Appendix 1 Methods for Cleaning, Disinfection and Sterilization of Patient Care Items and Environmental Surfaces 38

Appendix 2 Additional Resources and Reference Materials 39

Appendix 3 Exposure Management and Prophylaxis 40

Appendix 4 Loss of Potable Water 48

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 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 "Practice Owner" indicates the principal owner of the dental practice, dental hygiene practice or any institution where oral health care services may be offered. The Practice Owner bears full responsibility for infection control protocols.
- 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.
- DHCPs are trained to take precautions in order to protect patients and staff. In addition to previous instruction, it is important that all DHCPs receive office-specific training in infection prevention and control as part of their orientation, and whenever new tasks, procedures or equipment are introduced. In-office training and review of protocols is recommended on an annual basis for all staff. 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 DHCPs, implementation and oversight rests with the practice owner.

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

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.

DHCPs have an obligation to maintain the standards of practice of the profession and **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 is 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.

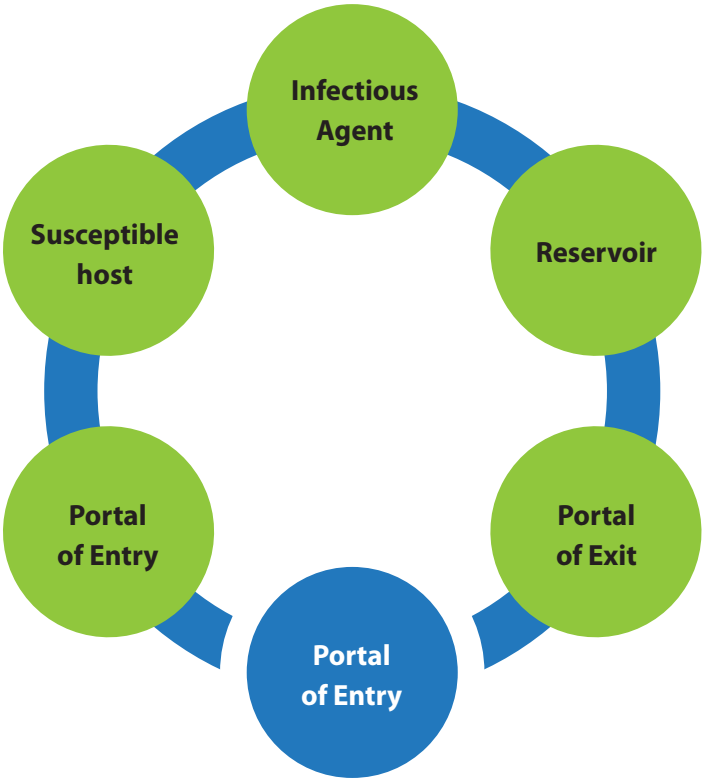
Transmission of Microorganisms and Principles of Infection Prevention and Control (IPAC)

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 micro-organisms, 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.

Break any link to break the chain of infection



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 microorgan-isms generated from an infected person, such as by coughing, sneezing or talking
- aerosol – particles of respirable size (<10um) 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, DHCPs can develop strategies to interrupt the transmission of microorganisms among patients and DHCPs, and from dental instruments, handpieces, devices and equipment.

Principles of Infection Precaution

IPAC principles include:

- patient assessment;
- following Routine Practices;
- using barrier techniques to protect both patients and DHCPs;
- 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 DHCPs, such as written procedures for the workplace and guidance on immunization;

c) educating DHCPs, as well as patients and their families, about everyone's role in infection prevention;

d) on-going review of policies and procedures, and evaluation of the IPAC program.

KEY PRINCIPLE: DHCPs 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 DHCPs 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 DHCPs 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 DHCP.

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 "hand washing" 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 **must 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 **must** 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, hand washing 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

Over the counter products are not recommended. Select products that are designed for use in a healthcare setting.

IMPORTANT

Avoid the use of hand jewelry and artificial nails. Jewelry 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 (see Part E, Section 10 for more details):

- Remove all hand and wrist jewelry.
- 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 jewelry.
- 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

DHCPs wear personal protective equipment (PPE) to shield their own tissues from exposure to potentially infectious material. This also protects patients by preventing the DHCP 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 DHCP and patient.

Patients should be provided with protective eye-wear 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. When 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 **must** 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-labeled 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. 16 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: DHCPs 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 *New Brunswick Human Rights Act* provides for equal rights and opportunities and freedom from discrimination based on race, colour, religion, national origin, ancestry, place of origin, age, physical disability mental disability, marital status, sexual orientation, sex, social condition, political belief or activity.

DHCPs are prohibited from discriminating against patients. This includes using extraordinary and unnecessary infection control or other measures that are not used for other patients. DHCPs may be required to modify 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 recognizes 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 responsibility of the practice owner to ensure that all staff is knowledgeable about and take appropriate steps to protect patient confidentiality.

Part B: Dental Health Care Providers' Responsibilities and Safety

1. Education and Training

DHCPs are more likely to comply with infection prevention and control protocols if they understand the rationale for them. It is important that all DHCPs 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 DHCPs 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 DHCPs 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 DHCPs should be adequately immunized against the following diseases:

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

It is important that all DHCPs know their personal immunization status and ensure that it is up to date. In this regard, DHCPs 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 DHCPs 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. DHCPs who fail to develop an adequate antibody response should complete a second vaccination series, followed by retesting for anti-HBs. DHCPs 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.

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

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

3. Illness and Work Restrictions

DHCPs 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 DHCPs;
- 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 DHCPs 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 DHCP include:

- Dermatitis – When the protective skin barrier is broken, as occurs with chapped hands or eczema, the DHCP 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 DHCPs 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.

DHCPs 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. DHCPs 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.

DHCPs 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 DHCPs 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 DHCPs. 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.

5. Personal Protective Equipment for DHCPs

General considerations

Personal protective equipment (PPE) is worn to shield the exposed tissues of DHCPs 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, **must** be discarded immediately after use.

IMPORTANT

Gloves and masks must be task- and patient-specific and discarded immediately after use.

Gloves

Gloves are worn to protect the hands of the DHCP 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 fluid 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 DHCPs should be protected from spatter and debris created during dental procedures by wearing appropriate eye-wear 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 DHCPs 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 DHCPs from contact with potentially contaminated droplet material. Masks lose efficiency over time, as they become moist from the DHCP'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.

Additionally, masks **must not** be worn around the neck. Due to spatter or splashing that could occur around the neck area when treating other patients, the chance of contamination may be increased which, in turn, reduces the level of protection to the DHCP.

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 DHCP'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 DHCP'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 responsibility of the practice owner to develop a policy that protective clothing 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 DHCPs 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 annually to ensure it is familiar to all DHCPs.

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 DHCPs.

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 practice owner. 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 DHCP should be immediately referred to her/his family physician, an infectious disease specialist or hospital emergency department for counseling, 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 DHCP 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 counseling and post-exposure management.

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

Under New Brunswick's *Occupational Health & Safety Act*, 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 and review with all staff on an annual basis.

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.

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 DHCPs 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. Health Canada outlines how manufacturers of reusable devices **must** include information on how the device is to be disinfected, cleaned and sterilized. (See Appendix 2)

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.

Risks 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) Sterilizations the preferred method.†
Non-critical items	Items that contact skin, but no mucous membranes or do not directly contact the patient (e.g. radiograph head/cone, bib clips, 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.

Table of Contents Previous Recommendation Next Recommendation

* 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.

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.

Air Quality

The *Occupational Health and Safety Regulation* (91-191) respecting control of exposure to biological and chemical agents provides Threshold Limit Values (TLVs) for chemical agents (e.g. gluteraldehyde). A TLV 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.

Offices should ensure proper air exchange and ventilation to meet 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. channeled 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 or 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. glutaral-dehyde, 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. 20) 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.

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 only be used under the following conditions:

- 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.

Because of the potential for serious infections, flash sterilization **must not** be used for implantable devices. 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 instruments used in placing dental implants should be quarantined after sterilization until the results of biological monitoring are known. Accordingly, unpackaged or flash sterilization of instruments used in the placing of implants 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. 20) 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.

7. 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. Class V chemical indicator **must** be placed in each sterilization cycle and the results **must** be kept in a register for a period of 1 year. In addition, for negative pressure sterilizers (type B), a test with chemical indicator type 2 (Bowie Dick) **must** be carried out at least weekly in an empty sterilizer chamber. 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. **Biological indicators must be used at least once a week to check each sterilizer in the clinic. The NBDS recommends its daily use.**

Spore tests may be conducted using an in-office system available through most dental suppliers. However, an independent lab **must** be used for a monthly test to confirm that in-office procedures are accurate and effective.

In addition, if a load contains implantable devices or instruments used to place implants, 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.

4. Concept of traceability of instruments The concept of traceability should be gradually introduced into sterilization procedures so that each bag or package of instruments would be marked with the date and the identifier of the sterilizer used. If the sterilization process fails with the biological test, marking the bags and packaging of the instruments will make it possible to trace the affected instruments.

IMPORTANT

The daily operation of every sterilizer must be reviewed and documented. A record must be kept for this purpose for a recommended 3 years indicating "operating as required", or noting any malfunctions and follow-up action taken.

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.

Part D: Environmental Infection Control and Waste Management

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 DHCPs.

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.

DHCPs should take particular care in the handling of patients' 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.

See Appendix 1 for Methods for Cleaning, Disinfection and Sterilization of Patient Care Items and Environmental 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 DHCP'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
- safety glasses - those worn by staff and those worn by patients
- bib clips

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). DHCPs 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. New Brunswick guidelines under the *Clean Environment Act* and WHMIS dictate that biomedical ("hazardous") 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 appropriately.

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 should be separated and collected in a red liner bag that is labelled with the universal biohazard symbol. This waste should 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 should 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 below, "Handling of Extracted Teeth".

ii) Non-anatomical waste
(i.e. sharps and blood-soaked materials)
Sharps (e.g. needles, syringes with needles, scalpel blades, clinical glass) should 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 should 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 should 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, contact the local office of the NB Department of Environment and Local Government.

Handling of Extracted Teeth

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.

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 DHCP 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.

(a) For offices using communal water supplies:

- Waterline heaters **must not** be used, as the heat encourages the growth of microorganisms.
- All waterlines **must** 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 **must** be removed from the waterlines.
- Handpieces using water coolant **must** be run for 20 to 30 seconds after patient care in order to purge all potentially contaminated air and water. The handpiece **must** 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 **must** 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, **must** be used to deliver sterile irrigation solutions since general waterline sterility cannot be ensured.

(b) For offices using closed or other water delivery systems:

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

(c) Loss of Potable Water

See Appendix 4.

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.

Table of Contents Previous Recommendation Next Recommendation

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, DHCPs 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 **must** 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 **must** 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 single 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 de-gloving 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 DHCP'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.

DHCPs 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, DHCPs 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 **must** be sterilized, cleaned and disinfected or discarded after use.

Finished prostheses and appliances delivered to the patient **must** 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, the specimen(s) **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 **must** 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 dental surgeon **must** 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, DHCPs 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 **must** be stored in an enclosed space, such as closed or covered cabinets. They **must** 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 DHCP's hands are clean.
6. Gloves **must** 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 DHCP's hands are clean. Transfer forceps should be readily available at all times.

KEY PRINCIPLE: DHCPs 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, DHCPs **must** take appropriate measures to ensure that infection control protocols are followed and patient safety is maintained. It is the responsibility of the DHCP 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. 27) 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, leakproof 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, leakproof 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 Practices for certain pathogens or clinical presentations, based on the method of transmission (e.g. contact, droplet, airborne).

Aerosol: Particles of respirable size (<10um) 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% ortho-phthalaldehyde.

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. These 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.

Table of Contents Previous Recommendation

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. DHCPs **must** use their professional judgment for every instrument, device and surface for their specific practices to ensure that these Guidelines are being met.

Table of Contents Next Recommendation

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 noncritical include (note this is not an exhaustive list):

- Curing Lights
- Bib clips
- Light handle covers
- 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	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-pthalaldehyde	Heat-sensitive, semi-critical items	**Not for use on environmental surfaces.** 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. **Cannot** 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

Best Management Practices for Hazardous Dental Waste Disposal
Nova Scotia Dental Association
www.nsdental.org/media_uploads/pdf/183.pdf

Guidelines for the Management of Biomedical Waste in Canada
Canadian Council of Ministers of the Environment, February 1992
www.ccme.ca/assets/pdf/pn_1060_e.pdf

Canadian Immunization Guide for 2012
Public Health Agency of Canada
www.phac-aspc.gc.ca/publicat/cig-gci/

Decontamination of Reusable Medical Devices (CSA Z314.8-14), 2014
Canadian Standards Association
http://shop.csa.ca/en/canada/sterilization/z3148-14/invt/27010632014

Guidelines for Disinfection and Sterilization in Healthcare Facilities, 2008
Centers for Disease Control and Prevention
www.cdc.gov/hicpac/pdf/guidelines/Disinfection_Nov_2008.pdf

Infection Control in Dental Settings
Centers for Disease Control and Prevention
http://www.cdc.gov/OralHealth/infectioncontrol/

CHICA-Canada-Links to Evidence Based Guidelines
www.chica.org/links_evidence_guidelines.php

Guidance Document: Information to be Provided by Manufacturers for the Reprocessing and Sterilization of Reusable Medical Devices. Health Canada Notice, June 1, 2011.
http://www.hc-sc.gc.ca/dhp-mps/md-im/applic-demande/guide-ld/md_gd_reprocessing_im_ld_retraitement-eng.php

Workplace Hazardous Materials Information System Regulation - Occupational Health and Safety Act (New Brunswick Regulation 88-221)
http://laws.gnb.ca/en/showfulldoc/cr/88-221//20140509

Appendix 3: Exposure Management and Prophylaxis

3.1 Percutaneous Injury

Exposure to blood or saliva by percutaneous injury is the greatest risk for acquiring a blood-borne pathogen in the dental health-care setting. Every effort should be made by all DHCP to avoid percutaneous injury.

Significant exposures should be dealt with immediately. A significant exposure exists whenever any of the following events occurs:

- Percutaneous injury, where the skin of the DHCP is punctured (i.e. blood is drawn).
- Blood, saliva or other body fluid is splashed onto non-intact skin (dermatitis, cuts or abrasions).
- Blood, saliva or other body fluid is splashed onto mucosa of the eyes, the mouth or the nose.

The steps in managing a significant exposure are:

1. Remove gloves or immediate clothing, if necessary, to assess the extent of the injury.
2. First-aid should be administered, if necessary, for percutaneous exposures.
3. Immediately wash the area, including the puncture or wound using antimicrobial soap and water. Exposed eye, mouth or nose mucosa should be flushed with copious amounts of water. The application of caustic agents such as bleach, or the injection of antiseptic agents into the wound is not advisable.
4. Report the injury to the Infection Control Officer, ICO, who is often the practice owner, who should then contact the appropriate health-care professional for advice and possible referral, and begin the necessary documentation. Ensure that the confidentiality of the health and personal data is strictly maintained.

Documentation should include (see template, Appendix 3.3.2):

- The name of the exposed DHCP, and details regarding the exposed person's vaccination status.
- The date and time of the exposure.
- The nature of the exposure, including the dental procedure being performed, the extent of the exposure, and immediate action taken.
- The name and health status of the source person, including details regarding any infectious diseases known or suspected.
- Referral for follow-up counseling and post-exposure management, as necessary.

3.2.1 Post-Exposure Prophylaxis

Every significant exposure should be evaluated by a qualified health-care professional for the potential to transmit a blood borne pathogen. The assessment of risk of transmission will be based on:

- The type and amount of body fluid or tissue involved.
- The nature of the exposure (e.g., percutaneous injury, mucous membrane or non-intact skin exposure).
- The known or unknown infection status of the source.
- The susceptibility of the exposed person.

All of these factors should be considered in determining the need for further follow-up care, including Post-Exposure Prophylaxis (PEP).

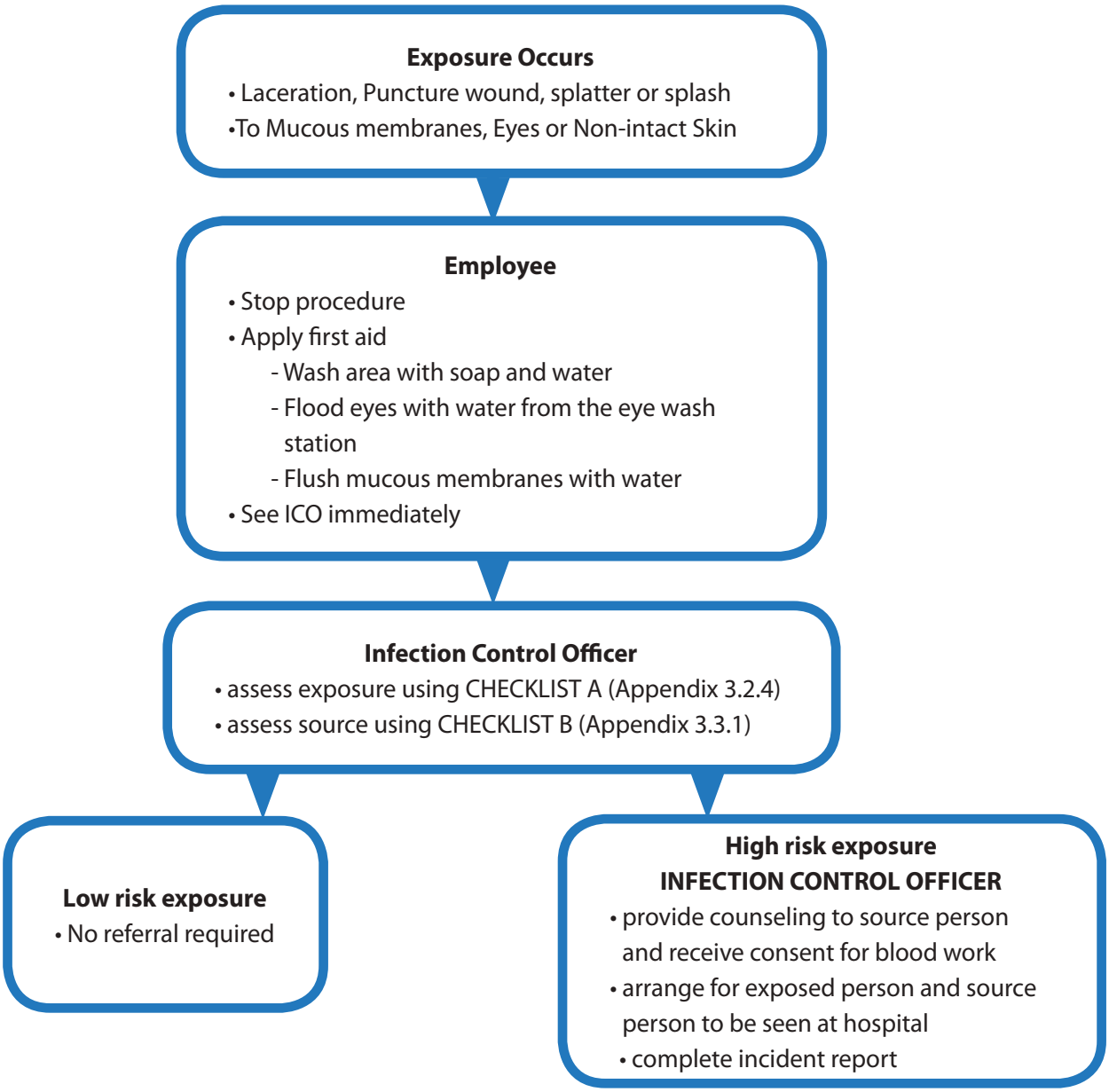
If the need to administer PEP is determined to be necessary, it should be done as soon as possible after the

exposure. For example, anti-retroviral drugs to treat an HIV exposure should be given within one to two hours after the exposure.

The PEP regimens considered will be determined by the health-care professional contacted by the Infection Control Officer following the exposure. The PEP regimen should be consistent with current infection prevention and control guidelines, as recommended by the Public Health Agency of Canada.

As well as having a written office Infection and Prevention Control Program and identifying an Infection Control Officer, the appropriate arrangements and contact health-care personnel should be determined well before an actual significant exposure occurs.

3.2.2 Management of Needlestick and Mucous



3.2.3 Needlestick Exposure Information and Consent

An accidental needle stick injury has occurred to our staff. Sometimes this injury may expose them to a source person's blood. This may lead to an infection. In order to reduce the risk of infection after injury it is important to know if the source person is infected with certain organisms. These include Hepatitis B, Hepatitis C and Human Immunodeficiency Virus (the virus thought to cause AIDS).

Given any positive risk factors, we ask you to go to the hospital to allow an immediate blood test to be taken so that we can determine if there is a risk of passing on an infection from you to our employee. We would ask you to allow us to obtain a copy of any positive results so the exposed person receives proper treatment.

Our office has policies and procedures in place to reduce injuries to employees. However, when accidents occur, we want to ensure that our employees receive proper care. We appreciate your cooperation in helping us to achieve this.

Consent to contact family physician for infectious disease blood test results

The above information has been reviewed and explained to me and I consent to the Infection Control Officer contacting my family physician or emergency physician to obtain blood test results.

Source person's name

Signature

Date:

Infection Control Officer

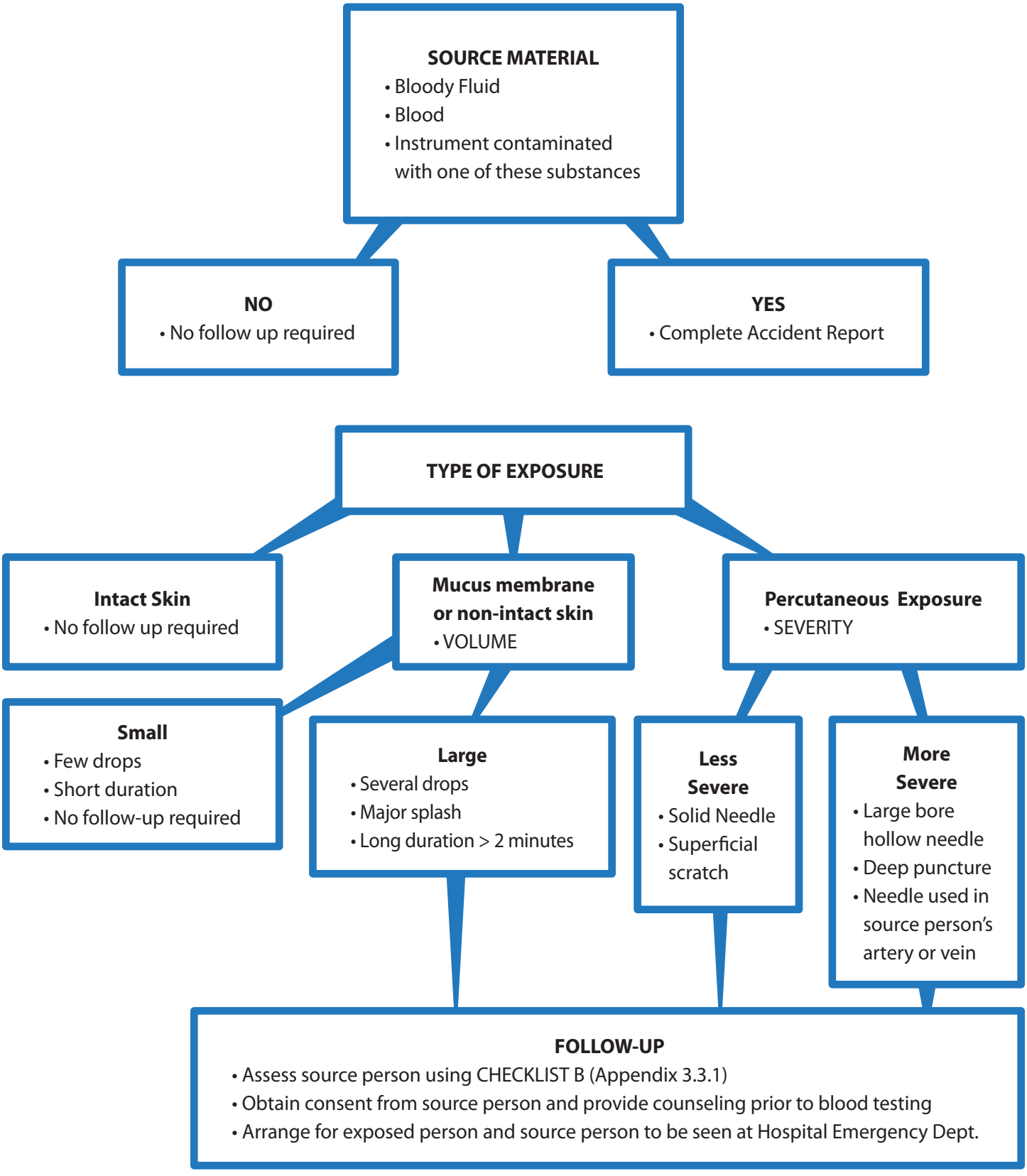
Signature

Witness Name

Witness Signature

3.2.4 CHECKLIST A

To Assess Exposure for Risk of Infection (completed by the Infection Control Officer)



3.2.5 Medical Follow-Up to Needlestick and Mucous Membrane Exposures

The Following Procedures will be directed by the Infection Control Officer:

1. **Medical management** of the injury.
2. **Referral of the source person** to the family physician or emergency physician for testing for Hepatitis B surface antigen, Hepatitis C surface antigen, and HIV antibodies. HIV testing will be done with appropriate pre- and post- counseling and informed consent.
3. **Referral of the exposed person** to the family physician or emergency physician for testing for Hepatitis B surface antibodies (if vaccinated) or Hepatitis B surface antigen (if not vaccinated), Hepatitis C antibodies, and HIV antibodies and to determine the need for Post-Exposure Prophylaxis.
4. **Documentation** of the following information (see template Appendix 3.3.2) in the employee's confidential medical file:
   - date and time of exposure
   - details of the procedure being performed by the employee at the time of exposure
   - details of exposure including amount of fluid or material, type of fluid or material, and severity of exposure
   - details of exposure source
   - details of counseling, post-exposure management and follow-up
5. **Follow-up care** of the employee (see template Appendix 3.3.3) including counseling, medical evaluation and blood tests at 6 weeks, 3 months, and 6 months.

3.3.1 CHECKLIST B

To Assess Source Person After Exposure (Completed by Infection Control Officer)

1. Inform the source person of the reason for the enquiry and allow them to time to read Needlestick Exposure Information. (App 3.2.3)
2. Evaluate the source person's risk of blood-borne infection by reviewing their medical history for clinical symptoms and asking them for additional information.

   Do you know if you are Hepatitis B, C or HIV positive or have any risk factors for exposure to the viruses?

   Hepatitis B ❑ Yes ❑ No _____ Date Diagnosed

   Hepatitis C ❑ Yes ❑ No _____ Date Diagnosed

   HIV ❑ Yes ❑ No _____ Date Diagnosed

   Risk Factors ❑ Yes ❑ No

   Risk factors may include:

   a) IV drug use/shared needles
   b) Receiving blood products
   c) Multiple sex partners
   d) Men having sex with men
   e) Prostitute sex
   f) Partner with Hepatitis B/C or HIV or any of the above risk factors

3. Request source person's consent to go for blood testing of their Hepatitis B/C and HIV status.

Source person's family physician

Dr. _____ Telephone Number _____

Address _____

Test results will also be sent to the Infection Control Officer.

3.3.2 Exposure Documentation

(NOTE: Confidentiality of this form **MUST** be ensured, i.e. only those people who need to see this form may do so) Name of Exposed Person: _____

Hepatitis B vaccination completed: Date ____ /____ /____ Post-vaccination titre: ____ mIU/mL

Date and time of Exposure: _____

Procedure being performed _____

Where and how exposure occurred: _____

Did exposure involve a sharp device: Yes ❑ No ❑

Type and brand of device: _____

How and when during handling exposure occurred:_____

Extent of the exposure (describe): _____

Blood ❑ Saliva ❑ Other body fluid ❑ Describe: _ _____

Percutaneous injury:

Depth of wound: _____ Gauge of needle: _____

Was fluid injected: Yes ❑ No ❑

Skin or mucous membrane exposure:

Estimated volume of fluid: _ _____ Duration of contact: _____

Condition of skin: Intact ❑ Chapped ❑ Abraded ❑

Source person information:

Known blood borne pathogen(s): _____

HIV: Yes ❑ No ❑ Unknown ❑

Anti-retroviral therapy: Yes ❑ If Yes, name(s)/dosage: _____ No ❑

Name of Attending Physician: _____

3.3.3 Exposure Documentation

(NOTE: Confidentiality of this form **MUST** be ensured, i.e. only those people who need to see this form may do so)

Follow-up care (describe in detail):

Date Yr/mth/day	Caregiver	Action Taken

Appendix 4: Loss of Potable Water

Boil water advisories occur whenever public health officials determine that municipally delivered tap water is unsafe to drink. Circumstances that compromise the safety of the municipal water system include compromises in the distribution system (e.g., water-main breaks), water treatment system failures and natural disasters (e.g., floods, hurricanes or earthquakes.

During a boil water advisory, the following precautions should be taken:

- Public water should not be delivered to the patient through the dental unit, ultrasonic scaler or other devices or equipment.
- Use alternative water sources through closed delivery systems.
- Postpone treatment delivery, if necessary.
- Patients should not rinse their mouths with tap water; bottled or distilled water should be used instead.
- Tap water should not be used for hand hygiene. Antimicrobial products that do not require water, such as alcohol-based hand rubs, should be used for hand hygiene. If the hands have been known or suspected to be contaminated, hands should be washed using bottled or distilled water and an antimicrobial soap.
- When the boil water advisory is cancelled, all incoming public water system lines, including any taps or other waterlines in the dental office, should be flushed for 1-5 minutes. The dental unit waterlines in all dental units and equipment should be disinfected according to the manufacturer's instructions prior to use. There may be public health advisories which may require further measures.

New Brunswick Dental Society
Société Dentaire du Nouveau-Brunswick

NEW BRUNSWICK COLLEGE OF DENTAL HYGIENISTS
ORDRE DES HYGIÉNISTES DENTAIRES DU NOUVEAU-BRUNSWICK

STANDARD OF PRACTICE

Approved by the College – November 2018

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Infection Prevention and Control in the Dental Office

CONTENTS

Introduction 3
- Purpose of the Document 4
- Professional and Regulatory Considerations 4

Principles of Infection Prevention and Control (IPAC) 5

Patient Safety 6
- Transmission of Microorganisms 6
- Screening of Patients 6
- Routine Practices 7
- Risk Assessment 7
- Hand Hygiene 7
- Protective Barriers and Techniques 11
  - General considerations
  - Protective eyewear
  - Protective draping
  - Use of rubber dam and high-volume suction
  - Latex sensitivity and allergies
- Handling and Disposal of Sharps 11
- Additional Precautions 12
- Human Rights and Confidentiality 12

Oral Health Care Workers' Responsibilities and Safety 13
- Education and Training 13
- Immunization 13
- Illness and Work Restrictions 14
- Exposure Prevention 14
- Personal Protective Equipment 15
  - General considerations
  - Gloves
  - Protective eyewear
  - Masks
  - Protective clothing
  - Latex sensitivity and allergies
- Minimizing Droplet Spatter 17
- Exposure Management 17
- Occupational Health and Safety Requirements and WHMIS 18
- Prohibition of Eating and Drinking in Non-Designated Areas 18

Cleaning, Disinfection and Sterilization of Patient-Care Items 19
- General Considerations 19
- Reprocessing of Instruments 20
  - Receiving, cleaning and decontamination
  - Rinsing and drying
  - Preparation and packaging
  - Sterilization
  - Monitoring of sterilization
  - Storage
- Sterilization of Unpackaged Instruments 25
- Reprocessing of Non-Critical Items 26
- Reprocessing Equipment Purchase, Use and Preventive Maintenance 26

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Office Cleaning, Housekeeping and Management of Waste 26
- General Considerations 26
- Clinical Contact Surfaces 27
- Housekeeping Surfaces 28
- Cleaning up Blood and Body Fluid Spills 28
- Management of Waste 28
  - Biomedical waste
  - General office waste
  - Handling of extracted teeth

Equipment and Area Specific Practice Guidelines 30
- Dental Unit Waterlines 30
- Boil Water Advisories 30
- Dental Handpieces 31
- Saliva Ejectors 31
- Single-Use Devices 31
- Dental Radiography Equipment 32
- Digital Radiography Sensors and Intra-Oral Cameras 32
- Lasers and Electrosurgery Equipment 32
- Dental Laboratory Asepsis 33
- Safe Handling of Injectables 33
  - Aseptic technique
  - Single dose vials
  - Multi-dose vials
- Handling of Biopsy Specimens 34

General and Surgical Aseptic Technique 35

Glossary of IPAC Terms 36

Appendices

Appendix 1 – Methods for Cleaning, Disinfection and Sterilization of Patient-Care Instruments, Items and Environmental Surfaces 38

Appendix 2 – Additional Resources and Reference Materials Available on the Internet 39

Introduction

The Standards of Practice of the Royal College of Dental Surgeons of Ontario (RCDSO) describe the minimum requirements that all dentists must meet in a particular area of clinical practice to maintain patient safety. On a regular basis, the RCDSO reviews and revises Standards to address any changes that are required. We urge all dentists to achieve excellence in every aspect of their work. They must ensure they are always up-to-date with the latest knowledge.

Infection prevention and control (IPAC) is a critically important part of safe patient care. In recent years, concerns about the possible spread of blood-borne diseases, and the impact of emerging, highly contagious respiratory and other illnesses have grown. Dentists and other health care workers have a clear responsibility to establish, evaluate, continually update and monitor their IPAC strategies and protocols.

The World Health Organization describes IPAC as:

> *....a practical, evidence-based approach which prevents patients and health workers from being harmed by avoidable infections. Preventing health care-associated infections avoids this unnecessary harm and at times even death, saves money, reduces the spread of antimicrobial resistance (AMR) and supports high quality, integrated, people-centred health services.*

Ontario's Provincial Infectious Diseases Advisory Committee (PIDAC) agrees that Infection Prevention and Control has never been more important:

> *Health care-associated infections affect 4% to 10% of patients and result in significant harm to patients/residents/clients. Maintaining a safe, clean and hygienic environment and minimizing microbial contamination of surfaces, items and equipment within the health care environment is increasingly recognized as an essential approach to reducing the risk of health care-associated infections for all patients/residents/clients, visitors and staff within health care settings.*

The World Health Organization and the PIDAC are among a growing number of organizations that advocate for antimicrobial stewardship.

The RCDSO is only one component of a larger system in Ontario to protect the health and well-being of patients. Public Health Ontario (PHO) provides the scientific evidence and expert guidance that shapes policies and practices for a healthier Ontario. The Ontario Ministry of Health and Long-Term Care (MOHLTC) has separate authority and legislation independent of the RCDSO and sets standards to be applied by local public health units. Those public health units have their own legislative mandate, expertise and role in their communities. They are also required to follow the MOHLTC's "Infection Prevention and Control Complaint Protocol" and the "Infection Prevention and Control Disclosure Protocol".

The RCDSO has worked with all of these partners to insure our IPAC Standard aligns with PHO, the Public Health Agency of Canada and the PIDAC.

We continue to collaborate with PHO and the MOHLTC to ensure that our standards, advice to members and the public are coherent and consistent with their guidelines and checklists for dental practices. This collaboration is reciprocal as we provide information to them about the practice of dentistry.

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.

Contravention of this or any Standard of the RCDSO may be considered professional misconduct.

PURPOSE OF THE DOCUMENT

This document is intended to provide all oral health care workers (OHCWs) with the knowledge to properly implement necessary IPAC measures in dental practice. It consolidates legislation, published standards and recommendations from government and other agencies, regulatory bodies and professional associations, as relevant to a dental context (see Appendix 2).

This document presents "best practices", reflecting the best evidence and expert opinion available at the time of writing.

In this document, the following assumptions have been made:

- **The terms "oral health care worker" (OHCW) and "staff" are used interchangeably. Staff encompasses all persons conducting activities within or associated with dental offices and includes dentists, dental hygienists, dental assistants, anesthetists and other support persons.**
- **The term "dental office" includes any facility in which oral health care is provided, such as traditional dental practices, community and school-based dental clinics, and collective living centres and other institutional settings.**
- **OHCWs are trained to take precautions in order to protect patients and staff. In addition to previous instruction, it is important that all OHCWs receive office-specific training in IPAC as part of their orientation, and whenever new tasks, procedures or equipment are introduced. It is recommended that one staff person should be appointed to manage the dental office's IPAC program and ensure that it remains current. While IPAC is the responsibility of all OHCWs, implementation and oversight rests with the principal dentist(s).**

PROFESSIONAL AND REGULATORY CONSIDERATIONS

Dentists have an obligation to maintain the standards of practice of the profession and must ensure that recommended IPAC policies and procedures are carried out in their offices.

OHCWs must maintain current knowledge of IPAC policies and procedures, and apply and maintain them appropriately and consistently. It is the dentist's responsibility to ensure that staff are adequately trained in IPAC policies and procedures, and that the necessary supplies and equipment are available, fully operational, up to date and routinely monitored for efficacy.

Dentists 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.

Principles of Infection Prevention and Control (IPAC)

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 IPAC principles, OHCWs can develop strategies to interrupt the transmission of microorganisms among patients and OHCWs, and from dental instruments, handpieces, devices and equipment.

IPAC principles include:

- risk assessment;
- following routine practices;
- using barrier techniques to protect both patients and OHCWs;
- 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 must focus on strategies to reduce the risk of transmission. These strategies include:

a) identifying, communicating and implementing standards and guidelines by preparing specific written IPAC policies and procedures, as part of the Office Manual;
b) effective occupational health and safety programs for all OHCWs, such as written procedures for the workplace and guidance on immunization;
c) educating OHCWs, 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.

All dentists are strongly encouraged to undertake audits of the IPAC policies and procedures in their dental offices to ensure that patient safety standards are adhered to and best practices are implemented. These audits should assess all core components of IPAC, as well as the reprocessing of instruments.

While it is preferred to involve external individuals with expertise and certification in IPAC, periodic (i.e. at least annually) audits by internal OHCWs with sufficient knowledge to identify and remediate deficiencies may be reasonable.

In collaboration with the RCDSO, PHO has developed two checklists that may be used to audit the IPAC policies and procedures in dental offices.

Patient Safety

Three main elements are required to spread infection:

1
A Susceptible Host

2
A Causative Agent

3
A Mode of Transmission

By removing any one of these elements, an infection cannot occur. This principle forms the foundation of an acceptable IPAC strategy.

TRANSMISSION OF MICROORGANISMS

Understanding the modes of transmission of infection is necessary for designing and implementing effective IPAC strategies.

Dental patients and OHCWs can be exposed to pathogenic microorganisms, including viruses (e.g. HBV, HCV, HIV, human herpes group of viruses, human papilloma virus), bacteria (e.g. staphylococci, streptococci) and other microbes that colonize or infect the oral cavity and respiratory tract.

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

1. direct contact transmission – direct physical contact with blood, oral fluids or other materials;
2. indirect contact transmission – contact with an intermediate contaminated object, such as a dental instrument, equipment or an environmental surface;
3. droplet transmission – 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.

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 post-operative 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 OHCWs from the spread of microorganisms, patients who appear to be ill should be re-scheduled if at all possible. If their dental condition is of an urgent nature, every effort must 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 contact or droplet transmission can be minimized.

A prominent sign should be posted at the entrance to the reception area, requesting that patients who are ill to identify themselves to the receptionist. In addition, the reception area must have alcohol-based hand rub and masks available with signage for their use.

There must be a written policy and procedure for managing patients with suspected febrile respiratory infections, rash and eye infections to reduce the risk of transmission.

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 re-scheduled.

ROUTINE PRACTICES

The Public Health Agency of Canada uses the term "routine practices" to describe basic standards of IPAC that are required for all 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 must routinely apply to contact with blood, body fluids and secretions (e.g. saliva), mucous membranes and non-intact skin.

Adherence to routine practices protects both OHCWs 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**

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 OHCW.

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.

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.

HAND HYGIENE

Hand hygiene is the most important and effective IPAC measure to prevent the spread of microorganisms.

The use of gloves does not replace the need for hand hygiene.

Hand hygiene is a general term referring to any action of hand cleaning. Hand hygiene relates to the removal of visible soil and the removal or killing of transient microorganisms from the hands, while maintaining good skin integrity resulting from a hand care program. Hand hygiene may be accomplished by using an alcohol-based hand rub (ABHR) or soap and running water. Hand hygiene also includes surgical hand antisepsis (the preparation of hands for surgery, using either an alcohol-based hand rub with persistent activity or antimicrobial soap and water).

There should be a written policy and procedure regarding a hand hygiene program that includes easy access to hand hygiene agents at patient point-of-care and effective use of emollients. There should also be a program to monitor, evaluate and improve hand hygiene compliance, with feedback to individual employees and managers.

Hand hygiene is necessary:

- before an aseptic procedure
- before putting on gloves
- after glove removal
- before and after direct contact with individual patients
- after contact with environmental surfaces, instruments or other equipment in the dental operatory
- after contact with dental laboratory materials or equipment
- before leaving the clinical operatory
- before eating or drinking
- whenever in doubt

PHO has simplified a hand hygiene training program into the "4 Moments of Hand Hygiene" (the moments where the risk of transmission of microorganisms via the hands is highest). For assistance in developing a hand hygiene program, PHO has education tools that may be used by dental offices.

If hands are NOT visibly soiled (i.e. the majority of instances), the use of a 70 to 90% ABHR is the preferred method of hand hygiene. It is more effective than hand washing with soap and water when hands are not visibly soiled and takes less time.

Despite perceptions to the contrary, ABHR has been shown to be less irritating to skin than soap and water. Select a product that contains emollients. If an OHCW feels a burning sensation following the application of ABHR, it is generally due to pre-irritated skin. **ABHR should not be used immediately after hand washing**.

There is sufficient evidence that ABHR is superior to washing with soap and water, except in cases where the hands are visibly soiled or contaminated with body fluids.

Soiled hands or hands contaminated with body fluids (or powder from gloves) must be washed with soap and running water, because alcohol is inhibited by organic matter. Hands must also be washed following personal body functions.

Use professional judgement for either procedure. If you think your hands have accidentally become contaminated with body fluids, wash with soap and running water to remove organic matter.

Liquid or foam soap should be provided in disposable pump dispensers. Bar soap must not be used. Hand lotion to prevent dry or cracked skin should also be available in disposable pump dispensers. Encourage regular, frequent use of hand cream. The best hand cream is one with a fat content of approximately 70%.

Ensure that the hand hygiene products used (ABHR, soaps, lotions) are compatible with the gloves used. For example, petroleum-based hand lotion affects glove integrity and must not be used.

To avoid contamination, disposable pump dispensers of liquid products should be discarded when empty and not "topped-up" or refilled.

The best evidence suggests that ABHR is equivalent to anti-microbial soap in terms of microorganism reduction, but less harsh on hands and less time-consuming to use. Where ABHR is available at the point-of-care, antimicrobial soap is not required.

Long nails are difficult to clean, may pierce gloves and harbour more microorganisms than short nails. Chipped

nail polish or nail polish worn longer than 4 days may harbour microorganisms that are not removed by hand washing, even with surgical hand scrubs. Artificial nails and nail enhancements harbour microorganisms and are more difficult to clean than natural nails.

Hand and arm jewellery, such as rings, watches, bracelets and other arm adornments, interfere with proper hand hygiene and may contribute to contact dermititis.

All OHCWs having direct contact with a patient must keep nails clean and short. Nail polish, if worn, must be fresh and free of cracks or chips. Artificial nails and nail enhancements must not be worn. Before performing hand hygiene, hand jewelry must be removed and arm jewellery, including watches, must be either removed or pushed up above the wrist. Rings should not be worn.

How should hand hygiene be done?

When using an ABHR for routine care:

- ensure hands are visibly clean
- apply one to two pumps of the product to one palm and rub both hands together for a minimum of 15 seconds
- spread product all over finger tips, between fingers, back of hands, and base of thumbs; these are the most commonly missed areas
- continue rubbing hands until product is dry; this will take a minimum of 15 seconds if sufficient product is used

When using soap and running water for routine care:

- wet hands with warm, not hot, water
- apply one to two pumps of liquid or foam soap and lather hands
- vigorously rub all surfaces of hands for a minimum of 15 seconds
- pay particular attention to finger tips, between fingers, backs of hands and base of the thumbs; these are the most commonly missed areas
- using a rubbing motion, thoroughly rinse soap from hands; residual soap can lead to dryness and cracking of skin
- dry hands thoroughly by patting hands gently with a paper towel
- turn off taps with towel and discard towel in a bin

When using a surgical hand rub (an ABHR with persistent activity) for major surgical procedures:

- apply to dry hands and forearms for the length of time recommended by the manufacturer
- allow hands and forearms to dry thoroughly before donning sterile gloves

When using a surgical hand scrub (antimicrobial soap and running water) for major surgical procedures:

- wash hands and at least 2 inches above the wrists thoroughly for the length of time recommended by the manufacturer, which is usually 2 to 5 minutes
- pay special attention to nails, subungual areas, between fingers and between thumb and index finger; the direction of the scrubbing procedure is from the hands toward the elbows, without returning to the cleaned hands
- brushes should not be used for hand scrubs
- dry hands and arms with a sterile towel, ensuring that hands and arms are completely dry before donning sterile gloves

Do not sequentially combine a surgical hand scrub with a surgical hand rub.

Disposable paper hand-towels provide the lowest risk of cross-contamination and must be used for drying hands in clinical areas. Hot-air dryers must not be used in clinical areas or with hand hygiene sinks. If hot-air dryers are used in non-clinical areas, hands-free taps are required to avoid re-contaminating the hands when turning off the taps.

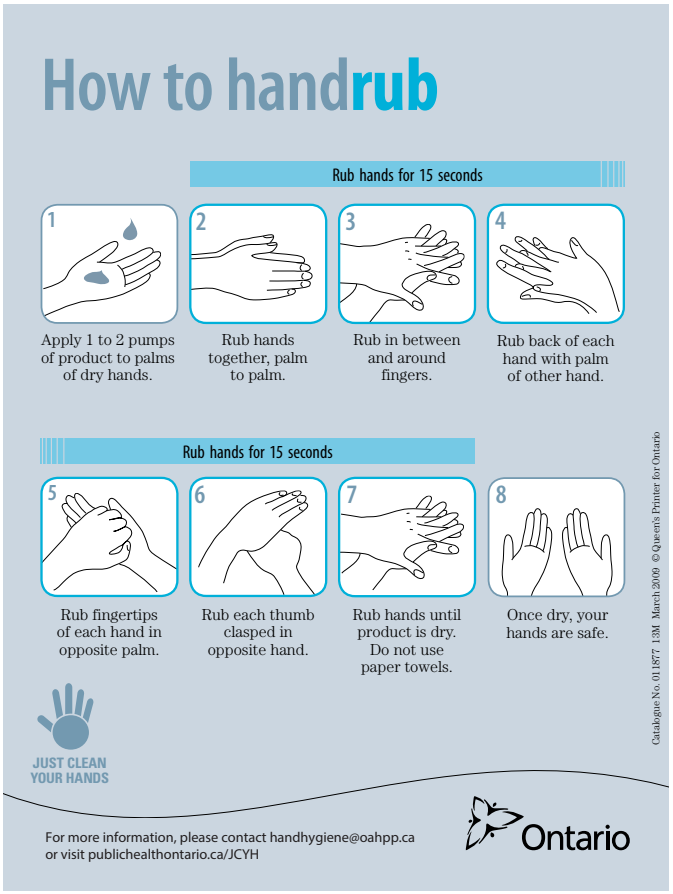
There must be easy access to a sink that is used for no other purpose than hand washing. Free-standing hand washing sinks are preferred. Do not clean equipment or discard waste in hand washing sinks. Maintain separate facilities for these tasks. Keep clean equipment away from sinks to avoid contamination.

Hand hygiene facilities should be located as close as possible to all dental operatories (point-of-care) and, preferably, in clear sight of patients. If they are out of sight, patients should be made aware that hand hygiene has taken place. In addition:

- soap dispensers should be placed at every sink
- ABHR dispensers should be strategically located for ease of use
- disposable paper towels should be readily available
- taps should be turned off with the aid of a paper towel to avoid recontamination of hands
- if renovating, consider installing hands-free faucets

Personal hand hygiene is also important for patients. ABHR should be provided to patients to reduce the risk of transmission of microorganisms (e.g. viruses, bacteria, fungi, parasites).

Cleaning with alcohol-based hand rub



Hand washing with soap and water

Source: "Just Clean Your Hands", Public Health Ontario

PROTECTIVE BARRIERS AND TECHNIQUES

General considerations

OHCWs wear personal protective equipment (PPE) to shield themselves from exposure to potentially infectious material. This also protects patients, by preventing the OHCW from becoming a source of transmission of microorganisms.

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 OHCW 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 becoming visibly contaminated.

Protective draping

Single-use bibs or drapes should be used to protect patients' 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 must 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 must 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 the medical history taking process, 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 pre-disposing 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, urogentital anomalies).

Patients with true latex allergy must be treated in an environment where contact with latex proteins, either directly or airborne, is kept as low as reasonably achievable. All latex-containing materials or devices must be removed from the operatory or adequately covered and isolated.

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

HANDLING AND DISPOSAL OF SHARPS

While this subject will be reviewed in detail in the following section dealing with the responsibilities and safety of OHCWs, it must be stressed that extreme care should be taken at all times to ensure patients are protected from injuries involving sharp objects. Sharps must be kept out of the reach of patients and safely collected in a clearly labelled puncture-resistant container.

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 IPAC 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 minimum two-metre spatial 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.

For more information about additional precautions, refer to *Routine Practices and Additional Precautions in All Health Care Settings*, revised November 2012 by the PIDAC.

HUMAN RIGHTS AND CONFIDENTIALITY

The Ontario *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, ethnic origin, citizenship, creed, sex, sexual orientation, age, record of offences, marital status, same sex partnership status, family status or disability.

The Code recognizes persons living with AIDS or HIV-related illness as disabled. Consequently, dentists are prohibited from discriminating against such patients. This includes using extraordinary and unnecessary infection control or other measures that are not used for other patients. Dentists 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. Patient records must be stored securely and not left unattended or in public areas of the office.

Sensitive medical information must 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 is documented within the patient's chart.

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

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

Oral Health Care Workers' Responsibilities and Safety

EDUCATION AND TRAINING

OHCWs are more likely to comply with IPAC protocols if they understand the rationale for them. Therefore, in addition to previous instruction, it is important that all OHCWs receive office-specific training in IPAC 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 OHCWs must receive training that includes information about their exposure risks, IPAC strategies specific to their occupational tasks, and the management of any work-related illness or injury.

It is also recommended that this Standard, as well as key reference materials and manufacturers' instructions for use of equipment and instruments, form part of an Office Manual.

All OHCWs must receive appropriate and ongoing training in IPAC. The Office Manual should include a process for recording and reporting the attendance of all OHCWs at staff meetings and continuing education courses and programs.

IMMUNIZATION

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

All OHCWs should be adequately immunized against the following diseases:

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

It is important that all OHCWs know their personal immunization status and ensure that it is up to date. In this regard, OHCWs should consult with their physician or other primary family health care provider about the status of their immunizations. Baseline and annual tuberculosis skin testing may also be considered. 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 OHCWs who may be exposed to blood, body fluids or injury involving sharps. As part of the immunization policy for the dental office, include a record of hepatitis B vaccination and documented immunity to hepatitis B by serology for all OHCWs.

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

Nonresponders 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.

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

OHCWs who might perform exposure-prone procedures have an ethical obligation to know their serologic status. If infected, dentists should seek guidance from the RCDSO with respect to the potential for transmission of their infection to their patients.

ILLNESS AND WORK RESTRICTIONS

OHCWs are usually concerned about contracting illnesses in the dental office. Such occurrences can be minimized by practicing the principles discussed in this document, including:

- ensuring adequate and appropriate immunization of all OHCWs;
- triaging patients and re-scheduling 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 OHCWs and patients. Please refer to the previous section of this document for detailed information regarding recommended hand hygiene procedures.

Unique situations that might warrant particular attention by an OHCW include:

- Dermatitis – When the protective skin barrier is broken, as occurs with chapped hands or eczema, the OHCW is at increased risk of acquiring and transmitting infection through the exposed area. Good skin care should always be practiced. Any areas of dermatitis should be covered, in addition to wearing gloves.
- Immunocompromised staff – Immunocompromised OHCWs are at increased risk of becoming infected and developing severe complications. 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.

OHCWs who have an upper respiratory illness (e.g. common cold) must take the necessary precautions to prevent the transmission of microorganisms to patients and other staff. Diligent hand hygiene is especially important. OHCWs who have a severe respiratory illness with fever, acute viral gastroenteritis with vomiting and diarrhea, or acute conjunctivitis must not attend the dental office until their symptoms have subsided and the period of communicability has passed. For example, staff should not attend the dental office for 24 – 48 hours after the resolution of acute vomiting and diarrhea.

OHCWs who have herpes simplex infections (e.g. cold sores) must pay particular attention to hand hygiene and not touch the affected area. In this situation, the use of a mask may help to remind the worker not to touch the lesions.

EXPOSURE PREVENTION

The primary method of preventing the transmission of blood-borne pathogens (e.g. HBV, HCV and HIV) to OHCWs is by avoiding occupational exposures to blood. In the dental office, exposures may occur through percutaneous injuries (e.g. needle-sticks or cuts with sharp objects), or 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, such as gloves, protective eyewear, masks and protective clothing, and safe work habits for the handling and disposal of sharps.

PPE must be used consistently during the treatment of patients, based on the likelihood of exposure to blood, body fluids and secretions, 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 must be covered with a waterproof bandage, transparent film dressing or other protective dressing and changed as needed. Large cuts may require medical assessment and re-evaluation of work duties.

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

- Sharps, needles and syringes must be safety-engineered medical sharps (SEMS), whenever reasonable options are available.
- Always use extreme caution when passing sharps during four-handed dentistry.
- Needles must remain capped prior to use.
- Needles must not be bent, recapped or otherwise manipulated by using both hands.
- Following use, needles must be recapped as soon as possible by using a one-handed scoop technique or a commercial recapping device.
- When suturing, tissues must 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 cleaning instruments.
- Used sharps must be collected in a clearly labelled puncture-resistant container.
- When cleaning contaminated instruments by hand, heavy-duty utility gloves, appropriate clothing and long-handled brushes must be used.

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.

Some instruments and equipment have been designed to increase safety, such as self-sheathing anesthetic needles and dental units that shield burs in handpieces. Safer versions of sharp devices must be considered as they become available in the dental marketplace.

PERSONAL PROTECTIVE EQUIPMENT

General considerations

Personal protective equipment is worn to shield the exposed tissues of OHCWs 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. PPE must be removed prior to leaving the operatory. Single-use barriers, such as gloves and masks, must be discarded immediately after use.

Gloves

Gloves are worn to protect the hands of the OHCW from contamination. Latex gloves are not recommended, because allergic reactions have been reported with their use. 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 must be performed before donning gloves and after removing them.

In the dental office:

- Gloves must be worn when contact with mucous membranes, non-intact skin (including rashes) or body fluids is anticipated.

- The same pair of gloves must not be used for more than one patient.
- Gloves must 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 must not be worn outside any room or area where they are required for personal protection.
- Gloves must not be washed and re-used.
- Double-gloving may be utilized for some specific procedures, which may involve the handling of multiple sharp instruments or during longer appointments. However, if used, double-gloving must be procedure-specific, not patient-specific. This would be in keeping with human rights considerations.

To reduce hand irritation related to gloves:

- Wear gloves for as short a time as possible.
- Hands must be clean and dry before donning gloves.
- Gloves must be intact, clean and dry inside.

There should be written policies and procedures regarding the use of gloves in the dental office, including education on the appropriate selection and limitations of glove use.

Protective eyewear

The conjunctival mucosa of OHCWs must be protected from spatter and debris created during dental procedures by wearing appropriate protective eyewear or face shields. Protective eyewear must be cleaned and disinfected between patients and whenever it becomes noticeably contaminated.

An eye-wash station must also be available in the dental office for both OHCWs and patients to aid in managing contact with any body fluid or dental chemical / solvent.

Masks

Appropriate masks that cover the nose and mouth must be worn during dental procedures to protect the respiratory mucosa of OHCWs from contact with potentially contaminated droplet material. Masks lose efficiency over time, as they become moist from the OHCW's breathing. Accordingly, masks must be changed when they become contaminated, wet, or more often such as during longer appointments, and always between patients.

Protective clothing

When it is anticipated that a dental procedure is likely to generate splashes or sprays of blood, saliva or other body fluids, protective clothing must be worn, such as a gown.

Discourage the wearing of uniforms and scrubs outside the dental office.

Latex sensitivity and allergies

Latex is commonly used in the manufacture of gloves and a large number of products employed in dental care, 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, and using proper hand hygiene practices.

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

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 the avoidance of all latex products in the workplace and at home.

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

EXPOSURE MANAGEMENT

Blood-borne pathogens, such as HBV, HCV and HIV, can be transmitted to OHCWs 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 Office Manual.

All OHCWs must know the dental office's exposure prevention policies and exposure management protocol and review them periodically.

Significant exposures include percutaneous injuries with contaminated needles, burs or other sharp instruments, as well as incidents in which blood, saliva or other body fluids are splashed on to 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 OHCWs.

In the event of a significant exposure, immediate first-aid measures must 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 must be reported to a dentist in the practice. However, in all cases involving a significant exposure, the dentist must 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 OHCW should be 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, anti-retroviral drugs should be administered within hours.

All cases involving a significant exposure must be documented, including:

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

OCCUPATIONAL HEALTH AND SAFETY REQUIREMENTS AND WHMIS

All Ontario employers and employees are subject to the requirements of the *Occupational Health and Safety Act* (OHSA), which includes Regulation 860: Workplace Hazardous Materials Information System (WHMIS).

Under OHSA, 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.

In addition, employees must work in compliance with the Act and its regulations, 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 safety data sheets (SDS) 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 and to that end, every dentist must be familiar with the legislation. *Workplace Hazardous Materials Information System (WHMIS): A Guide to the Legislation* is a useful resource and is available at the Ontario Ministry of Labour website (see Appendix 2).

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 of the dental office.

Eating and drinking in operatories, instrument reprocessing areas and in-office dental laboratories is prohibited. Do not store foods and beverages in refrigerators dedicated for biomedical wastes, drugs and other supplies.

Cleaning, Disinfection and Sterilization of Patient-Care Items

GENERAL CONSIDERATIONS

The goals of safe reprocessing of reusable patient-care items (dental instruments, handpieces, devices and equipment) include:

- preventing transmission of micro-organisms to OHCWs and patients;
- minimizing damage to patient care items from foreign material or inappropriate handling;
- safe handling of chemical disinfectants.

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

All reusable instruments must be properly cleaned, rinsed and dried prior to either disinfection or sterilization. These steps are essential, as residual debris will compromise the disinfection and sterilization process.

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 reprocessing requirements.

Category	Definition	Reprocessing
Critical reusable instruments	Penetrate soft tissue or contact bone (e.g. all surgical instruments, periodontal scalers, etc.)	Cleaning followed by sterilization
Semi-critical reusable instruments	Contact mucous membranes or non-intact skin (e.g. mouth mirrors, amalgam condensers, reusable impression trays, handpieces, etc.)	Cleaning followed by sterilization
Non-critical reusable items	Contact intact skin, but not mucous membranes, or do not directly contact the patient (e.g. radiograph head / cone, blood pressure cuff, facebow, pulse oximeter, etc.)	Cleaning followed by low-level disinfection

All critical and semi-critical instruments used in dentistry, including handpieces, are available in heat-tolerant and/or single-use (disposable) forms. All heat-tolerant reusable critical and semi-critical instruments must be heat-sterilized between uses. All single-use items must be disposed following use.

All newly-purchased reusable critical and semi-critical instruments must be inspected and sterilized prior to first use, in accordance with the manufacturer's instructions. If the instructions are unclear, incomplete or inadequate, the manufacturer must be contacted for clarification or additional information. If clear, validated instructions are unavailable for an instrument, it must not be used.

REPROCESSING OF INSTRUMENTS

To achieve sterilization, the reprocessing of instruments requires multiple steps. Sterilization is a complex process requiring specialized equipment, adequate space, qualified staff and regular monitoring for quality assurance. Correct sorting, cleaning, rinsing, drying, packaging, sterilizer loading procedures and sterilization methods must be followed to ensure that all instruments are adequately reprocessed and safe for reuse on patients.

All instruments must be reprocessed in a central area of the dental office that is designed to facilitate quality control and ensure safety. The instrument reprocessing area must provide for one-directional workflow of instruments with clear separation of dirty and clean sides to prevent cross-contamination. Depending on the design of the instrument reprocessing area (e.g. length of counter, placement of sinks), the separation of dirty and clean areas may be achieved with either physical distance, if space permits, or a physical barrier, such as a wall or shield.

Attention must be given to the placement of sinks in the instrument reprocessing area. In order that clean areas remain dry and free from contamination, efforts must be made to minimize splashing from sinks, which may necessitate the installation of a physical barrier in smaller dental offices. If a physical barrier is required, it must be constructed of materials that can withstand regular cleaning and disinfection.

The instrument reprocessing area must have separate sections for:

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

Receiving, cleaning and decontamination

To prevent percutaneous injuries, contaminated instruments must be placed in a puncture-resistant covered container or locked cassette at the point of use and then transported to the instrument reprocessing area. Reusable instruments must be received, disassembled in accordance with the manufacturer's instructions, sorted and cleaned in one section of the reprocessing area. A puncture-resistant sharps container must be available.

Cleaning involves the removal of debris (e.g. organic and inorganic matter). This is achieved either by scrubbing with a detergent formulated for medical device reprocessing or an enzymatic cleaner, or by an automated process (e.g. ultrasonic cleaner or automated washer with a cleaning solution).

The use of automated cleaning equipment is strongly recommended, as it may increase productivity, improve cleaning effectiveness and decrease worker exposure to blood and body fluids. Thus, the use of automated cleaning equipment may be safer and more efficient than manually cleaning contaminated instruments.

Gross debris must be removed from instruments prior to placement in an ultrasonic cleaner. In addition, ultrasonic cleaning solutions must be changed daily or more frequently if they become visibly soiled. Automated washers may not require presoaking or scrubbing of instruments. Refer to the manufacturer's instructions for use of the automated washer.

Organic matter may accumulate on brushes used for cleaning instruments. Cleaning brushes must be inspected frequently and discarded when worn or damaged. At the end of every day, cleaning brushes must be sterilized or discarded.

Automated systems must be routinely tested for efficacy according to the manufacturer's instructions, each day that automated washers are used and at least weekly for ultrasonic cleaners.

If cleaning cannot be performed immediately, instruments should be placed in a puncture-resistant holding container and soaked with a detergent formulated for medical device reprocessing or an enzymatic cleaner to prevent drying of organic material, and make subsequent cleaning easier and less time-consuming. Liquid chemical sterilants or high-level disinfectants (e.g. glutaraldehyde, ortho-phthalaldehyde) must 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 must 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 a protective gown to protect from splashing.

An emergency eye-wash station must be available to allow OHCWs to flush their eyes in the event of a significant exposure to blood-borne pathogens or hazardous chemical agents. A plumbed or self-contained eye-wash station that meets occupational health and safety requirements must be situated within a 10-second walk (i.e. 16 to 17 metres) of the reprocessing area.

To avoid injury from sharp instruments, the instrument reprocessing area should have two sinks, such that one may be dedicated to hand washing and (possibly) serve as an eye-wash station. Hand washing sinks must be dedicated to this purpose and not be used for any other purpose. If space does not permit the placement of two sinks, alcohol-based hand rub should be placed in the instrument reprocessing area and, when necessary, hand washing should be performed in another sink nearby.

Rinsing and drying

After cleaning, instruments must be rinsed with water to remove detergent residue, dried (e.g. lint-free cloth) and visually inspected to ensure all debris has been removed.

Preparation and packaging

In another section of the reprocessing area, cleaned and dried instruments must be inspected, assembled into sets or trays, and packaged for sterilization. Critical and semi-critical instruments must be reprocessed 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 must be designed for the type of sterilization process being used.

Instruments should be evenly distributed in a single layer within the package or container, unless the container is designed and validated to allow for more than one layer. Hinged instruments must be reprocessed open and unlocked.

Peel pouches are a convenient option to package instruments for sterilization. They are easy to use, come in a variety of sizes to accept single or small groups of instruments, and often include features such as self-sealing closures and chemical indicator strips. If pouches are used, the manufacturer's instructions must be consulted regarding the number of instruments that may be accommodated. In order to allow for adequate air removal, steam penetration to all surfaces and lumens, and subsequent evacuation of steam and moisture, pouches must not be overloaded.

A packaged instrument must not be placed within another package, unless this is supported by the manufacturer of the device and the manufacturer of the internal packaging has designed and validated its product for this use.

Each package must be labelled with the date reprocessed, sterilizer used, cycle or load number and the OHCWs initials in a manner that does not puncture or dampen the package. If instruments are not visible (e.g. a

wrapped cassette), the package contents must be labelled.

Labels, chemical indicator tapes, and handwritten or printed inks must be compatible with the packaging system and colour-fast, so as not to degrade, run, leach, fade or become illegible with exposure to the sterilization process.

Do NOT write directly on the paper side of peel pouches. .

Sterilization

The sterilization section of the reprocessing area includes the sterilizer(s) and related supplies, with adequate space for loading, unloading and cool down. The area may also include biological indicators and incubators for conducting tests, as well as enclosed storage for sterile and single-use (disposable) items.

All instruments must be sterilized by either steam under pressure (i.e. autoclaving), which is dependable and economical, or dry heat. Chemiclaves and bead sterilizers are NOT acceptable methods of sterilization.

For steam sterilization, dynamic air removal steam sterilizers (e.g. pre-vacuum and steam-flush pressure pulse sterilizers) are preferred over gravity displacement sterilizers.

All sterilization must 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 and placement of containers, wraps, and chemical or biological indicators, must be followed.

Steam sterilizers manufactured for use in dental offices use pre-programmed cycles with specific operating parameters for time, temperature and pressure.

Most dental instruments are made of solid metal and have uncomplicated design features (e.g. explorers, periodontal probes and scalers). All steam sterilizers using standard approved cycles should sterilize such instruments reliably, provided that all sterilization parameters recommended by the instrument manufacturer are met or exceeded. Excess instrument wear may occur when the sterilization parameters recommended by the manufacturer are exceeded, necessitating careful inspection of instruments throughout their life-cycle.

However, the design features of some dental instruments may affect sterilization efficacy (e.g. long or narrow lumens, sharp bends, screws, hinges). Examples include handpieces, surgical aspirators, bone grafting syringes, bone mills and guides, double action rongeurs, implant drills and screwdrivers, and torque wrenches and drivers. Sterilization temperatures and other operating parameters recommended by the manufacturer of these instruments must be followed. If sterilization parameters will be used that are different from those recommended, the dentist must obtain written, validated sterilization instructions from the instrument manufacturer.

Instrument packs must be allowed to dry inside the sterilizer chamber before removing and handling, in order to avoid wicking of moisture and, hence, contamination with bacteria from hands.

Monitoring of sterilization

Monitoring of sterilization must be conducted through a combination of physical, chemical and biological means, which evaluate both the sterilizing conditions and the procedure's effectiveness. The dental office must have written policies and procedures for monitoring of sterilization.

The information in this section of the Standard represents best practices for the monitoring of sterilization in the dental office, and meets or exceeds the recommendations of the PIDAC and the Canadian Standards Association (CSA). These are the prevailing standards for all healthcare settings in Ontario, including dental offices, and may be used as a basis for auditing purposes.

1. Physical indicators include the gauges or displays on the sterilizer for cycle time, temperature and pressure. Some tabletop sterilizers have recording devices that print out these parameters or store them electronically.

Tabletop sterilizers with recording devices are preferred. All new sterilizers must have this feature. If a sterilizer does not have a recording device, consideration should be given to replacing it in a reasonable time.

Physical indicators must be checked and recorded for each load. If the sterilizer has a recording device, the physical parameters must be checked at the conclusion of the sterilization cycle for each load and documented. This is to verify that the pre-programmed cycle operated correctly, and that the required conditions for sterilization existed in the chamber. If the sterilizer does not have a recording device, the physical parameters must be checked during the sterilization cycle for each load and documented.

2. Chemical indicators (i.e. internal and external) are designed to provide a chemical or physical change as a result of exposure to a defined 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 been exposed to heat, 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 barrier, through which the sterilizing agent must be drawn or forced in.

For these reasons, each package must have external and internal chemical indicators. Place a Type 1 chemical indicator on the outside of each instrument package. Also, place a Type 4, Type 5 or Type 6 chemical indicator inside each package. Some pouches incorporate Type 1 external and Type 4 internal chemical indicators.

Air Removal Test (Bowie-Dick):

Sufficient air removal is necessary for steam penetration and contact with instrument surfaces. An air removal test with a Type 2 chemical indicator (Bowie-Dick) is used specifically for testing pre-vacuum sterilizers.

For pre-vacuum sterilizers, an air removal test must be performed at the beginning of each day that the sterilizer is used. An air removal process challenge device (PCD) must be placed in the chamber of an empty sterilizer as per the manufacturer's instructions for use.

NOTE: Physical 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, such as sterilization failure, which may be caused by incorrect loading of the sterilizer or equipment malfunction. If either physical or chemical indicators demonstrate inadequate reprocessing, then the items in the load must be reprocessed.

3. Biological indicators (BIs or "spore tests") are the most accepted means for monitoring of 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.

The following requirements apply to biological monitoring:

- A BI must be placed in a PCD and used to test the sterilizer each day that it is used AND for each type of cycle that is used. The manufacturer's directions concerning the appropriate placement of the BI in the sterilizer must be followed.
- A BI must be placed in a PCD and included in every load containing implantable devices (e.g. dental implants, temporary anchorage devices, surgical screws/plates/staples). Implantable devices must be quarantined until the BI test results are known.
- For routine loads, items in the reprocessed load should not be released until the results of the BI test are available. If quarantine pending BI results is not possible, evaluation of a Type 5 or Type 6 chemical indicator and the specific cycle physical parameters must be used to justify their release:
  - If the load will be quarantined, then a Type 4, Type 5 or Type 6 chemical indicator must be placed in each package.
  - If the load will not be quarantined and the sterilizer has a recording device, then one PCD with a Type 5 or Type 6 chemical indicator may be used to justify the release of the reprocessed load. In addition, a Type 4, Type 5 or Type 6 chemical indicator must be placed in each package.
  - If the load will not be quarantined, the sterilizer has a recording device and a PCD is not used, then a Type 5 or Type 6 chemical indicator must be placed in each package to be released.
  - If the load will not be quarantined and the sterilizer does not have a recording device, then a Type 5 or Type 6 chemical indicator must be placed in each package to be released.

A process challenge device (PCD) is a test used to assess the performance of the sterilization process and the results must be verified and recorded at the end of the sterilization cycle. A PCD may be commercially manufactured or created in-house by selecting one instrument package for the load that is the most challenging to sterilize and placing a Type 5 or Type 6 chemical indicator and / or a BI at the centre of this package. Factors that make an instrument package difficult to sterilize include those with large metal masses (e.g. multiple elevators) and sets with mixed materials (e.g. plastic and metal). To identify this package, label it "PCD", and place it in the most challenging location to sterilize (as per the sterilizer manufacturer's instructions for use). The PCD is checked at the conclusion of the sterilization cycle for the load to confirm that the Type 5 or Type 6 chemical indicator has passed (i.e. meets the parameters for sterilization, pending a BI test result) and/or the BI has passed.

For a sterilizer that has a recording device:

- **The physical parameters must be checked at the conclusion of the sterilization cycle for each load and documented.**
- **One PCD with a Type 5 or Type 6 chemical indicator may be used to justify the release of a reprocessed load. Alternatively, a Type 5 or Type 6 chemical indicator must be placed in each package.**

For a sterilizer that does not have a recording device:

- **The physical parameters must be checked during the sterilization cycle for each load and documented.**
- **A Type 5 or Type 6 chemical indicator must be placed in each package.**

For further information, refer to the algorithm on How to Use Chemical Indicators, Biological Indicators and Process Challenge Devices to Monitor Sterilization.

The daily operation of every sterilizer must be reviewed and documented. A log book must be kept for this purpose. Any malfunction must be noted and appropriate action taken. Like other administrative or office records, the log book must be maintained for at least 10 years from the date of the last entry in that record.

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

- Remove the sterilizer from service.
- Review all records of physical and chemical indicators since the last negative BI, as well as all 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.
- If the cause of the test failure is immediately identified (usually operator error), correct it by addressing any procedural problems and properly loading the sterilizer. Repeat the BI test immediately using the same cycle that produced the failure. While waiting for the repeat test results, the sterilizer must 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 BI test is negative, and all physical and chemical indicators demonstrate adequate reprocessing, then the sterilizer may be put back into service.
- If the repeat BI test is positive or the cause of the initial test failure is not immediately identified, and all sterilization procedures have been performed correctly, then the sterilizer must remain out of service until it has been inspected, repaired and successfully rechallenged with BI tests in three consecutive full chamber sterilization cycles. Consider using a BI with a different lot number. In addition, all items from suspect loads dating back to the last negative BI must be recalled, to the extent possible, and reprocessed.
- Assess the risk to patients. Determine if the notification of patients, other facilities or regulatory bodies, such as the RCDSO or a public health unit, is required. If in doubt, consult the RCDSO.

Storage

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

To prevent contamination and maintain one-directional workflow, do not store sterile and single-use items on the dirty side of the reprocessing area.

Packages containing sterile instruments should be stored loosely, rather than tightly together, to avoid friction or shear action that may cause pinholes or tears of the packaging material and loss of instrument sterility.

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 health-care 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 must be inspected before use to verify the results of external and internal chemical indicators, barrier integrity and dryness. If the packaging is compromised (e.g. unsealed, damaged, wet, visibly soiled or dropped on the floor), the instruments must be cleaned, packaged and sterilized again.

Critical and semi-critical instruments must be reprocessed in a manner that will maintain sterility during storage. This includes ensuring that the integrity of the package is maintained.

STERILIZATION OF UNPACKAGED INSTRUMENTS

An unpackaged sterilization cycle (sometimes called "flash sterilization" or "immediate use sterilization") is a method for sterilizing patient-care items for immediate use. **Unpackaged sterilization must only be used in URGENT situations in which no other option is available. Unpackaged sterilization must not be used to compensate for a low inventory of instruments and must never be used for implantable devices**. In those situations in which unpackaged sterilization must be used, the following conditions must be met:

- a record is kept for each instrument undergoing unpackaged sterilization, including the name of the patient, procedure, dentist and instrument used;
- thorough cleaning and drying of instruments precedes the unpackaged sterilization cycle;
- physical indicators and Type 5 or Type 6 chemical indicators are used and checked at the end of the cycle;
- care is taken to avoid thermal injury to staff or patients;
- the sterility of instruments is maintained during removal from the sterilizer and transport to the point of use.

REPROCESSING OF NON-CRITICAL ITEMS

Non-critical items 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 hospital-grade low-level disinfectant with a Drug Identification Number (DIN) from Health Canada (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.

REPROCESSING EQUIPMENT PURCHASE, USE AND PREVENTIVE MAINTENANCE

All tabletop sterilizers and other reprocessing equipment must be CSA approved and accompanied by the manufacturer's instructions for use. Tabletop sterilizers undergo frequent use, and wear and tear. The manufacturer's recommendations must be consulted for guidance on use, weight limitations, load configurations and a preventive maintenance program, including regular inspection of gaskets and seals. The preventive maintenance, servicing and repair of all reprocessing equipment must be documented.

Office Cleaning, Housekeeping and Management of Waste

GENERAL CONSIDERATIONS

For the purposes of cleaning, a dental office has two component areas:

- public areas that are not involved in patient care, such as waiting rooms and reception areas;
- clinical areas that are involved in patient care, such as dental operatories and instrument reprocessing areas.

The ease of cleaning is an important consideration in the choice of materials for a dental office, especially for clinical areas. For example, cloth furnishings and carpeting are difficult to clean and cannot be reliably disinfected. When choosing materials for a dental office, consider the following:

- furnishings, surfaces and finishes should be smooth, nonporous and seamless, where possible;
- worn, stained or torn items that cannot be cleaned due to damage should be replaced as soon as possible;
- in clinical areas, cloth furnishings and carpeting must not be used;
- in clinical areas, materials should be cleanable with hospital-grade detergents, cleaners and disinfectants.

Smooth, nonporous and seamless furnishings, surfaces and finishes are preferred. Cloth or wood furnishings and carpeting are difficult to clean, cannot be reliably disinfected and must not be used in clinical areas.

Generally speaking, environmental surfaces in clinical areas do not contact the patient and do not pose a direct risk to their safety. However, such surfaces 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 OHCWs.

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.

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

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 an OHCW's gloved hands or contaminated instruments. Examples of clinical contact surfaces include:

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

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

Ideally, clinical contact surfaces and equipment should be disinfected with a cloth and disinfectant, allowing adequate wet contact time with the disinfectant, as described in the manufacturers' instructions for use. Disinfectant wipes are a convenient option, but it is difficult to attain adequate wet contact time with them. Accordingly, when using disinfectant wipes:

- the active ingredient must be an appropriate hospital-grade disinfectant;
- they must be kept wet and discarded if they become dry;
- multiple wipes may be required for large surfaces and equipment.

Applications of cleaning chemicals by aerosol or trigger spray bottles may cause eye injuries or induce or compound respiratory problems or illness. In accordance with best practices, apply cleaning chemicals to a cloth before using. Do not apply cleaning chemicals by aerosol or trigger spray bottles.

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 bags
- plastic sheets
- plastic tubing
- plastic-backed paper
- other moisture-proof materials

Since barriers can become contaminated during dental procedures, they must be removed and discarded between patients using gloves. Following barrier removal, the underlying surfaces must be examined to ensure they did not inadvertently become contaminated. Those that did must be cleaned and disinfected. Otherwise, clean barriers must be placed prior to the next patient. At the end of the workday, all barriers must be removed and these surfaces must be cleaned.

HOUSEKEEPING SURFACES

Housekeeping surfaces, such as floors and walls, have a limited risk of disease transmission. 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 must be cleaned first and then disinfected with an appropriate low-level disinfectant (e.g. bleach diluted 1:50 or 1000 ppm free chlorine). OHCWs must take appropriate precautions, including wearing gloves, for this purpose.

From a general housekeeping point of view, floors must be cleaned regularly and spills must be cleaned up promptly. Cleaning tools, such as mop heads, must be rinsed after use and allowed to dry before they are re-used. Fresh cleaning solutions must 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.

CLEANING UP BLOOD AND BODY FLUID SPILLS

Spills of blood and other body substances, such as urine, feces and emesis, must be contained, cleaned and the area disinfected immediately. If spills occur on carpets, a disinfectant other than bleach should be used. In certain cases, cleaning carpets may not be sufficient, and replacement and disposal of carpeting may be required.

The following procedure should be used for cleaning up a spill of blood or other body fluids:

- Restrict the activity around the spill until the area has been cleaned and disinfected and is completely dry.
- Put on gloves; if there is a possibility of splashing, wear a gown and facial protection (mask and eye protection or face shield).
- Confine and contain the spill; wipe up any blood or body fluid spills immediately using either disposable towels or a product designed for this purpose. Dispose of materials by placing them into regular waste receptacle, unless the soiled materials are so wet that blood can be squeezed out of them, in which case they must be segregated into the biomedical waste container (i.e. yellow bag).
- Disinfect the entire spill area with a hospital-grade disinfectant and allow it to stand for the amount of time recommended by the manufacturer.
- Wipe up the area again using disposable towels and discard into regular waste.
- Care should be taken to avoid splashing or generating aerosols during the cleanup.
- Remove gloves and perform hand hygiene.

MANAGEMENT OF WASTE

For the purposes of IPAC, waste from dental offices can be divided into two categories: **biomedical waste** and **general office waste**. Ontario 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 matter.

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 handled in accordance with Ontario Regulation 347: General – Waste Management.

NOTE: Extracted teeth are not classified as biomedical waste and should be handled differently. Please refer to the appropriate section below.

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 4 days, they must be handled in accordance with Ontario Regulation 347: General – Waste Management.

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. Some 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 Best Management Practices Flowcharts, available at the RCDSO's website.

Handling of extracted teeth

Extracted teeth may be returned to the patient without any special considerations for IPAC, 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.

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.

Equipment and Area Specific Practice Guidelines

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 OHCW 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 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 municipal or communal water supplies:

- Waterline heaters must not be used, as the heat encourages the growth of microorganisms.
- All waterlines must be purged at the beginning of each workday by flushing them thoroughly with water for a minimum of 2 minutes. Before purging is carried out, handpieces, air / water syringe tips and ultrasonic tips must be removed from the waterlines.
- Handpieces using water coolant must be run for a minimum of 20 seconds after patient care in order to purge all potentially contaminated air and water. The handpiece is then removed and, following cleaning and disinfection of clinical contact surfaces, another sterilized handpiece may be attached for use with the next patient.
- Sterile water or sterile saline 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.

For offices using closed or other water delivery systems:

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

BOIL WATER ADVISORIES

Boil water advisories occur when public health officials determine that municipally delivered tap water is unsafe to use or consume. Circumstances that compromise the safety of the municipal water system include compromises in the distribution system (e.g. water-main breaks), water treatment system failures and natural disasters (e.g. floods, hurricanes or earthquakes).

During a boil water advisory, the following precautions must be taken:

- Postpone treatment delivery, if possible. Develop a contingency plan in case of an extended boil water advisory.
- Public water must not be delivered to the patient through the dental unit, ultrasonic scaler or other devices or equipment.
- Use alternative water sources through closed delivery systems.
- Patients must not rinse their mouths with tap water. Bottled or distilled water should be used instead.
- Tap water must not be used for hand hygiene. Antimicrobial products that do not require water, such as alcohol-based hand rubs, should be used for hand hygiene. If the hands have been known or suspected to be contaminated, they should be washed using bottled or distilled water and an antimicrobial soap. Alternatively, moistened towelettes may be used to

remove visible soil, followed by the use of alcohol-based hand rubs.
- Consider contacting a portable sink manufacturer about the possibility of renting a portable sink that can operate with commercial-sized bottled water.
- When the boil water advisory is cancelled, all incoming public water system lines, including any taps or other waterlines in the dental office, must be flushed for a minimum of 5 minutes. The dental unit waterlines in all dental units and equipment must be disinfected according to the manufacturer's instructions prior to use. There may be public health advisories that require further measures.

During a period of water interruption, the same principles apply. For example, treatment should be postponed, if possible.

DENTAL HANDPIECES AND OTHER INTRA-ORAL 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 retracting oral fluids into their internal compartments, which 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 must be activated to discharge air and water for a minimum of 20 seconds after each patient use.

Dental handpieces and other intra-oral 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 must be strictly followed.

Some instrument components are permanently attached to dental unit waterlines; for example, electric handpiece motors, handles for ultrasonic devices, and attachments for saliva ejectors, high-volume suction and air / water syringes. Such components must 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 before the next patient is seated in the operatory.

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, OHCWs must be careful not to 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 must 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 must be flushed out with an enzymatic cleaner or appropriate cleaning solution.

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. 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 must be disposed of appropriately after use.

DENTAL RADIOGRAPHY EQUIPMENT

When taking radiographs, appropriate steps must 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 intra-oral radiographs (e.g. film-holders and positioning devices) must be sterilized between patients.

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 OHCW's gloved hands or contaminated film packets must be cleaned and disinfected after each patient use.

After a radiograph is exposed, the film packet must 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 must then be removed and hand hygiene performed before developing the film.

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

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

DIGITAL RADIOGRAPHY SENSORS AND INTRA-ORAL CAMERAS

Digital radiography sensors and intra-oral cameras come into contact with mucous membranes. These devices should be cleaned and heat-sterilized between patients. Alternatively, they must be protected with barriers to reduce gross contamination. However, following barrier removal, the underlying surfaces must be examined and if found contaminated, they must be cleaned and disinfected.

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

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 may include particles, gases, tissue debris, viruses and offensive odours.

OHCWs must 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. 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.

The manufacturer's instructions for cleaning, sterilization and maintenance of these devices must be strictly followed.

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 must be handled in a manner that prevents exposure of patients, OHCWs 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 must 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 items used in the mouth, such as impression trays or face bow forks, must 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, must be cleaned and disinfected according to the manufacturer's instructions.

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

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 must be cleaned and sterilized, cleaned and disinfected or discarded after use, as per the manufacturer's recommendations.

SAFE HANDLING OF INJECTABLES

The transmission of blood-borne viruses and other microbial pathogens to patients may occur due to unsafe and improper handling of injectables (e.g. local anesthetics, drugs and solutions for sedation).

The following practices must be adhered to when preparing and administering injectables.

Aseptic technique

- Perform hand hygiene prior to accessing supplies, handling vials and IV solutions, and preparing or administering drugs.
- Prepare drugs and supplies in a clean area on a clean surface.
- Use aseptic technique in all aspects of parenteral drug administration, drug vial use and injections. Limit access to select trained individuals, if possible.
- Never administer a drug from the same syringe to more than one patient, even if the needle is changed between patients.
- Never store needles and syringes unwrapped, as sterility cannot be assured.
- If an administration set is prepared ahead of time, all drugs should be drawn up as close to use as possible to prevent contamination. Once set up, an administration set should be covered.
- Do not use IV solution bags as a common source of supply for multiple patients.

Single dose vials

Single dose vials, intended for single patient use, typically lack preservatives. The use of these vials for multiple patients carries substantial risk for bacterial contamination and infection.

- Do not reuse single dose vials. Enter the vial once and immediately discard after use.

- Always use a sterile syringe and needle/cannula when entering a vial. Never enter a vial with a syringe or needle/cannula that has been used on a patient.
- Never combine or pool the leftover contents of single dose vials.
- A syringe for the administration of a local anesthetic must only be prepared at the time of use.

Multidose vials

Any error in following protocols for the correct use of multidose vials can result in the transmission of both bacterial and blood-borne viral pathogens. Transmission of HBV, HCV and HIV have been associated with the use of multidose vials.

The use of multidose vials for injectable drugs increases the risk of transmission of blood-borne pathogens and bacterial contamination of the vial **and should be avoided**. Patient safety should be prioritized over cost when choosing between multidose and single dose vials.

If multidose vials are used, the following practices must be followed each time the multidose vial is used:

- NEVER re-enter a vial with a used needle OR used syringe.
- Once medication is drawn up, the needle should be IMMEDIATELY withdrawn from the vial. A needle should NEVER be left in a vial to be attached to a new syringe.
- Use a multidose vial for a single patient whenever possible and mark the vial with the patient's name.
- Mark the multidose vial with the date it was first used and ensure that it is discarded at the appropriate time.
- Adhere to aseptic technique when accessing multidose vials. Multidose vials should be accessed on a surface that is clean and where no dirty, used or potentially contaminated equipment is placed or stored. Scrub the access diaphragm of vials using friction and 70% alcohol. Allow to dry before inserting a new needle and new syringe into the vial.
- Discard the multidose vial immediately if sterility is questioned or compromised or if the vial is not marked with the patient's name and original entry date.
- Review the product leaflet for recommended duration of use after entry of the multidose vial. Discard opened multidose vials according to the manufacturer's instructions or within 28 days, whichever is shorter.

The use of multidose vials increases the risk of transmission of blood-borne pathogens and bacterial contamination. Single dose vials are ALWAYS preferred.

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 must 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 must be cleaned and disinfected or placed in an impervious bag prior to transportation.

Biopsy kits, along with instructions for proper handling and shipping of specimens, can be obtained from both Ontario dental faculties:

Toronto Oral Pathology Service
University of Toronto

Oral Pathology Diagnostic Service
Western University

General and Surgical Aseptic Technique

The mouth is considered a clean-contaminated environment and the patient's own defences (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 most 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 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 surgical procedures (e.g. osteotomies, use of rigid internal fixation), the patient is prepared, surgical hand hygiene is performed, a sterile gown and 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 dental surgeon must 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, OHCWs 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 must 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 must only be retrieved using transfer forceps or by first ensuring that the OHCW's hands are clean.
6. Gloves must be applied just 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.

Maintaining aseptic technique is a cooperative responsibility of the entire dental team. Each member must develop a professional conscience for IPAC, as well as a willingness to supervise and be supervised by others regarding aseptic technique.

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

Glossary of IPAC Terms

Additional precautions: A term used to describe IPAC interventions that are taken in addition to routine precautions for certain pathogens or clinical presentations, based on the mode of transmission (e.g. contact, droplet, airborne).

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

Aseptic technique: A term used to describe practices that minimize the risk of 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 types of CIs:

> **Process indicator (Type 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. Type 1 CIs are usually applied to or visible on the outside of packages (e.g. sterilization tape or packaging printed with colour-changing inks). Type 1 CIs are directly exposed to the sterilization environment, so they usually "fail" only when there is a gross malfunction of the sterilizer.
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> **Specialty indicator (Type 2):** An indicator that is designed for use in specific test procedures in certain sterilizers (e.g. pre-vacuum sterilizers). Examples of Type 2 CIs include the indicators used in Bowie-Dick and Dart products, which are used for steam sterilizers.
>
> **Single-parameter indicator (Type 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, all of which must be reached for sterilization to occur.
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> **Multi-parameter indicator (Type 4):** An internal indicator that responds to two or more critical parameters of the sterilization process.
>
> **Integrating indicator (Type 5):** An internal indicator that responds to all critical parameters of the sterilization process. Type 5 CIs are correlated to the performance of biological indicators (BIs).
>
> **Emulating indicator (Type 6):** An internal indicator that responds to all critical parameters of the sterilization process for a specified sterilization cycle.

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 reprocessing.

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

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.

Low-level disinfection (LLD): A process capable of killing most vegetative bacteria, as well as some fungi and enveloped viruses. LLD is the 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 must have a DIN from Health Canada and include chlorine-based products, 0.5% accelerated hydrogen peroxide, 3% hydrogen peroxide, 60 to 95% alcohols, iodophors, phenolics and quaternary ammonium compounds.

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 healthcare 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 healthcare 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.

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

Process challenge device (PCD): A test used to assess the performance of the sterilization process.

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 reprocessing requirements of an item. The risk classes are as follows:

> **Critical items:** Items that penetrate soft tissue or contact bone. Critical items present a high risk of infection if the item is contaminated with any type of microorganism, including bacterial spores. Reprocessing of critical items involves meticulous cleaning followed by sterilization.
>
> **Semi-critical items:** Items that contact mucous membranes or non-intact skin, but ordinarily do not penetrate them. Reprocessing of semi-critical items involves meticulous cleaning followed by sterilization.
>
> **Non-critical items:** Items that contact intact skin, but not mucous membranes, or do not directly contact the patient. Reprocessing of non-critical items involves cleaning followed by low-level disinfection.

Routine practices: A term used to describe basic standards of IPAC that are required for all 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 must 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.

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 Instruments, Items and Environmental Surfaces

Table of Contents Previous Recommendation Next Recommendation

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 instruments.	Steam sterilization is the preferred method. Sterilization process must be audited and monitored with physical, chemical and biological indicators.
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. **Cannot** be relied on to kill mycobacteria, including Mycobacterium tuberculosis, or bacterial spores.	Chlorine-based products (e.g. diluted sodium hypochlorite) 0.5% accelerated hydrogen peroxide, 3 to 5% 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 non-ferous metals (e.g. aluminum, brass, copper, zinc), and some plastics and rubber. 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 Available on the Internet

Antibiotic Stewardship
Canadian Association of Hospital Dentists
https://cahd-acdh.ca/antibiotic-stewardship/

Best Management Practices Flowcharts, 2003
Royal College of Dental Surgeons of Ontario
www.rcdso.org/en-ca/rcdso-members/positions-and-special-initiatives

Best Practices for Cleaning, Disinfection and Sterilization of Medical Equipment/Devices in All Heath Care Settings, 2013
Provincial Infectious Diseases Advisory Committee, Ontario Ministry of Health and Long-Term Care
www.publichealthontario.ca/-/media/Documents/B/2013/bp-cleaning-disinfection-sterilization-hcs.pdf

Best Practices for Environmental Cleaning for Prevention and Control of Infections in All Health Care Settings, 2018
Provincial Infectious Diseases Advisory Committee, Ontario Ministry of Health and Long-Term Care
www.publichealthontario.ca/-/media/Documents/B/2018/bp-environmental-cleaning.pdf

Best Practices for Hand Hygiene in All Heath Care Settings, 2014
Provincial Infectious Diseases Advisory Committee, Ontario Ministry of Health and Long-Term Care
www.publichealthontario.ca/-/media/Documents/B/2014/bp-hand-hygiene.pdf

Best Practices for Infection Prevention and Control Programs in Ontario In All Health Care Settings, 2012
Provincial Infectious Diseases Advisory Committee, Ontario Ministry of Health and Long-Term Care
www.hqontario.ca/Portals/0/modals/qi/en/processmap_pdfs/resources_links/infection%20prevention%20control%20-%20english.pdf

Canadian Immunization Guide
Public Health Agency of Canada
www.canada.ca/en/public-health/services/canadian-immunization-guide.html

Canadian Medical Device Reprocessing (CAN/CSA-Z314-18), 2018
Canadian Standards Association
www.csagroup.org

Checklist: Infection Prevention and Control (IPAC) Core Elements in Dental Practice Settings, 2017
Public Health Ontario
www.publichealthontario.ca/-/media/Documents/C/2019/checklist-ipac-dental-core.pdf

Checklist: Reprocessing in Dental Practice Settings, 2017
Public Health Ontario
www.publichealthontario.ca/-/media/Documents/C/2019/checklist-ipac-dental-reprocessing.pdf

Guideline C-4: The Management of Biomedical Waste in Ontario, 2016
Ontario Ministry of the Environment
www.ontario.ca/page/c-4-management-biomedical-waste-ontario

Infection Prevention and Control Complaint Protocol, 2018
Ontario Ministry of Health and Long-Term Care
www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/protocols_guidelines/IPAC_Complaint_Protocol_2018_en.pdf

Infection Prevention and Control Disclosure Protocol, 2018
Ontario Ministry of Health and Long-Term Care
www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/protocols_guidelines/Infection_Prevention_and_Control_Disclosure_Protocol_2018_en.pdf

Infection Prevention and Control for Clinical Office Practice, 2015
Provincial Infectious Diseases Advisory Committee, Ontario Ministry of Health and Long-Term Care
www.publichealthontario.ca/en/eRepository/IPAC_Clinical_Office_Practice_2013.pdf

Routine Practices and Additional Precautions in All Heath Care Settings, 2012
Provincial Infectious Diseases Advisory Committee, Ontario Ministry of Health and Long-Term Care
www.publichealthontario.ca/en/eRepository/RPAP_All_HealthCare_Settings_Eng2012.pdf

Standard of Practice: Infection Prevention and Control Standards and Risk Management for Dentistry, 2010
Alberta Dental Association and College
www.dentalhealthalberta.ca/index/Sites-Management/FileDownload/DataDownload/10028/Standard-of-Practice-Infection-Prevention-and-Control_P/pdf/1/1033

Workplace Hazardous Materials Information System (WHMIS): A Guide to the Legislation, 2017
Ontario Ministry of Labour
www.ontario.ca/document/workplace-hazardous-materials-information-system-guide-legislation

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Provincial Dental Board
of Nova Scotia

STANDARD OF PRACTICE

Infection Prevention and Control
December 1, 2022

Table of Contents

Introduction 1
- Commonly Used Terms in This Document 1
- Purpose of the Document 1

Professional, Regulatory and Ethical Considerations 2

Principles of Infection Prevention and Control in the Oral Healthcare Setting 3
- Modes of Transmission 3
- Criteria for infection 3

Routine Practices 5
- Risk Assessment 5
  - SCREENING OF PATIENTS 5
- Hand Hygiene 6
- Storage 6
  - HANDWASHING 6
  - ALCOHOL-BASED HAND RUB (ABHR) 6
- Hand Care 7
- Use of Personal Protective Equipment 7
- Safe Handling and Disposal of Sharps 7
  - GENERAL CONSIDERATIONS 7

Additional Precautions 8

Human Rights and Confidentiality 8
- Patient Records 8

Personnel Health and Safety 9
- General Considerations 9
- Education and Training 10
- Immunizations 10
- Illness and Work Restrictions 11
- Exposure Prevention 11
- Exposure Management 12
  - EXPOSURE MANAGEMENT CHECKLIST 13
- Protocol Following Exposure 13
- Occupational Health and Safety Requirements and Workplace Hazardous Materials Information System (WHMIS) 15
- Prohibition of Eating and Drinking in Non-Designated Areas 15

Personal Protective Equipment 16
General Considerations 16
LATEX SENSITIVITY AND ALLERGIES 16
Gloves 16
Masks 17
Protective Eyewear 18
Protective Clothing 18
CLINIC ATTIRE 18
GOWNS/LAB-COATS 18
OTHER CONSIDERATIONS 18
PROTECTIVE DRAPING FOR PATIENTS 19
SAFE MANAGEMENT OF REUSABLE LINENS (LAUNDRY) 19
Respiratory Hygiene/Cough Etiquette 19
Sterilization and Disinfection of Patient Care Items (Reprocessing) 20
General Considerations 20
Reprocessing Critical Items 20
Reprocessing Semi-Critical Items 25
Reprocessing Non-critical Items 30
Environmental Infection Prevention and Control 31
General Considerations 31
Clinical Contact Surfaces 31
SURFACE CLEANING AND DISINFECTION 31
Housekeeping Surfaces 32
SURFACE BARRIER PROTECTION 32
Waste Management 33
Handling of Extracted Teeth 33
Facility, Equipment, and Specific Area Applications 34
Air Quality 34
Dental Unit Waterlines 34
ALL WATER SYSTEMS 34
CLOSED WATER SYSTEMS (PREFERRABLE TO OPEN WATER SYSTEMS, WHEN POSSIBLE) 34
Boil Water Advisories 35
Dental Handpieces and Other Devices 35
Suction Lines 36
Single-Use or Disposable Devices 36
Safe Handling of Injectables 36
ASEPTIC TECHNIQUE 36
SINGLE-DOSE VIALS 37
MULTI-DOSE VIALS 37

Dental Radiology 38
Pre-Procedural Mouth Rinses 38
Handling of Biopsy Specimens 38
Laser/Electrosurgery Plumes and Surgical Smoke 39
Cleaning of Removable Prothesis 39
Dental Laboratory Asepsis 40
IN-OFFICE PREPARATION PRIOR TO 'SHIPPING ITEMS' TO AN ON-SITE OR OFF-SITE LABORATORY 40
COMMERCIAL LABORATORY RECEIVING INCOMING ITEMS 40
SHIPPING ITEMS FROM A COMMERCIAL LABORATORY 40
DENTURE POLISHING AREA 41
Patients Infected with M. tuberculosis (TB) 42
Patients Infected with Other Communicable Respiratory Diseases (e.g., COVID-19, influenza) 42
Ongoing Infection Prevention and Control Evaluation 43
Additional Considerations for Alternative Practice Settings 44
Disposal of Biomedical Waste 44
Disposal of Environmentally Hazardous Waste 44
Disposal of Sharps 44
Transportation of Contaminated and Sterile Equipment 44
Glossary 45
Appendix 1 48
MANAGING CONTAMINATION 48
ENVIRONMENTAL SURFACES 49
DISINFECTANTS 50
Appendix 2 51
MANAGEMENT OF NEEDLESTICK AND MUCOUS MEMBRANE EXPOSURE TO BLOOD/BODY FLUIDS 51
CRITERIA TO ASSESS EXPOSURE FOR RISK OF INFECTION 52
MEDICAL FOLLOW-UP TO NEEDLESTICK AND MUCOUS MEMBRANE EXPOSURES 53
NEEDLESTICK EXPOSURE INFORMATION 54
NEEDLESTICK EXPOSURE CONSENT 54
CHECKLIST: POST-EXPOSURE ASSESSMENT OF SOURCE PERSON 55
EXPOSURE DOCUMENT 56
FOLLOW-UP CARE (DESCRIBE IN DETAIL) 57
Appendix 3 58
DONNING (PUTTING ON) PPE 58
DOFFING (TAKING OFF) PPE 59
Reference List 60

This 2022 PDBNS Infection Prevention and Control (IPAC) Standard of Practice is concurrent and in accord with Standards of the other three Nova Scotia Oral Health Regulators: the College of Dental Hygienists of Nova Scotia (CDHNS), the Denturist Licensing Board of Nova Scotia (DLBNS), and the Nova Scotia Dental Technicians Association (NSDTA).

The development of this document was initiated by the Nova Scotia Dental Association's Clinical Affairs Committee as a replacement for the 2013 NSDA document Infection Prevention and Control Guidelines. The Nova Scotia Oral Health Regulators owe a debt of gratitude to this NSDA Committee for the tremendous groundwork laid before transferring responsibility to the Oral Health Regulators. Particular appreciation goes to Dr. Kyla Romard for her dedication to this project.

Thanks go to the College of Dental Surgeons of Saskatchewan and the Royal College of Dental Surgeons of Ontario, for providing the building blocks of this document. Thanks as well to the Alberta regulatory bodies for dental assistants, denturists, dental technologists, and dental hygienists for granting permission to use and adapt the diagrams in their joint document Infection Prevention and Control Guidelines 2022.

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Introduction

This document contains practice parameters and standards which **must** be followed by all Nova Scotia ***Oral Health Care Providers*** (OHCPs) in the care of their patients. These standards will be used by the Provincial Dental Board of Nova Scotia (PDBNS), the College of Dental Hygienists of Nova Scotia (CDHNS), the Denturist Licensing Board of Nova Scotia (DLBNS), and the Nova Scotia Dental Technicians Association (NSDTA) in determining whether appropriate standards of practice and professional responsibilities have been maintained. Compliance with infection prevention and control (IPAC) standards is the responsibility of all OHCPs, not just the employer, contracting dentist, practice owner or corporate management team.

The major goal of an infection control program is to prevent the transfer of pathogens between contaminated items and individuals. Dentists, denturists, dental hygienists, dental assistants, and dental technicians have dealt with the concepts and principles of infection control and infection prevention since early in the histories of these professions. All OHCPs **must** be responsible for infection prevention and control in oral health facilities in Nova Scotia. Because of the realities of the oral environment, creating a medical-grade surgical operating room is not necessary or possible; however, OHCPs **must** strive to efficiently create an environment which is as pathogen free as possible.

Establishing scientific validity for every recommendation provided in this document is not always possible. Wherever possible, these requirements are based on data from peer reviewed sources (see Reference List).

In the absence of peer reviewed evidence, many of these standards are based on strong theoretical rationale, suggestive evidence, or opinions of respected authorities based on clinical experience, descriptive studies or committee reports. This document consolidates published recommendations from government and other agencies, regulatory bodies and professional associations. The standards will be updated as new evidence emerges.

The standards in this document are intended to protect all oral healthcare personnel and their patients from infectious disease transmission. OHCPs **must** apply this information as their standard of practice in a diligent, conscientious manner.

In the event of a public health emergency (e.g., pandemic), OHCPs must abide by the most current recommendations set forth by their regulatory body and the Chief Medical Officer of Health.

Commonly Used Terms in This Document

- ***Oral Health Care Providers*** (OHCPs) refers to dentists, denturists, dental hygienists, dental assistants, and dental technicians who are regulated and licensed to provide oral/dental care in the best interest of the public.
- ***Other personnel*** refers to the variety of paid and unpaid personnel in the oral healthcare setting (e.g., administrative, maintenance, and students) who might be exposed to infectious agents.
- ***Oral Healthcare Setting*** refers to all practice environments where oral healthcare is provided (e.g., dental clinic, denturist clinic, dental hygiene clinic, and dental lab).
- **Must** and **should** statements: "**Must**" statements are standards of practice that **must** be met. "**Should**" statements should be implemented but are not required.

Purpose of the Document

This document is not a step-by-step manual in how to implement specific infection control practices or procedures, nor does it endorse the use of specific infection control products. Rather, it lays out the IPAC principles and standards that OHCPs are expected to implement. These standards **must** be used to develop written facility-specific IPAC manuals.

Professional, Regulatory and Ethical Considerations

OHCPs have a professional duty to cause no harm to their patients, and to provide a safe working environment for all OHCPs and other personnel in their practice. Transmission of infectious diseases is possible before, during or after oral healthcare.

The oral health professions in Nova Scotia have a long tradition of providing appropriate and compassionate care to all segments of the public:

- OHCPs are morally and ethically required to provide necessary oral health care for all members of the public without discrimination. Accordingly, all OHCPs **must** not refuse to treat a patient on the grounds of the patient's infectious state.
- People living with infectious diseases may, however, be severely or profoundly medically compromised as a result of those infectious diseases. Planned oral healthcare may require modifications, in light of these conditions, to ensure the safe, appropriate delivery of oral healthcare.
    - ► OHCPs **must** be aware of oral and systemic effects of the disease or medications, potential interactions with other medications, as well as any necessary treatment modifications.
    - ► When a patient with an infectious disease is medically compromised, a multidisciplinary hospital setting may be a safer location for treating the patient.
    - ► OHCPs must triage and manage the care, as necessary, e.g., delaying treatment until the disease is controlled or not in an infectious state if the care is not an emergency, or urgent. As appropriate, OHCPs can provide care using virtual care (also called teledentistry), in accordance with any relevant profession-specific standards or guidelines.
- OHCPs with an infectious disease do not normally pose a significant risk of infecting patients, other OHCPs or the public, provided they are complying with current recommended IPAC procedures. OHCPs with an infectious disease have the duty to report to their regulatory authority (PDBNS, DLBNS, NSDTA or CDHNS) when a serious injury, dependency, infection, or any other condition has either immediately affected or may affect over time, their ability to practice safely and competently. Appropriate measures, including possible review by an expert panel, will then be taken to ensure the protection of the public and other personnel.
- OHCPs **must** maintain the standards of practice of the profession and, accordingly, **must** ensure that IPAC procedures are followed.
- OHCPs **must** only use products specifically designed for infection prevention and control in medical or oral healthcare settings.
- OHCPs **must** remain current in IPAC principles and procedures.

Principles of Infection Prevention and Control in the Oral Healthcare Setting

Modes of Transmission

Understanding modes of transmission helps OHCPs protect patients, other staff members, and themselves. Below is a list that identifies five common modes of pathogen transmission.

- Airborne transmission: Inhalation of aerosols or microorganisms that can remain suspended in the air. Aerosol generating procedures (AGPs) are those which can generate aerosols that consist of small droplet nuclei in high concentration and present a risk for airborne transmission of pathogens that would not otherwise be spread by the airborne route (e.g., COVID-19, influenza). Examples of AGPs in dentistry includes the use of:
  - ► Three-way air-water syringes
  - ► Ultrasonic and sonic devices
  - ► High-speed handpieces
  - ► Slow-speed handpieces in the presence of water/saliva
  - ► Lasers and electrosurgery units
  - ► Micro-abrasion devices
  - ► Air polishers
  - ► Pumice/polishing dental appliances in the presence of water
- Direct transmission: Direct physical contact with blood, oral fluids, or other substances from infected patients
- Indirect transmission: Contact with an intermediate contaminated object (instruments, computer/electronic equipment, or environmental surfaces)
- Droplet transmission: Contact of conjunctival, nasal, or oral mucosa with droplets (splatter) containing microorganisms generated from an infected person and propelled a short distance (by coughing, sneezing, or talking)
- Other transmission: Contact with a vehicle, such as food or water, causing the transfer of the pathogen.

Criteria for infection

Infection transmission through any of these routes requires that **all** the following conditions are met:

- An **infectious agent (pathogen)** of sufficient **virulence** and in adequate **numbers** to cause disease
- A **reservoir or source** that allows the pathogen to survive and multiply (e.g., blood)
- A **portal of exit** that allows the pathogen to leave the source
- A **mode of transmission** from the source to the host
- A **portal of entry** through which the pathogen can enter the host (e.g., needle-stick injury)
- A **susceptible host** (someone who is not immune)

The simultaneous occurrence of these criteria for infection transmission is referred to as the **chain of infection**. Effective IPAC procedures **must** interrupt one or more links in this chain.

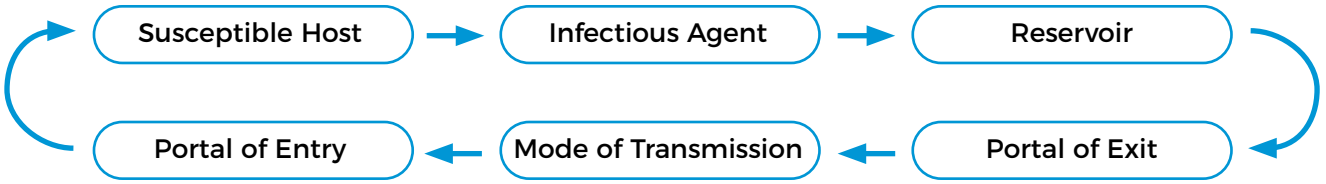


Figure 1: Chain of Infection – used with permission

If all IPAC processes are followed correctly, the risk of infection as a result of dental procedures is extremely low.

IPAC principles include:

- Following Routine Practices
- Assessing patients
- Using barrier techniques to protect both patients and OHCPs
- Applying the principles of cleaning, disinfecting, sterilizing, and storing 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:

- Identifying, communicating and implementing standards and guidelines by setting specific policies and procedures
- Establishing and implementing effective occupational health and safety programs for all OHCPs, such as written procedures for the workplace (e.g., implementing the hierarchy of controls) and guidance on immunization
- Educating OHCPs, as well as patients and their families, about everyone's role in infection prevention
- Ongoing review of policies and procedures, and evaluation of the IPAC program

Routine Practices

Health Canada uses the term "Routine Practices" to describe basic standards of IPAC that are required for safe patient care. A similar term, "Standard Precautions," is used by the Centers of Disease Control and Prevention in the United States. Routine Practices synthesize the major principles in "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 OHCPs and patients.

There are four principles that are inherent in Routine Practices:

1. Risk Assessment
2. Hand Hygiene
3. Use of Personal Protective Equipment (PPE)
4. Safe Handling and Disposal of Sharps

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 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 OHCP

Based on these factors, OHCPs **must** implement the appropriate strategies. For example, select appropriate PPE for procedures involving exposure to blood, body fluids and secretions, mucous membranes and non-intact skin.

SCREENING OF PATIENTS

It is possible that patients who are unwell may attend an oral healthcare appointment. Their health condition may relate to a dental problem (e.g., odontogenic or post-operative infection) or a non-dental problem (e.g., respiratory illness).

When confirming appointments, patients should be screened for illness (e.g., fever or cough). If a patient indicates symptoms that are not related to the dental problem, the appointment should be rescheduled.

Patients who present and appear to be ill should be rescheduled if possible. If their dental condition is of an emergency or urgent nature and appointment cannot be rescheduled, additional precautions **must** be implemented, as appropriate, based on patient assessment.

Hand Hygiene

Hand hygiene is the most important measure for preventing the transmission of pathogens and is often the weak link in an effective IPAC program. The purpose of hand hygiene is to reduce the quantity and diversity of the transient pathogens found on the surface of the hands, and not intended to remove the resident microorganisms found in the deep skin layers. The spread of these transient pathogens, through non-compliance with hand hygiene protocols, is connected with healthcare associated infections and the spread of multi-resistant organisms.

There are two acceptable methods of hand hygiene — hand washing and using alcohol-based hand rub (ABHR).

HANDWASHING

Handwashing should be done using plain liquid soap, cool or warm (not hot) water for at least 20 seconds, and single-use towels. Hands should be thoroughly dried after washing, as bacteria can quickly multiply.

Antimicrobial soaps are no longer recommended for routine hand hygiene but are recommended for surgical procedures.

The hands of OHCP that come in direct contact with patients **must** be washed:

- At the beginning of the workday.
- Whenever hands are visibly soiled.
- Before and after eating.
- After contact with contaminated environmental surfaces, instruments or other equipment in the dental operatory.
- After contact with dental materials that are contaminated or may be toxic.
- After using the washroom or blowing one's nose.
- Whenever the hands have become contaminated with blood, saliva or other body fluid, or whenever the hands have come in contact with some instrument, agent or surface that may have been contaminated with blood, saliva or some other body fluid.
- Prior to contact with patients who are latex sensitive. ABHRs are not sufficient for removing latex particles.

Between patients, or when gloves are changed during an appointment hand hygiene **must** be performed using one of the two hand hygiene methods.

ALCOHOL-BASED HAND RUB (ABHR)

Using ABHR is the preferred method to routinely decontaminate hands in clinical situations when hands are not visibly soiled.

Sufficient product is required to remain in contact with the hands for a minimum of 15 seconds. Often this is achieved by dispensing two full pumps. Hands should be rubbed until dry as the alcohol can cause glove material degradation resulting in loss of glove integrity.

OHCPs **must** use medical grade (minimum 70% alcohol) commercial products approved by Health Canada for ABHR use. These products **must** have a Drug Identification number (DIN) or Natural Product Number (NPN) from Health Canada.

Storage

Hand hygiene products **must** be used, stored, and dispensed according to the manufacturer's instructions. Liquid products **must** be stored in closed containers and dispensed from either disposable containers or from containers/pumps that have been washed, disinfected, and thoroughly dried between refilling. Liquid products **must** not be added to a partially empty dispenser or "topped up", due to the risk of bacterial contamination.

Hand Care

Emollient hand lotions should be considered for routine use to prevent hand irritation and dermatitis that comes from frequent hand hygiene and glove use. Manufacturers of hand hygiene products should be consulted regarding any possible interaction with hand lotions, soaps, and ABHR. If using latex gloves, petroleum-based lotions should be avoided during the workday, as these may weaken the glove material, resulting in increased glove permeability.

Fingernails are a common area of bacterial contamination. Fingernails should be kept short and trimmed to allow thorough cleaning under nails and prevent glove tears. During the initial hand wash, sterile nail brushes or disposable orangewood sticks may be used to clean cuticles and under fingernails.

Long natural or artificial nails **must** be avoided. Freshly applied nail polish on natural nails is acceptable, provided fingernails are kept short. Chipped nail polish **must** be avoided because as it can harbour microorganisms.

Jewellery, including rings, arm bands, wrist bands, bracelets and watches **must** not be worn. (Smooth metal ring bands are acceptable.) They compromise hand hygiene, make donning gloves difficult, and can increase the chance of tearing gloves. As well, jewellery cannot be adequately decontaminated.

Use of Personal Protective Equipment

GENERAL CONSIDERATIONS

OHCPs wear personal protective equipment (PPE) to shield themselves from exposure to potentially infectious material. This also protects the patients by preventing the OHCPs 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 materials.

Refer to Personal Protective Equipment for specifics.

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
- Collected in a clearly labeled puncture-resistant container located directly adjacent to the point of use
- Placed into the sharps container immediately following use or at the end of the procedure

See Exposure Prevention for more about sharps handling.

Additional Precautions

Routine Practices may not be sufficient for patients who are infected or colonized with certain microorganisms that pose special challenges in blocking their transmission (e.g., *M. tuberculosis*). The term "Additional Precautions" is used to describe measures that are taken in addition to Routine Practices 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 relevance in healthcare institutions where staff and patients may be at increased risk of disease transmission. In these settings, regional, local, or institutional authorities may implement additional protocols to limit this risk. 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 ambulatory settings, such as dental offices, Additional Precautions are required for patients who are known, or suspected, to have an infection that can be transmitted by large respiratory droplets. Examples of microorganisms that can be transmitted in this way include respiratory tract viruses, rubella, mumps, and *B. pertussis*.

To minimize the spread of microorganisms by droplet transmission in these cases, patients:

- **must** be offered a mask upon entry
- should perform hand hygiene
- should maintain a two-metre separation from other persons
- should be removed from the reception/waiting area and seated in a secluded operatory as soon as possible

Human Rights and Confidentiality

The Nova Scotia *Human Rights Act* protects against the violations of certain rights in Nova Scotia, specifically: age, race, colour, religion, creed, gender, pregnancy, sexual orientation, gender identity, gender expression, physical disability, mental disability, ethnic, national or aboriginal origin, family status, marital status, source of income, irrational fear of contracting an illness or disease, political beliefs, affiliation or activity and an individual's association with any individual or class of individual in the aforementioned list.

OHCPs are prohibited from discriminating against patients. This includes using extraordinary and unnecessary infection control or other measures on some patients that are not used for other patients. OHCPs may require modifications to Routine Practices based on the risks associated with certain dental procedures and in consideration of a patient's health history (e.g., *M. tuberculosis,* respiratory tract viruses).

Patient Records

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 **must** be stored securely and in accordance with the Personal Health information Act of Nova Scotia (PHIA) and any additional guidelines established by the OHCP's regulatory body. (For example, the *PDBNS Recordkeeping Guidelines* can be found at: http://pdbns.ca/licensees/policies-and-guidelines/recordkeeping-guidelines.)

Sensitive medical information should not be recorded in 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 recognizes 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.

Under PHIA, it is the responsibility of the "custodian" (e.g., dentist) to ensure that all staff is knowledgeable about and take appropriate steps to protect patient confidentiality including the development and implementation of appropriate patient confidentiality and record keeping policies. "Agents" of the custodian (e.g., employees) **must** collect, use, and disclose and dispose of personal health information as set out by legislation.

Personnel Health and Safety

General Considerations

Oral health care settings **must** have a written site-specific IPAC manual. This manual **must** be consistent with the current IPAC Standards for Nova Scotia's Oral Health Professions.

The site-specific manual **must** be reviewed, signed, and dated annually by all employees of the facility.

The site-specific manual **must** include the following elements:

- Policies that describe routine practices for all oral health care procedures within the facility
- Identification of an IPAC Officer (any OHCP) assigned to create, maintain, coordinate and evaluate the IPAC policies. The officer's duties include the education of OHCPs and other personnel regarding the IPAC principles, identifying work-related infection risks, instituting preventive measures, and ensuring prompt exposure management and medical follow-up.
- Contact information for local healthcare personnel trained in exposure management
- Policies and procedures for pre-treatment, treatment, and post-treatment periods of patient care
- Daily, weekly, and monthly routines, including documentation of all processes e.g., equipment maintenance (ultrasonic instrument cleaners and heat sterilizers)
- Protocols for sterilizer monitoring and sterilizer malfunction management, including documentation
- Policies on recording of staff immunizations (see **immunizations**)
- Policies regarding exposures to infections agents including prevention, management, and documentation. These policies **must** be consistent with local and provincial guidelines, including the Nova Scotia Personal Health Information Act. Visit the following for more information on exposures to infectious agents:
  - ► **https://www.cdha.nshealth.ca/employee-health/blood-bodily-fluid-exposures**
  - ► **https://www.cdha.nshealth.ca/employee-health/blood-bodily-fluid-exposures/after-accidental-exposure**
- Guidelines for education and training (documented in employee file)
- Location of first aid kit and eye wash station
- Protocols regarding staff medical conditions, work-related illness, and associated work restrictions
- Protocols regarding contact dermatitis and latex hypersensitivity
- Nova Scotia Health Authority emergency protocols for infectious diseases

Education and Training

IPAC practices are improved when OHCPs and other personnel understand the reasons why the policies exist.

OHCPs and other personnel **must** receive IPAC training as part of their practice orientation and whenever new tasks or procedures are introduced. Additionally, OHCPs and other personnel **must** receive an annual IPAC Guidelines review. Education and training should be appropriate to the assigned duties of specific personnel. The site-specific policies and protocols **must** be reviewed with all staff annually.

For OHCPs and other personnel, their training **must** include:

- A description of each individual's exposure risks
- A review of prevention strategies and infection-control policies and procedures
- The management of work-related illness and injuries, including post-exposure prophylaxis
- A review of work restrictions for the exposure or infection

All education and training courses **must** be documented.

For more information, please see the NSDA's documents entitled "The Occupational Health and Safety Act: Dental Office Interpretation" as well as the "Best Practices Checklist." These documents can be found using the following link: https://nsdental.org/resources/for-office-managers/office-management-documents/?category=ohs

Immunizations

Immunizations for vaccine-preventable diseases substantially reduce both the number of OHCP susceptible to infectious diseases and the potential for disease transmission to others.

It is important that all OHCPs know their personal immunization status and ensure that it is up to date. In this regard, OHCPs should consult with their family physician about the need for immunizations, as well as baseline and annual tuberculosis skin testing.

For records requests visit: http://www.nshealth.ca/service-details/Immunization%20Records%20Request

Employers need to be aware of immunization recommendation for healthcare workers (HCW) as noted in the Canadian Immunization Guide. All OHCPs should be adequately immunized against the following diseases:

- COVID-19
- Diphtheria
- Hepatitis B
- Influenza (annual)
- Measles
- Mumps
- Pertussis
- Rubella
- Varicella
- Tetanus (every 10 years)

This is not an exhaustive list and it may change over time based on changes in recommendations/requirements from provincial and/or federal authorities.

Employers may develop and enact policies around recommended and/or mandatory vaccinations in line with current directives from the Nova Scotia Department of Health and the Chief Medical Officer of Health. The mandating of vaccinations, as well as the maintaining records of employee vaccination status, **must** be done respecting current labour laws.

Employers **must** inform workers about recommended immunizations and allow for workers to receive these immunizations during normal working hours.

Illness and Work Restrictions

OHCPs may be concerned about contracting illnesses in oral healthcare settings. Such occurrences can be minimized by practising the principles outlined in this document, including:

- Ensuring adequate and appropriate immunization of all OHCPs
- Triaging patients and rescheduling those who are ill
- Adhering to Routine Practices

Unique situations that might warrant particular attention by an OHCP include:

- Dermatitis – When the protective skin barrier is broken, as occurs with chapped hands or eczema, the OHCP is at increased risk of acquiring and transmitting infection through the exposed area. Good skin care should always be practised. Any areas or dermatitis should be covered with bandages, in addition to wearing gloves.
- Immunocompromised staff – These OHCPs are at an 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.

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

OHCPs who have oral and/or nasal herpes simplex infections 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. Those with herpes simplex infections (herpetic whitlow) or other infectious conditions or issues on their hands that may prevent them from wearing appropriate PPE (e.g., gloves), **must** remove themselves from providing patient care and from performing reprocessing until the condition heals appropriately.

Exposure Prevention

Exposure to blood through percutaneous injury or contact with mucous membranes of the eye, nose or mouth, and non-intact skin are the primary modes of transmission of exposure to blood-borne pathogens. Percutaneous exposures involve the greatest risk for transmission and include needle-sticks or cuts with contaminated sharp objects. Non-intact skin includes all exposed skin that is chapped, abraded, or has dermatitis.

Avoiding direct contact with blood or any other body tissues/fluids should be of paramount importance in any IPAC program.

The majority of exposures in an oral healthcare facility may be preventable by using:

- Routine Practices: OHCPs **must** abide by Routine Practices such as hand hygiene and the use of PPE.
- Engineering Controls: Examples include technology-based designs for equipment and devices intended to reduce percutaneous exposures (e.g., automated instrument washers and dental units designed to shield burs on handpieces). Engineering controls should be used whenever possible.
- Administrative Controls (or Work Practice Controls): Examples will include policies developed to reduce aerosols and avoid percutaneous injuries.
- Administrative controls **must** include the following:
  - ► Using high-volume evacuation (HVE) in a heavy aerosol environment, for example with ultrasonic use and highspeed handpieces
  - ► Using a dental dam whenever feasible during operative procedures

- Using HVE and dental dam also minimize the ingestion or inhalation of contaminated or hazardous material and debris.

- Avoiding or using extreme caution when passing sharps during four-handed dentistry
  - Sharps include, but are not limited to, needles, scalers, laboratory knives, burs, explorers, and endodontic files and reamers.
- Not passing needles between OHCP during four-handed dentistry
- Removing burs before removing the handpiece from the dental unit
- Placing all syringes and needles, scalpel blades, and other sharp items in approved puncture-resistant sharps containers located at point of care or as close as feasible to where the items were used
- Using puncture-resistant containers labelled "Biohazard" and disposing according to municipal regulations
- Capping all needles prior to and immediately after use, including when changing the carpule and discarding
- Recapping needles using a needle guard, a one-handed scoop technique, or an engineered sharps injury protection device (needles with re-sheathing mechanisms)
- Capping needles before removing the needles from the syringe for disposal
- Recapping needles between each use when using one needle for multiple injections on the same patient
- Using extreme caution when contaminated sharp instruments are passed between OHCP or other personnel during four-handed dentistry
- Using extreme caution whenever contaminated sharp instruments are processed for sterilization

Other administrative controls may include, but are not limited to:

- Not using fingers in tissue retraction or palpation during suturing and administration of anesthesia
- Identifying and removing all sharps from an instrument tray prior to instrument cleaning
- Avoiding the manipulation or bending of needles by hand
- Ensuring that needles are not pointed towards an OHCP or other personnel
- Using one needle per injection to minimize risk of infection from needle stick
- Keeping instruments organized on the work surface to reduce the risk of sharps injury
- Wearing sturdy puncture resistant utility gloves for instrument processing and keeping in mind that no glove is foolproof and avoid handling these instruments by the handful

Exposure Management

Exposure to blood or saliva by **percutaneous injury** is the greatest risk for acquiring a bloodborne pathogen in oral healthcare settings. Every effort should be made by all OHCPs to avoid percutaneous injury.

Significant Exposures must be dealt with immediately, and exist when any of the following events occurs:

- The skin of an OHCP is punctured by a contaminated needle or sharp instrument (blood is released).
- Blood, saliva, or other body fluid is splashed onto non-intact skin (dermatitis, cuts, or abrasions).
  - Exposure to a patient's blood or saliva on intact skin is not considered significant.
- Blood, saliva, or other body fluid is splashed onto mucosa of the eyes, mouth, or nose.

EXPOSURE MANAGEMENT CHECKLIST

- √ Remove gloves, and clothing adjacent to the injury if applicable, to assess the extent of the injury.
- √ Immediately allow wound to bleed freely but do not squeeze it. Then wash the area, including the puncture or wound, using soap and water. Flush exposed eye, mouth, or nose mucosa with copious amounts of water.
- √ Do not apply caustic agents such as bleach or inject antiseptic agents into the wound.
- √ Report the injury to the facility's IPAC Officer as well as the dentist/employer/practice owner. The IPAC Officer **must** complete the Exposure Document Form which the OHCP takes to the emergency department of the healthcare facility identified in the site-specific IPAC manual.
- √ The designated emergency department should be notified ahead so they are best able to deliver the appropriate care on arrival.
- √ The OHCP **must** go immediately to the emergency department.
- √ If possible, the source patient should undergo serology testing (HBsAg, HCVAb, and HIVAb) with their consent.

Protocol Following Exposure

Post Exposure Prophylaxis (PEP) regimens will be determined by a qualified healthcare professional. Every significant exposure **must** be **immediately** evaluated to assess the potential to transmit an infectious disease. Timeliness is extremely important. For example, if the need to administer PEP is determined (e.g., retroviral drugs in the case of a suspected HIV exposure), it should be done **within one to two hours** after the exposure. The PEP regimens considered will be determined by the healthcare professional contacted by the IPAC Officer following the exposure.

The assessment of risk to transmit an infectious disease will be based on the following:

- The type and amount of body fluid or tissue involved.
- The nature of the exposure (percutaneous injury, mucous membrane, or non-intact skin exposure).
- The known or unknown infection status of the source.
- The susceptibility of the exposed person.

Documentation should include:

- The name of the exposed person, and details regarding the exposed person's vaccination status.
- The date and time of the exposure.
- The nature of the exposure, including the dental procedure being performed, the extent of the exposure, and the immediate action taken.
- The name and health status of the source person, including details regarding any infectious diseases known or suspected.
- All communication (oral or written) regarding the injury.

Copies of all documentation **must** be retained in the employee's personnel file.

The dentist/employer/practice owner **must** be advised of the incident and that Exposure Management and Protocol were followed.

Under Nova Scotia's Occupational Health and Safety Act (which applies to oral healthcare facilities) there is a mandatory requirement to report serious workplace injuries to the Health and Safety Division of the Nova Scotia Department of Labour and Advanced Education.

Initial reporting can occur by telephone or in writing and **must** occur within the following deadlines:

Fatalities—report immediately

Serious injury—report as soon as possible, within 24 hours

- Unconsciousness
- Fracture of the skull, spine, pelvis, arm, leg, ankle, wrist or a major part of the hand or foot
- Loss or amputation of a leg, arm, hand, foot, finger, or toe
- Third-degree burn
- Loss of sight in one or both eyes
- Asphyxiation or poisoning
- Any injury that requires admission to hospital
- Any injury that endangers life

Serious incident—report as soon as possible, within 24 hours

- An accidental explosion
- A major structural failure or collapse of a building or other structure
- A major release of a hazardous substance
- A fall from a work area where fall protection is required by the regulations

The provincial health authority will also complete an incident report.

■ **See Appendix for management of exposures including procedure protocols, consent forms, checklists, and other pertinent documentation.**

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

Under Nova Scotia's Occupational Health and Safety Act, there is a general duty for employers 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 legislation and use or wear any equipment, protective devices or clothing required by the employer. Employees also have responsibilities laid out in the legislation that they **must** fulfill, outlined in section 1.7 of the *OH & S Act*. This includes cooperating with the employer and fellow employees as well as taking every reasonable precaution to protect their own health and safety and that of others at, or near, the workplace. Employees **mus**t also immediately report conditions, devices, materials, or any aspect of the workplace that is, or may be, dangerous to someone's health and safety in the workplace.

WHMIS is a national communication standard that deals with hazardous materials in the workplace. All workplaces that use materials classified as controlled products under federal legislation, including oral healthcare facilities, are required to:

- Supply labels for all controlled products that do not have them
- Ensure safety data sheets (SDS) 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 employer **must** be familiar with the legislation.

The frequency of WHMIS retraining is not specified in the regulations. This regulation is written to be performance-based so employers have some flexibility in determining how to achieve compliance.

For example, employers can determine if retraining is required by testing employees on their knowledge. This knowledge retention test can be conducted on a fixed or random basis as determined by the employer, but the questions should vary over time.

Prohibition of Eating and Drinking in Non-designated Areas

The consumption of all foods and beverages **must** 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 **must** be prohibited.

Personal Protective Equipment

General Considerations

PPE is worn as part of Routine Practices to protect the skin of the hands, arms, and face from exposure to splashing or spraying of blood, saliva, or other body fluids, and from introducing the surface flora into deeper tissues by traumatic or environmental injury. PPE protects the conjunctival mucosa of the eyes, as well as the lining mucosa of the respiratory tract.

Primary PPE includes gloves, masks, protective eyewear, and protective clothing, the wearing of which will reduce the risk of exposure to potentially infectious material.

Large particle droplets of water, saliva, blood, and other debris are created when using rotary dental handpieces, ultrasonic and sonic scalers, endodontic equipment, and air-water syringes. This visible spray typically travels only a short distance (approximately 60 cm/ 2 feet or less from the patient's mouth) and settles out quickly. The droplets land on nearby surfaces, including operatory countertops, chairs, equipment, OHCPs and patients. Small particle droplets, called aerosols, can be inhaled by OHCPs or patients.

Appropriate work-practice controls will minimize the spread of droplets and aerosols. This includes, but is not limited to, the use of dental dam whenever possible and high-volume suction during procedures in which aerosolization will occur.

PPE should be removed prior to leaving the patient-care area. PPE designed to be re-used (protective eyewear and clothing) **must** be cleaned and disinfected according to manufacturer's instructions.

LATEX SENSITIVITY AND ALLERGIES

Patients with true latex allergy may react to common dental products, such as gloves, dental dams, prophylaxis cups, orthodontic elastics, and some medication vials. During the health history review, 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 a true latex allergy **must** 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 **must** 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.

Gloves

Gloves are worn to protect the skin of OHCPs' hands from contamination. Gloves do not replace the need for proper hand hygiene. Gloves may contain small, unapparent holes, can be torn during patient treatment, or hands may become contaminated during glove removal. Furthermore, resident organisms on the hands can multiply rapidly in the warm, moist gloved environment and could be passed to the next patient.

Appropriate hand hygiene **must** be performed immediately before donning gloves, and immediately after removing gloves. Hands should be allowed to dry completely before putting on new gloves.

- Due to the prevalence of latex allergies and sensitivities, the use of non-latex gloves is recommended.
- Gloves **must** be worn when contact with mucous membranes, non-intact skin, or body fluid is anticipated.
- Gloves are designed as single-use disposable items.
- Gloves should be put on immediately before the activity for which they are indicated.
- Gloves **must** be removed, hand hygiene performed, and new gloves applied between patients and whenever the gloves are torn or punctured.

- Gloves **must not** be worn outside operatories or reprocessing areas, unless required for personal protection (e.g., transport of contaminated instruments).
- During longer procedures, gloves **must** be changed periodically (after no longer than 90 minutes) to minimize the risk of undetected micro-perforations which occur over time.
- Single-use disposable gloves **must not** be washed and reused.
- Gloves should be stored in a cool dry location and never exposed to a heat source.

The type of gloves selected for use depends on the procedure being performed. Types of gloves include:

Patient Examining Gloves – are used for examinations, procedures involving contact with mucous membranes and skin, as well as laboratory duties and for some minor to moderate surgical procedures. These are latex, nitrile or nitrile blends, polyurethane, or styrene-based copolymers. If latex gloves are selected powder-free gloves are recommended as the exposure to latex proteins and the chemicals used in the manufacture of all gloves is reduced. Plastic (polyvinyl chloride) or vinyl gloves may also be used, however, these materials tend to tear more easily. New patient gloves may be used for operatory cleanup, according to disinfectant product manufacturers' instructions.

Sterile Surgical Gloves – are used for surgical procedures when an open surgical wound is anticipated and/or bone is exposed. These are sterile, hand size specific, and made of latex, nitrile or nitrile blends, polyurethane, or styrene-based copolymers.

Utility or Industrial Gloves – are used for cleaning and disinfection procedures, such as instrument processing and operatory cleanup for greater operator protection. These are nitrile or latex-nitrile blends, chloroprene / neoprene blends, butyl rubber, fluoro-elastomer, polyethylene, or other vinyl copolymer. These gloves are not for patient care and **must** be puncture and chemical resistant.

If utility gloves are reusable, they **must** be cleaned and disinfected (or sterilized) after each use and **must** be dried and stored appropriately in a designated area. If utility gloves are shared, clean patient examining gloves **must** be worn underneath. Best practice is that the utility gloves are not shared between OHCPs.

The integrity of gloves **must** be monitored after donning and during use, particularly when manipulating metal instruments. If the glove is compromised (manufacturing defect, punctured or torn during use), the glove **must** be removed immediately, hand hygiene performed, and new gloves donned. Refer to manufacturer's instructions regarding possible sterilization.

Refer to Appendix 3 re: proper donning and doffing of all PPE.

Masks

The respiratory mucosa of all OHCPs **must** be protected by wearing a mask that covers the nose, mouth and chin during all dental procedures that have the possibility of producing aerosols, splashes, sprays or splatter of blood, saliva or other body fluids.

Mask selection **must** be applicable to the aerosol environment of the procedure being performed. American Society for Testing of Materials (ASTM International) provides standards for various levels of face masks. Level 1 to level 3 are available; manufacturer's instructions **must** be followed. Other masks may be used as appropriate, e.g., fit-tested N-95.

The mask **must** be changed between patients, or more often if it becomes contaminated or wet during the procedure, including when the OHCP exhaled moist air during a longer procedure. The efficiency of filtration is reduced significantly whenever the outer surface of the mask becomes contaminated with droplets of spray, or by touching the mask with contaminated gloves or hands.

When working in a normal aerosol environment, masks should be changed at least every hour. When working in a heavy aerosol environment, masks should be changed every 20 minutes.

The mask **must** be moulded over the nose, mouth, and chin at all times, so that the OHCP is breathing though the mask, and air

is not bypassing the mask. The mask **must** be either on or off; it **must** never be worn around the neck or with the nose exposed. Single-use disposable masks **must** be removed by the ear-loop or string tie and properly disposed of after use. The OHCP should avoid touching the mask itself.

Protective Eyewear

The conjunctival mucosa of an OHCP **must** be protected from contact with potentially contaminated material by wearing protective eyewear during all dental procedures. OHCPs **must** wear protective eyewear with solid side shields or a face shield during dental procedures that have the possibility of producing debris, aerosols, sprays or splatter.

Prescription eyeglasses are not acceptable by themselves and should only be worn underneath face shields or other types of eye protection.

Protective eyewear **must** be used to protect patients' eyes from splatter, debris, or injury during dental procedures.

Protective eyewear for the OHCP and patient **must** be cleaned, disinfected, and dried between patients, or more frequently if visibly soiled, according to manufacturer's instructions.

A fixed or portable eye-wash station **must** be available in the oral healthcare facility, to aid in managing any chemical or body fluid splashes, sprays, or spills into the eyes of a OHCP or patient. Staff should be oriented as to the location, function, and indications for use of the eyewash station. The eyewash station **must** be cleaned and checked regularly according to manufacturer's instructions to ensure proper water flow. Portable eyewash devices **must** be checked for an expiry date on the solution.

Protective Clothing

The skin on the arms and chest of an OHCP should be protected from contact with potentially contaminated material by wearing protective clothing during any dental procedure where splash or spray is anticipated. Long-sleeve protective clothing, extending to the wrists, is ideal for this purpose. Short-sleeve protective clothing is acceptable, as long as there are no breaks in the skin integrity on the arms of the OHCP. If the arms are not protected, hand hygiene protocols **must** extend up the arms, past the wrists towards the elbows.

There are two types of protective clothing for OHCPs — clinic attire (such as uniforms/scrubs) and gowns/lab coats.

CLINIC ATTIRE

This protective clothing **must** be changed daily or changed as soon as possible if it becomes visibly soiled.

Clinic attire **must** be donned upon entering the clinic prior to patient care and removed before leaving the work area. It **must not** be worn outside the clinic.

GOWNS/LAB-COATS

Gowns/lab coats are long-sleeved garments that are intended to be **patient-specific** items of protective clothing. Gowns/lab coats **must** be worn over regular clinic attire when performing AGPs or during procedures likely to generate splatter or droplets of blood, body fluids, secretions, or excretions. They **must** be removed prior to seeing the subsequent patient.

Gowns can be disposable or washable. Washable cloth gowns/lab coats are also referred to as "reusable linens". Reusable linens **must** be laundered properly after each use or sent to an appropriate external laundering facility.

OTHER CONSIDERATIONS

Clinic shoes **must** be closed toe and **must not** be worn outside the clinic.

OHCPs **must** confine hair. Long hair **must** be tied back so it does not fall to the front of the shoulders. Headwear and hair coverings **must** be treated as clinical attire.

PROTECTIVE DRAPING FOR PATIENTS

Bibs or drapes should be used to protect the patients' clothing and reduce exposure to splatter and debris created during dental procedures. If used, they **must** be single-use or sterilizable. Single-use strips may be used to secure bibs and drapes in place of reusable bib clips. If reusable bib clips are used, they **must** be cleaned and disinfected (or sterilized) between each patient.

SAFE MANAGEMENT OF REUSABLE LINENS (LAUNDRY)

All reusable linens used in the direct care of patients **must** be managed as 'infectious' linen. They **must** be handled, transported, and processed in a manner that prevents exposure to the skin and mucous membranes of staff and contamination of their clothing and the environment. Disposable gloves **must** be worn and a gown or apron should be worn when handling infectious linen.

Single bags of sufficient tensile strength are adequate for containing laundry, but leak-resistant containment is needed if the laundry is wet and capable of soaking through a cloth bag. Bags containing contaminated laundry **must** be clearly identified with labels, color-coding, or other methods so that staff responsible for laundry can handle these items safely. Dispose the used bags into the normal waste stream.

Laundry services for healthcare facilities are provided either on or off-premises using the following protocol:

- Separate from other linens
- Launder in a load not more than half the machine capacity
- Launder at the maximum temperature the fabric can tolerate, then iron or tumble-dry.

Respiratory Hygiene/Cough Etiquette

OHCPs **must** be educated/trained on the importance of infection prevention measures to contain respiratory secretions and to prevent the spread of respiratory pathogens when examining and caring for patients with signs and symptoms of a respiratory infection. OHCPs **must** also screen themselves to ensure they are well enough to provide care.

Whenever possible, patients with signs or symptoms of respiratory infection **must** have their treatment rescheduled. Patients should be screened at the time of booking or confirmation.

The following measures will minimize the transmission of respiratory illnesses:

- Instructions for performing hand hygiene should be posted beside hand hygiene stations.
- Hand hygiene stations should be available upon entry to clinic.
- Signs should be posted at entrances with instructions to patients with symptoms of respiratory infection.
  Instruct patients to:
  - ► Cover their mouths/noses when coughing or sneezing.
  - ► Turn their head away from others when coughing or sneezing.
  - ► Use and dispose of tissues.
  - ► Perform hand hygiene after hands have been in contact with respiratory secretions.
- Tissues and no-touch receptacles for disposal of tissues should be provided.
- Masks **must** be offered to symptomatic patients upon entry if their treatment cannot be deferred.
- Persons with symptoms of respiratory infections **must** be seated at least two meters away from other patients. If possible, they should be seated in a separate area while waiting for care.

Sterilization and Disinfection of Patient Care Items (Reprocessing)

General Considerations

Reusable patient-care items, such as dental instruments, handpieces, devices, and equipment, can be categorized as critical, semi-critical, or non-critical, depending on the potential risk for infection associated with their intended use. This categorization is based on a modified Spaulding classification. (See Appendix 1).

Critical Items are used to penetrate soft tissue or bone. Critical patient care items have the greatest risk of transmitting infection and **must** be sterilized by heat. Examples of these items include surgical instruments, periodontal scalers, reusable burs, endodontic files, dental dam clamps, and dental implant drills.

Semi-Critical Items are those items that only touch mucous membranes or non-intact skin and have a lower risk of transmission (e.g., mouth mirrors, reusable impression trays). Semi-critical patient care items **must** be sterilized or considered as single-use items. The use of high-level disinfectants **is not** an appropriate sterilization method.

- All newly purchased critical and semi-critical instruments/items that are received non-sterile must be inspected and sterilized prior to first use, in accordance with the manufacturer's instructions (e.g., burs, scalers, matrix bands, stainless steel crowns).

Table of Contents Previous Recommendation Next Recommendation

Non-Critical Items (e.g., bib clips, radiograph cones and blood pressure cuffs) contact only intact skin, which serves as an effective barrier to microorganisms. Non-critical patient-care items pose the least risk of transmission of infection. Cleaning followed by disinfection with an intermediate-level disinfectant (ILD), is sufficient.

Cleaning or disinfection of some non-critical items may be difficult or may damage the surfaces (e.g., keyboard, mouse, intraoral camera). In those instances, the use of disposable barriers to protect these surfaces may be a preferred alternative. If contaminated following removal of the barrier, the item **must** be cleaned and disinfected.

Reprocessing Critical Items

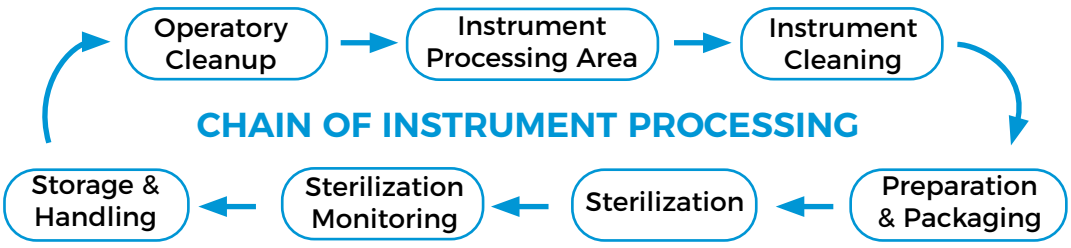
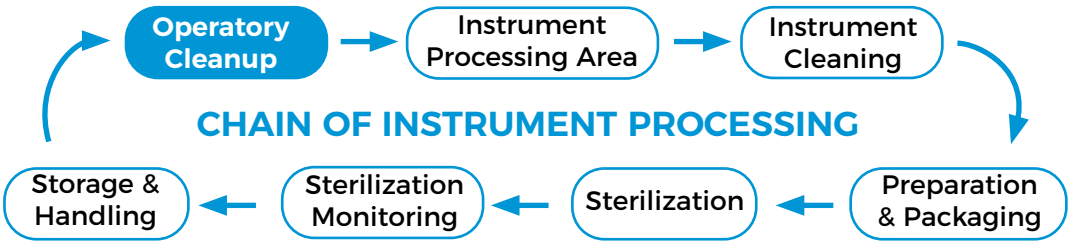


Figure 2: Chain of Instrument Reprocessing – Adapted with permission

Critical items **must** be sterilized by heat to prevent cross-contamination and the spread of infection in the oral healthcare setting. OHCPs and other personnel can be exposed to pathogens on contaminated critical instruments and devices through percutaneous injury, contact with non-intact skin on the hands or other body parts, or contact with mucous membranes of the eyes, nose, or mouth.

Sterilization is a complex process requiring specialized equipment, adequate space, and qualified personnel who are provided with ongoing training and regular monitoring for quality assurance. Instrument Processing requires multiple steps to achieve sterilization. These steps include disassembly and sorting, cleaning, rinsing, drying, inspection, corrosion reduction, packaging, sterilization, cooling, drying, storage and delivery. These steps **must** be followed to ensure that all instruments are adequately processed and safe for re-use on patients. The goal of sterilization is to break the chain of infection and eliminate the potential for patient-to-patient transmission.

Policies and procedures **must** be in place for processing critical items including the mandatory wearing of gloves, masks, and protective eyewear.

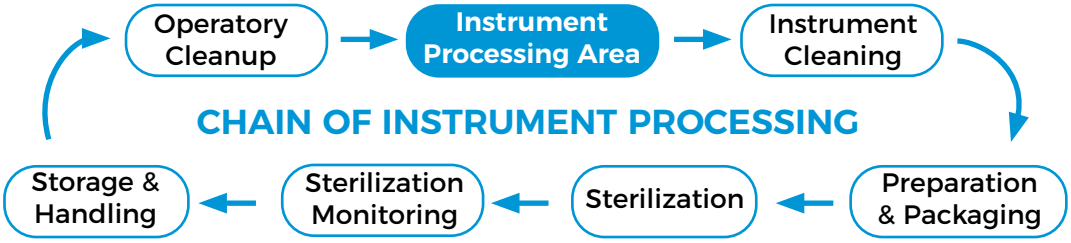


Operatory Clean-up:

Visible debris **must** be removed from contaminated instruments at point of use (e.g., impression material, calculus/plaque on scalers). Contaminated instruments **must** be handled carefully to prevent percutaneous injuries. Disposable sharps such as needles and blades **must** be discarded in an appropriate container at the point of use or located as close as feasible to where the items were used. Instruments that have been used on a patient should be handled with puncture-resistant utility gloves during operatory clean-up. At a minimum, procedural gloves **must** be worn to clean the operatory.

Transportation:

Instruments should be placed in a cassette or puncture-resistant container at the point of use to prevent percutaneous injuries during transport to the instrument processing area. This is particularly important when instruments are transported through a common/public area (e.g., hallway).

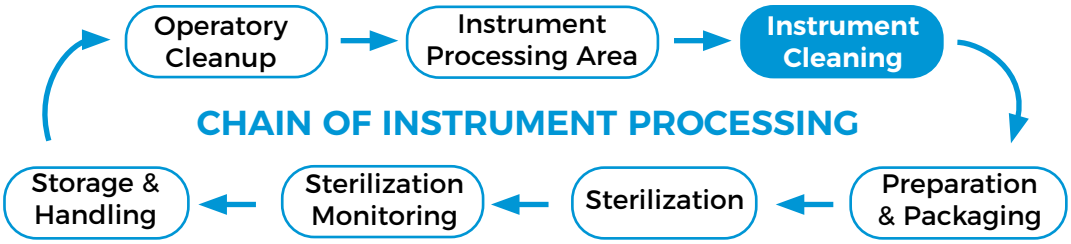


Instrument Processing Area:

A designated instrument processing area or a separate room **must** be constructed in the oral healthcare facility. This central processing area **must** be unidirectional and have clear sections for:

- Receiving, cleaning, and decontamination
- Sterilization
- Preparation and packaging
- Storage of sterilized instruments

Walls or partitions should separate the sections to control traffic flow and contain contaminants generated during processing. If physical separation of these sections is not possible, adequate spatial separation is necessary. OHCPs or other personnel processing the instruments **must** be trained in work practices to prevent contamination of clean areas. Space **must** be adequate for the volume of work anticipated and the items to be stored.



Instrument Cleaning:

Instruments should be cleaned immediately after use. If immediate cleaning is not possible, an enzymatic product **must** be used to prevent contaminants from drying on the instruments. All instruments **must** be cleaned within 24 hours of usage.

The surface of an instrument cannot be sterilized if there is blood, saliva and other debris adhering to the surface. Cleaning involves using a cleaning agent with water to remove debris, organic and inorganic contamination by an automated process or manual scrubbing. The method of cleaning will depend on the debris/materials present on the instrument so the processes may overlap.

Methods include:

- An automated washer: The use of an automated instrument washer (e.g., HYDRIM®) is recommended as the best option for cleaning instruments. All washers **must** be specifically designed for washing medical instruments.

- Ultrasonic cleaner: The use of an ultrasonic cleaner (with strainer-type baskets) is an alternative.
  - ► Following removal from the ultrasonic, instruments **must** be rinsed to remove chemical residue, taking care to minimize splashing.
  - ► Solutions **must** be changed daily or sooner if there is visible bioburden.
  - ► Use a monthly foil test or daily ultrasonic monitoring strips to monitor performance. If monthly foil tests are used, test sooner if instruments do not appear clean.
  - ► For further details see CDA Essentials: http://www.cda-adc.ca/en/services/essentials/2020/issue1/38/

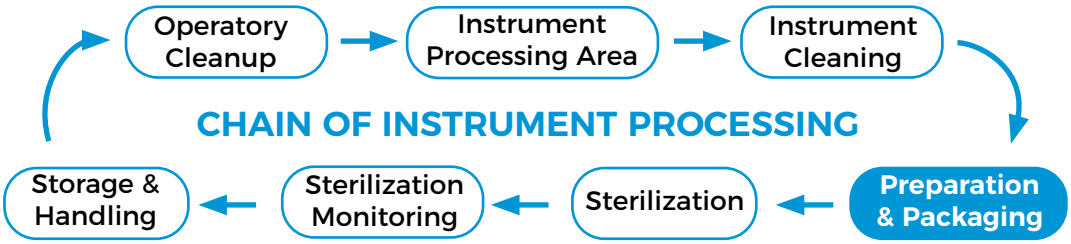
- Hand scrubbing: When manual scrubbing, puncture-resistant utility gloves **must** be used. When personnel are using a long-handled brush, instruments should be held in a downward direction and brushed away from the user. A handful of instruments **must** not be cleaned at one time.

Use of Rust Inhibitors:

If rust inhibitors are applied to items, follow the manufacturer's instruction.

Holding Solution:

Instruments are placed in a puncture-resistant container and immersed in a holding solution containing detergent or sprayed with an enzymatic cleaner to prevent drying of debris.



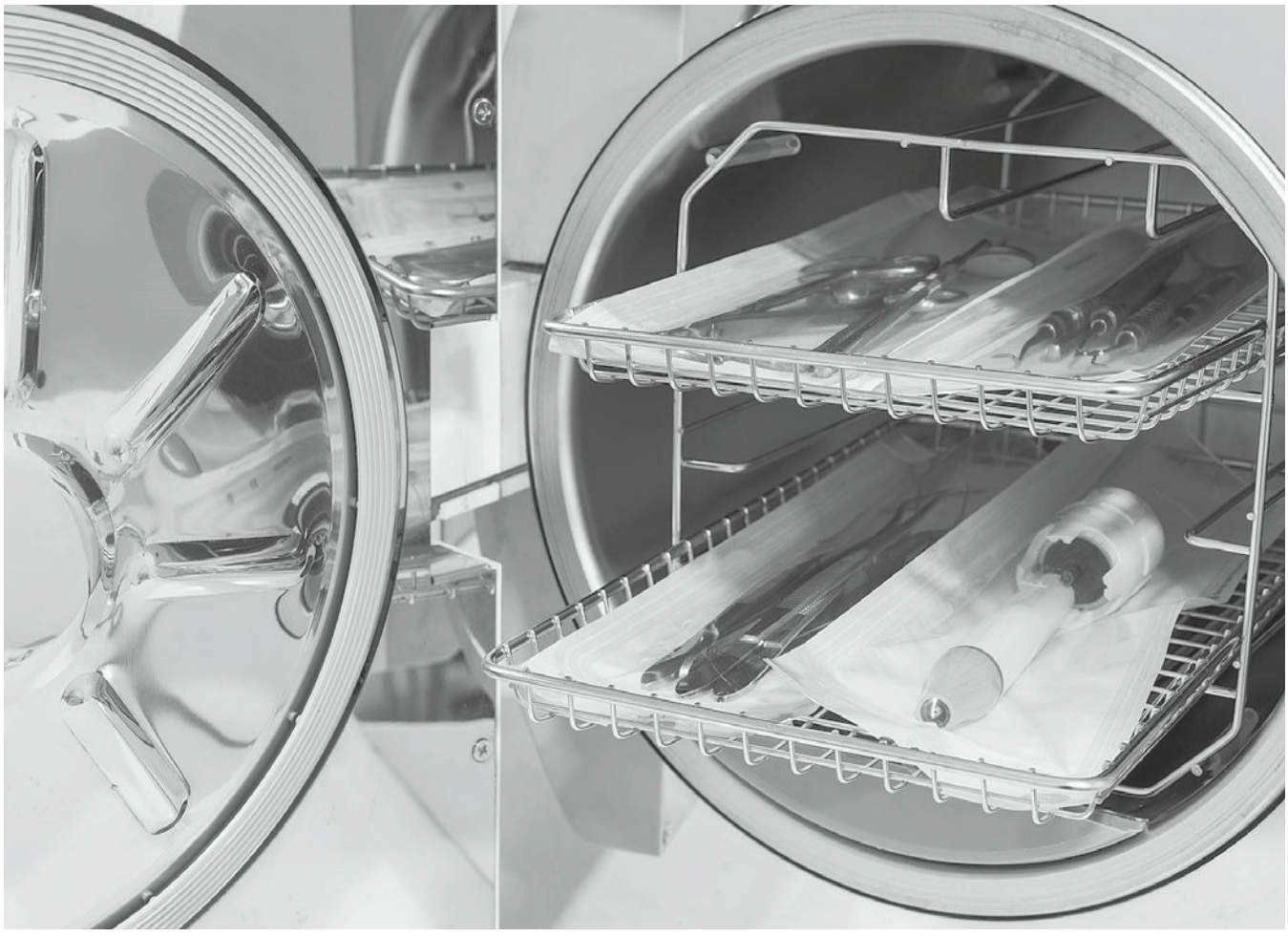
Instrument Preparation and Packaging for Sterilization:

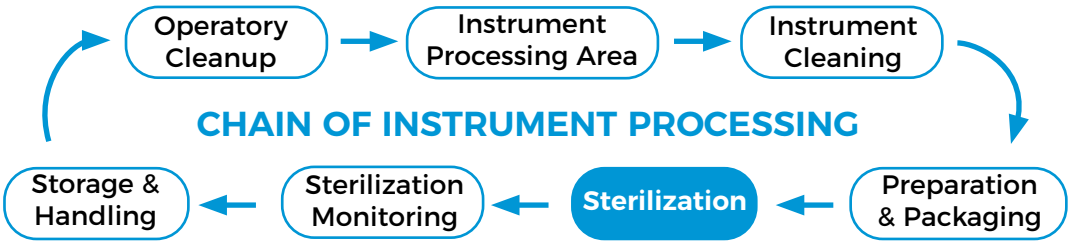
At this point, these instruments are still contaminated. OHCPs should make every effort to rinse away or remove biological debris, disinfecting solutions, chloride solutions and highly alkaline detergents before sterilizing instruments. These substances can cause pitting or staining of metal surfaces. Manufacturer's instructions **must** be consulted to correctly process possible non-compatible metals (e.g., titanium and carbon steel scalers). Packaging together items of widely dissimilar metals should be avoided because of the potential for electrolytic damage to instrument surfaces.

All instruments must be dry prior to packaging.

Cleaned instruments **must** be inspected and placed into cassettes, wrapped, or packaged for sterilization. Packaging and wrapping materials **must** be specifically designed for the type of sterilization process used by the facility and **must** be used according to manufacturer's instructions.

An external (Class 1) and separate internal (Class 4 or 5) chemical indicator **must** be used with every instrument package. Refer to the manufacturer's instructions regarding use and correct placement of chemical indicators.





Sterilization:

Heat-tolerant dental instruments are sterilized in an oral healthcare facility using:

- Steam under pressure (autoclaving)
- Dry heat

For steam sterilization, both pre-vacuum (Class B) and pulsed-pressure sterilizers are acceptable; however, pre-vacuum steam sterilizers are preferred for sterilizing dental instruments.

The use of *chemical vapour* **is not** an acceptable method of sterilization under any circumstance.

"Liquid chemical disinfectants" (e.g., cold sterilization) **must** not be used to sterilize critical instruments in dentistry, because their effectiveness cannot be verified with biological monitors.

All sterilization **must** be performed using medical sterilization equipment specifically designed for the sterilization of instruments. Manufacturer's instructions **must** be followed for:

- sterilization times
- temperature
- other operating parameters
- correct use of containers and wraps
- placement and type of chemical or biological indicators
- capacity and arrangement of instruments or packages

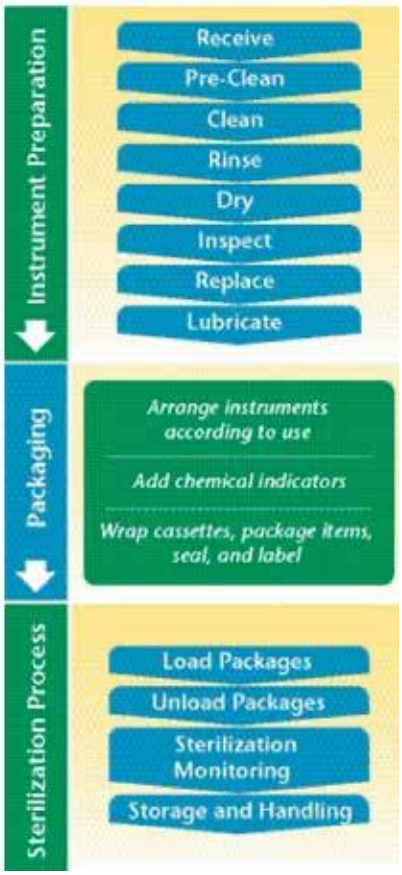
Loading the Sterilizer Chamber:

- Items **must** be placed in the sterilizer according to manufacturer's instructions.
- The chamber **must not** be overloaded; adequate space **must** be allowed between items.
- Bagged items should be placed on trays with the paper side facing up or down as per sterilizer/manufacturers requirements.
- The trays **must not** be overloaded; items **must** be spread in a single layer.
- Hinged instruments **must** be sterilized in the open and unlocked position (e.g., forceps)
- Packages and cassettes **must** be dry prior to placement in the sterilizer.
- ***Note:*** If all packages contain a Class 5 chemical indicator (CI), they may be released prior to obtaining the biological indicator (BI) results. If not, packages **must** be quarantined until the results of the daily BI are known. (Sterilization Monitoring for details on CIs and BIs.)

Instrument packs must be allowed to dry inside the sterilization chamber before opening, removing and handling, to avoid wicking of moisture and, potentially, microorganisms from hands or gloves. It is recommended that the date, time, and sterilizer used be stamped or written on the product wrapping upon removal from the sterilizer.

Instrument cassettes or trays containing sterilized instruments **must** remain in sterilization packaging to maintain sterility during storage.

The workflow pattern is linear and flows only one way between areas.



Immediate Use ("Flash") Sterilization: This process involves sterilizing unwrapped instruments and must be limited to emergency situations. Operative scheduling and lack of instruments do not qualify as "emergencies". The disadvantage is that unwrapped instruments are no longer sterile once removed from the sterilizer. As such, instruments processed in this manner **must** be used immediately upon removal from the sterilizer.

A log **must** be maintained of instruments sterilized in this method and include:

- date and time of cycle
- patient name
- rationale for use
- confirmation that all parameters were met (e.g., cycle time and temperature)

Sharpening of Instruments:

Sharpening of contaminated instruments presents a risk for disease transmission through accidental exposures. Sterilized instruments that require sharpening must be sharpened at point of care to maintain sterility using a sterilizable sharpening stone or card.

If using a non-sterilizable sharpening stone or card, instruments **must** be sterile prior to sharpening and reprocessed and sterilized after sharpening. These stones or cards **must** be cleaned after use and appropriately stored according to manufacturer's instructions

Figure 3: Instrument Reprocessing workflow pattern – Adapted with permission

Reprocessing Semi-critical Items

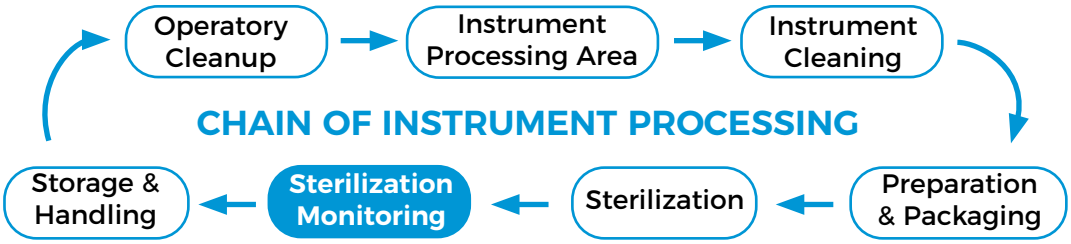
Table of Contents Previous Recommendation Next Recommendation

Semi-critical items are items that touch mucous membranes or non-intact skin and have a lower risk of transmission.

As the majority of semi-critical patient care items in dentistry are heat-tolerant; all heat-tolerant semi-critical items **must** be sterilized.

"Liquid chemical disinfectants" **must** not be used to sterilize semi-critical instruments in dentistry. Their effectiveness cannot be verified with biological monitors.

If a semi-critical item is heat-sensitive, single-use items **must** be used. (See Appendix 1: Managing Contamination)



Sterilization Monitoring:

The condition of sterility is ensured by thorough monitoring of sterilization procedures and equipment, utilizing mechanical, chemical and biological monitors.

Quality assurance for reusable instruments:

All sterilized packages, cassettes, and instruments **must** be inspected prior to patient use.

Ensure that:

- Package integrity is intact (no rips, tears, or holes)
- Packaging is dry (e.g., drying cycle **must** be completed before removing)
- External process indicator (Class 1) has changed colour
- Internal process indicator (Class 4 or 5) has changed colour
- Instruments are free of debris

If instrument, package, or cassette fails inspection, do not use for patient care. The contents **must** be cleaned and sterilized again.

Mechanical techniques:

Monitoring sterilization includes assessing cycle time, temperature, and pressure by observing the gauges or displays on the sterilizer and noting these parameters for each load. Correct readings do not ensure sterilization; however, incorrect readings may be an early indication of a problem with the sterilization cycle. New sterilizers have printouts or USB data devices for documentation recording.

Chemical indicators:

(TABLE 1) Chemical indicators (classes 1 to 4) assess one or more of the physical variables of time, temperature and pressure during the sterilization process. Internal and external chemical indicators (chemical indicator tape or special markings) change colour rapidly when a specific variable is reached. This verifies that the package has been exposed to the sterilization process but does not ensure sterilization.

Chemical indicators **must** be used inside and outside of each package (indicators are incorporated in sterilization pouches) to signify that the package has undergone the sterilization cycle. If either an internal or external chemical indicator indicates inadequate processing, items in the load **must** not be used until they have been reprocessed.

Chemical Integrating Indicators:

Class 5 indicators are known as chemical integrating indicators and are designed to react to all critical variables. Class 5 chemical integrating indicators are for use with each sterilization cycle, because they are considered to be the most accurate chemical indicator; however, they do not ensure sterilization.

If a Class 5 indicator is used in a package, you do not need to quarantine your packages until the daily BI results have been confirmed. **It is strongly recommended that each package contains a Class 5 CI.**

Class 6 indicators may be used. Carefully read information in the table below to determine if this would be appropriate in your setting.

The following table shows the six types of steam chemical indicators and their specific uses.

Table 1: International Classes of Steam Chemical Indicators

Type		Description	Action Required
1	**Process Indicator**	Used to differentiate processed from non-processed items Examples: Peel back pouches usually have a chemical indicator manufactured on the paper side of the package, chemical indicator tape	• Responds to one or more critical process variables • Provides instant results and visual evidence that the packages were exposed to a sterilant • Placed on or is integral to the outside of every package that is sterilized
2	**Specific Test Indicator**	Used in specific tests or procedures to evaluate sterilizer performance Its purpose is to evaluate proper air removal from the sterilizer Example: Bowie-Dick test	• To be used with dynamic air removal (pre-vacuum) sterilizer • Performed each day the sterilizer is used
3	**Single-variable Indicator**	Reacts to a single critical process variable (e.g., temperature or time) Examples: Type 1 peel pouch, temperature tubes	• Exposure control monitoring in a specific location (e.g., temperature in a specific location in the chamber. • Rarely used in oral healthcare settings
4	**Multi-variable Indicator**	Indicator that reacts to two or more critical variables in the sterilization cycle under the conditions specified by the manufacturer Examples: Class 4 indicator stripes on the inside of the peel back pouches	May be used for process control
5	**Integrating Indicator**	Responds to all critical variables in the sterilization process (e.g., time, temperature, presence of steam) Example: external indicator strips	• Used as an internal CI process control • Responds to all critical variables in the same way that a BI responds • Used as an additional monitoring tool to release sterilizer loads that do not contain implants
6	**Emulating Indicator**	Reacts to all critical variables (time, temperature, and presence of steam) for a specified sterilization cycle (e.g., 10 min, 18 min, 40 min) ***Note:*** Consider using a Class 5 CI rather than a Class 6 if you intend to use this tool to release sterilizer loads. The results of a Type 5 integrator are closely correlated (matched) to the results of a BI. This means that both the CI and the BI will show similar pass or fail results. A Type 6 does not, since it uses only one specific end point and a death curve slope can't be taken from one point.	• Used as an internal CI process control • A different Class 6 emulating indicator is required for each sterilization cycle time and temperature used • May be used as an additional monitoring tool to release sterilizer loads that do not contain implants; however, the Class 5 CIs would be the preferred choice for the reasons stated in the 'Description'.

Adapted from Public Health Ontario (2013). *Best Practices for Cleaning, Disinfection and Sterilization of Medical Equipment/Devices, 3rd Ed*

Biological Monitoring:

Spore tests verify the sterilization process directly by assessing the killing of known highly resistant microorganisms. The spores used in biological indicators (BI) are the most resistant and present in greater numbers than the common microbial contaminants found on patient-care instruments. A negative spore test signifies that other potential pathogens in the load have been killed, thus confirming sterilization. The date, sterilizer and cycle number **must** be documented and then signed by an OHCP. A control biological indicator **must** be run each day the sterilizer is used and for each type of cycle that is used (to confirm that the incubator is functioning correctly).

The control biological indicator should yield positive results for bacterial growth. The date and time for the control biological indicator **must** also be recorded and then signed by an OHCP.

Manufacturer's directions determine the placement and location of the biological indicator in the sterilizer.

Monitoring Processes:

Each day oral healthcare facilities **must** document and retain records from in-house biological monitoring. These records **must** indicate the sterilizer, date, time, and signature of staff member completing the process. A record **must** be kept for this purpose for a recommended 3 years indicating "operating as required" or noting any malfunctions and follow-up action needed.

- An in-office biological indicator test **must** be completed daily for each sterilizer using a process challenge device (PCD or test pack). In addition to this, one control biological indicator **must** be incubated daily to confirm that the incubator is functioning.
- A periodic biological indicator test, provided by a mail-in system available through Dalhousie Dentistry, or other external testing service, may be completed for each sterilizer.

Process Challenge Devices (PCDs or test packs):

A process challenge device (PCD), also known as a biological test pack, is used as a key component in sterility quality assurance since it monitors the performance of the sterilization process each day.

To test the sterilizer's performance, a PCD simulates an equal or greater challenge than the most difficult instrument/device set routinely processed for that sterilizer and/or cycle. PCDs can be created in-office using a grouping of dental instruments that are no longer used, or with a commercially validated PCD. Place the PCD into the sterilizer according to manufacturer's instructions, and in the area of the chamber that creates the highest likelihood of sterilization failure.

There are three commonly used types of PCDs:

1. Air removal/Bowie-Dick PCD test pack
2. Biological indicator PCD test pack*
3. Chemical indicator PCD test pack*

*You can combine a BI and CI tests into one test pack.

Air removal/Bowie-Dick testing evaluates the performance of pre-vacuum sterilizers (also called dynamic air removal sterilizers) by confirming adequate air removal from the sterilizer's chamber. Air left in a sterilizing chamber can act like a shield between the steam and the item being reprocessed, which potentially prevents proper sterilization.

PCDs can be commercially manufactured or prepared in-house. A PCD presents a challenge to the process that is equal to or greater than the challenge posed by the most difficult item that is routinely sterilized. A biological test pack is an example of a PCD.

Biological monitoring must also be completed:

- When introducing a new sterilizer
- Following sterilizer repairs
- When introducing new packaging material
- Every load containing implantable devices and/or the instruments used to place implantable devices (including but not limited to dental implant instrument, bone grafting or ridge preservation instrument including instrument used to place pins, screws and plates) **must** be biologically monitored with a spore-test. These items **must** be quarantined until the test results are known.

In the event of a positive in-house or external service spore test, the oral healthcare facility **must** be able to identify all sterilization packages since the last confirmed negative test and then reprocess all packages prior to use. A biological indicator test **must** be repeated immediately after correctly loading the sterilizer and using the same cycle that produced the failure. If the repeat spore test is negative, and the mechanical and chemical indicators demonstrate adequate processing, then the sterilizer may be put back into service. All records of chemical and mechanical monitoring since the last negative biological indicator test **must** be reviewed.

The sterilizer operating procedures **must** be **IMMEDIATELY** reviewed, including packaging, loading, and spore testing, with all OHCP or other personnel who work with the sterilizer to determine whether operator error could be responsible.

Common reasons for a positive spore test in the absence of mechanical failure of the sterilizer include:

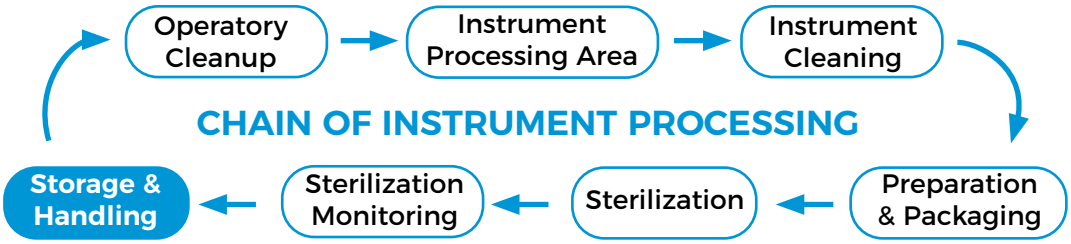
- **Improper** *packaging*
- **Improper** *loading*
- **Improper** *timing*
- **Improper** *temperature*
- **Improper** *method of sterilization*

The sterilizer must be IMMEDIATELY removed from service. A second monitored sterilizer in the oral healthcare facility **must** be used. A pre-tested sterilizer from a sales or repair company may be obtained to minimize facility disruption while waiting for the repeat biological indicator results on the sterilizer with the positive spore test. All sterilized packages from that sterilizer **must** be reprocessed as a precaution. If the repeat biological indicator is negative and chemical and mechanical monitoring indicates adequate processing, the sterilizer may be put back into service.

If the repeat biological indicator is positive, and packaging, loading, and operating procedures have been confirmed as being performed correctly, the sterilizer **must** remain out of service until it has been inspected, repaired, and re-challenged with a biological indicator in three consecutive empty chamber sterilization cycles. Whenever possible, items from suspect loads dating back to the last negative biological indicator **must** be recalled, re-wrapped, and re-sterilized. To facilitate package tracing, each package should be labelled. Examples of labels can include sterilizer identification number and/or date, time, and load number.

If instruments were used on patients subsequent to the last negative test, public health **must** be contacted for direction with respect to contacting patients and any other follow-up required.

All other packages which were run through the sterilizer during this time period **must** be recalled, reprocessed (including repackaging), and sterilized.



Storage and Handling:

All critical instruments (including cutting burs) **must** be stored in a sterile state in closed storage until the point of use. The use of a bur block for the storage of cutting burs is no longer acceptable unless the bur block is cleaned, packaged and sterilized after each patient. Packages should be used on a rotating basis (e.g., oldest dated packages are to be used first).

Packages **must** be stored to ensure package integrity is maintained e.g., store packages in single layers, or on their side.

Packages **must** be monitored to ensure integrity is maintained. If a package is compromised (e.g., torn or punctured) it **must** be removed, repackaged, and sterilized. Expiry dates of your specific packaging materials **must** be monitored. Any packages that have expired, **must** be removed, repackaged, and sterilized.

Reprocessing Non-critical Items

Non-critical patient-care items pose the least risk of transmission of infection because they contact only intact skin, which serves as an effective barrier to microorganisms. Examples of non-critical items include radiograph heads/cones, blood pressure cuffs, dental dam punch, and pulse oximeters.

Non-critical patient care items **must** be cleaned, or, if contaminated, cleaned and then disinfected with an intermediate-level disinfectant. Cleaning and disinfection of some non- critical items may be difficult or may damage the surfaces. In those instances, the use of disposable surface barriers may be a preferred alternative to help reduce risk of contamination. (See Surface Barrier)

Environmental Infection Prevention and Control

General Considerations

Environmental surfaces in the dental operatory that do not contact the patient directly are not a direct risk to patient safety. These surfaces can become contaminated during patient care, and then act as a reservoir for microbial contamination. Transmission of this type occurs primarily through OHCP or other personnel hand contact, or by touching the environmental surface with a contaminated instrument. Pathogens can be transferred to instruments, hands, nose, mouth, or eyes of OHCP or patients.

Proper hand hygiene and the wearing of PPE is an essential part in minimizing such potential transmission. Surface protection using either surface barriers or cleaning and disinfection, also protects against microbial transfer from environmental surfaces.

Environmental surfaces can be divided into:

- **Clinical Contact Surfaces:** These surfaces may come in direct contact with a OHCP hands, patient-care items, or with a patient, and have a minimal, but potential risk of infectious disease transmission. Examples would include operative surfaces, light handles, dental radiograph equipment, drawer handles and doorknobs.
- **Housekeeping Surfaces:** These surfaces have limited risk of disease transmission, unless they inadvertently come in direct contact with an OHCP's hands, patient-care items, or dental appliances. Examples would include floors, walls, and sinks.

An important first step in disinfecting any surface is cleaning. Cleaning removes debris such as organic matter that interferes with the microbial inactivation by a disinfectant. When using disinfectants, manufacturer's directions **must** be precisely followed. Strict attention **must** be given to proper use of the product-specific instructions. Disinfection does not occur if the surface does not stay wet for the prescribed length of time.

Clinical Contact Surfaces

Clinical contact surfaces can be directly contaminated with blood, saliva, bodily fluids, or water containing bodily fluids by direct spray, splatter, contact with contaminated instruments, or a OHCP gloved hands. These surfaces can contaminate other instruments, devices, hands, or gloves. Surfaces can be contaminated by aerosols. (See Environmental Surfaces.)

SURFACE CLEANING AND DISINFECTION

All clinical contact surfaces that may have been contaminated **must** be cleaned and disinfected at the beginning of the day, between patients, and at the end of the workday using an intermediate-level disinfectant (ILD). OHCPs or other personnel **must** wear appropriate PPE (i.e., gloves, mask, and protective eyewear) while cleaning and disinfecting clinical contact surfaces.

The same type of ILD **must** be used for all areas of the practice e.g., do not use an accelerated hydrogen peroxide product in one area and an ILD with the active ingredient of isopropyl alcohol in another. These are not compatible and may counteract their effectiveness.

Disinfection may be accomplished by the **wipe-discard-wipe** or **spray-wipe-spray** method. The disinfecting step **must** keep the surface wet for the prescribed length of time according to the manufacturers' instructions.

Using aerosol or trigger spray bottles may cause eye injuries or induce/exacerbate respiratory problems. To minimize this risk, implement these best practices:

- Apply cleaning chemicals to a wipe before using
- Keep the spray bottle as close to the wipe as possible

To make daily cleaning easier treatment areas **must** be kept clear of unnecessary equipment and supplies. Manufacturers' instructions should be consulted regarding compatibility of devices and equipment with liquid chemical disinfectants.

SURFACE BARRIER PROTECTION

Clinical contact surfaces and equipment can be protected from contamination using surface barrier protection, particularly if they are difficult to pre-clean prior to disinfection. If surface barriers are used, they **must** be appropriately secured. Surface barrier protection is particularly effective for those clinical contact surfaces that are difficult to clean and disinfect due to surface topography or material chemical incompatibilities.

Surface barrier protection materials include:

- Clear plastic wrap
- Plastic bags
- Plastic sheets
- Plastic tubing
- Plastic-backed paper
- Plastic computer keyboard covers
- Other materials, such as 'self adhesive barriers' that are impervious to moisture

Surface barriers become contaminated during patient care. While gloved, surface barriers **must** be carefully removed and discarded between patients. Following removal of the surface barrier, the clinical contact surface **must** be examined to ensure it did not become inadvertently contaminated. If contaminated, the surface **must** be cleaned and disinfected with an ILD.

Following removal of the surface barrier, gloves **must** be removed, hand hygiene **must** be performed, and clean surface barriers **must** be placed prior to the next patient treatment.

Housekeeping Surfaces

Although housekeeping surfaces, such as floors, walls, sinks, and reception area surfaces have a limited risk of disease transmission in oral healthcare settings, regular cleaning with diluted detergents or household low-level disinfectants is required. Routine disinfection of floors, windows, walls, drapes, window blinds and other vertical surfaces is not necessary unless the surfaces are known or are suspected to be contaminated. Carpeting and cloth furnishings are difficult to clean and cannot be reliably disinfected. Carpeting and cloth furnishings **must not** be used in patient care areas.

If a surface becomes contaminated with blood, saliva, or other bodily fluids, follow these protocols as quickly as possible:

- OHCP and other personnel **must** wear appropriate PPE.
- Remove visible organic material with absorbent material (e.g., disposable paper towels discarded in a leak-proof container).
- Clean and disinfect non-porous surfaces with an ILD.
  - ► If such products are unavailable, a 1:10 dilution of sodium hypochlorite (1 part 5.25% household chlorine bleach to 9 parts water) is an inexpensive and effective disinfecting agent.

Reusable cleaning tools, such as mop heads or cleaning cloths, should be cleaned after use, and allowed to dry before reuse. Single-use, disposable mop heads and cloths may be preferable to minimize cross-contamination risk.

Manufacturers' instructions for preparation and use **must** be followed. Fresh cleaning solution should be made each day, discarding any remaining solution, and allowing the container to dry between uses. Diluted solutions of detergents or disinfectants, if prepared in dirty containers, stored forlong periods of time, or prepared incorrectly, may become reservoirs for microorganisms.

Mechanical rooms **must** also be kept clean.

Waste Management

General waste from oral healthcare settings is no more infective than residential waste. The oral healthcare facility is responsible for the waste until it is safely removed from the premises.

Generally, items that may have come in contact with blood, saliva, other bodily fluids or water or other liquid that contains bodily fluids is not likely to be infective and treating all such waste as infective is neither practical nor necessary.

Medical waste of concern requires special storage, handling, neutralization, and disposal, according to provincial and municipal regulations. Such waste includes:

- Solid waste soaked or saturated with blood or saliva (e.g., gauze so saturated with blood following surgery that it is freely dripping blood or could easily release liquid blood if compressed)
- Surgically removed hard or soft tissue (not including extracted teeth; see below)
- Contaminated sharp items (needles, scalpel blades, burs, wires)

Non-sharp medical waste **must** be placed in a sturdy, leak-resistant bag. Local regulations may require that this bag is labelled as "biohazardous" waste. The exterior of the bag should not be contaminated prior to disposal. If the exterior of the bag is contaminated or punctured, the bag should be placed in a second sturdy bag, similarly labeled. All bags **must** be securely closed for transportation and disposal.

Sharp medical waste **must** be placed in biohazard puncture resistant containers at point of use.

General and medical waste should be disposed of daily to avoid accumulation. Oral healthcare facilities **must** have a plan for management of medical waste that complies with local provincial and municipal regulations.

All containers with blood or saliva (suctioned fluids) may be poured into a utility sink, drain or toilet, which drains into a sanitary sewer system or septic tank. OHCPs **must** wear appropriate PPE during this task.

Handling of Extracted Teeth

Extracted teeth may be returned to the patient following cleaning of visible blood and debris. If being discarded, extracted teeth without amalgam fillings may be disposed as general office waste. Extracted teeth containing dental amalgam **must** be placed in an amalgam waste container, as they cannot be incinerated with general or biomedical waste.

Extracted teeth to be used for educational purposes **must** be cleaned of visible blood and debris and immersed in a 10% formalin solution for at least 2 weeks. Provincial and municipal regulations for shipping biohazard materials **must** be followed.

If extracted teeth are being sent to Dalhousie University, they **must** be stored in diluted sodium hypochlorite (1:10) in a container with a lid, place in a sealed plastic bag, and delivered/sent to:

Dalhousie Dentistry Oral Surgery Department
5981 University Avenue
PO Box 15000
Halifax, NS, B3H 4R2

For more information on Dalhousie's protocol, please visit:
https://cdn.dal.ca/content/dam/dalhousie/pdf/dentistry/NewsEvents/2015ExtractedTeeth.pdf

If being sent to a dental laboratory for shade or size comparisons, extracted teeth **must** be cleaned, disinfected with an appropriate ILD, and transported in a sealed container.

Facility, Equipment, and Specific Area Applications

Air Quality

Offices **must** ensure that air exchange and ventilation meet Occupational Health and Safety Regulations, CSA standards, and manufacturer's recommendations for products, including chemical agents.

Dental Unit Waterlines

Dental unit waterlines (DUW) can become heavily colonized with waterborne microorganisms, which form a biofilm on the interior surface of the waterline.

High numbers of these opportunistic microorganisms are not necessarily dangerous to the general population, unless the OHCP or patient is a susceptible host. Susceptible hosts include individuals that are immunocompromised (e.g., organ transplant, cystic fibrosis, chronic bronchitis).

Conventional dental units do not reliably deliver sterile solutions, even when equipped with independent water reservoirs, due to the formation of biofilm along the water pathway. Therefore, sterile water or sterile saline **must** be used when irrigating open vascular sites and whenever bone is cut during invasive surgical procedures. Delivery systems, such as bulb syringe or sterile, single-use disposable products can be used to deliver sterile irrigation solutions.

The potential risk of infection from DUW microorganisms can be effectively reduced to counts of potable water standards (less than 500 cfu/ml) by following regular waterline maintenance procedures. These procedures are as follows:

ALL WATER SYSTEMS

- Waterlines **must** be purged by flushing them thoroughly with water for at least 2 minutes at the beginning of each day and for 30 seconds following each patient.
  ► Before purging is carried out, handpieces and air/water syringe tips **must** be removed from the waterlines.
- Waterline heaters **must** not be used in a dental unit or in dental equipment, as these heaters encourage waterline microorganism growth.
- Refer to manufacturer's instructions relative to your specific system.
- Purge all water lines dry when the units will not be used over an extended period of time to prevent biofilms forming in stagnant water.
- When waterline units are shut down for an extended period of time (i.e., 2 or more weeks) waterline testing should be performed.

CLOSED WATER SYSTEMS (PREFERRABLE TO OPEN WATER SYSTEMS, WHEN POSSIBLE)

- Clean hands/gloves **must** be used when changing the water bottle.
- Waterlines **must** be maintained.
  ► A variety of products are available. Manufacturer's instructions **must** be followed.

Boil Water Advisories

Boil water advisories occur whenever public health officials determine that municipally delivered tap water is unsafe to drink. Circumstances that compromise the safety of the municipal water system include compromises in the distribution system (water-main breaks), water treatment system failures, and natural disasters (floods, hurricanes, or earthquakes).

During a boil water advisory, the following precautions **must** be taken:

- Public water **must** not be delivered to the patient through the dental unit, ultrasonic scaler, or other devices or equipment.
- For closed delivery systems, water from an alternative approved source may be used.
- If necessary, treatment should be postponed.
- Patients **must** not rinse their mouths with tap water; bottled or distilled water **must** be used instead.
- Tap water **must** not be used for hand hygiene. Antimicrobial products that do not require water, such as alcohol-based hand rubs, should be used for hand hygiene. If the hands have been known or suspected to be contaminated, hands should be washed using bottled or distilled water and an antimicrobial soap.
- When the boil water advisory is cancelled, follow guidance provided by the local water utility regarding adequate flushing of all incoming public water system lines, including any taps or other waterlines in the oral healthcare facility. If no guidance is provided, flush all waterlines for 2-5 minutes prior to using for patient care. All DUWs **must** be disinfected (shock system) according to the manufacturer's instructions prior to use. (See Glossary for shock system definition.)

Dental Handpieces and Other Devices

Several dental devices contact mucous membranes and expel air and water into the patient's mouth and potentially into open wounds. These devices are attached to the air or waterlines of the dental unit, and include, but not limited to:

- High and low-speed handpieces
- Surgical handpieces and motors
- Prophylaxis angles and nose cones
- Ultrasonic inserts and sonic scaling tips and handpieces
- Ultrasonic and sonic endodontic handpieces
- Air abrasion devices
- Air/water syringe tips

These devices have the potential of retracting oral fluids into internal compartments of the device. This retained patient material can then subsequently be expelled in the oral cavity of a patient during later use. Restricted physical access often limits the cleaning of these internal compartments, and compromises decontamination.

Any dental device connected to the dental air/water system that enters the patient's mouth must be run to discharge water and air for a minimum of 20 seconds after each patient use. This procedure is intended to physically flush out any patient material that might have entered the turbine and air and waterlines.

All dental handpieces and other intraoral devices that can be removed from the air and water lines of dental units are considered semi-critical devices and **must** be cleaned and sterilized between patients. Manufacturers' instructions for cleaning, lubrication, and sterilization **must** be followed.

Table of Contents Previous Recommendation Next Recommendation

Components of dental devices and equipment that are *permanently attached* to DUWs should be treated as clinical contact surfaces. Such components (electric handpiece motors, handles for ultrasonic devices or dental unit attachments for saliva ejectors, high-volume evacuators, and air/water syringes) **must** be cleaned and disinfected with an ILD prior to use on the next patient or covered with surface barriers that are changed after each use.

Suction Lines

Backflow can occur when previously suctioned fluids present in suction tubing flow back into the patient's mouth. Backflow in low-volume suction lines can occur when a seal around the saliva ejector is created (by patient closing their lips around the tip of the ejector, creating a partial vacuum).

OHCPs should discourage patients from forming a seal over the saliva ejector tip. Alternatively, OHCPs may use specifically designed saliva ejector tips that do not allow a negative pressure to form around the tip of the saliva ejector or use anti-backflow devices.

At a minimum, water **must** be run through suction lines between patients to remove loosely adherent debris and microorganisms and to reduce the likelihood of infectious material backflow. The air/water syringe may be used for this purpose to produce turbulent flow in the line, which will also accomplish the required 20 second flush of the air/water syringe. High-volume and low-volume suction lines **must** be cleaned daily with an enzymatic cleaner, and following all surgical procedures. It is strongly recommended that enzymatic cleaner/disinfectant is used to flush the suction lines between patients.

Dental unit suction traps **must** be inspected weekly or more frequently, as dictated by usage. They are to be cleaned or replaced as necessary. Amalgam waste **must** be deposited in amalgam waste recycling. Dental suction units should use disposable traps when available. For disposable traps with dental amalgam, place the used trap into a properly labelled container with a mercury vapour suppressant (e.g., Merconvap).

Single-Use or Disposable Devices

A single-use (disposable) device is designed to be used on one patient and then discarded, not reprocessed for use on another patient. Examples of single-use or disposable devices include syringe needles, single-use burs, single-use endo files, high-volume evacuator tips, prophylaxis cups and brushes, and orthodontic brackets. Single-use disposable items **must** be disposed of appropriately after use.

Implantable devices **must** be considered single-use and **must** not be reused in other patients.

Safe Handling of Injectables

The transmission of blood-borne viruses and other microbial pathogens to patients may occur due to unsafe and improper handling of injectables (e.g., local anesthetics, drugs, and solutions for sedation).

The following practices **must** be adhered to when preparing and administering injectables.

ASEPTIC TECHNIQUE:

- Perform hand hygiene prior to accessing supplies, handling vials and IV solutions, and preparing or administering drugs.
- Prepare drugs and supplies in a clean area on a cleaned and disinfected surface using an ILD (as per clinical contact surfaces section).
- Use aseptic technique in all aspects of parenteral drug administration, drug vial use and injections. This includes using a sterile syringe and needle for each patient. Rubber septum/diaphragm **must** be disinfected with a 70% alcohol wipe.
- Limit access to trained individuals.
- Never administer a drug from the same syringe to more than one patient, even if the needle is changed between patients.
- Both the needles and syringes **must** be in sealed packages. Never store needles and syringes unwrapped, as sterility cannot be assured.
- If an administration set is prepared ahead of time, all drugs should be drawn up as close to use as possible and covered.
- Do not use IV solution bags as a common source of supply for multiple patients.

SINGLE-DOSE VIALS

Single-dose vials, intended for single patient use, typically lack preservatives. The use of these vials for multiple patients carries substantial risk for bacterial contamination and infection.

- Do not reuse single-dose vials.
- Enter the vial once and immediately discard after use.
- Disinfect the rubber septum/diaphragm with a 70% alcohol solution.
- Always use a sterile syringe and needle/cannula when entering a vial.
- Never combine or pool the leftover contents of single-dose vials.

"*Syringes and needles are sterile, single-use items and, after entry into a patient's vascular system or attachment to infusions, a syringe and needle should be considered contaminated and used only for that patient. A syringe* ***must*** *not be used for multiple patients even if the needle is changed. Before use, prepared syringes and needles should be stored in a clean container and syringes capped to avoid contamination. After use or at the end of the anaesthetic, all used syringes with needles should be discarded into an approved sharps container.*"

Reference: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2773534/

MULTI-DOSE VIALS

Any error in following protocols for the correct use of multi-dose vials can result in the transmission of both bacterial and blood-borne viral pathogens. Transmission of HBV, HCV and HIV have been associated with the use of multi-dose vials.

The use of multi-dose vials for injectable drugs increases the risk of transmission of blood- borne pathogens and bacterial contamination of the vial. Prioritize patient safety over cost when choosing between multi-dose and single-dose vials.

If multi-dose vials are used, the following practices **must** be followed:

- Never re-enter a vial with a used needle or used syringe.
- Once medication is drawn up, the needle should be immediately withdrawn from the vial. A needle should never be left in a vial to be attached to a new syringe.
- Use a multi-dose vial for a single patient whenever possible and mark the vial with the patient's name.
- Mark the multi-dose vial with the date it was first used and ensure that it is discarded at the appropriate time.
  - ► Discard opened multi-dose vials according to the manufacturer's instructions or within 28 days, **whichever is shorter.**
- Adhere to aseptic technique when accessing multi-dose vials.
  - ► Multi-dose vials **must** be accessed on a clean surface and where no dirty, used, or potentially contaminated equipment is placed or stored.
  - ► Disinfect the access diaphragm of vials using 70% alcohol.
  - ► Allow to dry before inserting a new needle and new syringe into the vial.
- Discard the multi-dose vial immediately if sterility is questioned or compromised, or if the vial is not marked with the patient's name and original entry date.

Dental Radiology

Cross-contamination of radiographic equipment and environmental surfaces with blood or saliva is possible. Each oral health-care facility **must** develop its own protocol, based on their specific equipment.

Below are practices that **must** be integrated into each facility-specific protocol:

- Gloves, masks, and protective eyewear **must** be worn when taking radiographs and handling contaminated PSP (phosphor storage plates) or sensors/film packets.
- Film-holding and positioning devices (e.g., Rinn kits) are semi-critical items and **must** be sterilized between patient uses.
- Contaminated radiography equipment (radiograph tube head and control panel, PSP or sensors/film packets) **must** be cleaned and disinfected after each patient use.
- Surface barriers, if used, **must** be changed after each patient. Once removed, the device **must** be carefully inspected, and if contaminated, the device **must** be cleaned and disinfected prior to next patient use.
- After exposure of the radiograph and before glove removal, the film packet **must** be disinfected using an ILD.
  - ► Alternately, the contaminated film packets may be opened using gloved hands, the film dropped onto a clean surface without touching and the empty packets disposed in an area where cross-contamination is not possible. The gloves **must** then be removed, hand hygiene performed, and the film processed.
  - ► Film barrier pouches may alternately be used. The film packets **must** be carefully removed from the pouch to avoid contamination of the inner film packet.
- After exposure of the PSP and before glove removal, open PSP barrier carefully to avoid contamination and drop PSP onto clean surface. The gloves **must** then be removed, and the PSP scanned according to manufacturers' instructions.
- Any surfaces that become contaminated **must** be cleaned and disinfected using an ILD.

Pre-Procedural Mouth Rinses

Antimicrobial mouth rinses such as chlorhexidine gluconate (15ml), povidone-iodine (0.2%, 0.4% or 0.5%, 9ml), hydrogen peroxide (1.5% or 3%, 15ml), or cetylpyridinium chloride (0.05%, 15ml) may be used prior to all dental procedures. Have the patient rinse for the recommended amount of time. Using mouth rinses reduces the number of microorganisms released from the patient's mouth during treatment.

- Pre-procedural mouth rinses should be used for all surgical procedures to decrease the number of microorganisms introduced in the patient's bloodstream during invasive dental procedures.
- This procedure may not be practical for those patients that cannot rinse or spit, and considerations may be given where the antimicrobial solution is brushed or swabbed in the mouth prior to beginning oral healthcare treatment.
- Use non-alcohol containing products if alcohol is contraindicated for that patient.

Handling of Biopsy Specimens

Biopsy specimens **must** be placed in a sturdy, leak-proof container with a secure lid for transportation. If the outside of the container becomes, or is suspected to be contaminated, it **must** be cleaned and disinfected and placed in an impervious bag prior to transportation. This container **must** be clearly labelled with the patient's name, any other necessary information, and a universal biohazardous symbol. When storing prior to transport, it **must** be stored in a designated storage area separate from clean supplies.

Provincial and municipal regulations **must** be followed when storing, transporting, and shipping biopsy specimens.

Laser/Electrosurgery Plumes and Surgical Smoke

Lasers, electrocautery devices, and similar equipment are used for surgery, ablation (removal of tissues), or cauterization to vaporize, coagulate, and cut tissue. The by-products of these procedures include vapours, smoke, and particulate debris, which are collectively called plume.

Plumes may contain bioaerosols, viruses, blood fragments, cellular debris, and bacteria depending on the type of the procedure.

They also contain carbon monoxide, polyaromatic hydrocarbons, and various toxic gases and vapours. Plume may also contain chemicals that form from gases, dyes, and coolants. Plumes may contain chemicals such as formaldehyde, hydrogen cyanide, acrolein, phenol, butane, and benzene.

Plume may also contain blood (plasma and blood cells or pieces of cells), and related blood-borne pathogens including viruses such as HPV and HIV, or bacteria such as Bacillus subtilis, Escherichia coli, and Staphylococcus aureus.

OHCPs **must** use work practice and engineering controls to avoid inhaling or otherwise coming in contact with laser and electrosurgical plumes and surgical smoke, in accordance with manufacturer's recommendations). General room ventilation (dilution ventilation) is not sufficient to remove air contaminants.

Work practices **must** include:

- Routine Practices (high-filtration surgical masks and possibly face shields)
- Use of HVE systems
- Education/training on proper procedures for the safe use of equipment

These practices may include using:

- Central room suction units with in-line filters to collect particulate matter from minimal plumes
- Dedicated mechanical smoke exhaust systems with a high-efficiency filter to remove substantial amounts of laser plume particles, e.g., plume scavenging system (PSS).

For more details on how to control laser-plumes in healthcare, go to the Canadian Centre for Occupational Health and Safety website.

Cleaning of Removable Prothesis

Any prosthesis or dental appliance coming from the oral cavity is a potential source of infection. When cleaning, follow these protocols:

- Masks, gloves, and eye protection **must** be worn.
- When a prosthesis or dental appliance is soiled with debris, it **must** be sprayed first with an appropriate disinfectant using the manufacturer's instructions and then removed of debris.
- A dedicated ultrasonic cleaner **must** be used to clean these items.
- The item should be placed in a sealable bag, containing an appropriate cleaning agent, according to manufacturer's instructions.
- The bag should be placed into the ultrasonic cleaner.
- Once removed from the ultrasonic cleaner, the prostheses should be thoroughly rinsed, according to manufacturer's instructions.
- Return the prosthesis to the patient in a clean sealable bag containing a mouth rinse.
- If a second impermeable container (e.g., beaker) is not used, the dedicated ultrasonic cleaner **must** be cleaned and disinfected between uses.
- As an alternative to the use of an ultrasonic cleaner, the prostheses may be soaked in a non-permeable bag or single-use container and then thoroughly rinsed according to manufacturer's instructions.

Dental Laboratory Asepsis

Good communication is required to confirm that appropriate cleaning and disinfection occurs in the oral healthcare facility and at the dental laboratory. This section outlines the responsibilities of community oral healthcare facility that sends items *to* a commercial laboratory, as well as the responsibilities of the commercial dental laboratories (on-site or off-site). It is best practice to have a written protocol agreement between a community oral health practice and the lab(s) where the items are sent, so that it is clear how the items are received (e.g., impressions are cleaned and disinfected prior to shipping).

A commercial laboratory is subject to all areas of this document, as they apply to the practice setting e.g., environmental infection prevention and control and Reprocessing.

See Environmental Infection Prevention and Control and Sterilization and Disinfection of Patient Care Items (Reprocessing).

A commercial dental laboratory has dedicated and distinct spaces for:

- laboratory practice
- patient care
- shipping/receiving
- reprocessing

IN-OFFICE PREPARATION PRIOR TO 'SHIPPING ITEMS' TO AN ON-SITE OR OFF-SITE LABORATORY

- Impressions, occlusal rims, prosthesis, face bow forks, or bite registrations **must** be thoroughly cleaned, disinfected, and rinsed of all debris before being removed from the operatory and transported to an on-site or off-site laboratory.
- Manufacturers' instructions **must** be consulted regarding the stability of specific materials during disinfection.
- "Wet" impressions or appliances **must** be placed in an impervious bag prior to transportation to an off-site laboratory.
- Clinical materials and devices that are transported from an oral healthcare facility to an off- site laboratory **must** follow provincial and municipal regulations.

COMMERCIAL LABORATORY RECEIVING INCOMING ITEMS

A separate receiving and disinfecting area is established in the laboratory to reduce contamination and the risk of transmission. Unless there is a different written policy in place with a specific practice, the OHCP treats all incoming items as contaminated and performs cleaning and disinfection procedures before performing any clinical activity. This includes:

- Wearing appropriate PPE (mask, gloves, and protective eyewear), dental laboratory staff **must** perform disinfection procedures before handling the material or device. If during manipulation of a material or appliance, a previously undetected area of blood or other organic debris becomes apparent, cleaning and disinfection procedures **must** be repeated.
- Rinsing items thoroughly to remove all residual traces of disinfectant
- Disposing of single-use shipping materials (e.g., plastic bags)
- Disinfecting/sterilizing reusable shipping materials (e.g., reusable plastic containers), according to manufacturer's instruction
- Labelling items, as required, to prevent loss.

SHIPPING ITEMS FROM A COMMERCIAL LABORATORY

- Appliances and prosthesis delivered to the patient should be free of contamination.
- If the dental laboratory staff performs the disinfection, a compatible ILD **must** be used and the item placed in a tamper-evident container before returning the item to the oral healthcare facility.
- If such documentation is not provided regarding disinfection procedures, the oral healthcare facility **must** provide final disinfection procedures.

Table 2: Instrument Reprocessing for Laboratory Items

Instrument or Instrument Type	Action Required
Laboratory items (e.g., polishing points, rag wheels, laboratory knives) that are used on contaminated or potentially contaminated appliances, protheses, or other material	Heat-sterilize, or purchase single-use disposable items, or reprocess according to manufacturer's instructions after each case. For items such as rag wheels that do not come with instructions, and therefore cannot be reprocessed, treat as single use or disinfect case prior to and after exposure to rag wheel.
Heat-tolerant items used in the mouth (e.g., metal impression trays, face bows)	Clean and sterilize after each use.
Heat-sensitive lab items exposed to patient materials	After each case, reprocess according to manufacturer's instructions. If no manufacturer's instructions are provided, treat item as single-use.
Pressure pots and water baths that have had prior patient contact	Clean and disinfect after each case.
Pressure pots and water baths used on new appliances only	Clean and disinfect daily, or more frequently, if visibly soiled.
Any equipment used for direct patient care, or on an appliance that has had prior direct patient contact	Clean and disinfect between patients *or* protect with a surface barrier that is changed, and the surface disinfected, between patients.
Work pans	Clean and disinfect after each case.
Articulators	Clean and disinfect after each case.
Ultrasonic cleaning solution	Change daily, according to manufacturer's instructions, or more frequently if it becomes visibly soiled. Disinfect ultrasonic chamber prior to refilling.
Pumice used on appliances that have had prior patient contact	Change after each case.
Pumice used on new appliances	Change daily.

DENTURE POLISHING AREA

Dentures, whether new or existing, **must** be disinfected prior to being brought into the designated polishing area of the oral healthcare facility. Masks, gloves, eye/face protection, and gowns should be used when polishing, as the aerosols produced can be harmful and/or contain pathogens. It is also recommended that a suction or closed vacuum system should be used to reduce exposure to aerosol/airborne particles generated by polishing. **Follow the protocols outlined in Table 2, for any items that you use during these procedures.**

Patients Infected with M. tuberculosis (TB)

M. tuberculosis is a bacterium carried in airborne infective droplet nuclei that can be generated when persons with pulmonary or laryngeal TB sneeze, cough, speak or sing. These small particles (1-5 µm) can stay suspended in the air for several hours.

Infection occurs when some susceptible person inhales droplet nuclei containing *M. tuberculosis*, which then travel to the alveoli of the lungs. Typically, within 2-12 weeks after initial infection with *M. tuberculosis*, immune response prevents further spread of the TB bacteria, although the bacteria can remain viable in the lungs for years, a condition termed "latent TB infection". People with latent TB infection usually exhibit a reactive tuberculin skin test (TST) [formerly Mantoux], have no symptoms of active disease and are not infectious. However, people with latent TB infection can develop active disease later in life if they do not receive treatment for their latent infection.

Approximately 5% of persons who have been recently infected and not adequately treated for latent TB infection will progress from infection to active disease during the first 1-2 years after infection; another 5% will develop active disease later in life. Although both latent TB infection and active TB disease are described as TB, only the person with active disease is contagious and presents a risk of transmission. Symptoms of active TB disease include a productive cough, night sweats, fatigue, malaise, fever, unexplained weight loss and occasionally oral ulceration(s). Certain immunocompromising medical conditions (HIV disease) increase the risk that TB infection will progress to active disease at a faster rate.

When taking a patient's initial medical history and at periodic updates, OHCPs should routinely ask all patients whether they have a history of TB or symptoms indicative of TB. Patients with a medical history or symptoms indicative of undiagnosed active TB **must** be referred promptly for medical evaluation to determine possible infectious risk. These patients **must** not remain in the oral healthcare facility any longer than required to evaluate their dental condition and arrange for a medical referral. While in the oral healthcare facility, the patient **must** be isolated from other patients and OHCPs. The suspected TB patient **must** be instructed to wear a surgical mask when not being evaluated and **must** be instructed to cover their mouth and nose when coughing or sneezing. Elective oral treatment **must** be deferred until a physician confirms that a patient does not have infectious TB, or if the patient is diagnosed with active TB disease, until confirmed the patient is no longer infectious; typically, 48 hours following institution of anti-tuberculous therapy.

Surgical masks typically used in oral healthcare settings do not prevent inhalation of *M. tuberculosis* droplet nuclei due to their small diameter, and therefore, Routine Practices are not sufficient to prevent transmission of this organism so additional precautions (airborne) may be necessary.

TB transmission is controlled through a hierarchy of measures, including:

- **Administrative controls:** Because potential for transmission of M. tuberculosis exists in outpatient settings, oral healthcare facilities should develop a TB control program appropriate for their level of risk. Administrative goals of a TB infection-control program include detection of a person with active TB disease and prompt isolation from susceptible persons to reduce the risk of transmission. Although OHCPs and other personnel are not responsible for diagnosis and treatment of TB, they **must** be trained to recognize signs and symptoms to help with prompt detection.
  - ▸ OHCPs who have contact with patients should have a baseline TST, preferably by using a two-step test at the beginning of employment. The facility's level of contact with patients at risk of TB will determine the need for routine follow-up TST.
- **Environmental controls:** If urgent oral care is provided for a patient who has, or is suspected of having active TB disease, the care **must** be provided in a facility (e.g., hospital) that provides airborne infection isolation (using such engineering controls as TB isolation rooms, negatively pressured relative to the corridors, with air either exhausted to the outside or HEPA-filtered if recirculation is necessary).
- **Personal respiratory protection:** OHCPs treating patients with active TB **must** use respiratory protection (e.g., fit-tested, disposable N-95 respirators).

Patients Infected with Other Communicable Respiratory Diseases (e.g., COVID-19, influenza)

For patients who have active communicable respiratory infections, all oral healthcare procedures, except emergency care, should be deferred until the patient is deemed no longer contagious. If treatment cannot be deferred, patients are to be treated using airborne precautions.

Ongoing Infection Prevention and Control Evaluation

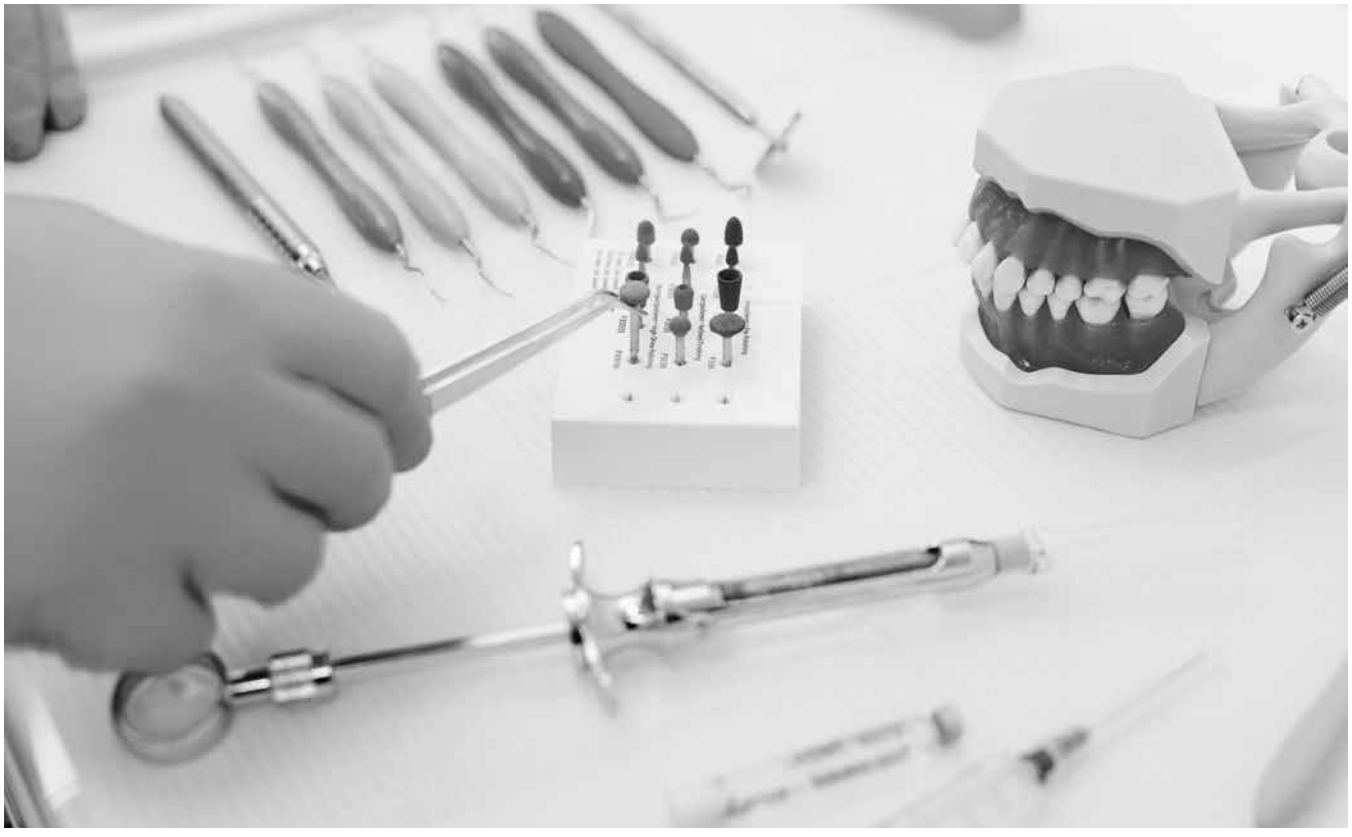
The goal of an IPAC program is to provide a safe treatment environment for the patient and a safe working environment for the OHCP and other personnel. This goal is accomplished by reducing the risk of healthcare associated (nosocomial) infections in patients and occupational exposures in OHCPs and other personnel. Breaches in IPAC practices are caused by the failure to follow protocols.

Effective program evaluation is a systematic way to ensure procedures are useful, feasible, ethical, and accurate. Program evaluation is an essential organizational practice. Evaluation offers an opportunity to improve the effectiveness of both the IPAC program and dental practice protocols. Such program evaluation **must** be practised consistently across program areas and be well integrated into the day-to-day management of the IPAC program.

A successful IPAC program depends on developing standard operating procedures, evaluating practices, routinely documenting adverse outcomes (such as occupational exposures to blood) and work-related illnesses in OHCPs and monitoring healthcare-associated infections in patients. Strategies and tools to evaluate the infection control program can include:

- Periodic in-office observational assessments by the facility IPAC officer
- Checklists to document procedures
- Annual review of occupational exposures to blood-borne pathogens
- Facility audit by the regulators appropriate to each licencing body.

Effective implementation of IPAC programs is an ongoing process, requiring OHCPs to monitor the scientific literature and to stay abreast of new knowledge of emerging infectious diseases.



Additional Considerations for Alternative Practice Settings

Alternative practice settings include any setting where OHCPs may provide services that are not confined to a conventional clinical operatory. These settings may include, but are not limited to the following:

- Group home
- Long term care facilities
- Rehabilitation facilities
- Private home
- Community center
- Educational facilities
- Hospitals

OHCPs **must** take appropriate measures to ensure that IPAC protocols are followed and patient safety is maintained.

The following topics **must** be carefully considered when providing oral healthcare in alternative practice 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 color-coded containers that are marked with the universal biohazard symbol
- Released to an approved biomedical waste carrier for disposal

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 **must** be treated as hazardous materials and should not be thrown in the garbage and liquid mercury **must** never be poured down the drain. Contact a certified hazardous waster carrier for recycling and disposal of all amalgam waste.

For more information, please see the NSDA's document entitled "Hazardous Waste Documents – Best Management Practices for Hazardous Dental Waste Disposal". This document can be found using the following link:
https://nsdental.org/resources/for-office-managers/office-management-documents/?category=ohs

Disposal of Sharps

Sharps (e.g., needles, syringes with needles, scalpel blades, clinical glass) **must** be separate and collected in an approved puncture resistant, leakproof sharps container. 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, sterile instruments **must** be transported in sealed packages to maintain sterility until opened for use on site. Similarly, contaminated instruments **must** be packaged in sealed, sturdy, leakproof containers to prevent cross-contamination. 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., color coding).

Disposable sharps such as needles and blades must be removed and disposed of in an approved 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 patients, or contamination of environmental surfaces.

Glossary

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

Aerosol: Particles of respirable size (<10um) 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.

Aerosol Generating Procedures (AGPs): Procedures which can generate aerosols that consist of small droplet nuclei in high concentration and present a risk for airborne transmission of pathogens that would not otherwise be spread by the airborne route (e.g., COVID-19, influenza).

Airborne precautions: Providing oral health care services in operatories with floor to ceiling walls and doors, appropriate negative pressure ventilation, and appropriate PPE.

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).

Emulating Indicator (Class 6): An internal indicator that reacts to all critical variables (time, temperature, and presence of steam) for a specified sterilization cycle (e.g., 10 min, 18 min, 40 min). This may be used as an additional monitoring tool to release sterilizer loads that do not contain implants; however, the Class 5 CIs would be the preferred choice for the reasons stated in Table 1 in the main part of this document.

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.

Cohort Environment: An open concept office with no physical barriers separating dental chairs.

Custodian: One responsible for the collection, use, disclosure, retention, and destruction of personal health information.

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

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, and 6% hydrogen peroxide.

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., splatter) 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 healthcare 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 healthcare 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.

Nosocomial infections: Also referred to as healthcare-associated infections (HAI), are infection(s) acquired during the process of receiving health care that was not present during the time of admission. (Sikora, Zahra, 2022)

OHCP: Oral healthcare provider.

Percutaneous: According to the Merriam Webster medical dictionary, it is 'through the skin'.

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.

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. OHCPs **must** use their professional judgment for every instrument, device and surface for their specific practices to ensure that these Guidelines are being met.

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.

Routine practices: A term used to describe basic IPAC standards 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-intactskin.

Sharps: Items including, but not limited to, needles, scalers, laboratory knives, burs, explorers, and endodontic files and reamers.

Shock System: "Shocking is the process of treating dental unit waterlines with strong chemicals that detach biofilm from the internal surfaces of the waterline" (Dewhirst and Molinari, May 2018). Shock systems or treatments contain high-level disinfecting agents meant to "shock" the system and eradicate all biofilm in the water. *Continuous water treatment products* like tablets and drops effectively maintain already clean dental waterlines. Always check manufacturer's instructions. Different manufacturers recommend different shock protocols and different treatment products.

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

Splatter: 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 cavitation's produced by ultrasound waves

Appendix 1

MANAGING CONTAMINATION

Patient Care Items (Modified Spaulding Classification)

Table of Contents Previous Recommendation

Category	Description	Examples	Management
CRITICAL ITEMS	Penetrates soft tissue or bone	• Air/water syringe tips • Anesthetic syringes • Endodontic instruments, including files (hand and rotary) and reamers • Gauze for surgery • Dental implant instruments • Metal matrix bands prior to use • Mouth mirrors (when used during a procedure where tissue is cut or manipulated) • Orthodontic bands prior to use • Periodontal instruments including ultrasonic tips • Restorative / operative instruments • Rotary burs and diamonds • Dental dam clamps • Scalers • Stainless steel crowns prior to use • Surgical instruments • Surgical suction tips	Items that are not single-use disposable **must** be sterilized and stored wrapped until point of care. Single-use disposable items **must** not be re- processed. Follow manufacturer's instructions regarding sterilization prior to use.
SEMI-CRITICAL ITEMS	Touches intact mucous membrane or non-intact skin	• Articulating ribbon holder • Handpieces • Crown removing instruments • Dental dam frame and forceps • Impression trays • Lab burs • Nasal hoods • Orthodontic pliers • Facebow • Laboratory knives and spatulas	Items that are not single-use disposable **must** be sterilized and stored wrapped until point of care. Single-use disposable items **must** not be re- processed. Follow manufacturer's instructions regarding sterilization prior to use.
NON-CRITICAL ITEMS	Contacts intact skin only	• Blood pressure cuffs • Curing Lights • Lead aprons • Intra-oral camera and radiograph sensors • Dental dam punch • Laboratory specific instruments	Items **must** be protected with barriers and/or cleaned and disinfected between use when contaminated.

ENVIRONMENTAL SURFACES

Category	Description	Examples	Management
CLINICAL CONTACT SURFACES	Direct contact with OHCP or other personnel's hands, patient-care items or patient skin	• Dental chairs • Keyboard and mouse • Dental units and countertops • Doorknobs • Drawer and cupboard handles • Light handles • Radiograph equipment	Protect with surface barrier or disinfect with intermediate- level disinfectant.
HOUSEKEEPING SURFACES	Inadvertent contact with OHCP or other personnel's hands, patient-care items or dental appliances	• Floors • Sinks • Walls	Frequent cleaning based on use. If contaminated by blood or saliva use intermediate-level disinfection.

■ The examples given are for illustration only and these lists are not to be considered exhaustive.

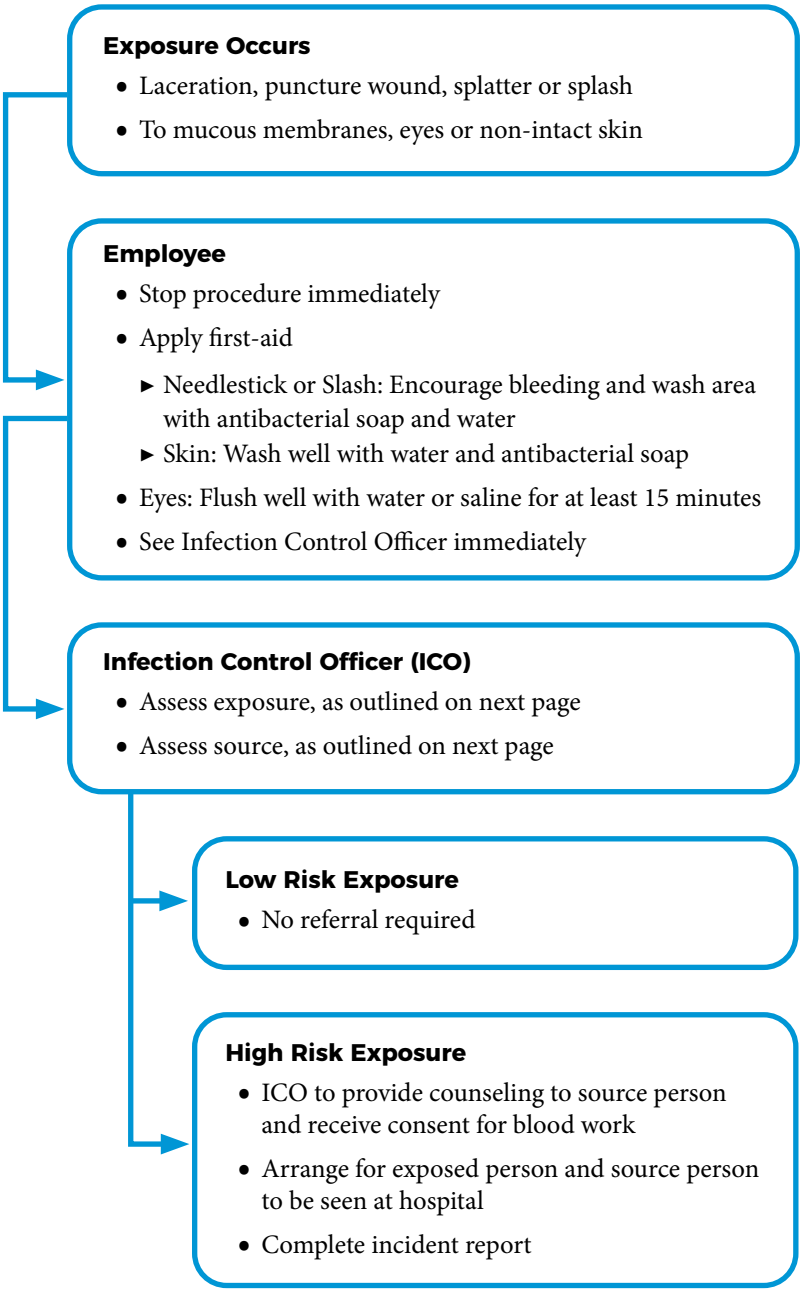
Semi-critical instruments or devices that have been exposed to blood or have the potential to be exposed to blood **must** be treated as critical. OHCP **must** use professional judgment for every instrument, device and surface for their specific practices to ensure that the standards are being met.

DISINFECTANTS

Category	Examples	Advantages	Disadvantages
INTERMEDIATE LEVEL DISINFECTANT (destroys all vegetative bacteria, mycobacteria, most viruses and most fungi, but not bacterial spores)	• Chlorine-based products *(sodium hypochlorite diluted in-office, chlorine dioxide, commercial preparations with surfactants)*	• Low cost • Fast acting • Readily available	• Corrosive to metals • May destroy fabrics • Inactivated if not well cleaned • Irritating to exposed skin and mucous membranes • Chlorine dioxide is poor cleaner • Unstable when diluted - **must** be prepared daily
	• Halogens *(sodium bromide & chlorine)*	• Fast acting • Simple to mix • Minimal storage space required	• Used on hard surfaces only • Strong chlorine odour
	• Hydrogen peroxide, 0.5% accelerated	• Fast acting • Non-irritating • Odourless • Effective for bioburden removal • Stable and effective • on environmental surfaces	• Slow fungicidal activity • An oxidizing agent which will accelerate rusting of metal instruments • Relatively expensive
	• Iodophors *(iodine combined with surfactant)*	• Rapid action • Relatively less toxic and less irritating • Residual action • Effective cleaner and disinfectant	• Stains fabrics and synthetic materials • Corrosive to exposed skin and mucous membranes • Inactivated by hard water • Unstable when diluted – **must** be prepared daily unless manufacturer's instructions state otherwise
	• Quaternary ammonium compounds with alcohols *("dual" or "synergized")*	• Generally non- irritating • Non-corrosive	• Older generation had narrow spectrum • Inactivated by anionic detergents and organic matter • Can damage some • materials • Rapid evaporation
	• Phenolics *("complex" or "synthetic" containing multiple phenolic agents)*	• Residual biocidal, action • Available with detergents	• May be absorbed through skin or by latex • Degrade plastics with prolonged contact, leave a film on disinfected surfaces or etch glass surfaces

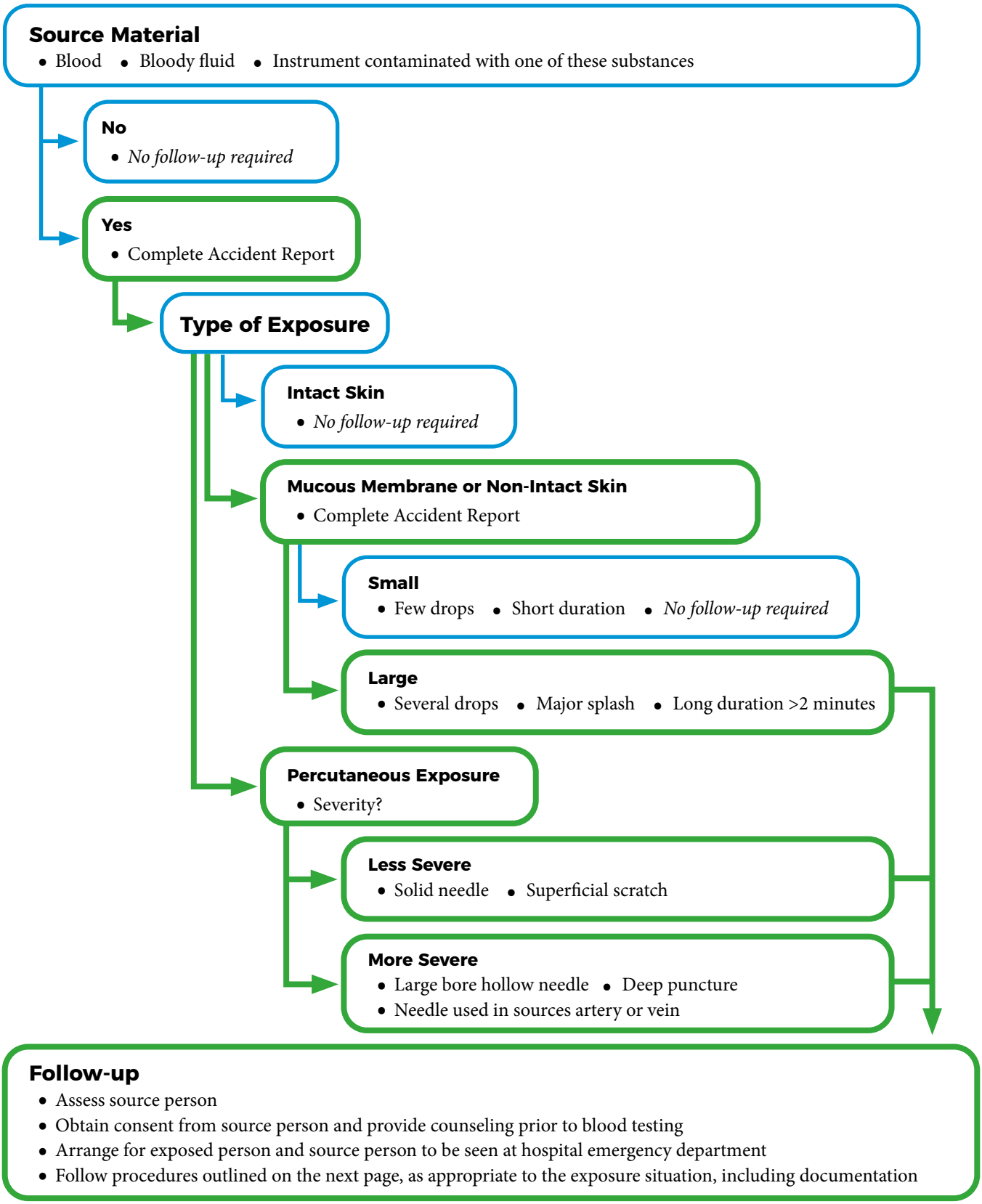
Appendix 2

MANAGEMENT OF NEEDLESTICK AND MUCOUS MEMBRANE EXPOSURE TO BLOOD/BODY FLUIDS



CRITERIA TO ASSESS EXPOSURE FOR RISK OF INFECTION

To be evaluated by the Infection Control Officer = *Follow-up/Action Required*



MEDICAL FOLLOW-UP TO NEEDLESTICK AND MUCOUS MEMBRANE EXPOSURES

The following procedures will be directed by the Infection Control Officer:

1. **Medical management** of the injury

2. **Referral of the source person to the family physician or emergency physician for testing** of Hepatitis B surface antigen, Hepatitis C surface antigen, and HIV antibodies. HIV testing will be done with appropriate pre and post counseling and informed consent.

3. **Referral of the exposed person to the family physician or emergency physician for testing** of Hepatitis B surface antibodies (if vaccinated) or Hepatitis B surface antigen (if not vaccinated), Hepatitis C surface antigen, and HIV antibodies and to **determine the need for Post-Exposure Prophylaxis.**

4. **Documentation** of the following information in the employee's confidential medical file:
   a. Date and time of exposure
   b. Details of the procedure being performed by the employee at the time of exposure
   c. Details of the exposure including amount of fluid or material, type of fluid or material, severity of exposure and exposure site description (e.g., needlestick, size of needle, size of wound)
   d. Details of exposure source
   e. Details of counseling, post-exposure management and follow-up

5. **Follow-up care** of the employee including counseling, medical evaluation and blood tests
   a. For Injuries requiring Post-Exposure Prophylaxis re: HIV: follow up blood tests are at 2 weeks, 4 weeks, and 12 months.
   b. For Injuries requiring Post-Exposure Prophylaxis re: Hep C: follow up blood tests are at 0, 3 and 6 months.
   c. For Injuries requiring Post-Exposure Prophylaxis re: Hep B: Vaccinate, if not previously vaccinated; for vaccinated individuals, check Hep B antibody levels.

NEEDLESTICK EXPOSURE INFORMATION

An accidental needlestick injury has occurred to a member of our staff. Sometimes this injury may expose the staff member to blood from a "source person" (e.g., a patient) which may lead to an infection. In order to reduce the risk of infection following this type of injury, it is important to learn more about the source person's health and well-being, including whether they are infected with certain organisms. These include Hepatitis B, Hepatitis C and Human Immunodeficiency Virus (HIV).

We have developed the following consent and risk assessment for to learn more about a source person's health in the event of an accidental needlestick exposure. Given the risk involved, we ask you provide the Infection Control Officer with answers to the questions listed below and then go to the hospital for an immediate blood test so we can determine if there is a chance that our staff member could become infected. We require your consent to obtain a copy of any positive results so the exposed staff member can receive the any necessary treatment.

Our office has policies and procedures in place to reduce injuries to employees. However, when accidents occur, we want to ensure that our employees receive proper care. We appreciate your cooperation in helping us to achieve this goal.

NEEDLESTICK EXPOSURE CONSENT

Consent to contact family physician for infection disease blood test results.

The above information about needlestick exposure has been reviewed and explained to me, and I consent to the Infection Control Officer contacting my family physician or emergency physician to obtain relevant blood test results.

Source Person

Print Name:

_____

Signature:

_____

Date: yyyy/mm/dd

_____

Infection Control Officer

Print Name:

_____

Signature:

_____

Date: yyyy/mm/dd

_____

Witness

Print Name:

_____

Signature:

_____

Date: yyyy/mm/dd _____

CHECKLIST: POST-EXPOSURE ASSESSMENT OF SOURCE PERSON

The following is to be completed by the Infection Control Officer following an accidental needlestick exposure:

❒ Inform the source person of the reason for the enquiry and allow them time to read the "Needlestick Exposure Information and Consent"

❒ Evaluate the source person's risk of blood-borne infection by reviewing their medical history for clinical symptoms and asking them the following additional information:

■ Are you Hepatitis B, C, and/or HIV positive or have any risk factors for exposure to these viruses?

- Hepatitis B ❒ No ❒ Yes & Date Diagnosed: yyyy/mm/dd _____
- Hepatitis C ❒ No ❒ Yes & Date Diagnosed: yyyy/mm/dd _____
- HIV ❒ No ❒ Yes & Date Diagnosed: yyyy/mm/dd _____

■ Risk Factors ❒ No ❒ Yes

Risk factors may include:

► *IV drug use and/or shared needles*
► *Receiving blood products*
► *Multiple sex partners and/or sex partners who have one or more of the listed risk factors*
► *Unprotected/unsafe sex*

❒ Request source person's consent to go for blood testing for their Hepatitis B/C and/or HIV status

Source person's family physician:

Dr. _____ **Phone Number:** _____

Address: _____

EXPOSURE DOCUMENT

- **Infection Control Officer must have copies of this form on file.**
- **A copy of this form must be taken to the hospital.**
- **A copy must be retained in the employee's personnel file.**
- **Confidentiality of this form must be ensured.**

Name of Exposed Person:		
Hepatitis B vaccination completed:	**Date**:	**Post-vaccination titre**: mIU/mL
Date and **Time** of Exposure:		

Procedure being performed:

Where and how exposure occurred:

Did exposure involve a sharp device: ❒ No ❒ Yes

Type and brand of device:_____

How and when during handling exposure occurred: _____

_____

Extent of the exposure (describe): _____

_____

❒ Blood ❒ Saliva ❒ Other body fluid Describe: _____

Percutaneous injury

- ► Depth of wound:_____
- ► Gauge of needle:_____
- ► Was fluid injected: ❒ No ❒ Yes

Skin or mucous membrane exposure

- ► Estimated volume of fluid: _____
- ► Duration of contact: _____
- ► Condition of skin: ❒ Intact ❒ Chapped ❒ Abraded

Source person information

- ► Known infectious disease(s): HIV ❒ No ❒ Yes ❒ Possible
- ► Anti-retroviral therapy: ❒ No ❒ Yes Viral Load: _____

FOLLOW-UP CARE (DESCRIBE IN DETAIL):

Date:	Caregiver:	Action Taken:

Appendix 3

DONNING (PUTTING ON) PPE

GUIDE TO PUTTING ON PERSONAL PROTECTIVE EQUIPMENT

Droplet & Contact Precautions (Universal Masking)

1 Procedure/surgical mask

Process will depend on what face/eye protection is available

Scenario 1: If goggles or full-face shield is available, leave mask on and proceed to Step 2.

Scenario 2: If mask needs to be replaced with a mask with visor or N95, perform hand hygiene, remove original mask, and store as per guidance. Proceed to Step 2.

2 Hand Hygiene

Perform hand hygiene.

Alcohol-based hand rub is preferred. Use soap and water if hand are visibly soiled.

3 Long-sleeved gown

- Select level of gown based on fluid exposure risk.
- Make sure the gown covers from neck to knees to wrist.
- Tie at back of neck and waist.

4 N95 Respirator (if applicable)

- Required for AGMPs for patients with unknown, novel or emerging pathogens.
- Refer to manufacturer for specific donning instructions.
- Perform a 'seal check' with each use.
- N95 respirators must be 'fit tested' prior to use.

5 Face/Eye Protection

- Put on mask with visor or goggles or full shield as available.
- Place over the eyes or face.
- Adjust to fit
- **NOTE**: Eyeglasses are not considered protective eyewear.

6 Gloves

- Put on gloves.
- Pull the cuffs of gloves over the cuffs of the gown.

FOR NOVEL AND EMERGING PATHOGENS: Initiate Contact & Droplet Precautions and wear gloves, gowns, procedure/surgical mask and face/eye protection when within 2 metres of patient.

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Last revised April 19, 2020

DOFFING (TAKING OFF) PPE

GUIDE TO REMOVING PERSONAL PROTECTIVE EQUIPMENT

Droplet & Contact Precautions (Universal Masking)

1 Gloves

- Outside of glove is contaminated.
- Use glove to glove, skin-to-skin technique.
- Discard in garbage

2 Hand Hygiene

Perform hand hygiene.

Alcohol-based hand rub is preferred. Use soap and water if hand are visibly soiled.

3 Long-sleeved gown

- Carefully unfasten ties. DO NOT rip off.
- Grasp the outside of the gown at the back by the shoulders and pull down over the arms.
- Turn the gown inside out during removal.
- Carefully fold into bundle.
- Place disposable gown in garbage or place non-disposable gown in laundry hamper.

4 Hand Hygiene

Perform hand hygiene.

Alcohol-based hand rub is preferred. Use soap and water if hands are visibly soiled.

5 Face/Eye Protection

- Handle only by headband or earpieces.
- Carefully pull away from the face.
- Place non-disposable face/eye protection in designated area for disinfection & disposable items in garbage.

6 Mask OR N95 Respirator

Scenario 1- LEAVE MASK ON if wearing full face shield and mask is not visibly soiled or mask integrity is affected by moisture/ humidity. Proceed to Step 7.

Scenario 2: If you wore goggles or wearing mask with visor, mask must be removed. Do not touch front of mask, allow to fall away from face & discard.

N95 must be removed outside of room.

7 Perform Hand Hygiene

8 Exit Patient Room. Remove N95 (if applicable). Perform Hand Hygiene

9 If Applicable, Obtain New Mask or Apply Stored Mask

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Last revised April 19, 2020

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