Foreword

This document has been developed as a resource for dentists and oral health team personnel. It is intended to offer a general outline for infection control protocol for dental offices in Manitoba. The document does not define or establish a standard of practice nor is it intended to deprive the dentist of the ability to exercise professional judgment. Individual dentists may find it useful, in whole or in part, within their dental practice, and they may choose to modify procedures and approaches outlined as they see fit.

Introduction

An efficient and effective infection control program in the dental office is the result of its execution by all individuals working in the dental office. The dentist is responsible for developing, maintaining, and upgrading infection control protocols according to professional standards. This Manual has been upgraded utilizing many current sources, including the CDA Workbook on Infection Control (March 2001), CDA Draft Infection Control Guidelines 2005, Guidelines for Infection Control in Dental Health-Care Settings (December 2003), Health Canada, and Manitoba Health Guidelines.

Objectives of an Infection Control Program

• To disseminate strategies for dealing with infection control issues. The sign of a good infection control program is that it follows accepted guidelines and it is tailored to the individual and their office.
• To provide guidance with the assumption that everyone is infected with a virulent pathogenic microorganism.
• To protect patients and the dental team from exposure in order to reduce risk of potential infection.
• To provide information to the dental team in order that they can in turn reduce the risk of transmissible diseases to themselves and their patients.
• To reduce the numbers of available pathogenic microorganisms.
• To interrupt the spread of pathogenic microorganisms.
• To disseminate strategies for dealing with significant exposures.

It is recommended that all dental office personnel familiarize themselves with information contained in this document and incorporate applicable components into their daily routine.
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Chapter 1

TRANSMISSION OF INFECTION IN THE DENTAL OPERATORY

Provision of oral healthcare is an “at risk” occupation by nature of continual contact with blood, saliva and tissues, use of sharp instruments, and the variety of procedures performed in the dental office.

Oral healthcare providers should be aware that pathogenic agents may occur in the oral cavity as a result of four basic conditions: bloodborne diseases, oral diseases, systemic diseases with oral lesions, and respiratory diseases.¹

<table>
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<th>SOURCE OF PATHOGEN</th>
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<td>Viral Hepatitis, HIV/AIDS</td>
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<td>Oral diseases</td>
<td>Pharyngitis, human herpes virus types 1 and 2, and Candidiasis</td>
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<td>Systemic diseases with oral lesions</td>
<td>Secondary syphilis, chickenpox, measles, mumps, infectious mononucleosis, Coxsackie infections</td>
</tr>
<tr>
<td>Respiratory diseases</td>
<td>Influenza, common cold, bronchitis, pneumonia, Streptococcal pharyngitis, tuberculosis</td>
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The Manitoba Health website² provides a wealth of information on incidence and description of these diseases. The goal of an infection control program is to eliminate cross-contamination and reduce risk due to exposure to pathogenic microorganisms between all of the potential sources of infection (people, objects, and environment) and how they interact.
Spread of Microorganisms from person to person

Microorganisms from a patient’s oral cavity may be spread to others by three basic modes of disease transmission: direct contact (contact at source), indirect contact (contact with surfaces, instruments, contaminated sharps), and droplet infection (sprays, splashes, aerosols, or spatter).

Entry

Microorganisms must enter a new person in order to constitute transmission and potentially infect the new person. There are four routes of entry:

1. Inhalation (breathing aerosol particles generated by treatment)
2. Ingestion (swallowing saliva, blood, or tissue)
3. Entry through mucous membranes of the eyes, nose, or mouth
4. Directly touching microorganisms or being spattered with saliva or blood onto non-intact skin or punctures with contaminated sharps.

Risk for Disease

Risk is the chance of developing the disease following significant exposure. Significant exposure means that there is entry of contaminated body fluid from one person to another. Exposure is not synonymous with infection. The risk of infectivity is expressed as:

\[
\text{Risk} = \text{Virulence} \times \text{Concentration of pathogen at portal of entry} \times \text{Time of exposure} \times \text{Virulence of pathogen} \times \text{Host resistance}
\]

Refer to Appendix 1: Statement on the Ethical and Legal Considerations of Treating Patients with Infectious Diseases (Page 49)

Status of Dental Health Care Workers

In Manitoba, registered and licensed dental health care workers who are hepatitis B, C, or HIV/AIDS positive or carriers of hepatitis are requested to self report their status to the MDA. Status will be reviewed by the Adhoc Bloodborne Pathogens Advisory Committee to determine their status regarding practice. The MDA Registrar sits on this committee.

Refer to Appendix 2: Sources of Bloodborne and Airborne Pathogens (Page 51)
Chapter 2

PRECAUTIONS TO REDUCE EXPOSURE AND TRANSMISSION OF INFECTIOUS AND POTENTIALLY PATHOGENIC MICROORGANISMS

Since medical history and examination cannot reliably identify all patients infected with blood-borne diseases, dental health care workers may unknowingly be exposed to a variety of pathogens from blood, saliva, and gingival fluid. These micro-organisms should be considered infective. They have variable life spans ranging from minutes to months with potential to result in morbidity and/or mortality. To prevent such infections and cross-infection, “Standard Precautions” are recommended for all dental personnel. Standard Precautions DO NOT mean extra personal protective equipment for certain “high risk” patients, taking extra spatter precautions for HIV or hepatitis patients, processing certain patient’s instruments separately, immersion sterilization of certain patient’s instruments before heat sterilization, or special operatory treatment after certain patient appointments. Standard Precautions DO apply to blood, all body fluids, secretions and excretions (except sweat), non-intact skin, and mucous membranes. Standard Precautions should be used in the care of all patients, regardless of infection status. Implementation of Standard Precautions means the use of the following infection control procedures routinely.

1. Immunization
2. Patient screening
3. Hand hygiene
4. Barriers
5. Needle and Sharp Instrument Safety
6. Instrument sterilization and Disinfection
7. Surface Disinfection
8. General Operatory Asepsis
9. Radiographic Asepsis
10. Laboratory Asepsis

A new precaution standard has also been added that is recommended to prevent the spread of specific diseases such as TB, SARS, and prion diseases. These guidelines are known as “Expanded or Transmission Based precautions”. They include the use of specific respiratory protection for TB and SARS that are not usually used in the dental office but rather in hospital-based dentistry facilities or in emergency settings when the patient is known to be infected with the disease.

For those patients with diagnosis or familial history of Creutzfeldt-Jacob and variant Creutzfeldt-Jacob, dental instruments and devices touching pulpal tissue should be discarded in sharp containers after each patient use (FDI, Policy Statement Transmissible Spongiform Encephalopathies: Implication for the Profession of Dentistry, 2001, Sept.)
SECTION 1
IMMUNIZATION

Dental personnel can reduce the risk of exposure to infectious disease by maintaining their health and immune status. All dental personnel should maintain up-to-date immunization records which should include the following: measles, mumps and rubella (MMR), diphtheria, tetanus, and poliomyelitis, and Hepatitis B. Testing for tuberculosis is recommended following a suspected exposure.

Refer to Appendix 3: The Canadian Guide for Immunization\(^5\) (Page 54)

Hepatitis B Immunization

Hepatitis vaccines were developed in the 1980s. The original hepatitis B vaccine was Heptavax. Since then, two new genetically engineered vaccines, Engerix B and Recombivax have been developed and can be used interchangeably. The recommended dosing schedule is 0,1,6 months, although accelerated regimens are possible at 0,1,2 months with a booster at 12 months. The National Advisory Committee on Immunization no longer recommends periodic testing to determine antibody levels nor booster doses in immunocompetent people.\(^6\)

Rates of immunization are high among dentists. However, rates among dental assistants and hygienists are found to be much lower.\(^7\) All nonimmune dental health care workers should receive immunization with recombinant hepatitis B vaccine. The Manitoba Dental Association strongly recommends that postimmunization serology be performed to ensure that adequate surface antibody levels of ≥ 10mIU/ml have been reached. Booster doses of vaccine are not required.\(^8\)

[www.cdc.gov/ncidod/diseases/hepatitis/b/factvax.htm]

Antibody Levels Required for Protection

Following vaccination, protection occurs with development of antibody to the surface antigen, called anti-hepatitis B surface antigen (anti-HBsAg). Seroconversion occurs in about 95% of those healthy adults vaccinated. About 20% of non-responders will respond after 4th injection; 50% may respond after 6th injection.\(^9\) Increased age and obesity reduces chances of seroconversion. The vaccine will not be effective if the patient is already a carrier of HBsAG and the vaccine will not eliminate HBsAG carrier state. Testing for seroconversion should occur 1-6 months after the 3rd injection. Levels of anti-HBs above 10mIU/ml provide virtually complete protection against HBV.
SECTION 2

PATIENT SCREENING

Complete medical histories should be taken for every new patient and updated at recall appointments to ascertain those who are physiologically compromised and for whom dental treatment procedures may have to be modified and, to the extent possible, to determine infectious status. Many infected persons are in the carrier state and are asymptomatic, making Standard Precautions essential for all patients.

Questions regarding medications, recent and past illnesses or operations, weight loss, swollen lymph glands, and oral problems may produce significant responses. Dentists should be familiar with the oral manifestations of infectious diseases, especially those which may be transmitted by dental treatment.

The following are diseases whose oral and general signs and symptoms should be known.

**COMMUNICABLE DISEASES**

<table>
<thead>
<tr>
<th>Condition</th>
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<td>Candidiasis</td>
<td>HIV – AIDS</td>
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<td>Chicken Pox – Shingles</td>
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<td>Cytomegalovirus Infection</td>
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<td>Diphtheria</td>
<td>Infectious Mononucleosis</td>
<td>Syphilis</td>
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<td>Gonorrhea</td>
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Certain histories demand additional consideration. Patients, who are medically compromised, especially if related to organ transplantation, chemotherapy, or immunotherapy, are at increased risk of acquiring infections. It may be beneficial to reappoint these patients when attending personnel are displaying symptoms of acute upper respiratory infections.
SECTION 3

HAND HYGIENE

CDA Guidelines: “Hands should be washed with a germicidal soap prior to and immediately after the use of gloves.”

“An effective antimicrobial solution should be used each time the hands are washed.”

“The purpose of hand washing is to remove soil, organic material and transient microorganisms from the skin. The components of good hand washing include using an adequate amount of soap, rubbing the hands together to create some friction, and rinsing under running water. The mechanical action of washing, rinsing and drying removes most of the transient bacteria present.”

Detergent (plain soap) with water can physically remove a certain level of microbes, but antiseptic agents are necessary to kill or inhibit microorganisms and reduce the level still further.

Handwashing Considerations

Consider skin sensitivities and allergies when selecting a hand-washing agent.

The following agents have been found to be effective:
- 2-4% chlorhexidine – displays substantivity (residual effect)
- 0.3-1% triclosan - displays substantivity
- 0.6% parachlorometaxylenol (PCMX)
- 60-70% propanol

Bar soaps are not acceptable as they may actually harbour pathogens. Store liquid hand care products in closed containers, disposable containers, or containers that are washed and dried before refilling. Do not top up a partially empty dispenser.

1. The initial procedure at the beginning and end of each work session (morning, afternoon, evening clinics) should be a thorough wash that includes cleaning under nails with a brush or orange stick. Subsequent washing procedures -before gloving and after glove removal - should be the same except there is no special emphasis on nail care.

2. Nails should be trimmed and smooth to prevent glove tearing. Fingernail polish, if worn, should be clear and fresh as chipped nail polish harbours increased numbers of microorganisms. False fingernails should not be used in the dental office.

   Rings that can result in the tearing of gloves or danger to the patient should not be worn.

3. Wash and rinse with cool water. Whenever possible, faucets should be foot, elbow or electronically controlled to prevent cross-contamination from faucet handles.

4. Dry hands thoroughly using disposable paper towels. Trash receptacles should not have to be lifted or touched by the hands.
Wash performed before and after each clinical session

1. Watches and other wrist jewelry should be protected from contamination by covering with the glove and/or cuff of the uniform. If exposed, these items will become contaminated with aerosols and spatter created during dental treatment.
2. Wet hands and fingernail brush with cool water. Place soap on the brush and clean fingernails until visible soil is removed. Alternatively, use a plastic or orangewood stick.
3. Rinse under cool, running water and leave fingernail brush in sink.
4. Place soap on the hands and scrub vigorously. Include thumbs, finger pads, and between the fingers.
5. Rinse for 10 seconds.
6. Dry with single use, disposable towels. If faucets are hand controlled, use this towel to shut off hand controlled sink faucets.

Wash performed before and after gloving

1. Wet hands with cool water.
2. Apply germicidal soap and scrub vigorously for a minimum of 10 seconds.
3. Rinse under cool, running water until all soap is removed.
4. Dry hands thoroughly using single use, disposable towels.

Waterless hand scrubs

Although these alcohol based hand scrubs are even better than soaps and antimicrobial soaps for reducing bacterial counts due to their long lasting antibacterial qualities (also known as substantivity), they should be used only if no visible soil exists on the hands [www.cdc.gov/handhygiene/materials.htm]. These can also be used in between patients if no visible soil exists on the hands. Although, the alcohol content can be drying to hands, this maybe a useful alternative in an outreach facility or at a patient’s home,
SECTION 4

BARRIER TECHNIQUES

Infectious diseases are transmitted in the dental setting through direct contact with contaminated blood and saliva; through indirect contact with contaminated instruments, equipment, or surfaces; and through contact with airborne contaminants present in droplets, spatter, or aerosols of oral and respiratory fluids.\textsuperscript{13} The techniques used to interfere with this transmission by providing a physical barrier between the body and a source of contamination are called barrier techniques. Those barriers that are used by the health care worker are called personal protective equipment (PPE). Barriers that reduce microorganism numbers in aerosols are called operating barriers. Barriers used to protect equipment and reduce time required for cleaning are equipment barriers, and will be discussed under “Operatory Asepsis”. (Page 27)

Personal Protective Equipment (PPE): Protective clothing (including headcover), eyewear, masks, gloves\textsuperscript{14}

General Comments
Personal Protective Equipment is placed in the following order so that there is minimal risk for cross-contamination to the patient:

1. Protective outerwear
2. Mask, placed and adjusted
3. Protective eyewear – safety glasses/loupes with side shields. If a faceshield is worn, it would be placed after the mask is placed.
4. Wash hands, place gloves

Once these barriers have been placed, only the patient and those instruments, equipment and supplies used for the patient should be touched. Do not touch yourself or other barriers such as glasses or mask, radiographs, charts, or any part of the operatory without either first removing gloves and washing hands or placing overgloves. When obtaining equipment or supplies, place overgloves, do not touch or remove the mask or glasses as they are now contaminated and touching with overgloves would contaminate them. While wearing overgloves do not touch any articles other than those involved with patient care. As overgloves are not sufficiently clean to directly handle articles to be used intraorally, these articles are obtained using cotton pliers or a clean paper towel.

Personal Protection Equipment Removal
1. Gloves removed and discarded.
2. Mask removed by the ties (removal from front increases risk of transmission to any broken skin) and discarded.
3. Protective eyewear removed
4. Wash hands.
A. Protective clothing—outerwear and head coverings

CDA Guidelines state:
“Such clothing should be water resistant and have long sleeves and high collars. Alternately, short sleeved clothing may be worn, which permits washing of the forearms. Gowns or other protective clothing should be changed and washed whenever they become visibly soiled.”

“A high temperature wash cycle (60-70 C) with normal bleach concentration followed by machine drying (100 C) is recommended for clothing. Dry cleaning and steam pressing is also appropriate.”

The following choices of clinic wear are appropriate. The chief concern is to reduce the risk of transmission through direct contact and cross-contamination to yourself and others from contaminated outerwear.

- **Lab jacket or coat** as per CDA guidelines over street clothing. Once the outerwear is contaminated, when the dental healthcare worker takes a break for eating or steps away from the office (but will be returning and reusing this outerwear) it should be hung in a separate, designated area apart from non-contaminated clothing. Hands should be washed after hanging the contaminated outerwear.
- **Uniform** (tunic, scrubs, street clothes worn as uniform). The uniform should be donned at the office and then replaced by street clothes at day’s end. During breaks when food is handled and when leaving the office environment either street clothes are replaced or a lab jacket or coat is worn over the uniform to reduce the risk of cross-contamination. After the lab jacket or coat is worn, it is considered contaminated and is correctly stored by hanging in a separately designated area.
- **Disposable outerwear.** Although this is an alternative, costs and production of considerable waste need to be considered.

**Protective Head Coverings**
Although no guidelines for headwear has been specified by the CDA, there are sufficient concerns from many dental healthcare worker regarding aerosol production to warrant use of surgical type headwear. Additionally, when a patient is identified as bearing head lice and the patient has emergency needs, the team and the patient should consider the use of surgical-type headwear.

**B. Masks**

1. Masks worn routinely by dental personnel should have more than 95% efficiency for particles 3 to 5 microns in diameter.
2. Masks should be worn whenever aerosols or spatter may be generated. Masks should be worn to cover the mouth and the nose to reduce transmission due to inhalation as well as protecting the mucous membranes from direct contamination.
3. The wearing of masks is strongly suggested for any procedure when treating patients who are immunologically compromised. These patients should be reappointed when dental personnel display symptoms of acute respiratory infections.
4. While it is not suggested that a fresh mask be worn for each patient, all masks lose their effectiveness upon becoming moist, which, depending upon the nature of treatment, may occur within one to two hours. Masks should be changed following a procedure where sufficient spatter or aerosol spray was created to wet the mask.
Dental aerosols are a solid or liquid airborne particle that is a source of microorganism capable of inducing illness. Use of high-speed turbines and ultrasonic scalers increase bacterial counts as high as 3000% releasing organisms into the air which are usually not found in the air. Filtering efficiencies of masks vary from 14-99% with the glass fiber mat and synthetic fiber mat the most effective filters. When purchasing masks, look for high filtration efficiency, bacterial filtration efficiency (BFE), or protective filtering efficiency (PFE). Choose masks also on the basis of filtration particle size - the smaller the better. It is important during selection of a mask to select a mask that fits the face well to minimize passage of unfiltered air. Once removed, masks are discarded. Masks are not to be worn under the chin.

Masks normally worn by dental personnel are inadequate filters if treating patients with active untreated tuberculosis (1-5 microns in diameter). When airborne infection isolation precautions are necessary, particulars filter respirators or N95, N99, or N100 masks are to be worn.

C. Protective eyewear

Eyes of dental personnel and patients should be protected with some type of covering to protect from spatter of blood, saliva, and particulate matter.

This is partially accomplished by standard prescription glasses or glasses with plain lenses; however, the effect of this barrier is dramatically increased when protective side pieces are used. Glasses will become contaminated and should be washed following patient care at the same time hands are washed. Clear face shields may also be used in place of protective eyeglasses; however, a mask is still worn to protect the mucosa of the mouth and nose.

Protective eyeglasses for patients are to be used whenever production of spatter or aerosol spray is anticipated, or when chemicals are used or rotary or sharp instruments are used. Protective eyewear for patients may be disposable or be capable of being subjected to chemical disinfection following use by each patient. Curing light filters are not considered infection control devices; however, they should be used to protect eyes during use of curing light to prevent eye injury of dental personnel.

Care of dental loupes or magnification devices should be provided by the manufacturer. They should be cleaned regularly according to manufacturer’s direction.
D. Gloves

CDA Guidelines:

1. “Gloves should not be worn indiscriminately. They are not to be used when greeting patients, handling records or radiographs, but only when performing intraoral procedures or handling instruments to be used or already used within and around the oral cavity. Gloves are disposable items and similar to injection needles, anesthetic carpules, and saliva ejectors, must be discarded after use on each patient”.

2. “If latex allergies are present, precautions must be taken to avoid contact with latex allergens.”

3. “Gloved hands should never be washed. A fresh pair of gloves must be used for each patient.”

4. “Heavy duty utility gloves should be used for handling contaminated instruments during cleaning. Wearing gloves does not replace the need for handwashing. Hands should be washed and dried thoroughly immediately before placing gloves and immediately after removing gloves.”

Types of gloves:

1. Patient Care
2. Utility
3. Other

Patient care gloves include sterile gloves used for surgical procedures and examination gloves. These may be purchased powdered or powder free.

- Surgical gloves are individually packaged sterile gloves, generally available as right and left handed and are available in latex, reduced protein latex, neoprene, styrene, and synthetic copolymer.
- Examination gloves are not sterile, usually fit either hand and are available in many materials including natural rubber latex (NRL) or latex, nitrile, nitrile and NRL blends, nitrile and chloroprene (Neoprene), vinyl, polyurethane, and styrene-based copolymer.

Gloves are worn when treating all patients when contact with oral fluids is anticipated or handling instruments used or to be used within and around the oral cavity. Gloves are changed between patients or when torn. If the patient is left during treatment, gloves are removed and discarded and a fresh pair is placed upon returning due to the increased risk to the operator of contamination from the gloves during replacement. Although, it has been suggested that gloves be changed during longer procedures, there is no consensus on the optimal time for changing gloves during prolonged procedures.
2. Utility gloves.
There are two types: heavy gloves used for housekeeping and when handling contaminated sharps or chemicals and overgloves or “food handler” gloves.

- **Puncture-resistant utility gloves** used for cleaning instruments and operatory surfaces come in many materials including heavy grade latex, nitrile, and chloroprene (Neoprene). These gloves should be sterilized following each operatory cleaning between patients.

- **Overgloves** are polymer/copolymer gloves used when supplies or instruments are required after treatment gloves have been placed whether they are new (to protect the patient from cross-contamination) or contaminated. New overgloves are used for each patient. Overgloves can be taped to any area that can be disinfected along with the rest of the operatory following treatment and are easily accessed by any member of the dental team.

3. Other gloves

- **Undergloves**: generally cotton. These are generally used by health care worker who are experiencing skin problems. A fresh pair is to be used for each patient and the gloves are then washed in the same way as all overwear.

- **Heat-resistant gloves** used during sterilization

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**Latex Allergies and Contact Dermatitis**

The risk of developing hypersensitivity increases with exposure. Health care providers are at higher risk to developing allergies to latex as well as all the other chemicals found in the dental office. Untoward dermal, conjunctival, and respiratory responses require diagnosis. Self diagnosis, although helpful to the physician, if not substantiated may lead to two problems. When the true diagnosis is unknown, the hypersensitized person may be unknowingly subjecting themselves to a threatening exposure. On the other hand, if the true diagnosis is unknown, the affected person may be avoiding the use or consumption of something unnecessarily.

Intact skin is one of the most important barriers to entry of microorganisms. Repeated hand washing and glove use can lead to contact dermatitis. Contact dermatitis can be classified as irritant or allergic. Irritant dermatitis is characterized by dry or fissured skin and redness to the affected area. Hypersensitivity or allergic responses are exaggerated or pathological reaction to substances. Allergic responses require a sensitizing dose followed by a challenge dose where exposure to the allergen will lead to manifestation of symptoms. The two most common responses are the Type IV or delayed response ("poison-ivy response) and the Type I, immediate, or anaphylactic response. Type IV requires at least 12 hours to develop, with allergen usually through the skin and characterized by a rash and is usually confined to the area of contact. Type I is mediated by IgE, characterized by histamine release causing systemic reactions such as itching, hives, eczema, runny eyes, difficulty with breathing. It may be life threatening depending on the type and amount of allergen, the portal of entry, the duration of exposure, and pre-existing condition.

Healthcare workers and patients who have other allergies are considered atopic or more prone to developing a reaction to more allergens. People who have a previous history of spina bifida, urogenital anomalies, or allergies to avocados, kiwis, nuts, or bananas are considered atopic to natural rubber latex (NRL). Natural rubber latex proteins responsible for latex allergy have been shown to attach to glove powder. When powdered latex gloves are worn, more protein reaches the skin and more particles become aerosolized. Work areas where only powder-free low-
allergen latex gloves are used demonstrate lower prevalence of latex allergies. Those patients and healthcare workers with known latex allergies should not have direct contact with latex containing materials. The safest way to accomplish this is by creating a latex free office environment. Additionally, facilities should be appropriately equipped and have procedures in place to handle all emergencies, including acute latex allergic reactions.

**TREATMENT BARRIERS**

1. Rubber dam
2. High volume evacuators (HVE)
3. Pre-procedural rinse

1. Rubber dam

Reduction in microorganisms escaping a patient’s mouth in aerosols or spatter can approach 100% with proper use of the rubber dam. Simultaneous use of the rubber dam and HVE provide the best approach to minimizing production of aerosols during tooth preparation.

2. High Volume Evacuators

Use of high volume evacuation during treatment procedures when large amounts of aerosols are produced, reduces the escape of some of these aerosols into the environment of the office.

3. Pre-procedural rinse\(^1^8\) (water, chlorhexidine gluconate, povidone-iodine)

No scientific evidence indicates that pre-procedural mouth rinsing prevents clinical infections for the dental team, including patients; however using a long-lasting antimicrobial rinse reduces the level of oral microorganisms generated during routine dental procedures with rotary instruments. Even the use of a simple water rinse prior to treatment reduces the number of oral microorganisms by ninety percent. There is also limited support for pre-procedural rinsing as an adjunct for patients at risk for bacterial endocarditis.
SECTION 5

NEEDLE AND SHARP INSTRUMENT SAFETY

CDA Guidelines:
1. “Sharp items, such as needles and scalpel blades, should be placed in puncture-resistant containers prior to disposal and discarded according to provincial and municipal requirements.”

2. “All used sharps should be placed in sturdy containers, which are identified as containing sharps. It is safer if the container is not completely filled and if it is secured by a tight fitting lid. Used sharps, no matter how they are packaged, cannot typically be disposed of in the general waste. Dental personnel should comply with pertinent municipal or provincial laws regarding the disposal of sharps originating from the private dental office.”

Needlestick/sharp instrument injuries are of major concern to health care workers when dealing with patients.

The Province of Manitoba Bill effective January 1, 2006 requires medical workplaces to protect workers by ensuring that safety engineered needles – such as shielded needle devices or retractable needle systems – are used whenever possible. In addition, they must implement safe work procedures and practices relating to the use of needles. Dental offices are included in the amendment, but will not have to comply until government decides to prescribe it by passing a regulation.

Where the use of safety needles is not regulated the employer must:
1. Ensure that safe work procedures and practices relating to the use of hollow-bore or intravenous needles are implemented
2. Develop procedures to be followed when a worker suffers a needlestick injury, including instructions for the worker suffering the injury

Basic Safety Precautions
1. Keep the sharp end angled away from yourself and co-workers when receiving, handling or passing sharp instruments.
2. When resheathing needles:
   a. Use only one hand to scoop the cap
   b. Alternately, hold the sheath with a hemostat or use a resheathing device or a syringe stand
3. Used needles should not be bent or broken prior to disposal.
POST-EXPOSURE PROTOCOL
Strategies for dealing with Significant Exposures
Refer to Appendix 4: Manitoba Health – Integrated Post-Exposure Protocol (Page 56)

Significant exposures to human blood/body fluids include puncture wounds due to a needlestick or sharp instrument, bites and scratches as well as exposures due to a splash of body fluid onto any mucous membrane and/or non-intact skin. Significant exposures are a serious concern and should be treated as a medical emergency.

Strategies for dealing with significant exposures can be broken into two distinct phases:
A. Planning appropriate action in the event that an exposure should occur.
B. Steps to be taken when an exposure occurs.

A. Planning appropriate action in the event that an exposure to a dental health care worker should occur.
   1. Each office should have someone appointed to oversee infection control concerns.
   2. Consider discussing this issue and course of office action in the event of significant exposure at the patient’s first visit. This serves to introduce the patient to the office policy and to the concept of post-exposure protocol.

B. Steps to be taken when an occupational exposure occurs.

Significant exposure is defined as an injury during which one person’s blood or other high-risk body fluid comes in contact with someone else’s body cavity; subcutaneous tissue; or non-intact, chapped, or abraded skin or mucous membrane.

Every office should determine its own policy on how to deal with significant exposures following initial first aid care to the exposed person. In developing such policy the following issues may be considered:

- Informing patients at the first visit that should a significant exposure occur, they will be asked to provide blood for testing.
- Naming the person responsible for informing the patient that this has occurred. In the event, that it does occur it is office policy to request source blood testing and that the source is required to have this performed as soon as possible.
- Stating where the source person and exposed person will go for testing and counseling if required.

1. Provide first aid
   - Needlesticks and cuts should be washed well with soap and running water – squeezing the wound or use of antiseptics will not reduce transmission.
   - Use of bleach is not recommended.
   - Splashes to nose, mouth, or skin are flushed thoroughly with cold water.
   - Splashes or other injuries to the eyes should be irrigated with clean water, saline, or sterile solutions.
   - Determine the need for covering the site with a bandage or repairing the skin with sutures or other medical intervention.
2. Informing the source person the testing for HBV, HCV, HIV should be done

3. Counseling at the emergency center where the exposed person presents regarding bloodborne pathogens will be based on the following factors:
   - Type of exposure - percutaneous, mucous membrane, non-intact skin, bite
   - Type and amount of fluid/tissue – blood, saliva with visible blood, tissue
   - Status of source - known HBV, HCV, HIV or unknown source for example, needle in trash
   - Status of exposed person – pregnant, HBV vaccinated with known titre, general immune status

Guidelines for Post Exposure Protocol

1. A report should be filled out which includes the following: (Manitoba Health recommendations)
   - Date and time of incident
   - Job duty being performed at time of injury
   - Details of exposure
   - Description of source of exposure
   - Protective measures employed
   - Action taken after exposure

2. Post-exposure assessment and prophylaxis if indicated

3. Baseline and follow-up serology of the dental health care worker if indicated

Risk Assessment for Transmission

This is a summary from the “Manitoba Health Integrated Post-Exposure Protocol, Guideline for Managing Exposures to Blood/Body Fluids” For complete details please refer to Appendix 4 – Page 56

A high risk exposure for blood borne diseases (HIV, Hepatitis B, Hepatitis C) is defined as at least one of the following:
   - deep puncture or wound with or without bleeding
   - visible blood present on the device associated with the exposure
   - exposure from a procedure which involved a needle placed directly into the source’s vein or artery

Saliva has been shown to be potentially capable of HBV transmission, but not HIV or HCV.

Hepatitis B
Risk of transmission following a significant exposure ranges from 22% to 31% (approximately 30%) for those people who have not had an immunization series with subsequent verification of adequate antibody titre. Therefore, all oral healthcare workers should have received HBV vaccine series AND have a known adequate titre of 10mIU/ml.
Hepatitis C
Risk of transmission following a significant exposure ranges from 0-7% (approximately 3%).
If the exposure is identified as a significant exposure and a high risk exposure, urgent referral to an Emergency Department or Urgent Care Centre is highly recommended.

HIV
Risk of transmission following a significant exposure ranges from 0.2% to 0.5% (approximately 0.3%).

Risk factors for HIV include at least one of the following histories:
- residence in a country or area with a high HIV prevalence
- injection drug use
- sexually transmitted disease
- multiple sex partners
- hepatitis B or C
- recipient of blood products prior to 1985
- if male, having had sex with another male

Studies have suggested that post-exposure prophylaxis with agents such as zidovudine (ZDV) reduces the risk of HIV seroconversion following percutaneous exposure. It is also suggested that the sooner this is done, preferably within 2 to 4 hours, the more effective it is, although treatment up to 72 hours is encouraged and after that, advice from a physician is recommended. Efforts to determine the HIV antibody status of the source should be as soon as possible as this may affect management for the exposed person. Anti-HIV testing is performed at Cadham Provincial Laboratory with negative results available within 24-48 hours.
SECTION 6
INSTRUMENT STERILIZATION AND DISINFECTION

A. Determining What Should be Sterilized, Disinfected, or Discarded

STERILIZE – all instruments used in a patient’s mouth
DISINFECT – all surfaces and equipment that are used in patient care
DISCARD – any items purchased as a disposable item are disposed after one use

Appendix 5: Sterilization/disinfection guide for commonly used dental instruments and materials (Page 65)

B. Preparation for Instrument Sterilization/Disinfection

Personal protection equipment should be worn when processing instruments. Instruments need to be cleaned prior to sterilization or disinfection to dislodge blood, saliva and other debris which may act as barriers to the sterilization/disinfection process. Following scrubbing, instruments are then rinsed with water to remove chemical or detergent residue. The following procedures are recommendations:

1. Holding (Presoaking)
   - Used when instruments cannot be cleaned immediately after use. Place them into a perforated cleaning basket, then into a holding solution. This prevents drying of the saliva and blood which facilitates subsequent cleaning.
   - The holding solution may be the same detergent as that used for subsequent cleaning, water, or an enzyme solution.
   - The solution should be discarded at least daily.

2. Pre-cleaning – Removal of debris
   - Pre-cleaning reduces the number of microorganisms present and removes organic and inorganic material that may insulate microorganisms from the disinfectant or sterilizing solution
     a. Hand Scrubbing
        - Wear heavy utility gloves to minimize skin puncture.
        - Immerse instruments in detergent solution and scrub with a long handled soft brush, holding both brush and instrument under the water surface to prevent splashing and formation of aerosols.
        - Rinse and dry instruments.
b. Ultrasonic Cleaning

- When placing the instruments into the cleaner, heavy utility gloves should be worn and caution taken to avoid punctures.
- Replace the lid during operation to prevent aerosols from escaping into the dental office environment.
- Use a cleaning solution that is recommended for use in ultrasonic cleaners and maintain the solution so that instruments are submerged in the cleaning chamber.
- Process instruments until they are visibly clean, remove the basket using utility gloves, rinse with a minimum of splashing, and dry prior to processing in a sterilizing unit.
- The ultrasonic solution should be changed if it becomes visibly soiled or at least daily.
- Rinse, and dry the cleaning chamber at the end of the day while wearing protective equipment.
- Test the functioning of the ultrasonic unit with the aluminum foil test – insert and hold a piece of aluminum foil slightly shorter than the length of the chamber and slightly shorter than the depth of the solution in the chamber vertically so that it does not touch the bottom of the chamber. Operate the unit for 20 seconds, remove and observe for even distribution of indentations, called "pebbling". If there are areas greater than one centimeter square having no pebbling, the unit may need servicing.

c. Instrument Washers

- These are used in hospital settings but are new to the dental profession. They are similar to the household dishwasher in appearance and are used to wash, disinfect and dry instruments prior to sterilization.

3. Inspection – wear personal protection equipment

Instruments should be inspected for cleanliness, rust, or cracks.

4. Corrosion control, drying, lubrication

- Non-stainless steel instruments may be dipped or sprayed with a corrosion-inhibitor solution (sodium nitrite) if being sterilized in a steam autoclave or dried and sterilized in a dry heat sterilizer.
- Instruments processed in a steam sterilizer must be clean but not necessarily dry unless packaged in paper or paper/plastic wrap where, if wet, will tear during packaging.
- Any hinged instruments (calipers, forceps, pliers) should be adequately but not excessively lubricated at the hinge and left open in the sterilizing bag.

5. Wrapping (bagging) for sterilization

At this stage, instruments are free of debris but are contaminated and handled with utility gloves.

- Packaging must be porous enough to permit penetration of the sterilization agent while maintaining sterility of the instruments after sterilization.
• Non-perforated closed containers or aluminum foil cannot be used in an autoclave because they prevent the steam from reaching the inner sections of the pack but could be sterilized with dry heat if sufficient exposure time is used.
• Packaging materials include: thin fabric, biofilm/paper pouches, nylon tubing, sterilization wrap and paper-wrapped cassettes with opening on all sides.
• Packages should be sealed with tape or heat and not be sealed with metal such as staples because of the resultant holes which will breach sterility.
• When instruments are ‘flash’ sterilized (unwrapped, higher temperatures for shorter times for immediate use), handling to reduce post-sterilization contamination will include use of sterile tongs or clean gloves and preventing contact with contaminated surfaces while transporting to point of use.

C. Sterilization

Sterilization is utilized in dental offices following instrument cleaning and bagging to ensure that reusable instruments and devices are safe for patient use. Sterilizers must be operated according to manufacturer's instructions. The 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. ²⁰ Please refer to Page 23 “Overview of Heat Sterilizers”

The traditional methods for sterilization in the dental health care environment are by three heat processes:
   1. Steam under pressure (gravity autoclaves and pre-vacuum autoclaves)
   2. Dry heat
   3. Unsaturated chemical vapor.

Glass bead sterilizers are not recommended. Ethylene oxide gas sterilizers are still not used commonly in the dental environment but are included in the table for completeness of information.

1. Steam under pressure
   a. Gravity autoclaves
      Steam is generated in or introduced into the sterilizing chamber forcing the heavier air downward into an outlet port or drain line in the lower part of the chamber.
   b. Pre-vacuum autoclaves
      These are faster because a vacuum pump is used to evacuate air prior to the introduction of the steam.

2. Dry heat
   a. Static air or Gravity convection
      Air is heated and rises, displacing the rising heated air. Due to this rising and falling of heated air, there is temperature variation that in turn results in difficulty in monitoring the effectiveness of the sterilizer.
   b. Mechanical convection
      This sterilizer contains some type of device that continually circulates the heated air to maintain a uniform temperature throughout the chamber.

3. Unsaturated chemical vapor
   Rather than using steam alone, these devices use a proprietary formula that includes formaldehyde and alcohol to generate a chemical vapor. The lower humidity results in less corrosion.
D. Sterilization Monitoring

Sterility is a biologic state. Three quality assurance methods should be used to ensure that this state is maintained: mechanical assurance, chemical indicators, and biological indicators.

► Mechanical assurance is provided by the person working with the sterilizer in the daily assessment of cycle time and temperature by examining the temperature and pressure gauges.

► Chemical indicators monitor the parameters of time, temperature, and/or pressure. These are applied to the outside of the package, placed inside the package, or are part of the packaging and will change color rapidly when a given parameter is reached. Chemical indicators do not prove that sterilization has been achieved; only that parameters have been attained. Chemical indicators should be used with every package.

► Biological indicators, or spore tests, are the only valid method for monitoring the sterilization process. Spore strips should be placed in the least accessible area of the sterilizer. If the spores are made non-viable during the sterilization cycle, it is reasonable to state that all other less resistant organisms have been destroyed and that the sterilizer is effective.

Spore tests should be performed at least weekly. Tests should also be performed at the initial use of new equipment, following the return of repaired equipment, when training new staff, whenever a new type of packaging material or tray is used, or after any change in the sterilizing procedure.

Loads containing implantable devices should be monitored with such indicators and these items should not be used until spore tests are known to be negative.

Actions to take if the spore test is positive:

If mechanical and chemical indicators suggest that the sterilizer is functioning properly, a single positive spore test probably does not indicate sterilizer malfunction, however implantable devices should be reprocessed. The spore test should be repeated immediately and sterilization procedures reviewed to assess potential operator error.

1. If the repeat test is positive, the sterilizer should not be used until the reason for the positive test has been determined and remedied. Items from the suspect loads should not be used until they have been processed in another sterilizer.

2. Before a repaired or new sterilizer is used routinely, spore testing should be performed.

A more conservative approach has been recommended. Any positive spore test is assumed to represent sterilizer malfunction and requires that all materials processed in that sterilizer, dating from the sterilization cycle having the last negative biologic indicator to the next cycle indicating satisfactory biologic indicator results, should be considered non-sterile. These items should be retrieved, if possible, and reprocessed or held in quarantine until the results of the repeat spore test are known. This approach is considered conservative because the margin of safety in steam sterilization is sufficient enough that infection risk, associated with items in a load...
indicating spore growth, is minimal, particularly if the item was properly cleaned and the temperature was achieved (e.g., as demonstrated by acceptable chemical indicator or temperature chart). Published studies are not available that document disease transmission through a nonretrieved surgical instrument after a steam sterilization cycle recording a positive biological indicator. This more conservative approach should however be used for sterilization methods other than steam (e.g., dry heat, unsaturated chemical vapor, ethylene oxide, or hydrogen peroxide gas plasma).

Results of biological monitoring should be recorded and sterilization monitoring records (i.e., mechanical, chemical, and biological) are to be retained for two years. Such records are an important component of an overall dental infection control program.

Common reasons for sterilization failure:
1. Inadequate cleaning of instruments
2. Improper packaging – either wrong material, too much material, solid metal container in steam or chemical vapour sterilizer
3. Improper loading – overloading or no separation between packages or cassettes
4. Improper timing – mechanical problems, dry heat sterilizer door opened without starting cycle over, timing started before proper temperature being reached, incorrect operation of the sterilizer
5. Improper temperature
6. Improper method of sterilization
7. Spore tests are expired or incorrectly handled.
<table>
<thead>
<tr>
<th>Sterilization Method</th>
<th>Temperature (°C)</th>
<th>Pressure (mmHg)</th>
<th>Time (minutes)</th>
<th>Advantage</th>
<th>Disadvantage</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacteriostatics</td>
<td>37.0</td>
<td>10</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Bactericidal</td>
<td>121.3 (240)</td>
<td>15</td>
<td>5</td>
<td>Fungicide Jersey, Potatoes, Vegetables</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sterilization</td>
<td>132.2 (270)</td>
<td>30</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Notes:**
- Fungicide: Jersey, Potatoes, Vegetables
- Incubation: Autoclave
- Steam: Irradiator
- Sterilization: Oven
- Chemical Vapor: Ethylene Oxide
E. Storage of Sterile Instruments

Instruments should always be packaged or they will be subject to contamination from the dental office aerosols immediately upon removal from the sterilizer. Sterile packages that are torn, wet or otherwise damaged must be considered contaminated and are to be repackaged and reprocessed.

Shelf life is a function of intact packaging. Oldest sterile packages should be used first. A maximum storage time must be considered as one month at which time all unused items are unpackaged, repackaged with new packaging material, and re-processed through the sterilizer.

F. Disinfection - Immersion

Disinfectants are classified as drugs as defined by the Food and Drugs Act if the label states that the product is intended to be used as a disinfectant on environmental surfaces and other inanimate objects for the mitigation or prevention of disease in humans or animals or for the disinfection of dental instruments.

G. High Level Disinfectant

Heat-sensitive critical and semi-critical instruments and devices can be disinfected using liquid chemical germicides registered as a “sterilant”. Following is a table of the classifications of liquids which can be used for this purpose. Manufacturer recommended variables such as dilution, exposure time, shelf life, use life, and reuse life have to be followed in order to ensure that instruments exposed to these chemicals will be safe for use as there is no simple chemical or biological indicator (spore test or other) which can be used for this purpose.

H. Shelf Life

Time that a product may be stored before it loses its effectiveness.

I. Use Life

Life expectancy for the solution once it is activated but not actually put into use with contaminated items.

J. Re-use Life

Amount of time a solution can be used and reused as it is challenged with instruments that are wet or coated with bioburden (takes into account a dilution factor because of added water from wet instruments, effect of soap and detergents, and evaporation)
# Liquid Chemical Sterilants

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Hypochlorite</td>
<td>Economical</td>
<td>• Requires daily preparation&lt;br&gt;• Corrosive to metals and other surfaces with prolonged use</td>
</tr>
<tr>
<td>Chlorine Dioxide</td>
<td>6 hours for Sterilization</td>
<td>• Requires daily preparation&lt;br&gt;• Corrosive to metals</td>
</tr>
<tr>
<td>Gluteraldehyde</td>
<td>• Kills spores&lt;br&gt;• Good material compatibility</td>
<td>• Toxic to skin, respiratory, olfactory, and ocular tissues&lt;br&gt;• Prolonged exposure times&lt;br&gt;• Cannot monitor</td>
</tr>
<tr>
<td>Hydrogen peroxide</td>
<td>• No activation required, no disposal issues&lt;br&gt;• Does not coagulate blood or fix tissues to surfaces</td>
<td>• Serious eye damage if contacted&lt;br&gt;• Cosmetic material compatibility for brass, zinc, copper, nickel/silver plating</td>
</tr>
<tr>
<td>Ortho-phthalaldehyde</td>
<td>• Faster than gluteraldehyde&lt;br&gt;• Requires no activation&lt;br&gt;• Does not irritate respiratory, olfactory, or ocular tissues&lt;br&gt;• Lasts longer before reaching minimum effective concentration limit</td>
<td>Stains proteins grey (including skin)</td>
</tr>
<tr>
<td>Peracetic acid/hydrogen peroxide</td>
<td>• No activation required&lt;br&gt;• Odour, irritation not significant</td>
<td>Materials compatibility both esthetic and functional (lead, brass, copper, zinc)</td>
</tr>
<tr>
<td>Peracetic acid</td>
<td>Rapidly sporicidal</td>
<td>Equipment specific for the procedure is required</td>
</tr>
<tr>
<td>Superoxidized water</td>
<td>Environmentally friendly</td>
<td>Equipment specific for the procedure is required</td>
</tr>
</tbody>
</table>
SECTION 7

GENERAL OPERATORY ASEPSIS:

Surface Disinfection, Equipment Barriers, Sterilization of Handpieces and Other Devices Attached to Air/Waterlines, Waterline Care, Suction Care

Because surfaces and equipment in the dental operatory become contaminated during patient care, these surfaces may be a reservoir for transmissible organisms. Adequate safety for clinical contact can be achieved by removal of all organic material and visible blood with the use of intermediate level disinfection following treatment of each patient.

Guidelines for Operatory Asepsis

- **Carpeting and cloth furnishings** are harder to clean and have been shown to harbour diverse microbial populations whereas non-porous hard-surface coverings are readily disinfected.

- **A unit dose system** wherein most instruments and materials needed for scheduled treatment are prepared prior to seating the patient is recommended.

- **Disinfection** should be done using an intermediate level (tuberculocidal) disinfectant. Disinfection consists of cleaning surfaces first with a clean cloth or 4 x 4 gauze soaked in the disinfectant (sanitization) followed by wiping with a second clean disinfectant soaked cloth and then allowed to dry. This is known as the “wipe/wipe” method of disinfection. It reduces the amount of aerosol production from the disinfectant from the method known as “spray-wipe-spray” which is falling out of favor due to awareness of harm from inhaling some disinfectants.

- **When the surfaces** cannot be adequately cleaned due to their nature such as incompatibilities of electrical switches and liquid or when the surface receives high traffic (such as light handles), they should be covered with surface barriers.

- **Avoid touching** any surfaces not involved with patient care once treatment gloves have been placed especially items that cannot be disinfected such as charts and radiographs. Once treatment gloves are contaminated, overgloves are worn to access any additional supplies or instruments that are required. Any article that will be used intraorally should not be touched directly with overgloves – obtain these articles with clean cotton forceps.

- **Prior to the first patient** of the day being seen, waterlines should be flushed (see next section) and the unit disinfected. This is done because dust or insects may have settled on the units and zealous janitorial staff may have cleaned the dental operatory with their own cleaning supplies.

- **All surfaces** that could be contaminated by aerosols and spatter should be disinfected.

- **Personal Protection Equipment** is worn during operatory decontamination to prevent exposure to infectious microorganisms and the chemical disinfectants.
Because disinfectants may degrade treatment gloves, utility gloves should be worn to protect skin from exposure to chemicals.

A. Surface disinfection

The table on page 28 provides an overview of the various classes of intermediate level disinfectants that are marketed. Note that some are appropriate and some are not appropriate for use in operatory asepsis. The key phrases to remember when purchasing are “intermediate level” or “tuberculocidal” and “time required for disinfection.”

For surface disinfection, clean vigorously first using a cloth soaked with disinfectant, wipe with a second cloth that has been soaked with disinfectant. Follow manufacture’s instructions.

B. Equipment Barriers (also known as Surface Barriers)

A barrier is any material that prevents penetration of microorganisms, particulates, fluids, and contamination of the underlying surface. Plastic wrap and sleeves are most commonly used. These are used in places where cleaning can result in damage to the equipment such as electrical switches in chairs and radiographic equipment. Additionally, they are used in high traffic areas (such as light handles) to save time during the sanitization step. Note that the area must still be disinfected following removal.

Guidelines for barrier use:

- They are convenient but not essential except for those areas that are very difficult or very time consuming to clean or that may become damaged if exposed to the liquid disinfectant.
- They are used to reduce time and the amount of work required for cleaning, especially high bioburden areas which are handled frequently during treatment.
- The most effective barriers are also impermeable to water. However, paper is used for countertops and bracket tables to assist in cleaning following the use of wax or impression materials.
- Following patient treatment, utility gloves are worn. Coverings are removed, discarded, and the area disinfected. Utility gloves are removed, hands are washed and new barriers are placed with clean hands.

C. Sterilization of any device attached to air and/or waterlines

There is the risk that any device that is attached to air and/or waterlines will retract oral fluid into the internal compartment of the device. Consequently, high-speed handpieces, nose cones, contra-angles, low-speed motors, motor-to-angle adapters and prophylaxis angles (except disposable angles), ultrasonic and sonic scaling tips, air abrasion devices, and air/water syringe tips must be heat sterilized between patients. Non-sterilizable handpieces are not recommended. High level disinfection is not recommended as an alternative to heat sterilization. The cleaning, sterilization and maintenance procedures described by the handpiece manufacturer must be meticulously followed to ensure proper sterilization and maximum longevity from the handpiece.
### Surface Disinfection Guidelines

<table>
<thead>
<tr>
<th>TYPE</th>
<th>LEVEL</th>
<th>MAJOR ADVANTAGES</th>
<th>MAJOR DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohols (Ethyl and isopropyl)</td>
<td>Not recommended</td>
<td></td>
<td>- Exposure to alcohol denatures and dehydrates proteins making them insoluble and adherent to most surfaces which then protect these surfaces from disinfectant property of alcohol or other chemical</td>
</tr>
<tr>
<td>Chlorine releasing compounds-</td>
<td>Intermediate level/low</td>
<td>- Inexpensive,</td>
<td>- Requires daily mixing</td>
</tr>
<tr>
<td>hypochlorite</td>
<td>level</td>
<td>- Rapidly effective</td>
<td>- Not compatible with metals and can also damage plastics, vinyls, fabrics</td>
</tr>
<tr>
<td>Chlorine dioxide</td>
<td>Sterilant/high level/</td>
<td>- 6 hours for sterilization</td>
<td>- Requires daily mixing</td>
</tr>
<tr>
<td></td>
<td>intermediate level/</td>
<td>- 3 minutes for disinfection</td>
<td>- Not compatible with aluminum</td>
</tr>
<tr>
<td></td>
<td>intermediate level</td>
<td></td>
<td>- Adequate ventilation required</td>
</tr>
<tr>
<td>Iodophors</td>
<td>Intermediate level</td>
<td>- Biocidal activity within 5-10 minutes</td>
<td>- Requires daily mixing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Corrosive</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Stains</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Irritation of tissues</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Allergenicity</td>
</tr>
<tr>
<td>Complex (Synthetic) Phenols</td>
<td>Intermediate level</td>
<td>- Useful on metal, glass, rubber, and pastic</td>
<td>- Skin and eye irritation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Degrades some plastics and etch glass over prolonged use</td>
</tr>
<tr>
<td>Stabilized hydrogen peroxide</td>
<td>Intermediate level</td>
<td>Does not require activation</td>
<td>- Compatible with most surfaces</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Minimal irritation of tissues</td>
</tr>
<tr>
<td>Quaternary ammonium compounds</td>
<td>Low level</td>
<td>Not recommended</td>
<td>- Inactivated by organic matter</td>
</tr>
<tr>
<td>Quats/alcohols</td>
<td>Intermediate</td>
<td>Tuberculocidal activity</td>
<td>- Sanitization step has to be done with a water based cleaner</td>
</tr>
</tbody>
</table>
Following patient treatment, waterlines should be flushed for 20-30 seconds with the device (handpiece, scaler, air abrasion tip, air/water syringe) still attached. Remove the device and thoroughly clean the external/internal surfaces as directed. Package before sterilization and process through the sterilizer according to the manufacturers’ instructions. Also, lubricate handpieces according to manufacturer’s instruction. When lubrication is required before and after sterilization, two containers of lubricant are required to avoid contamination after sterilization.

D. Waterline Care

CDA Guidelines

Dentists are encouraged to take steps to reduce any potential risk of dental unit waterline microorganisms causing infection through the following waterline maintenance procedures:

1. Avoid heating water for the dental unit
2. At the beginning of each clinic day, purge all lines by removing handpieces, air/water syringe tips and ultrasonic tips and flushing thoroughly with water. The decrease in bacterial counts associated with such purging has been confirmed in two Canadian studies. According to Barbeau et al., 1996, and Whitehouse et al., 1991, approximately a 5-8 minute purge is required to reduce bacterial counts to potable water standards (<500 cfu/ml).
3. Run high-speed handpieces for 20-30 seconds after each patient, to purge all air and water.
4. Use sterile water or sterile saline when flushing open vascular sites and/or cutting bone during invasive surgical procedures.
5. Follow manufacturer's instructions for daily and weekly maintenance if using bottled water or other dedicated delivery system.

Whenever water is in constant contact with a surface, a complex microbial community is formed. This slimy film consists of a matrix resistant to dislodgement from the surface as well as a layer of live microorganisms attached to the matrix. This community is collectively known as “biofilm” and it forms whether the waterline is attached to a municipal water source or a self-contained water source. The live microorganisms may come from the municipal water supply, or from the handling of the tubing by the dental staff (self-contained water system), or from mechanical suck-back from the patient’s mouth through any of the devices which attach to the waterline. Dedicated waterlines should be tested at least once/month for total plate count or, alternately, Pseudomonas aeruginosa.

E. Suction care

New dental equipment is built with anti-retraction valves and older equipment can have these valves installed. However, there still remains potential for retraction of fluids from the suction into the patient’s mouth when a seal around the saliva ejector is created by the patient closing their lips around the tip of the ejector. Consequently, operators should discourage this practice for all their patients.

Suction lines, including saliva ejector lines and high volume suction lines should be evacuated with clean water following each patient in order to flush saliva, blood, and dental materials from the suction lines. At the end of the day, a generous amount (a minimum of one liter applied intermittently) of cleansing solution or water should be evacuated through the lines and the unit’s solid waste filter trap cleaned or replaced. Additionally, the suction
housing should be cleaned with cotton tipped applicator after each patient to remove bioburden from this part of the suction.

**Boil Water Advisory**

Operators of dental clinics are obligated to ensure that water supply to their clinic is safe and free from microbials. In the event that a risk is present, office water supply must be altered or substituted with a safe water supply.
SECTION 8

RADIOGRAPHIC ASEPsis

Generally, the same rules that guide all operatory asepsis guide infection control during radiography. All radiographic equipment used during patient care requires disinfection following contamination (either in conjunction with operatory asepsis if the equipment is in the same room, or immediately following the procedure if the equipment is in a separate area) and placement of barriers on exposure switches which are subject to degradation from liquid disinfectants. Devices which are used for film placement are sterilized with heat, subjected to high level disinfection if they are heat sensitive, or disposable devices are used.

Because many microorganisms can survive radiographic processing, film entering the processor must be clean. Also, care must be taken to prevent contamination of the daylight loading area as this is frequently constructed of materials which cannot be disinfected.

1. Placement and removal of lead apron
Handle lead aprons and thyroid collars before and after placement with treatment gloves that are covered by overgloves or with clean bare hands.

2. Film placement and exposure
Place barriers on switches that cannot be exposed to disinfectant.
Either place barriers on the tube head or treat as usual surface disinfection at the end of the appointment. Film placement equipment (eg. RINN), requires sterilization after patient use.

3. Preparation of film for developing/transport to developer/film development

   a) Film with barrier
   Exposed film with barrier, either conventional or digital, is handled with contaminated hands. Immediately following exposure, the film barrier is removed and the film packet is dropped onto a clean surface. It should be transported and processed with overgloves. Alternately, and for ease of handling film, contaminated gloves are removed, hands are washed, and the film is processed with bare hands.

   b) Plastic covered film
   Film that is not barrier protected and is plastic covered is either disinfected or developed with a change of gloves during processing.

      i) Disinfecting plastic covered film
      Cloths or gauzes are dispensed and soaked with disinfectant prior to exposing the film. After film exposure, contaminated treatment gloves are removed, utility gloves placed, and the film packet is disinfected. Film may then be transported and exposed with bare hands. For films developed this way, time required for disinfection must be added to time required for processing.
ii) Processing with removal of gloves during processing
Following exposure, films are placed directly into a container for transport to the processor. Overgloves are placed, lead apron removed, and the container transported and placed into the daylight loader. The lid of the loader is closed, films are removed from their packets with overgloves and then treatment gloves and overgloves are removed and placed into the now emptied container. Films are developed with bare hands. Due to concern for powder adhering to the film, either powderless gloves are worn during film exposure, or a fresh pair of gloves is placed into the daylight loader and placed prior to placing the film into the developer.

c) Paper covered film
Film protected with a paper cover cannot be wetted safely with disinfectant. Consequently, it can only be processed with a removal of gloves during processing (as above) or purchased covered with barrier.

Films used during surgery or endodontics in which the film is itself an integral part of the procedure are most easily accommodated through the use of double film packets. This allows the use of one radiograph for handling which is then discarded following use at the end of the appointment while the other is kept uncontaminated in the chart to serve as a permanent record.
SECTION 9
LABORATORY ASEPSIS

The principles of infection control and general cleanliness are applicable to the laboratory environment.

Basic Principles:
1. All items entering and leaving clinics and laboratories are to be disinfected.
2. Items are placed in sealed plastic bags labeled with disinfection status.
3. All packing materials are new prior to transport and are destroyed after use.
4. Prescriptions are uncontaminated and are attached to the outside of the bag containing items sent to the laboratory.

Irreversible Hydrocolloid Impression Disinfection

Alginate varies depending on the manufacturer as to whether or not it can be immersed for disinfection, although it has been shown that immersing alginates can result in negative effects to the final cast surface. On the other hand alginate CAN be disinfected with a spray of 1:10 dilution 5% sodium hypochlorite as long as the exposure is not greater than 30 minutes and as long as it is maintained in 100% humidity.

1. The impression is rinsed with water until no visible debris or blood remains,
2. Sprayed until the excess disinfectant runs off the surface
3. Rinsed with water,
4. Spray until a liquid residue is evident on the surface.
5. Wrap the impression in a paper towel moistened with the disinfectant and placed into a plastic bag for 10-30 minutes
6. Rinse
7. Pour.

Rinsing with cold water is an important part of the disinfection process because inadequate rinsing results in incorporation of disinfectant in the cast which in turn can cause a significant softening of the stone cast.

Impressions other than Alginate

1. Rinse under running tap water to remove saliva and blood.
2. Immerse in appropriate disinfectant for the time recommended for tuberculocidal disinfection. Generally, most impressions can be safely disinfected with a 1:10 dilution of 5% sodium hypochlorite for 10 minutes.
3. Rinse thoroughly.
4. Pour or send to the laboratory.

PROSTHESIS/APPLIANCES except for bisque porcelain*

1. Clean with sterile instrument brush
2. Rinse under running tap water
3. Immerse in a 1:10 dilution of 5% sodium hypochlorite for 10 minutes
4. Rinse thoroughly and dry
5. All acrylic prosthesis or appliances should be kept from distortion by maintaining on cast or kept moist

*Bisque porcelain cannot be disinfected without significant clinical changes. Following staining, sterile forceps should be used to transport to the porcelain oven.

Stone Casts
Casts can become contaminated during try-in of interim prosthesis such as base plates and occlusion rims, trial dentures, fixed and removable frameworks. Prior to return of the lab the casts are disinfected as follows:

1. Rinse and remove visible blood, saliva, or denture adhesive.
2. Spray with 5% sodium hypochlorite 1:10 dilution until wet. Allow to dry.
3. Alternately the cast can be gently cleaned off and then immersed in iodophor or hypochlorite that has been made using a clean slurry for 10 minutes. 27

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<td>Rag Wheels</td>
<td>Burs, Stones (any cutting surface that will dull with steam vapour)</td>
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<td>Shade Guide (follow manufacturers instructions)</td>
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Chapter 3

INFECTION CONTROL MANUAL

INFECTIOUS DENTAL WASTE CLASSIFICATION

The Canadian Standards Association has developed Guidelines for the Management of Biomedical Waste in Canada in the form of a report to the Canadian Council of Ministers of the Environment (CCME), which are applicable to dentists’ offices/clinics. It is anticipated that these guidelines, accepted by the CCME as minimum national standards, will form the basis of provincial and municipal biomedical waste regulations.

The definition of biomedical, or infectious waste, is pertinent to assist dentists in identifying those waste products which are subject to provincial and federal regulation for both their handling and disposal.

Biomedical Waste includes

1. **Anatomical Waste:**
   - human anatomical waste
   - human tissues, organs and body parts, but excluding teeth,

2. **Nonanatomical Waste**, prior to disinfection or decontamination:
   - **microbiology laboratory waste**
     lab cultures, stocks or specimens, vaccines and materials in contact with them
   - **blood and body fluid waste**
     fluid blood and blood products, items saturated or dripping with blood, body fluids contaminated with blood and body fluids removed for diagnosis or removed during surgery, treatment or autopsy,
   - **waste sharps**
     clinical and lab materials consisting of needles, syringes, blades or laboratory glass capable of causing cuts or punctures

**NOTE:** Nonanatomical wastes identified above which have been disinfected or decontaminated are not considered biomedical or infectious waste for the purpose of regulation.

The Canadian Standards Association reiterates the CDC position that, while any item that has had contact with blood exudates or secretions may be potentially infectious, it is not usually considered practical or necessary to treat all such waste as infectious, since these waste materials do not generally provide the conditions required to support the growth and survival of infectious agents, or the means by which the agent can escape from its source via an infectious mode of transmission.
Accordingly, the following items should be considered general waste:

- soiled dressings
- sponges
- surgery drapes
- lab coats and aprons
- extracted teeth
- disposable pads
- disposable gloves
- specimen containers
- casts
- disposable sheets

It is adequate to place such waste items in sealed, sturdy impervious bags (heavy duty garbage bags or double bagging) to prevent leakage or breakage, and to dispose of them as regular garbage.

- Extracted teeth return to patient
- Extracted teeth sent to lab
- Extracted teeth collected for use in pre-clinical educational training
SECTION 1

INFECTIOUS DENTAL WASTE MANAGEMENT & DISPOSAL

General waste from dental health-care settings is considered no more infective than residential waste. 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 saturated with blood following surgery)
- Surgically removed hard or soft tissue (not including extracted teeth)
- Contaminated sharp items (e.g. needles, scalpel blades, wires)

Any item 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 not practical or necessary.

Non-sharp medical waste should be placed in a leak-resistant sturdy bag. Local regulations may require that this bag is labeled 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, if required. All bags should be securely closed for transportation and disposal. Puncture-resistant sharps containers should be located at the point of use (i.e. in the operatory) for immediate disposal of scalpel blades, needles, syringes, and unused sterile sharps.

Dental offices should dispose of general and medical waste regularly to avoid accumulation. Every dental care facility should have a plan for management of medical waste that complies with local provincial and municipal regulations to ensure health and environmental safety.

All containers with blood or saliva (i.e. suctioned fluids) may be safely poured into a utility sink, drain, or toilet, which drains into a sanitary sewer system or septic tank. Dental health care personnel should wear appropriate personal protection equipment during this task.

The Manitoba Dental Association acknowledges the risk of acquisition of community based infections from dental infectious waste material.

The simple presence of viable organisms does not constitute a hazard; a mechanism by which these organisms can infect a host must coexist. Since Hepatitis B and HIV are usually transmitted by inoculation, the concern with blood per se is misplaced; this concern is more appropriately applied to clinical sharps.

MUNICIPAL AND PROVINCIAL LAWS AND REGULATIONS IN MANITOBA REGULATING DISPOSAL OF SHARPS AND WASTES

In Manitoba, there are no Provincial Laws and Regulations that regulate the disposal of sharps or wastes. In the City of Winnipeg there is a bylaw that has been passed at the request of operators of land fill disposal sites for their protection. This states that whoever is bringing the sharps, declares that they have been autoclaved prior to disposal.
Ideally, sharps and all biomedical wastes should be incinerated; however there is a problem with availability of incineration which makes this treatment difficult for individual offices to access, except through a company which specializes in this service. Refer to Appendix 6: City of Winnipeg Sharps By-Law (Page 68)

Safety Needles in the Workplace

The Province of Manitoba Bill which comes into effect on January 1, 2006 requires medical workplaces to protect workers by ensuring that safety engineered needles – such as shielded needle devices or retractable needle systems – are used whenever possible. In addition, they must implement safe work procedures and practices relating to the use of needles. Dental offices are included in the amendment, but will not have to comply until government decides to prescribe it by passing a regulation.

Dentists are encouraged to refer to the Integrated Post-Exposure Protocol Guidelines For Managing Exposures To Blood/Body Fluids: Appendix 4 (Page 56)
SECTION 2

MANAGEMENT AND STORAGE OF BIOMEDICAL WASTES

Management and storage of biomedical wastes (see pages 35 & 36 for definition) prior to disposal must be done in accordance with Manitoba Workplace Health Hazard Regulation 53/88. This involves:

- labeling the container in which the biomedical waste is stored;
- ensuring that up-to-date material safety data sheets (MSDS) are maintained, disclosing hazardous ingredients and exposure limits, disease transmission or contamination routes, toxicological properties, first aid and prevention measures;
- implementing and documenting a worker education program regarding hazards, proper handling and disposal of controlled products in the identified biomedical waste products;
- maintaining an up-to-date, written inventory of controlled products in biomedical wastes produced in the facility;
- maintaining an up-to-date, written prevention program which details the steps required to ensure that no worker is exposed to a controlled product in biomedical wastes in excess of the occupational exposure limit.

**NOTE:** These same requirements apply to other hazardous materials (chemical, liquid, gas, and fugitive emissions) identified as controlled product under Workplace Safety and Health Regulations 52/88 (WHMIS) and 53/88 noted at the beginning of this section. REFER TO THESE REGULATIONS TO ENSURE COMPLIANCE
SECTION 3

DISPOSAL OF BIOMEDICAL WASTE

Provincial and municipal authorities in Manitoba do not specifically regulate the disposal of biomedical wastes from dental offices. However, biomedical wastes, as defined above, are prior to disinfection or decontamination — considered hazardous wastes and therefore subject to The Dangerous Goods Handling and Transportation Act, which stipulates that hazardous wastes must only be disposed of at a licensed hazardous waste disposal facility or in a manner approved or specified by the Department.

In this context and in light of recommendations contained in the AIDS Interim Guidelines for Dentistry (July 1987), which are pertinent from the standpoint of standards precautions for infection control, the following guidelines are recommended for disposal of biomedical waste likely to be produced in a dental office.

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<thead>
<tr>
<th>WASTE CLASSIFICATION</th>
<th>PROCEDURE FOR DISPOSAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body tissue, organs or parts excluding teeth</td>
<td>Place in durable, leak-proof containers, colour-coded RED and label with the biohazard symbol, and arrange for incineration in a biomedical waste or municipal solid waste incinerator</td>
</tr>
<tr>
<td>Lab cultures, stocks or specimens</td>
<td>Place in durable, leak-proof containers for incineration as above, or autoclave prior to disposal with general waste</td>
</tr>
<tr>
<td>Blood, suctioned fluids, or other liquid waste</td>
<td>Carefully pour into a drain connected to a sanitary sewer system</td>
</tr>
<tr>
<td>Items saturated or dripping with blood</td>
<td>Autoclave or arrange for incineration as for body tissue or organs</td>
</tr>
<tr>
<td>Sharp items</td>
<td>In Winnipeg – Follow Winnipeg By-law regarding the disposal of sharps Refer to Appendix 6 (Page 68)</td>
</tr>
<tr>
<td></td>
<td>Outside of Winnipeg - Place in sealed, puncture-proof containers, identified as containing sharps and colour-coded RED. Dispose of in a sanitary landfill – waste should not be subject to impaction. Alternately, sterilized sharps maybe placed in a used alginate container with dental stone poured over it for transport by a license carrier to a landfill site.</td>
</tr>
</tbody>
</table>
DEFINITIONS

The following terms are useful when discussing sterilization and disinfection.

*Alcohol-based hand rub:* An alcohol-containing preparation designed for reducing the number of viable microorganisms on the hands.

*Antimicrobial soap:* A detergent containing an antiseptic agent.

*Antiseptic:* A germicide used on skin or living tissue for the purpose of inhibiting or destroying microorganisms (e.g., alcohols, chlorhexidine, chlorine, hexachlorophene, iodine, chloroxylenol [PCMX], quaternary ammonium compounds, and triclosan).

*Bead sterilizer:* A device using glass beads 1.2--1.5 mm diameter and temperatures 217°C--232°C for brief exposures (e.g., 45 seconds) to inactivate microorganisms. (This term is actually a misnomer because it has not been cleared by the Food and Drug Administration [FDA] as a sterilizer).

*Bioburden:* Microbiological load (i.e., number of viable organisms in or on an object or surface) or organic material on a surface or object before decontamination, or sterilization. Also known as *bioload* or *microbial load*.

*Critical:* Items that penetrate soft tissue, contact bone, enter into or contact the bloodstream, or other normally sterile tissues of the mouth and have highest risk of transmitting infectious organisms and should be sterilized by heat.

*Decontamination:* Use of physical or chemical means to remove, inactivate, or destroy pathogens on a surface or item so that they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

*Disinfectant:* The intended use for patient care will determine the necessary level of decontamination. There is no single disinfectant that displays all the ideal properties. Manufacturer instructions must be followed for use of disinfectants.

*Disinfection:* A process of microbial inactivation, generally less lethal than sterilization that eliminates virtually all recognized pathogenic microorganisms but not necessarily all microbial forms (e.g. Bacterial spores). The process of disinfection requires that organic and inorganic matter has first been removed or cleaned – a process known as sanitization. All items that have been used in patient care but can not be sterilized due to their nature or size should be disinfected.

*Germicide:* An agent that destroys microorganisms, especially pathogenic organisms. Terms with the same suffix (e.g., *virucide*, *fungicide*, *bactericide*, *tuberculocide*, and *sporicide*) indicate agents that destroy the specific microorganism identified by the prefix. Germicides can
be used to inactivate microorganisms in or on living tissue (i.e., antiseptics) or on environmental surfaces (i.e., disinfectants).

**Hand hygiene:** General term that applies to handwashing, antiseptic handwash, antiseptic hand rub, or surgical hand antisepsis.

**Health-care–associated infection:** Any infection associated with a medical or surgical intervention. The term health-care–associated replaces nosocomial, which is limited to adverse infectious outcomes occurring in hospitals.

**Hepatitis B immune globulin (HBIG):** Product used for prophylaxis against HBV infection. HBIG is prepared from plasma containing high titers of hepatitis B surface antibody (anti-HBs) and provides protection for 3–6 mos.

**Hepatitis B surface antigen (HBsAg):** Serologic marker on the surface of HBV detected in high levels during acute or chronic hepatitis. The body normally produces antibodies to surface antigen as a normal immune response to infection.

**Hepatitis B e antigen (HBeAg):** Secreted product of the nucleocapsid gene of HBV found in serum during acute and chronic HBV infection. Its presence indicates that the virus is replicating and serves as a marker of increased infectivity.

**Hepatitis B surface antibody (anti-HBs):** Protective antibody against HBsAg. Presence in the blood can indicate past infection with, and immunity to, HBV, or immune response from hepatitis B vaccine.

**High level disinfectant:** An instrument disinfectant (not a surface disinfectant) that will inactivate all microbial life, including spores and viruses used on equipment or devices that will not withstand heat from a sterilizer.

Disinfectants must be used according to manufacturer’s instructions if they are to be effective. The following definitions are important for understanding manufacturer’s instructions.

**Hospital level disinfectant:** This level of surface disinfectant is required to demonstrate or documented to kill the following species of test bacteria: Staphylococcus aureus, Salmonella choleraesuis, and Pseudomonas aeruginosa. This level does not require a claim of tuberculocidal on the product label. In order to be used in the dental operatory, the disinfectant would need to be labeled as tuberculocidal hospital disinfectant.

**Immunization:** Process by which a person becomes immune, or protected against a disease. Vaccination is defined as the process of administering a killed or weakened infectious organism or a toxoid; however, vaccination does not always result in immunity.

**Immunoglobulin:** One of a family of closely related though not identical proteins capable to acting as antibodies. Five major types of immunoglobulins are normally present in the human adult (IgA, IgD, IgE, IgG, IgM)
IgE: Produced by cells of the lining of the respiratory and intestinal tracts. IgE is important in forming antibodies. About 50% of patients with allergic diseases have increased IgE levels.

Implantable device: Device placed into a surgically or naturally formed cavity of the human body and intended to remain there for >30 days.

Intermediate level disinfectant: A disinfectant used for surface disinfection that will inactivate most vegetative bacteria, most fungi, mycobacteria, and most viruses.

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

Low level disinfectant: A chemical used for surface disinfection that will inactivate most vegetative bacteria, some fungi, and some viruses but cannot be relied upon to inactivate resistant microorganisms such as mycobacteria or bacterial spores.

Occupational exposure: Reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or OPIM that can result from the performance of an employee's duties.

Non-critical surfaces: Items that have contact only with intact skin.

Prion: Protein particle lacking nucleic acid that has been implicated as the cause of certain neurodegenerative diseases (e.g., scrapie, CJD, and bovine spongiform encephalopathy [BSE]).

Reuse life: Amount of time a solution can be used and reused as it is challenged with instruments that are wet or coated with bioburden (takes into account a dilution factor because of added water from wet instruments, effect of soap and detergents, and evaporation).

Sanitization: The process of cleaning or removal of organic and inorganic debris necessary to effect disinfection.

Semi-critical: Items that contact mucous membranes, but will not penetrate soft tissue or contact bone. They should be sterilized using heat but if they are heat sensitive, must be treated with high level disinfectant.

Seroconversion: The change of a serological test from negative to positive indicating the development of antibodies in response to infection or immunization.

Shelf life: Time that a product may be stored safely.

Spaulding classification: A method for categorizing reusable patient care items (instruments, devices, and equipment) based on their use in order to determine the method which is most appropriate for preparation for another patient.

Sterile: Free from all living microorganisms; usually described as a probability (e.g., the probability of a surviving microorganism being 1 in 1 million).
**Sterilization:** The use of a physical or chemical procedure to destroy all microbial life, including bacterial endospores. All instruments used intraorally should be sterilized.

**Surfactants:** Surface-active agents that reduce surface tension and help cleaning by loosening, emulsifying, and holding soil in suspension, to be more readily rinsed away.

**Ultrasonic cleaner:** Device that removes debris by a process called cavitation, in which waves of acoustic energy are propagated in aqueous solutions to disrupt the bonds that hold particulate matter to surfaces.

**Use life:** Life expectancy for the solution once it is activated but not actually put into use with contaminated items.

**Vaccination:** See immunization.

**Vaccine:** Product that induces immunity, therefore protecting the body from the disease. Vaccines are administered through needle injections, by mouth, and by aerosol.

**Washer-disinfector:** Automatic unit that cleans and thermally disinfects instruments, by using a high-temperature cycle rather than a chemical bath.
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APPENDIX 1

Statement on the Ethical and Legal Considerations of Treating Patients with Infectious Diseases

The Canadian Dental Association believes that individuals with infectious diseases should have access to dental treatment, and that treatment should provide for the well-being of these patients as well as for the protection of the health of the public and the dental care providers. The dental profession in Canada has a long tradition of providing appropriate and compassionate care to the public, including special groups with special needs. It is the intention of the Canadian Dental Association to maintain related guidelines based on current scientific knowledge and accepted legal, moral and ethical imperatives. Policy will be reviewed on a regular basis and may be modified as new information and developments become available.

A number of facts must be considered:

1. Serious and potentially life threatening infections such as those caused by human immunodeficiency virus (HIV) and hepatitis B virus (HBV) and other blood-borne pathogens exist throughout Canada and are transmissible.

2. Most of those who have been infected with blood-borne pathogens are unaware of their infected state and are, therefore, capable of transmitting the infection unknowingly to others. Patients so infected cannot always be readily identified in the dental setting by means of a medical history and examination.

3. Adherence to current infection control procedures (as outlined in the CDA Considerations re: Infection Control Procedures) can virtually eliminate the risk of transmission of blood-borne pathogens within the dental setting. Where such infection control procedures are used, there is no discernible risk of transmission of blood-borne pathogens from dentist or other dental health personnel to patients, from patient to dental health personnel, or from dental patients to other dental patients.

4. Dentists have a professional obligation to maintain the standards of practice of the profession and, accordingly, must ensure that infection control procedures are carried out in their practice. Dental personnel recognize an obligation to maintain currency of knowledge of infection control procedures and to apply these procedures in the practice setting. Dental personnel should accept a responsibility to contribute to public understanding of effective approaches to infection control.

5. Dentists are the only persons who can provide a comprehensive oral diagnosis, plan overall treatment and management of patients with dental diseases or injuries and provide necessary dental services. As professionals qualified by their educational preparation and license to practise, dentists recognize a moral and ethical requirement to render necessary dental treatment to all members of the public. Accordingly, a dentist must not refuse to treat a patient on the grounds of the patient’s infectious state.

6. A dentist infected by a blood-borne pathogen who practises current infection
control methods does not pose a significant risk of infecting patients. However, in accordance with the CDA’s Code of Ethics (Article 2: Competency. April 1997):

Practitioners should inform the dental licensing authority 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.

Dental treatment can and should be provided in the dental office to most patients with infectious diseases since their safe treatment simply requires following established communicable disease protocols and taking routine precautions to protect the dentist, the staff, and other patients who attend the office. It is recommended that patients in advanced stages of infectious diseases be managed in hospital based dental programs that are staffed and equipped to provide comprehensive dental care to medically compromised patients.

Approved by Resolution 99.16
Canadian Dental Association Board of Governors
March, 1999

Statement on Legal and Ethical Considerations of Treating Patients with Infectious Diseases
APPENDIX 2

Viral Hepatitis/ Hepatitis family

Hepatitis is an inflammation of the liver. It can be caused by various disease states and drug reactions. However, in dentistry, the concern is bloodborne transmission via the specific virus.

**Hepatitis B** is a major cause of acute and chronic hepatitis, cirrhosis, and primary hepatocellular carcinoma worldwide. HBV related cancer mortality rates are only second to those related to smoking. Clinical symptoms and signs include various combinations of anorexia, malaise, nausea, vomiting, abdominal pain, and jaundice. The incubation period is long: 45-160 days. This disease has a variety of ultimate outcomes, including a carrier state, cirrhosis, acute hepatitis, and primary liver cancer.

HBV is transmitted by percutaneous injuries with the risk of transmission as high as 30% as well as nonpercutaneous modes. Nonpercutaneous is through the transfer of infectious body secretions such as saliva, blood, and a mixture of both. Dental occupational risks for exposure is blood and saliva contamination of cuts and cracks on the skin or ungloved hands or hands with torn gloves and spraying of blood and saliva onto open lesions on the skin or onto mucous membranes. Between 6-10% of young adults become carriers with approximately a quarter of these developing cirrhosis and a high risk of primary liver cancer. Hepatitis B (HBV) is the most infective bloodborne pathogen (100 times more so than HIV). However, although there were several reports of transmission from dentist to patient prior to 1987, there have been few reports of HBV transmission in the dental environment since then due largely to the widespread use of the HBV vaccine and the application of standard precautions in the dental office, particularly good sterilization technique. It is important to recognize that some infections may be subclinical and asymptomatic with abnormal liver function tests being the only evidence of infection. The carrier state may develop without a patient having had any indication that they have been exposed to the virus. In Manitoba, there were 13 cases in 2000, 2 reported in 2003, and none reported to end of March 2004.

**Hepatitis C** (HCV) is a chronic state disease in which up to 90 percent of the cases remain subclinical and asymptomatic for up to 20 years and up to 40 percent of the infections have no identifiable risk factors. At least 50 percent of HCV infections develop chronic complications. Manitoba Health has initiated an identification system for those people who may have contracted the disease through blood transfusions. In Manitoba, there were 735 cases in 2001, 532 in 2002, 461 in 2003, and 140 cases reported to the end of March 2004. This means that there may be fewer new cases and also that the identification system was effective for cases to be identified when the program was initiated in 2001.

**Hepatitis D** (HDV) requires a previous or concurrent HBV infection and does have a chronic state.

**Hepatitis G** (HGV) infections are initially asymptomatic, but a chronic infection develops in the majority of infected persons.

**HIV** There have been no reported cases of HIV transmission through exposure only to saliva. Between 1985 and December 2002 there were 819 new cases of HIV reported in Manitoba, with 83% of the cases residing in Winnipeg. In 2003 there were 111 new cases reported in Manitoba representing a 59% increase over 2002. The dental team should be aware of the oral manifestations of the AIDS syndrome, especially the onset of a monilial infection in the mouth. Additionally, the other opportunistic infections include histoplasmosis, herpes simplex infections and development of neoplasms such as Kaposi's sarcoma, Non-Hodgkin lymphoma and others.
Herpetic Infections

Due to the high morbidity related to infections caused by Herpes Simplex Virus1 (HSV1), it is advisable to postpone treatment until the herpes lesions have resolved.

Although the use of Standard Precautions is effective, especially during the first 24 hours of the vesicular stage when the numbers of viral particles is highest, aerosolization or direct contact in areas such as waiting rooms, washrooms, and reception areas places DHCW and patients at increased risk.

Office policy to determine whether or not the patient with HSV1 will be treated during the vesicular stage and communication of this policy, again, during the initial visit may be a consideration in the individual dental office. At the University Of Manitoba Faculty Of Dentistry, patients in the vesicular stage are reappointed upon mutual consent of the patient, student, and instructor.

Sexually Transmitted Diseases (STDs)

These agents are transmitted between partners engaged in sexual activity. They include gonococcus, chlamydia, herpes viruses, moniliasis and syphilis. The dental team should be familiar with the various oral manifestations of syphilis in each of its various stages and be prepared to refer any suspicious patient for further evaluation as the surfaces of a chancre or of the mucous patches of secondary syphilis are highly infective.

Tuberculosis

This disease still represents a small but real threat to the dental profession. Minimize risk of transmission by minimizing production of aerosols by using proper patient positioning, high volume evacuation, rubber dam, limiting use of high-speed handpieces and ultrasonic scalers. Masks used routinely in most dental offices are relatively ineffective in preventing the airborne transmission of TB. Active TB cases are best handled in a hospital setting where negative pressure ventilation is regulated and where dental personnel are fit-tested for masks that are effective against the transmission of TB.

Pulmonary TB represents the largest percentage of TB cases. In Manitoba, there were 22 cases reported to end March, 2003, 74 cases reported in 2001 up from 58 in 1997. In Manitoba, the incidence of extrapulmonary (non-respiratory) cases increased from 32 in 1997 to 24 in 2001. Oral lesions may occur on the tongue, lips, buccal mucosa and palate. Prevention of disease transmission begins with identifying patients who are infectious or likely to be infectious. Patients who are known to have active disease, except in the most unusual of emergency situations, should have treatment deferred until they have received several weeks of therapy. Those with a history of active disease who have completed a full course of therapy and are asymptomatic may receive routine dental care. Those with no known active disease but a positive tuberculin skin test should be treated on an emergency basis until their infectious status has been determined or have completed a full course of prophylactic medication. Those with no skin test but other risk factors such as recent contact with a known active disease, recent immigrants from areas with a high prevalence of TB, intravenous drug abusers, and the immunocompromised, especially those with HIV disease.

Guidelines for Preventing the Transmission of Tuberculosis in Canadian Health Care Facilities and Other Institutional Settings

The precise requirements for effective TB respiratory protection cannot be determined with currently available data for a number of reasons. Patients with TB vary in their level of infectivity. Exposed individuals vary in their degree of susceptibility (see Section III). The smallest infectious dose that results in transmission of TB has not been determined but, in theory, one organism can cause infection. The highest level of exposure to M. tuberculosis at which transmission will not occur has also not been defined. These factors are further complicated in that the duration and type of exposure that HCWs have to patients with TB also vary (see Section IV.D.7).
According to theoretic considerations based on particle size, an appropriate mask for respiratory protection against TB should be able to meet or exceed the following recommendations:

- filters particles one micron in size (infectious TB particles are one to five microns in size);
- has a 95% filter efficiency, tested in the unloaded state; and
- provides a tight facial seal (less than 10% facial seal leak).

In addition, user fit and comfort are important factors to consider.

The effectiveness of any mask is a function of all of the above factors. For the mask to filter out the droplet nuclei, the air must pass through and not around the mask. When gaps are present between the face and the mask resulting in a poor facial seal, air will preferentially flow through the gaps and bypass the mask filter. Higher efficiency masks that do not fit tightly have high rates of air leakage that lower the overall efficiency of the device\(^{79,80}\). For example, a mask with a 90% filtering efficiency that has a 10% face-seal leak will be as effective as a mask with a 99.97% filter efficiency that has a 20% face-seal leak\(^{36}\).

**Types of Masks**

Surgical masks are effective in decreasing aerosolization of exhaled infectious particles. Patients with suspected or confirmed infectious TB should use surgical masks (or a more efficient mask that does not have an expiratory valve) during transport or when they are required to leave the isolation room. Surgical masks effectively filter less than 50% of inhaled particles that are one to five microns in size and have marked leakage because of loose facial seals. Thus, surgical masks may not prevent the inhalation of droplet nuclei\(^{86,87}\). In the United States, National Industrial Occupational Safety Health (NIOSH) refers to surgical masks as “masks”.

**N.B.** NIOSH now uses the term “respirator” to refer to equipment worn by health care workers for respiratory protection. In this document, the term “mask” is used to refer to respiratory protective equipment worn by patients or health care workers.

In July 1995, NIOSH instituted a new respirator (mask) certification program (42 CFR part 84) to certify respirators\(^{84}\). The NIOSH program no longer uses the terms dust-mist masks and dust-mist-fume masks. Instead, it identifies three classes of respirators called Class N, R, and P. Each certified respirator has been tested to determine filtration at a 95%, 99% or 99.97% (referred to as 100%) degree of efficiency of a penetrating aerosol particle (0.3 microns in size) in the unloaded state.

**Emerging Diseases**

It has been said that there is at least one major new infectious disease emerging annually\(^{30}\). Although many of these have serious consequences for society at large, they do not pose a significant risk to the dental team due to their mode of infectivity. Examples of this are West Nile, monkeypox, and prion diseases. Epidemiology of sporadic Creutzfeld-Jakob disease (sCJD) suggests that prions are not transmitted via spatter or aerosols of blood or saliva. What is unknown is if cross-contamination can occur via instruments that touch tonsils and/or lymphoid tissue or if asymptomatic persons transmit Creutzfeld-Jakob Disease (CJD). Furthermore, World Health Organization (WHO) guidelines for decontamination of instruments used on known or suspected cases call for incineration of instruments and wastes or to use a “less effective” method which includes immersion in 1N NaOH and heat in a gravity-displacement autoclave at 121°C for 30 minutes, rinse, clean, and then perform routine sterilization.\(^{30}\)

Other diseases which can potentially affect the dental team are the respiratory and influenza viruses. Of note are Sudden Acute Respiratory Syndrome (SARS), Respiratory Syncitial Virus, Paramxoviridae (Parainfluenza virus), and Metaphneumovirus. Transmission is generally through contact, fomites, and droplet and prevention measures include handwashing, and control from discharges from coughs and sneezes.
APPENDIX 3

Manitoba Immunization Schedule

Communicable Disease Control

Manitoba Routine Immunization Schedule for Infants and Children

<table>
<thead>
<tr>
<th>Age at Immunization</th>
<th>DaPTE</th>
<th>Hib</th>
<th>MMR¹</th>
<th>Td</th>
<th>IPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 months</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 months</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 months</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 months</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 months</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 years</td>
<td>X*</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 years</td>
<td></td>
<td>X</td>
<td>X#</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Manitoba Immunization Schedule for Children ≥ 7 years who have not received previous immunizations

<table>
<thead>
<tr>
<th>Age at Immunization</th>
<th>Td</th>
<th>IPV</th>
<th>MMR¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>First visit</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2 months later</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6-12 months after 2nd visit</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>10 years after 3rd visit</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

DaPTE = diphtheria, acellular pertussis, tetanus, inactivated polio
Hib = haemophilus influenzae B (PRP-T)
MMR = measles, mumps, rubella
Td = tetanus; adult diphtheria formulation
IPV = inactivated polio

* Not required if the fourth dose was given after the fourth birthday.

# Required only if all previous immunizations have been with IPV. Future studies with children who have received all previous doses with enhanced IPV may show that this dose of IPV is no longer necessary. Can be given together with tetanus and diphtheria as TdPolio vaccine.

¹ Children born 1985-1990 inclusive were offered a second dose of measles vaccine in a mass campaign in October 1996. Those who missed this dose should be immunized with a second dose of MMR or MR as opportunities arise.
## Manitoba Immunization Schedule for Children <7 years Not Immunized in Early Infancy

<table>
<thead>
<tr>
<th>Age at Immunization</th>
<th>DTP</th>
<th>Hib*◊</th>
<th>MMR+</th>
<th>Td</th>
<th>IPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>First visit</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 months later</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 months after 2nd visit</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-12 months after 3rd visit</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 years</td>
<td>X*</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 years</td>
<td>X</td>
<td></td>
<td>X#</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DTP = diphtheria, acellular pertussis, tetanus, inactivated polio
Hib = haemophilus influenzae B (PRP-T)
MMR = measles, mumps, rubella
Td = tetanus; adult diphtheria formulation
IPV = inactivated polio

+ Given at 12 months of age or older.
* Not required if the fourth dose was given after the fourth birthday.
◊ Required only if all previous immunizations have been with IPV. Future studies with children who have received all previous doses with enhanced IPV may show that this dose of IPV is no longer necessary. Can be given together with tetanus and diphtheria as TdPolio vaccine.

Number of doses of Hib depends on age at which immunization begins:
- 2-6 months: 3 doses 2 months apart with booster at 15-18 months
- 7-11 months: 2 doses 2 months apart with booster at 15-18 months
- 12-14 months: 1 dose with booster at 15-18 months
- 15-59 months: 1 dose
- 60 months and older: no doses required

Booster dose should be given at least 2 months after preceding dose.

Children with a lapse in administration should be immunized as follows:

<table>
<thead>
<tr>
<th>Age at presentation</th>
<th>Prior immunization history</th>
<th>Number of doses required</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-11 months</td>
<td>1 dose</td>
<td>1 dose with booster at 15-18 months</td>
</tr>
<tr>
<td></td>
<td>2 doses</td>
<td>same as above</td>
</tr>
<tr>
<td>12-14 months</td>
<td>1 dose</td>
<td>1 dose and booster at 15-18 months</td>
</tr>
<tr>
<td></td>
<td>2 doses</td>
<td>1 dose</td>
</tr>
<tr>
<td>15-59 months</td>
<td>any incomplete schedule</td>
<td>1 dose</td>
</tr>
</tbody>
</table>

Doses should be given a minimum of 2 months apart.
APPENDIX 4
Integrated Post-Exposure Protocol – Manitoba Health October 2000

1. This is an integrated protocol for managing occupational exposure to human blood/body fluids. The protocol integrates post-exposure guidelines for three bloodborne pathogens: hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV).

2. A significant exposure is defined as an injury during which one person’s blood or other high-risk body fluid comes in contact with another person’s body cavity; subcutaneous tissue; or non-intact, chapped, or abraded skin or mucous membrane. Body fluids presenting risk for bloodborne-disease transmission are: most importantly blood; also semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, amniotic fluid and peritoneal fluid; other body fluids (e.g., urine or vomitus) only if there is visible blood; or laboratory specimens containing HCV, HBV, or HIV. (Reference: CCDR 1992; 18:177-184). Saliva has been shown to be potentially capable of HBV transmission, but not HIV or HCV.

Injuries of concern include needlestick injuries, injuries from other sharp items, splashes and bites. It is important to note that any needle that has been used to immunize or inject any substance into a person should be considered contaminated, whether blood is visible or not.

3. Prevention of occupational exposures to blood/body fluids is most important. The best available infection-control measures should be used to minimize or eliminate such exposures. Additionally, all significant workplace exposures should be reported to a supervisor, through a mechanism that assures confidentiality; with the aim of decreasing the possibility of recurrences.

4. Provide first aid when a significant exposure occurs:
   a) encourage bleeding at the injured site
   b) wash area well with soap and warm water
   c) if splash is to the eyes, wash out the eye area well with cold water


5. Document the incident in the worker’s confidential medical file by recording the following:
   a) date and time of incident
   b) job duty being performed at time of exposure
   c) details of exposure incident
   d) protective measures employed
   e) action taken after exposure
   f) results of initial and follow-up testing of Source and Exposed


6. Manitoba Health recommends testing as outlined in the accompanying protocols. However, testing is voluntary, both for the worker occupationally exposed to blood/body fluids (“the Exposed”), and for the patient or client whose blood/body fluid is the source of the exposure (“the Source”). Both the Exposed and the Source have the right to refuse the recommended testing. If the Exposed refuses testing, it is generally not recommended that testing of the Source be pursued.
7. **Informed consent** must be obtained prior to all testing. It may be given verbally rather than in writing, but this should be recorded. For the Source, consent should include permission to make the test results available to the Exposed. The Exposed should not become involved in obtaining consent from the Source.

8. When the Source is an infant up to the age of 6-12 months, antibody testing of infant serum and **maternal serum** will likely yield identical results, unless other risk factors are present in the infant. Therefore, consideration may be given to testing the mother as an alternative to testing the infant.

9. **Hepatitis B Virus:**

   9.1) Recommended actions after exposure to HBV are outlined in Protocols 2 to 8.

   9.2) **Immunization and Post-immunization Testing**

    All health or other workers who may be exposed to blood/body fluids should be immunized against hepatitis B and receive post-immunization antibody testing. Anti-HBs levels should be documented 1-2 months after receipt of the third dose of vaccine to assist in the management of future significant exposures. Specimens should be labeled “Post-hepatitis B immunization antibody testing” and submitted to the Cadham Provincial Laboratory (CPL). Previously immunized workers who have not been tested should be tested for anti-HBs as well, as opportunity presents.

    For health care workers testing susceptible (see Section 9.3) 1-2 months after completing a three dose series of vaccine (primary vaccine failure), administration of an additional three dose series followed by repeat testing is recommended. Those testing susceptible > 2 months after completion of their initial immunization series (primary vaccine failure or declining antibody over time) should receive a single booster dose followed by anti-HBs testing 1-2 months after the booster. If subsequent testing indicates susceptibility, administration of two additional doses to complete a second three dose series is recommended, again followed by testing. If the worker remains susceptible after two complete immunization series, he/she should be tested for HBsAg and core antibody (anti-core IgG) to rule out infection.

   9.3) **Susceptibility and Immunity**

    Cadham Provincial Laboratory reports anti-HBs levels as follows:

    \[
    \begin{align*}
    < 1 \text{ I.U.} / \text{L} & \quad \text{“negative”} \\
    1-9 \text{ I.U.} / \text{L} & \quad \text{“low”} \\
    \geq 10 \text{ I.U.} / \text{L} & \quad \text{“positive”}
    \end{align*}
    \]

    • Persons whose test result is “positive” are generally considered immune. Immunity may derive from immunization or natural infection. To be considered immune after immunization, the “positive” result must occur at least one month after completion of a full immunization series.

    • Persons are generally considered susceptible if the anti-HBs level is “low” or “negative.” However, persons who have ever had a “positive” anti-HBs result are considered immune (not susceptible), even if they subsequently have a “low” or “negative” anti-HBs result, as long as the “positive” result occurred at least one month after completion of a full immunization series.

    • Persons who are HBsAg positive are defined as infected with hepatitis B.
9.4) Hepatitis B Immune Globulin (HBIG)

HBIG, when indicated, should be given as soon as possible, ideally within 48 hours after the exposure. With non-sexual exposures, efficacy is unknown after seven days; with sexual exposures, benefit has been demonstrated up to 14 days. HBIG is available in a 5 ml and 1 ml format (variable availability of the latter). The dose is 0.06 ml/kg.

9.5) Hepatitis B Vaccine

The dose of Hepatitis B vaccine is brand and age dependent:

<table>
<thead>
<tr>
<th>Age</th>
<th>Recombivax</th>
<th>Engerix-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children ≤10 yrs*</td>
<td>2.5 µg</td>
<td>0.25 µg</td>
</tr>
<tr>
<td></td>
<td>0.25 ml</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>11-19 yrs.</td>
<td>5.0 µg</td>
<td>0.5 µg</td>
</tr>
<tr>
<td></td>
<td>10 µg</td>
<td>1.0 ml</td>
</tr>
<tr>
<td>Adults</td>
<td>10 µg</td>
<td>1.0 ml</td>
</tr>
<tr>
<td>Haemodialysis† and immunocomprised</td>
<td>40 µg</td>
<td>1.0§ ml</td>
</tr>
<tr>
<td></td>
<td>40 µg</td>
<td>2.0 ml</td>
</tr>
</tbody>
</table>

* except infants of hepatitis B carrier mothers
§ when special formulation is used
† four-dose series for haemodialysis patients

9.6) Obtaining HBIG and Hepatitis B Vaccine

**Due to limited quantities and expense, HBIG is stored only at selected locations:**

- St. Boniface General Hospital
- Health Sciences Centre (Adult and Pediatric departments)
- Misericordia Health Centre
- Brandon General Hospital
- Flin Flon General Hospital
- Thompson General Hospital
- Churchill Health Centre Pharmacy
- Dauphin Regional Health Centre

To obtain HBIG and hepatitis B vaccine at a site other than those listed above, contact Livingston Health Care Services Inc., 204-633-2621 (phone) or 204-694-2380 (fax). After 4:30 p.m. call 204-781-5342. Assistance in determining the need for HBIG and hepatitis B vaccine can be obtained from the local Medical Officer of Health (MOH). If the MOH is unknown, call Health Links with the patient’s address; 788-8200 or 1-888-315-9257. During evenings, weekends and holidays, contact the MOH on-call at 945-0183. Local public health units may also be able to provide assistance in identifying, contacting and counseling the Exposed and/or Source.

9.7) Follow-up Testing

Testing the Exposed following receipt of HBIG and vaccine is recommended to document lack of infection and development of immunity in the event of future exposures. Testing for antiHBs and HBsAg should occur 1-2 months after receipt of the last dose of vaccine, or four months after receipt of HBIG, whichever is later. This applies to both occupational and non-occupational exposures.
10. Hepatitis C Virus:
10.1) Recommendations for HCV testing are outlined in Protocols 2 to 8.

10.2) If the Source is HCV antibody negative, no further action for HCV is required unless the Source is an injection drug user and there is reason to suspect that he/she may have been infected recently, and not yet produced sufficient antibody to test positive (i.e., is in a window period of infection). In this case, follow the same protocol as for where the Source is antibody positive (see 10.3 below).

10.3) If the Source is antibody positive for HCV, test the exposed person for HCV antibody at the time of exposure. If negative, test for HCVRNA at three months post-exposure and for HCV antibody at six months post-exposure. If the exposed person is antibody positive at the time of the exposure, or on subsequent RNA or antibody testing, obtain appropriate medical consultation.

10.4) If the HCV status of the Source cannot be determined, test the exposed person for HCV antibody at the time of exposure. If negative, test for HCV antibody at six months post-exposure. If the exposed person is antibody positive at the time of the exposure, or on subsequent antibody testing, obtain appropriate medical consultation.

11. Human Immunodeficiency Virus:

11.1) HIV antibody testing of both Source and Exposed should always be accompanied by both pre-test and post-test counseling, with informed consent.

11.2) Post-exposure Prophylaxis (PEP) Indications

Studies have suggested that post-exposure prophylaxis (PEP) with chemoprophylactic agents such as zidovudine (ZDV) reduces the risk of HIV seroconversion following percutaneous exposure. (Reference: MMWR 1995; 44(50): 929-933).

Chemoprophylaxis should therefore be offered to exposed workers after occupational exposures in either of the following circumstances:

a) Significant exposures where the Source is known to be HIV positive (see guideline 2 for definition of significant exposure);

OR

b) Significant exposures where the Source is known, but the HW status of the Source is unknown at the time of the exposure, and BOTH of the following conditions are present:

i) A High Risk Exposure has occurred, which is defined as at least one of the following:
   • deep percutaneous injury (deep puncture or wound with or without bleeding)
   • visible blood present on the device associated with the exposure
   • exposure from a procedure which involved a needle placed directly into the Source’s vein or artery

(Examples of significant exposures which are not High Risk Exposures would include splashes; superficial punctures without blood on the device; etc.)
ii) **Risk factors for HIV infection** are already known in the Source. At least one should be present, and these may include:

- history of residence in a country or area with a high HIV prevalence
- history of injection drug use
- history of sexually transmitted disease
- history of multiple sex partners
- history of hepatitis B or C
- recipient of blood products prior to 1985
- if male, having had sex with another male

Effort should be made to determine the HIV antibody status of the **Source as soon as possible**, as this may affect management (see below). Ensure that informed consent is obtained (see guidelines 6 and 7 above). If the Source has previously tested negative for HIV, re-testing the Source is still recommended.

If chemoprophylaxis has not been initiated at the time of exposure, but the Source subsequently tests HIV seropositive, begin chemoprophylaxis as soon as possible. Chemoprophylaxis in this circumstance may be initiated on the basis of a positive HIV antibody screening test, before results of a confirmatory test are obtained.

Chemoprophylaxis is generally not recommended for other exposures. This includes exposures to needles or sharps where the Source is unknown. There have been no documented HIV seroconversions after exposure to abandoned needles or sharps. In contrast to HBV, HIV does not survive long on exposed surfaces. PEP would therefore not be recommended for exposure to an abandoned needle found in a hospital laundry. HIV testing and follow-up is generally not recommended in these circumstances, but may be undertaken for purposes of documentation or if the Exposed person requires reassurance. Only in rare situations, if there is reasonable suspicion that an abandoned sharp or needle may have been in recent contact with an HIV infected person, might chemoprophylaxis and HIV testing be considered.

If chemoprophylaxis is to be implemented, it **should be started as soon as possible, ideally within 2 to 4 hours**. Efficacy is thought to be reduced if delayed. However, since there are no data to indicate if there is a specific time after which PEP is ineffective, consider implementing for up to 72 hours after exposure. For intervals longer than 72 hours, consult an infectious disease specialist.

11.3) **Discontinuing Post-exposure Prophylaxis**

When results of HIV testing of the Source are available, therapy should be re-evaluated. If the **Source is HIV negative, discontinue** chemoprophylaxis. Follow-up HIV testing of the Exposed is not generally necessary. In rare circumstances, chemoprophylaxis and/or follow-up HIV testing may be continued if there is concern about the Source being in a window period of infection (seroconversion phase). Therapy and follow-up HIV testing of the Exposed may also be continued if the Source refuses testing, and a High Risk Exposure has occurred and HIV risk factors are known in the Source (see definition in 11.2 above).

11.4) **Recommended Chemoprophylactic Regimens**

Zidovudine (ZDV) should be used in all chemoprophylactic regimens because it is the only agent for which there are data to support efficacy. The recommended regimen is 200 mg three times a day for four weeks. At least one other agent, such as lamivudine (3TC), should be given together with ZDV for increased antiretroviral activity and to address the possibility of ZDV-resistant strains. The suggested regimen for 3TC is 150 mg two times a day for four
weeks. For individuals who have been exposed to a known HIV-infected Source and have had a High Risk Exposure (see definition in 11.2 above, and include exposure to a Source with advanced HIV-related disease), consider adding a third agent, such as a protease inhibitor, after consultation with an infectious disease specialist. If the Source is already on anti-retroviral therapy and drug resistance is a possibility, consult an infectious disease specialist for the optimal regimen. Triple therapy should be instituted immediately in this situation.

Exposed workers should be informed that knowledge about the efficacy and toxicity of chemoprophylaxis is limited; that there are few data on the effectiveness or side effects of antiretroviral agents other than ZDV when used for this purpose; and that the exposed worker may decline or discontinue treatment at any time. General symptoms such as fatigue, nausea and headache are not uncommon among individuals on anti-retroviral therapy, and are not indications for discontinuation. The main side effects can often be mitigated with acetaminophen and gravol. Contraindications to therapy include chronic renal insufficiency, hepatic insufficiency and bone marrow dyscrasia. Caution should be used in persons treated with myelosuppressive, nephrotoxic, or hepatotoxic drugs in the two weeks prior to initiation of therapy. Zidovudine as PEP appears safe and well tolerated in both pregnant women and their children. Lamivudine also appears safe during pregnancy for women and their children, but follow-up has not yet been long-term. An infectious disease specialist should be consulted before prescribing antiretroviral drugs in pregnancy.

Post-exposure prophylaxis should be initiated by the occupational health physician or designate of the institution or organization. If this individual is not available to institute therapy within 2 to 4 hours, the emergency room or on-call physician or designate can perform this function.

Follow-up counseling and medical evaluation should be provided for all workers who are given chemoprophylaxis. Follow-up should be provided by the occupational health physician, or other designated health professional. HW tests should be done at baseline, 6 weeks to 3 months, and 6 months. Follow-up to 12 months may be undertaken in rare instances where it is felt that HIV seroconversion may be delayed. Counseling should be given to prevent possible secondary transmission. Abstinence from sexual contact is desirable. If this is not possible, any sexual contact should be protected with the use of a condom. Counseling for prevention of other modes of secondary transmission, such as through blood or organ donation, should also be provided.

No laboratory evaluation is required prior to initiation of chemoprophylaxis. If therapy is continued after five days, baseline tests should be performed on the Exposed. Drug toxicity monitoring at baseline and at 2 weeks after starting chemoprophylaxis should include a complete blood count and hepatic chemical function tests (total bilirubin, AST, ALT, alkaline phosphatase). If toxicity is noted (i.e. hemoglobin <80 mg/l, three-fold increase in liver function tests, neutropenia < 1000/mm³), dose reduction or dose substitution should be considered, after consultation with an infectious disease specialist.

11.5) Availability of Chemoprophylactic Regimens

Five-day starter kits for zidovudine (200 mg three times a day) and lamivudine (150 mg twice a day) are provided by Manitoba Health through its supplier, Misericordia Health Centre Pharmacy, to selected depots throughout the province, primarily hospital emergency departments. Facilities which are not designated depots may obtain starter kits when required from a depot in their region. If after the initial five days of therapy it is decided to continue for the full 28-day course (an additional 23 days), the additional drugs required will also be provided to the depot. However, Manitoba Health will not assume the cost of these drugs. It will be the responsibility of the client to do so, although it is expected in the case of
occupational exposures that either the employer will cover the cost, or that a claim will be filed with the Workers’ Compensation Board. The usual Pharmacare procedures and deductibles applicable to a given client would apply to the additional drug costs associated with non-occupational exposures (or occupational exposures where the cost is not covered by the employer or the Workers’ Compensation Board). Refill starter kits and additional drugs required to complete 4-week courses of therapy are available upon request from the Misericordia Health Centre Pharmacy (telephone 788-8235, fax 774-8488) in a timely fashion following an order being placed. Drugs required to complete a 4-week course are available at a competitive (cost) price and regimens are pre-packaged, with appropriate information for the provider and client included. Costs associated with drug ordering and shipping are covered by Manitoba Health.

11.6) Further Information

Further information on this protocol can be obtained during regular office hours (8:30 to 4:30) by contacting your local public health office. The appropriate public health office is the one serving the place of residence of the Exposed. After hours, contact the Medical Officer of Health on-call at 945-0183.

12. Procedures for Laboratory Testing

All diagnostic testing for hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) in Manitoba is performed at the Cadham Provincial Laboratory (CPL) (tel. 945-6123).

12.1) Testing Schedule

- Hepatitis B surface antigen (HBsAg) and antibody (anti-HBs) - daily Monday to Friday; results available within 24-48 hours.
- Anti-HCV testing - daily Monday to Friday; results available within 24-48 hours.
- Anti-HIV testing - daily Monday to Friday; negative results available within 24-48 hours.

12.2) Sample Collection

- Samples from the Source and the Exposed should be taken at the same time to facilitate timely intervention if required.
- Two tubes of blood are required; one for HBV and HCV, and the other for HIV.
- Record the requisition numbers for future reference.

12.3) Requisition

- Complete the routine CPL requisition form for HBV and HCV testing. For HIV testing, the specific HIV requisition form must be filled out completely, with code and epidemiological data. Label both forms NEEDLESTICK or EXPOSURE TO BLOOD/BODY FLUIDS and indicate clearly whether the sample is from the Source or the Exposed.
- Provide the following additional information on requisition forms:
  a) Name of the person to whom results are to be provided. If arrangements have been made to phone results, include telephone number of person to whom results are to be phoned.
b) Name/code of Source if known
c) Time and type of exposure
d) HBV vaccination status of Exposed

12.4) Urgent Test Requests

- Phone the laboratory and ask for the Serology Department:
- To inform the lab how and when the samples will arrive
- To provide the name of the person who is to be notified of the results
- To provide the name (or code) of the Exposed and Source
- To ensure that the specimens will receive prompt attention

- After hours the telephone is answered by the CPL security guard. Ask to speak to the physician on call.

- When phoning for results of urgent tests, please ensure that you provide the requisition numbers as well as the name/code of the patient.

13. Abbreviations and Definitions

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBV</td>
<td>Hepatitis B virus</td>
</tr>
<tr>
<td>HBsAg</td>
<td>Hepatitis B surface antigen</td>
</tr>
<tr>
<td>anti-HBs</td>
<td>Antibody to Hepatitis B surface antigen</td>
</tr>
<tr>
<td>anti-core IgG</td>
<td>IgG antibody to core antigen</td>
</tr>
<tr>
<td>anti-HCV</td>
<td>Antibody to Hepatitis C virus</td>
</tr>
<tr>
<td>HIV</td>
<td>Human immunodeficiency virus</td>
</tr>
<tr>
<td>anti-HIV</td>
<td>Antibody to human immunodeficiency virus</td>
</tr>
<tr>
<td>HBIG</td>
<td>Hepatitis B Immune Globulin</td>
</tr>
<tr>
<td>HCV</td>
<td>Hepatitis C virus</td>
</tr>
<tr>
<td>PEP</td>
<td>Post-exposure prophylaxis</td>
</tr>
<tr>
<td>ZDV</td>
<td>Zidovudine - an anti-retroviral drug</td>
</tr>
<tr>
<td>3TC</td>
<td>Lamivudine - an anti-retroviral drug</td>
</tr>
<tr>
<td>Exposed</td>
<td>An individual exposed to blood/body fluids</td>
</tr>
<tr>
<td>Source</td>
<td>An individual whose blood/body fluids represents the source of exposure</td>
</tr>
<tr>
<td>Immunoglobulin</td>
<td>One of a family of closely related though not identical proteins capable to acting as antibodies. Five major types of immunoglobulins are normally present in the human adult (IgA, IgD, IgE, IgG, IgM)</td>
</tr>
<tr>
<td>IgE</td>
<td>Produce by cells of the lining of the respiratory and intestinal tracts. IgE is important in forming antibodies. About 50% of patients with allergic diseases have increased IgE levels.</td>
</tr>
</tbody>
</table>


The foregoing guidelines are directed at occupational exposures to blood or body fluids, and were formulated primarily with needlestick injuries in mind. However, they can also be applied to other kinds of occupational exposures, as well as to non-occupational exposures. There are a wide variety of such exposures and they must be assessed on a case-by-case basis, but the following examples illustrate how the guidelines might be applied. For exposures in children, consult an
infectious disease specialist regarding drug dosages for HIV post-exposure prophylaxis.

14.1) Human Bites

As per the guidelines, saliva is considered to be a high-risk body fluid for transmission of HBV, but not HIV or HCV. Therefore for HBV, Protocol 2 should be followed. For HIV and HCV, an assessment must be made as to whether the human bite was associated (or likely associated) with transfer of blood. The presence of visual blood is particularly relevant. If blood transfer was unlikely, then no further action is required. If it was likely, then Protocol 2 should be followed for HCV and HIV; specifically, PEP should be initiated if the bite was deep, and if risk factors for HIV infection are known to be present in the Source. Judgement may have to be exercised as to the likelihood of the presence of risk factors for HIV infection. PEP may be discontinued according to the guidelines 11.3.

14.2) Exposure to blood from cuts, nosebleeds, etc., as a result of fights or sports injuries

Again, an assessment must be made as to whether a significant exposure has occurred, or has likely occurred, i.e., blood from a source has come into contact with an exposed person’s body cavity, subcutaneous tissue, or non-intact, chapped or abraded skin or mucous membrane. If not, then no further action is required. If so, then for HBV, Protocol 2 should also be followed. Protocol 2 should also be followed for HCV and HIV; specifically, PEP should be initiated if there is deep penetration of the Exposed’s skin or other tissue, and if risk factors for HIV infection are known to be present in the Source. Judgement may have to be exercised as to the likelihood of the presence of risk factors for HIV infection. PEP may be discontinued according to the guidelines 11.3.

14.3) Exposure to abandoned needles

This type of exposure may occur in schoolyards, laundry bags, etc. Protocol 1 for HBV, HIV and HCV should be followed. PEP and follow-up testing for HIV is generally not recommended (see Protocol 1 and the guidelines 11.2), but may be undertaken for purposes of documentation, or if the exposed person requires reassurance.

14.4) Exposure as a result of needle-sharing

This type of exposure is significant, and in the case of HIV infection, would constitute the equivalent of a High Risk Exposure, with risk factors for HIV present in the Source. Protocol 2 should be followed for HBV, HIV and HCV; specifically, PEP for HIV should be initiated, but may be discontinued according to the guidelines 11.3.

14.5) Sexual assault

In the case of sexual assault, if semen has come into contact with genital, anal or oral tract mucosa, then a significant exposure has occurred. For HBV, Protocol 2 should be followed. For HIV, the equivalent of a High Risk Exposure may be assumed, but often the identity of the Source is unknown or the Source cannot be tested for HIV. PEP would generally be indicated, but it is important to counsel the client as to the probability of transmission given an HIV-positive source (in the order of 1-2 per thousand, but probably somewhat higher if genital/rectal trauma/bleeding has occurred), as well as the probability of the assaulter being HIV infected (unknown, but even among identifiable high risk behaviour groups in Manitoba, probably not higher than 10-15%). The overall probability of HIV infection therefore is very small (probably less than 1 in 10,000), but not zero. Ultimately, the client (victim) must make an informed decision as to whether this risk is sufficient to accept prophylaxis.
Appendix 5
Dental Instrument and Materials Sterilization/Disinfection Guide

Dental items which should be discarded, rather than disinfected or sterilized include:

- Needles (DO NOT RE-USE!)
- Non-heat resistant plastic fluoride gel trays
- Plastic impression trays
- Prophylaxis cups
- Saliva evacuation/ejectors – low melting plastic

The following table is adapted from the American Dental Association Biological Indicators for Verifying Sterilization, JADA, Vol 117, October 1988. Instruments and materials are grouped according to categories and daily use.

Recommendations for mode of sterilization/disinfection are ranked numerically:
1 = Effective and preferred method
2 = Effective and acceptable method
3 = Effective method, but risk of damage to materials
X = Ineffective method with risk of damage to materials

<table>
<thead>
<tr>
<th>Dental Instruments and Materials</th>
<th>Chemical Vapour</th>
<th>Steam Vapour</th>
<th>Dry Heat</th>
<th>Ethylene Oxide</th>
<th>Chemically Disinfect/Sterilize</th>
<th>Other Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mirrors</td>
<td>1</td>
<td>3</td>
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<td>Hand Instruments</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Carbon Steel</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
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<td>1</td>
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<td>Instruments in Packs</td>
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<td>2</td>
<td>1</td>
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<td>Instruments Tray Set-ups</td>
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<td>Restorative or Surgical</td>
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<td>Endodontic Instruments</td>
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<tr>
<td>- broaches, files, reamers</td>
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<tr>
<td>- stainless steel handles</td>
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<tr>
<td>- Stainless/plastic handles</td>
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Heat Sterilizer
## Dental Instruments and Materials

<table>
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<tr>
<th>Material Type</th>
<th>Chemical Vapour</th>
<th>Steam Vapour</th>
<th>Dry Heat</th>
<th>Ethylene Oxide</th>
<th>Chemically Disinfect/Sterilize</th>
<th>Other Methods</th>
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<tr>
<td>Surgical Instruments</td>
<td>1</td>
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<td>- With plastic parts</td>
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<td>x</td>
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<td>Rubber Dam Equipment</td>
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<td>- Carbon Steel Clamps</td>
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<td>1</td>
<td>3</td>
<td></td>
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<tr>
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<td>Saliva Evacuators/Ejectors</td>
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<td>- High-melting plastic</td>
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<td>Ultrasonic Scaling Tips</td>
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<td>- Heat-resistant plastic</td>
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</table>
## Dental Instruments and Materials

<table>
<thead>
<tr>
<th>Impression Trays</th>
<th>Chemical Vapour</th>
<th>Steam Vapour</th>
<th>Dry Heat</th>
<th>Ethylene Oxide</th>
<th>Chemically Disinfect/Sterilize</th>
<th>Other Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Aluminum</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td></td>
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<tr>
<td>- Chrome-plated</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>- Custom acrylic resin</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

| Polishing wheels/disks     |                 |              |          |                |                               |               |
| - Garnet and cuttle        | 3               | X            | 3        | 1              | X                             |               |
| - Rag                      | 2               | 1            | 3        | 1              | X                             |               |
| - Rubber                   | 3               | 2            | 3        | 1              | 2                             |               |

| Removable Prostheses       | 3               | 3            | 3        | 2              | 2                             |               |

| Impression Materials       | X               | X            | X        | X              | 1                             |               |

| X-Ray Equipment            |                 |              |          |                |                               |               |
| - Collimating devices      | X               | 3            | X        | 1              | 2                             |               |

| X-ray Equipment            | Sterilizable Preferable – Follow Manufacturer’s Recommendation |               |               |                               |               |
| - Plastic Film Holders     |                                                               |               |               |                               |               |

| Nitrous Oxide Nose Pieces & Hoses | Sterilizable Preferable – Follow Manufacturer’s Recommendation |               |               |                               |               |

| Handpieces & Attachments   | Sterilizable Preferable – Follow Manufacturer’s Recommendation |               |               |                               |               |

### INSTRUMENT PACKAGING GUIDELINES

**Note** that the type of wrapping or packaging material utilized affects the sterile shelf-life of the instrument(s) it contains.

<table>
<thead>
<tr>
<th>Packaging Materials</th>
<th>Shell Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>- paper envelopes</td>
<td>1 month</td>
</tr>
<tr>
<td>- double thickness cloth</td>
<td>2 months</td>
</tr>
<tr>
<td>- nylon, plastic or plasticized (tape sealed)</td>
<td>6 months</td>
</tr>
<tr>
<td>- heat sealed packages</td>
<td>12 months</td>
</tr>
</tbody>
</table>

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APPENDIX 6

MUNICIPAL AND PROVINCIAL LAWS AND REGULATIONS IN MANITOBA REGULATING DISPOSAL OF SHARPS

In Manitoba, there are no Provincial Laws and Regulations that regulate the disposal of sharps. In the City of Winnipeg there is a bylaw that was put in place at the request of operators of land fill disposal sites for their protection. This bylaw essentially is a paper trail that states that whoever is bringing the sharps, declares that they have been autoclaved prior to disposal.

On the 8th of July, 1992 the City of Winnipeg passed a By Law about Biomedical Waste Sharps which every dentist must comply with.

Numerous consultations with the representatives from the City of Winnipeg Waterworks Waste and Disposal Department have resulted in the Department agreeing with the following procedures:

- Once Biomedical Waste Sharps have been treated in an autoclave, they then can be placed in an alginate container with a screw top lid and be shipped for disposal to a City of Winnipeg landfill site. We request that the alginate container be marked in some fashion to indicate that it contains treated Biomedical Waste Sharps
- Once treated Biomedical Waste Sharps have been placed in an alginate container, we do not require that dental stone be placed on top of the sharps within the container.
- Treated Biomedical Waste Sharps must be transported to a City of Winnipeg landfill site by a licensed carrier.
- Shipments of treated Biomedical Waste Sharps must be accompanied by a certificate of treatment as provided for under the By Law.
- Multiple pick-ups by a licensed carrier at several dental facilities to minimize cost would certainly be an acceptable procedure.

Members therefore have choices with regard to how they comply with the City By Law.

1. Hire a licensed carrier to pick up untreated sharps.
2. Autoclave sharps as described above & hire a licensed carrier (courier company) to dispose of a large volume of containers
3. Hire an out of province licensed carrier to dispose of treated or untreated sharps eg Biocan in Thunder Bay.

If you choose to autoclave, the alginate containers must be marked with a magic marker “Treated Biomedical Waste Sharps”, numbered, and accompanied by a certificate indicating that the lot #1 - #x has been autoclaved and delivered to the City landfill site by your licensed carrier.
Ideally, sharps and all biomedical wastes should be incinerated, however there is a problem with availability of incineration which makes this treatment difficult for individual offices to access, except through a company which specializes in this service.

In Winnipeg, the company that removes infectious waste, including sharps from the office is called Med Tech Environmental Ltd. This company in turn sends the infectious waste to Fargo, North Dakota for incineration.

The telephone number is 697-4463. There is optimism within the industry that in the near future, anyone using such companies within Manitoba will be required to be registered with the Provincial Government, Department of Conservation, again in order to be able to maintain a paper trail for surveillance purposes.