



THE
COLLEGE
OF
PHYSICIANS
AND
SURGEONS
OF
ONTARIO

Infection Control *in the* Physician's Office

2004 Edition

Preface

The need for strict infection prevention and control measures in medical facilities has probably never been more apparent to the general public and to the medical community at large than it is now. Our recent experience with Severe Acute Respiratory Syndrome (SARS), as well as events related to inadequate sterilization and disinfection of medical equipment, have underscored the notion that every person is vulnerable if proper safeguards are not in place to prevent the transmission and acquisition of infection.

According to the *Public Hospitals Act*, medical institutions must have an Infection Control Committee, and a proper infection control infrastructure is required to meet hospital accreditation standards. In contrast, the intent of these requirements has not consistently been realized in office practices. The face of infection control is rapidly changing with new infections being described, more outpatient procedures being performed, new products and medical equipment being manufactured, and new standards, directives and guidelines being developed by provincial, national and international organizations.

This third edition of the guidelines is as comprehensive as possible, including new and updated information, as well as issues physicians should consider when setting up a new office. We have created algorithms to simplify comprehension and implementation of the guidelines and other visuals that can be posted in the office as required. Our goal is to educate the medical community on current infection control practices necessary for an office practice. By doing this we will elevate the standard of practice in health care and protect the public by minimizing the risk of infection transmission.

We hope that this guideline will be a useful tool, a handy reference to provide you with a framework and practical information to prevent the transmission of infection to patients, visitors, health care workers and other employees associated with your clinical practice.

Anne Matlow, MD, MSc, FRCPC

This edition of *Infection Control in the Physician's Office* is dedicated to the memory of our two nursing colleagues, Nelia Laroza and Tecla Lin, and Dr. Nestor Yanga, all of whom contracted SARS while caring for patients and lost their lives in so doing.

Acknowledgements

In 1993, the College of Physicians and Surgeons of Ontario asked that a team of outside experts be assembled to draw up infection control guidelines specifically designed to meet the needs of physicians in their offices. The College felt that there was an information gap in this area and accepted responsibility for drafting a set of practical infection control guidelines. The first edition was published in 1995.

The College is grateful for the work of the original team which researched, wrote and assembled the 1995 guidelines: Anne Matlow, MD, MSc, FRCPC; Henry Wu, MD, BSc; Carol Goldman, RN, BScN, CIC; and Arthur Franklin, BSc, PhD; as well as the work on the 1999 and 2004 editions by Dr. Matlow and Ms. Goldman.

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Ms. Goldman is an Infection Control Practitioner at the Hospital for Sick Children in Toronto. Her interest in infection control began in 1978, and she has been an active member of the Community and Hospital Infection Control Association-Canada (CHICA), serving on the board and in its various committees over the years. She sits on many local and provincial committees. Ms. Goldman is active in preparing infection control guidelines at both the provincial and federal level.

Infection Control in the Physician's Office, 2004 edition, is being sent to all physicians in Ontario as an insert in the March/April 2005 issue of *Members' Dialogue*, the official publication of the College.

These guidelines are also available on the College's website www.cpso.on.ca, in the Publications section.

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Executive Summary

The College of Physicians and Surgeons of Ontario (the “College”) is pleased to publish the third edition of *Infection Control in the Physician’s Office*. These guidelines have continued to evolve from 1995 through direct experience and our changing world, as the prevention and control of the spread of infection has become a global challenge.

For the most part, these are educational guidelines for doctors. Some components have been derived from legislation and regulations, and will state in explicit terms what physicians should or should not do. However, many parts of the guidelines are best practices, designed to raise awareness about day-to-day risks of transmission in a doctor’s office, and to equip doctors with suggestions and tools to minimize such risks. Professional judgement and the realities of medical practices in Ontario will always inform how each best-practice recommendation is used by individual doctors. In the event that Ontario experiences a serious infectious disease outbreak, these best practices may be superseded by directives from the Ministry of Health and Long-Term Care, Public Health, the College, or another designated national or provincial organization. The risks of such a situation will hopefully be mitigated by careful consideration of these guidelines by all physicians and their teams in community health practices.

The guidelines consist of three sections:

- **Patient Care** – how is infection transmitted, what are “routine practices” and what are some of the precautions that can be taken?
- **Health Care Workers** – what are the recommended immunization practices for health care workers and how can personnel health impact on potential transmission?
- **The Environment** – what are appropriate waste disposal, sterilization and disinfection, general housekeeping, and office design considerations?

Assisted by diagrams and flowcharts, the College hopes that this edition of the guidelines will be the most helpful one for doctors to date.

As you read the guidelines, think about your practice and where changes might be warranted to address some of the typical areas of risk.

In your practice, do you:

- Practice hand hygiene for staff and patients?
- Handle sharps properly?
- Have adequate personal protective equipment?
- Have N95 or equivalent respirators for airborne precautions?
- Complete adequate sterilization and disinfection?
- Separate and properly dispose of biomedical waste?
- Follow protocols for exposure to blood or body fluids? Vaccine storage and handling? WHMIS? Reportable communicable diseases?
- Use single-use devices only once?

All of the above are derived from legislation, regulations or accepted standards of practice based on research, evidence and experience – there is little room for variability, with the exception of the use of protective equipment.

Consider the following for your practice:

- Droplet, contact and airborne precautions;
- Signage to help your patients do the right thing, such as respiratory etiquette practices;
- The possible need to isolate a patient;
- Booking and triaging patients who are at higher risk for seriously transmissible infections;
- General housekeeping tips;
- Use of multi-dose vials;
- The benefits of a policy and procedure manual on infection control in your office;
- The role of your staff in helping to reduce the risk.

All of the above are practices worthy of review and consideration. You may not be able or need to implement all practices, but this information will help you use your professional judgement as necessary.

Introduction

An infection prevention and control program in a physician's office is akin to a safety infrastructure in place in a personal residence. Locks on doors, fire extinguishers, and smoke and carbon monoxide detectors are recognized safeguards against theft, fire and carbon monoxide poisoning respectively, and the consequences of omission can be devastating and even fatal. Just as it is incumbent upon a homeowner to protect individuals within the home, so it is incumbent on a physician to protect individuals within his or her office practice. This responsibility is not restricted to patients, but rather, includes office staff and other visitors as well.

Both from a structural and functional point of view there are ample opportunities for infection to be transmitted in an office setting. By definition, sick people are seeking medical help and the waiting room of an office practice may be a concentrated environment of communicable diseases. Infection is not only spread person-to-person, but can also be spread indirectly through inanimate objects known as fomites. As such, protective mechanisms must be in place, not only in direct patient management but in handling of the office environment as well.

Examples of fomites: magazines, toys, waiting room surfaces.

During the SARS outbreak in the spring of 2003, patients frequenting outpatient medical facilities and hospitals were screened for infectious diseases and provided with a hand hygiene agent on entry. Although at the time these measures were targeted specifically at halting the transmission of SARS, there is no doubt that the principles underlying these recommendations are applicable to communicable diseases in general. During the SARS outbreak, we were carefully attuned to the vigilance required for infection prevention and control. As time passes, however, it is easy to lose collective memory and go back to previous habits.

If we were to map out the patient-physician visit as a continuum that begins the moment an appointment is booked until the moment the appointment ends and the patient leaves the office, we would note many potential human and environmental encounters. Each encounter could, in fact, be an opportunity for infection transmission or prevention. Our job is to minimize the risk of acquiring an infection in the physician's office. There are many considerations, but application and adherence to standard rules when creating and maintaining your office will maximize success.

These guidelines are set up differently than the previous two editions. We have divided this document into three major sections consisting of issues that relate primarily to the care of patients, health care workers, and the environment. We have also included a glossary and resources section. Our goal has been to create a comprehensive, evidence-based document to help you prevent and control infection in your office.

Sit back and reflect for a moment on your existing practice, or on the practice you are just starting to build. Features unique to your individual practice must guide infection control considerations.

Ask yourself the following: Given my specialty, what kinds of patients do I see? Adults or children? Are they immunocompromised? Do I see patients with tuberculosis or HIV? What procedures do I perform? Are they invasive?

Once you answer these questions, you must consider the implications of the answers in the context of infection control. What do I do with a patient with chickenpox? Will I have a mechanism in place for separating an immunocompromised patient from a waiting room full of patients with respiratory infections? How should I disinfect vaginal specula? What supplies do I need?

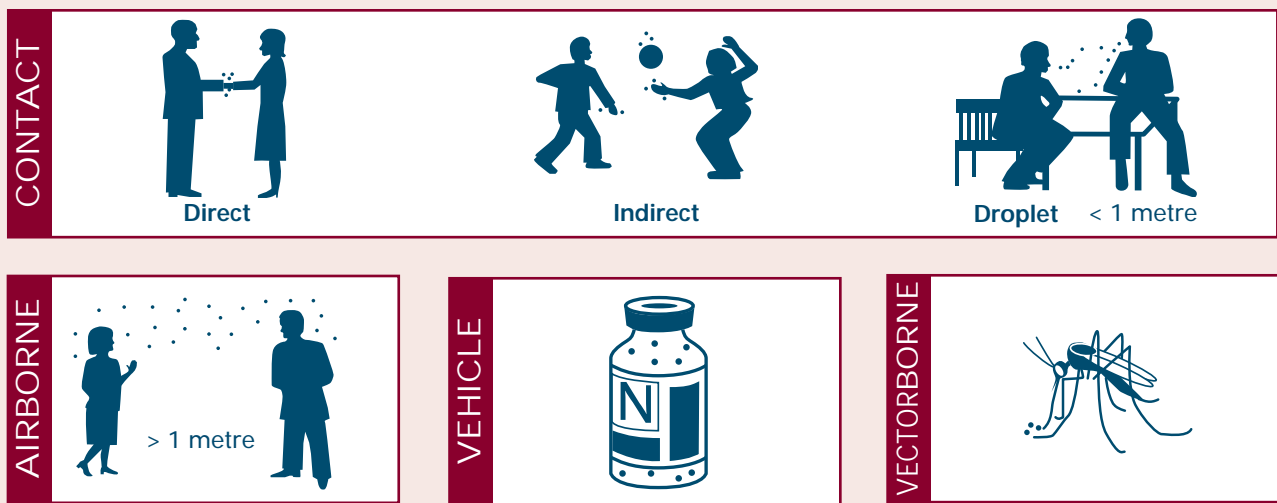
In Appendix 1, we have included a checklist of supplies that should be considered in your office set up. Please remember that this guideline is but one resource for you and there are many others available. Familiarize yourself with the Ministry of Health and Long-Term Care (MOHLTC) website <http://www.health.gov.on.ca>. Acquaint yourself with a local infectious disease specialist who can help if required. Know who your local public health personnel are and how to contact them (see Appendix 4).

And finally, take care of yourself and your staff. Practice good hand hygiene. Keep your vaccinations up-to-date. If you or your staff are sick, stay at home. If this is not feasible, use your judgement and the best information available to prevent your patients from becoming infected.

Transmission of Organisms

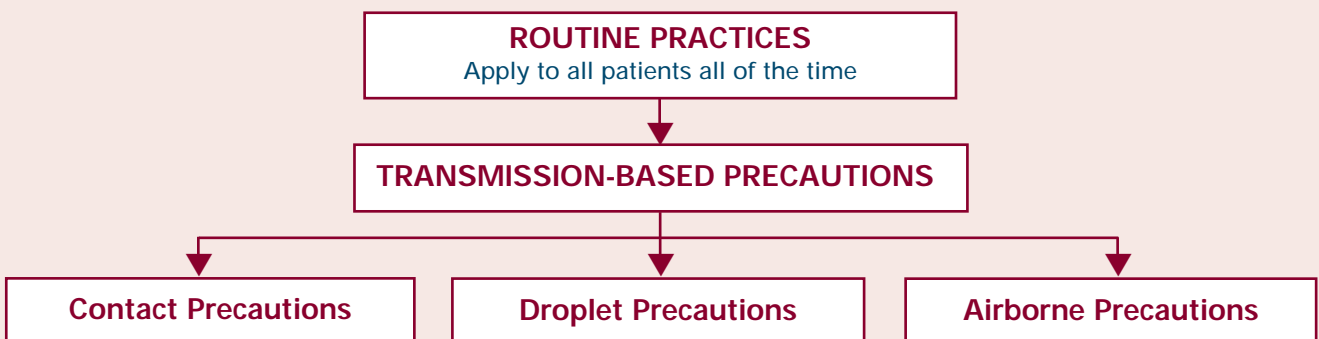
Understanding the mode of transmission of infection is necessary for practicing and designing infection control strategies. Four main routes spread organisms: **contact (direct, indirect or droplet); airborne; vehicle; and vectorborne transmission**. Although vector-related spread is not likely to be of relevance in an office setting, the other mechanisms are all potentially important modes of transmission in a doctor's office.

Figure 1: HOW MICROORGANISMS ARE ACQUIRED



With an understanding of the modes of transmission of microorganisms, you can understand why adherence to safe aseptic standards of practice will limit the spread of microorganisms. **“Routine practices”** is the term used to describe those standards you should use in the care of all patients all of the time. **“Transmission-based precautions”** are **added** to routine practices to provide protection for infections not covered by routine practices. This chart provides a framework for understanding these principles, and further details follow.

Figure 2: THE TWO-TIERED ISOLATION SYSTEM



Routine Practices

The term “routine practices” is the new Health Canada term used to describe basic standards of infection control required to care for all patients.

The term “standard precautions,” is the term used by the Centers for Disease Control.

These terms synthesize the major principles of “universal precautions” (designed to reduce the risk of transmitting blood borne pathogens) and those of “body substance precautions” (designed to reduce the risk of transmitting pathogens from moist body substances).

“Transmission-based precautions” are designed to be practiced in conjunction with routine practices when patients are suspected or confirmed of being infected with transmissible or epidemiologically significant organisms (refer to section on transmission-based precautions).

Hand hygiene is the single most important measure for preventing the transmission of microorganisms.

“Routine practices” refers to the standards of practice that should be followed for the care of ALL patients at ALL times. They are based on the premise that all patients are potentially infectious, even when asymptomatic, and that the same safe standards of practice should be taken routinely when handling blood, body fluids, secretions and excretions, mucous membranes, non-intact skin, and undiagnosed rashes of all patients.

Adherence to routine practices protects not only the health care worker but also other patients who may subsequently be in contact with that health care worker.

There are three principles that are inherent in routine practices:

- Hand hygiene
- Personal protective equipment (PPE)
- Safe handling and disposal of sharps

i) Hand Hygiene

The term “hand hygiene” has replaced hand washing and includes the use of plain or antimicrobial soap with running water, as well as the use of an alcohol-based hand sanitizer.

When should you wash and with what type of product?

Wash with plain or antimicrobial soap and water:

- When hands are visibly soiled or contaminated with body fluids.
- When caring for a patient with diarrhea, including suspected or confirmed *Clostridium difficile* infection (refer to sidebar on page 11).

Wash with plain or antimicrobial soap and water, or a waterless/alcohol-based product when performing routine care and non-invasive procedures:

- Following personal hygiene (e.g., use of toilet, blowing nose);
- Before eating, drinking or serving food;
- Before and after direct contact with individual patients;
- Before preparing or handling sterile products or medications;
- Between “clean” and “dirty” procedures on the same patient;
- After removing gloves;
- After contact with the environment or equipment in the treatment room; and
- After contact with laboratory specimens.

Self-contained disposable liquid soap containers with pumps should be used wherever possible to minimize contamination. If soap containers are reusable, never refill by “topping up”. Instead, wash, rinse, dry the soap container thoroughly, and then refill. The use of bar soap is discouraged because organisms can grow on the soap and in the pooled water that collects under the soap.

Hand lotion to prevent dry or cracked skin should be available for staff. Disposable pump-type containers are recommended. Lotions should not be petroleum based, because they could affect glove integrity. The best times to apply hand lotion are after you’ve washed your hands and before you are taking a break. Hand lotion won’t help if you use it and then wash your hands again.

Table 1 outlines the minimum hand hygiene requirements for various clinical activities.

Table 1. HAND HYGIENE	
INDICATIONS FOR HAND HYGIENE	MINIMUM REQUIREMENT
Routine Care	Plain soap and water or alcohol-based hand sanitizer
Care of Patients with Diarrhea	Plain soap and water
Surgical Procedure	Antimicrobial* soap and water or alcohol-based hand sanitizer
*Antimicrobial soaps contain one of the following antiseptic agents: chlorhexidine gluconate, iodophors, triclosan, ethanol or isopropyl alcohol 60-90%.	

Soap and water must be used if hands are visibly soiled or contaminated with body fluids or spores (*Clostridium difficile*) as alcohol-based hand sanitizers are not effective. The primary action of soap and water is through the mechanical removal and rinsing of organisms.

Soaps containing emollients are available and help prevent drying and cracking of the skin.

When selecting hand hygiene products, you may opt to purchase a “total package” from a single company that provides soaps, alcohol-based hand sanitizer and hand lotions that are compatible with each other. Call your local hospital’s purchasing or infection control department for advice on products and distributors.

There is sufficient evidence that alcohol-based hand sanitizers are at least as good as and possibly superior to soap and water except in cases where hands are visibly soiled or contaminated with body fluids or spores.

How should hand hygiene be done?

When Using Soap and Water

For routine care:

- Wet hands.
- Apply adequate amount of soap to achieve a lather.
- Rub vigorously for 10-15 seconds, covering all surfaces of hands and fingers including under nails.
- Rinse well with running water.
- Dry thoroughly with a disposable paper towel. Turn off the taps with the towel and discard in a bin.
- Avoid the use of prosthetic nails and heavy jewelry.

For surgical office procedures:

- Remove all jewellery.
- Wash hands, and up to a minimum of two inches above wrists thoroughly for **two minutes**.
- Clean under nails. A disposable manicure stick can be used; nailbrushes are NOT recommended as they can become contaminated and damage the skin around the nails.
- Nails should be short enough to allow thorough cleaning underneath and not cause glove tears.
- Rinse off soap and dry hands well.

When Using an Alcohol-Based Hand Sanitizer

For routine care:

Apply the product to the palm of one hand and rub hands together, covering all surfaces of hands and fingers, until hands are dry.

For surgical office procedures:

Remove jewellery, and follow hand hygiene protocol outlined above for routine care when using soap and water. Apply alcohol-based hand sanitizer and rub for a minimum of 30 seconds or according to manufacturer's instructions.

Recommended Technique For All Hand Hygiene Agents

1. Palm to palm



2. Palm over dorsum



3. Palm to palm, fingers interlaced



4. Back of fingers to opposing palms



5. Rotate thumbs in palm



6. Rotate fingers in palm



General Principles

Hand Hygiene Facilities - Sinks or Alcohol-Based Hand Sanitizer Dispensers

- Ideally, locate as close as possible to the examining/procedure room and specimen collection area. (Note: soap dispensers should be placed at every sink).
- Turn taps off with the aid of a paper towel to avoid recontamination of hands. If renovating, consider hands-free faucets (electric eye, or foot operated).
- A hand wash sink is not to be used for any other purpose. Do not clean equipment or discard waste in a hand wash sink. Maintain separate facilities for equipment cleaning and specimen disposal, and examination rooms.

Antiseptic Agents: Beyond Hand Hygiene

An “antiseptic” is an antimicrobial substance that can be used on human skin or tissue. We have just discussed antiseptics in the context of hand hygiene agents. Antiseptics are also used to prepare the patient’s skin before invasive procedures (skin prep).

The following antiseptics are available as skin preps:

- Isopropyl alcohol (70%)
- Chlorhexidine gluconate (4%, 2% detergent base, 0.5% tincture)
- Iodine/iodophor (10%, 7.5%, 2%, 0.5%)

References:

1. Guideline for Hand Hygiene in Health-Care Settings, Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Centers for Disease Control and Prevention, 2002.
2. Infection Control Guidelines – Hand Washing, Cleaning, Disinfection and Sterilization in Health Care. Health Canada Steering Committee on Infection Control Guidelines. Available on-line at: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/98pdf/cdr24s8e.pdf>.
3. Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care. Revision of Isolation and Precaution Techniques. Health Canada Steering Committee on Infection Control Guidelines. Available on-line at: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/99vol25/25s4/index.html>.

ii) Personal Protective Equipment

Remember to ask whether your patient is allergic to latex. If you or your patient has a latex allergy, latex-free gloves must be used.

Use of low protein powder-free non-sterile latex gloves will prevent sensitization of employees to latex.

Gloves protect the patient AND the health care worker.

Gloves do not replace hand hygiene.

For a list of basic office supplies for infection prevention and control, please see Appendix 1.

Surgical masks with an attached visor with ear loops for ease of use, are now available.

Personal protective equipment (PPE) are worn to protect the health care worker and to prevent the health care worker from becoming a vector. For routine practices, PPE are selected based on the anticipated exposure. PPE should not be reused between patients.

Gloves

Gloves are not necessary for routine activities when contact is limited to intact skin. Gloves should be worn for any contact with patients or contaminated articles when direct exposure to blood, body fluids, mucous membranes, non-intact skin, or undiagnosed rashes is anticipated.

Non-sterile examination gloves (latex, vinyl or nitrile) in all appropriate sizes, should be readily available for routine use in patient care areas and utility rooms. Vinyl gloves may be less durable than the others. Gloves that are better fitting are recommended for use in procedures that require tactile sensation. Sterile procedure gloves should be used for invasive procedures.

Allergic reactions have been reported with the use of latex gloves, and consideration must be given to this when purchasing gloves. Powdered gloves lead to an increased risk of latex allergy.

Gloves must be used only once and be discarded into the regular garbage after each patient and/or procedure (refer to Waste Disposal section). Hands should be sanitized with soap and water or with an alcohol-based hand sanitizer after glove removal.

Gowns

Additional protective wear such as gowns or plastic aprons are necessary when secretions, excretions, blood, or body fluids are likely to soil the clothing of the worker.

Masks and Eye Protection

As part of routine practices, masks and eye protection are worn to protect the health care worker from splashes of blood and other body fluids to the mucous membranes of the face. Masks and eye protection also form the basis of protection for diseases spread by the droplet route, e.g., influenza (see Transmission-based Precautions on page 18).

a) Masks

Not all masks are the same and therefore they are not necessarily interchangeable. **Surgical masks** should be more widely used in an office environment. They cover the user's nose and mouth and provide a physical barrier to fluids and particulate matter. Surgical masks are used to protect either the patient or the health care worker from droplets or splashes. They do not, however, guarantee protection against airborne infectious agents.

When worn while performing an invasive procedure, surgical masks minimize the risk of contaminating the site with droplet-borne organisms from the health care worker's nostrils. Similarly, they protect the health care worker from patient infections spread by large droplets.

N95 or equivalent respirators do the following:

- Filter particles one micron in size or smaller;
- Have a 95% filter efficiency;
- Provide a tight facial seal (less than a 10% leak).

The N95 terminology is specifically applied to those respirators that have been approved by the U.S. agency NIOSH. In Canada, there is no agency that similarly certifies respirators; as a result, respirators with equivalent characteristics but without NIOSH approval can be used. Fit testing should be done according to manufacturer's instructions. Fit checking (forceful inspiration to determine if the mask seals tightly to the face) should be done with each usage. For further information, access the Public Health Agency of Canada website at: http://www.phac-aspc.gc.ca/sars-sras/ic-ci/sars-respmasks_e.html.

Because facial structures differ, individual health care workers must be fit tested to ensure they wear an N95 respirator that provides them with the proper seal between the respirator's sealing surface and their face. Note that physicians, as employers, have a duty to ensure that nurses and staff are fit tested for N95 respirators if such respirators will be used in their practice. Detailed information on respiratory programs, including fit test procedures can be found at the U.S. Occupational Safety & Health Administration website: <http://www.osha-slc.gov/SLTC/etools/respiratory/index.html>.

N95 respirators or equivalent, when worn properly, maximize protection against airborne infectious agents and are used to reduce the risk of inhaling hazardous airborne particles. Infections spread by the airborne route include chickenpox and tuberculosis. Surgical masks will NOT prevent acquisition of these infections.

b) Eye-protection

Eye protection can be in the form of safety glasses, goggles, splash guards or facial shields. Eyeglasses do not provide appropriate protection.

A respirator is a personal protective device designed to help provide the wearer with respiratory protection from airborne contaminants. It has a snug fit around the face to help avoid leaks where contaminants may enter. In the United States, OSHA requires respirators to be NIOSH certified (N95).

N95 respirators should be fit checked upon each application.

Fit testing is important for proper use of N95 respirators. Once you have been fit tested to a particular mask, check that you have no air leak around the mask (fit check) every time you put on the mask. Consult your local hospital's Infection Prevention and Control Service or the occupational health service for fit testing information. Beards interfere with the proper fit of N95 respirators.

iii) Handling and Disposal of Sharps

The following practices will minimize the risk of sharps injuries:

- **Do not recap needles.** If recapping is necessary, use a one-handed method of recapping. Mechanical devices designed for holding the needle sheath are available and can be used to reduce the likelihood of injury.
- Discard sharps at point of use in a designated sharps container.
- Pass needles in a manner to avoid injuries.
- Each person using a sharp must dispose of it him/herself.

Sharps Containers

A dedicated, puncture-resistant, tamper-resistant, leak-proof container, which is impenetrable by sharps, under normal circumstances, should be available. It should have a carrying handle plus a tight-fitting lid, bear a clearly identifiable biological hazard label and be designed so that used sharps can be dropped in with one hand. It should be easily accessible in every “point of use” area (e.g., individual examining room) and mounted above the reach of children. It should not be filled with disinfectant, or filled to the top with sharps. When it is filled to three-quarter capacity, the lid should be closed securely, and the container promptly removed and replaced. Used sharps are considered biomedical waste. Refer to the section on Waste Disposal, for appropriate disposal of sharps containers.

iv) Patient Appointments: Booking, Reception and Triage

Up until now we’ve discussed the basic infection prevention and control measures you should strive for as a baseline for every patient attending your office. You must, however, be additionally prepared for patients who will arrive with a communicable disease.

Assessing every patient for the possibility of infection is desirable, but not always practical. Think about your staff’s interactions with patients from the first phone call to the time of the appointment. Can your staff collect simple triaging information on the phone: symptoms, signs (cough, fever, diarrhea, rash) and significant exposures, e.g., travel, or exposure to a patient with chickenpox or a significant respiratory illness. Since the SARS outbreak, there has been heightened awareness of febrile respiratory infections and screening for these is particularly relevant. However, it is still important to screen for any communicable disease, keeping in mind your patient population (e.g., in a paediatric practice, screen for chickenpox). Refer to Appendix 2 for screening tools.

In the health care setting, blood borne infections are usually transmitted by sharps injuries. Most injuries happen after use, before or during disposal.

Be familiar with regulations on waste management.

Share the responsibility for infection control with your patients and consider the following:

1. Triage patients by phone when they call to book an appointment by asking the following:
 - i) Do you have a fever and a cough or worsening shortness of breath?
 - ii) Do you have diarrhea?
 - iii) Do you have a new rash?
 - iv) Have you been exposed to someone with chickenpox, shingles or measles in the past three weeks?
2. Post a sign at your entrance requesting that patients presenting with symptoms of infection identify themselves to the receptionist.
3. Make every effort to minimize contact in the waiting room with potentially infectious patients by directing these patients into an examination room as soon as possible.
4. Try to arrange your waiting room to provide a separation of at least one metre between patients who are symptomatic with respiratory or gastrointestinal symptoms when they cannot be immediately moved to an examination room.
5. A respiratory etiquette program is recommended, which includes:
 - Signage (an example of signage for respiratory etiquette is available at the Centers for Disease Control and Prevention website, <http://www.cdc.gov/flu/protect/covercough.htm>);
 - Providing surgical face masks as close to the entry of the office as possible, with instructions on proper use and disposal;
 - Providing tissues and waste containers;
 - Providing instructions to cover the nose and mouth when coughing or sneezing; and
 - Providing readily accessible alcohol-based hand sanitizers.

If you identify patients who may be symptomatic with specific communicable diseases, you should initiate transmission-based precautions. Patients presenting with a febrile respiratory illness and a travel history to areas with current human or avian infection, with an emerging respiratory pathogen, require particular vigilance, as they may be the sentinel cases for an unusual respiratory illness (e.g., SARS, avian influenza). An algorithm for these patients is presented in Appendix 2.

It is recommended that an alcohol-based hand sanitizer be widely available in the office setting such as:

- Outside the front door, or at the entry vestibule
- On the receptionist's desk
- In the waiting room in strategically located places with easy access for patients and out of reach of children
- Outside each exam room, or
- Within each patient exam room.

Many infections for which transmission-based precautions are indicated are reportable under the *Health Protection and Promotion Act*. These infections must be reported to the public health department (see the Public Health section in Appendix 4) to enable appropriate investigation and case finding.

Similarly, if you suspect an outbreak of a communicable disease in the community by seeing a cluster of patients with a given infection or symptom complex, report this to public health. Front-line health care providers are key to timely and effective public health.

For airborne precautions, the health care worker must wear an N95 or equivalent respirator and the patient a surgical mask and be separated from other patients.

Patients with infections often require laboratory testing. In selecting the laboratory venue (community versus hospital versus other), consider the degree and nature of infectivity of the suspected pathogens, as well as the patient's clinical status. Patients with suspected airborne infections should not go to community laboratories without first checking with their physician or with the laboratory.

No special or different room cleaning is needed after examining a patient under airborne precautions. The medical equipment used should be reprocessed according to your office protocol.

Transmission-based Precautions

Transmission-based precautions enhance your routine practices for certain pathogens or clinical presentations. These precautions are based on the mode of transmission and should be used (in addition to routine practices) for patients with infections transmitted by the airborne or large droplet routes. As well, they may be indicated for patients with certain highly transmissible or epidemiologically important organisms transmitted by direct or indirect contact. There are three categories of transmission-based precautions: **airborne, droplet and contact.**

i) Airborne Transmission Precautions

In diseases transmitted by the airborne route, the infectious organism enters the body through small droplets (less than five microns in diameter) or droplet nuclei inspired into the respiratory tract. Many outbreaks have occurred where people have had no closer contact than sharing the same room air for short periods of time. For this reason, consider making special arrangements for patients with suspected or confirmed respiratory tuberculosis, chickenpox (active or in the incubation period), and measles. Minimum standards of care for seeing patients with airborne infections are as follows:

1. Make every effort to see these patients at the end of the day, if clinical status allows.
2. Quickly triage the patient out of the common waiting areas; move the patient to an examining room. If possible, such patients should enter and exit through a separate entrance and go directly in and out of the examination room.
3. Provide a surgical face mask for these patients to wear at all times while in all areas of the office. For practices with a large paediatric component, masks for children are now available.
4. Keep the door to the treatment/exam room closed, and try to ensure that visitors and health care workers do not enter the room unless they are immune to the disease (where immunity is an issue). Open a window in the room, if this is possible.
5. Post a sign on the closed door to notify staff (see Appendix 3 for sample signs).
6. The **health care worker entering the patient's room must wear an N95 or equivalent respirator** for care of patients with infectious TB. They need not wear an N95 or equivalent respirator if they are documented to be immune to a suspected airborne infection (e.g., chickenpox, measles).
7. If possible, allow for sufficient time for the air to exchange in the room and be free of droplet nuclei before using the room for another patient with TB or for a non-immune patient (measles, chickenpox). The time required may be minimized if the patient has worn a surgical mask consistently.

8. If you routinely follow patients with infectious TB, consider buying a stand-alone device that provides high efficiency particulate filtration to the air and avoids recirculating potentially infectious air if vented outside.
9. Routine tuberculin skin testing of your office staff should be part of your office management if you routinely follow patients with infectious TB. Varicella vaccination should be offered to non-immune staff (refer to Health Care Worker section).
10. If there has been an unprotected exposure to tuberculosis or measles in your office, call your local public health department.

ii) Droplet Transmission Precautions

Droplet transmission refers to large droplets (greater than five microns in diameter) generated from the respiratory tract that are inoculated or directly deposited onto the mucous membranes of the eyes, nose or mouth of the new host. These droplets can be propelled a short distance (one metre) through the air during coughing or sneezing or during procedures that could generate aerosolization of respiratory secretions.

Consider the following:

1. See these patients at the end of the day, if clinical status allows.
2. Keep masks, eye protection and a hand hygiene agent on hand for the receptionist to use as soon as they encounter a patient where this is required.
3. Provide a surgical mask for these patients to wear at all times while in all areas of the office.
4. Quickly triage the patient out of the common waiting areas; move the patient to an examining room. Try to separate your patients by at least one metre when they cannot be triaged into an examination room.
5. Encourage respiratory etiquette (see sidebar).
6. Post a sign at the entrance of the room to notify staff.
7. Wear a surgical mask and eye protection when in direct contact with the patient. If soiling of the hands and clothing is likely, wear gloves and a gown.
8. At the end of the office visit, wipe all horizontal surfaces in the examining room that have been in contact with the patient, as well as equipment used to examine the patient (blood pressure cuff, stethoscope, etc.) with a detergent solution (refer to Low-Level Disinfection section).
9. Add contact precautions when caring for children with respiratory infection, as contamination of the environment is more likely.

Air exchange calculations are based on room size and size/motor of the exhaust fan (ventilation system, HVAC). It takes 46 minutes for a 99.9% decrease in contaminant concentrations in a room with nine air changes/hour (refer to reference #5 at the end of this section).

Some respiratory viruses can remain viable in droplets that settle on objects in the immediate environment of the patient. Viruses such as respiratory syncytial virus (RSV), influenza, parainfluenza, and the SARS coronavirus survive long enough on surfaces to be picked up on the hands of other patients or personnel. For this reason, consider limiting these patients' stay in the waiting room.

Components of a respiratory etiquette program:

1. Post signs in appropriate languages at all entrances.
2. Provide readily accessible waterless hand hygiene products.
3. Separate patients with respiratory illness from other patients.
4. Protect personnel from contact by installing a plexi-glass barrier.
5. Place a box of surgical masks as close to entry as possible.
6. Provide masks to all patients with new onset respiratory symptoms.
7. Provide tissues to patients who cannot wear a mask.
8. Provide container for disposal of mask or tissue.

Contact precautions should be followed for antibiotic-resistant organisms such as MRSA and VRE.

It is recommended that the charts of patients with antibiotic-resistant organisms be tagged to facilitate recognition on subsequent visits.

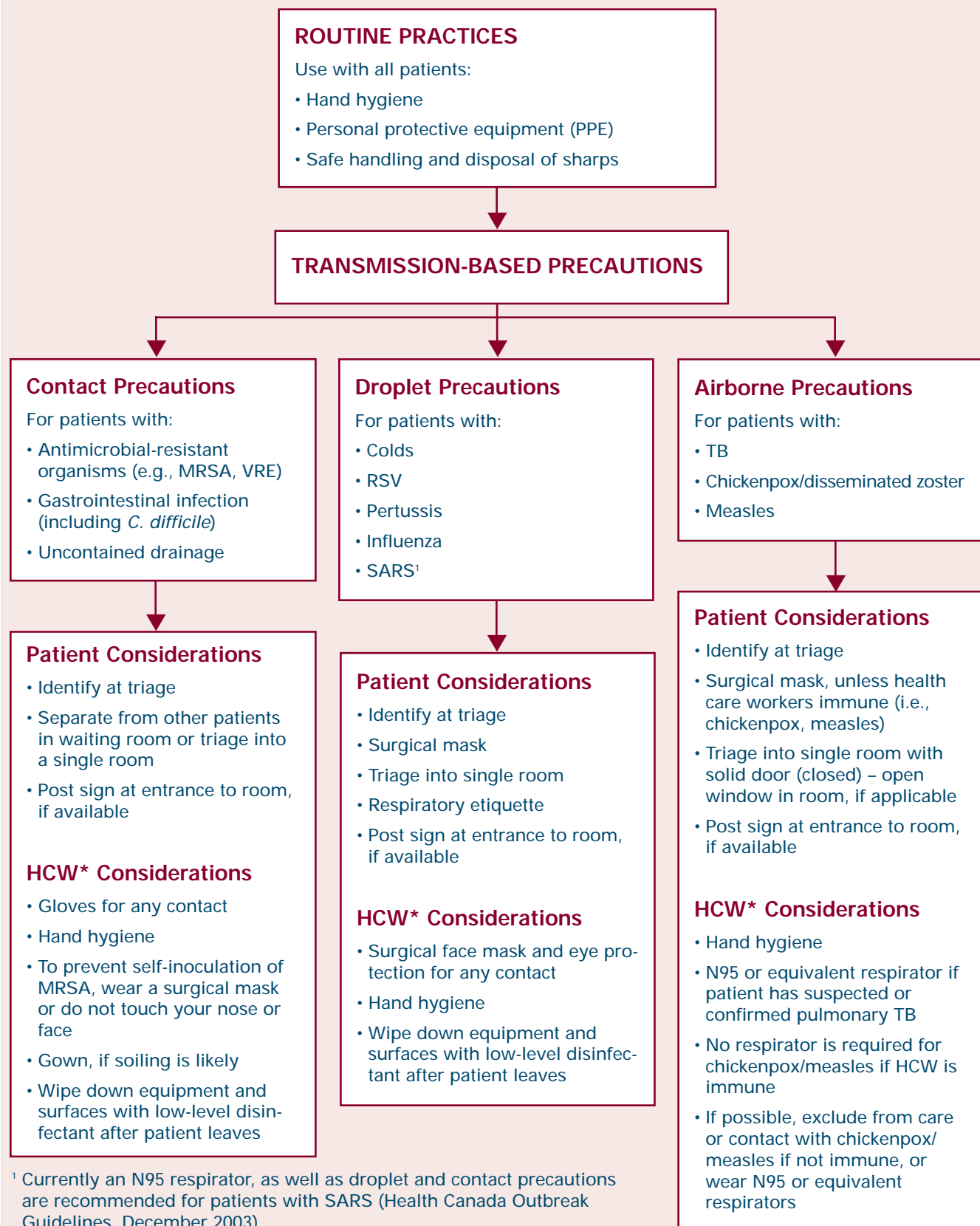
iii) Contact Transmission Precautions

Contact transmission includes direct and indirect contact. Direct contact occurs when there is direct physical contact between the source and the susceptible host, or direct person-to-person contact. Indirect contact spread happens when a host comes into contact with a contaminated intermediate object. Examples of patients requiring contact precautions are those with gastroenteritis or antibiotic-resistant organisms such as MRSA or VRE.

Consider the following:

1. See these patients at the end of the day, if clinical status allows.
2. Quickly triage the patient out of common waiting areas; move this patient to an examining room. Assure that the patient is separated from other patients when they cannot be triaged into an examination room.
3. Post a sign at the entrance of the room to notify staff.
4. Wear gloves for any patient contact and for contact with items touched by the patient. Wear a gown if soiling of clothing is likely.
5. At the end of the office visit, wipe all horizontal surfaces in the examining room that have been in contact with the patient, as well as equipment used to examine the patient (blood pressure cuff, stethoscope, etc.) with a detergent solution (refer to Low-Level Disinfection section).

Colonization and infection with strains of bacteria that are resistant to a multitude of commonly used antibiotics are causing problems for all health care facilities, including both acute and long-term care facilities. The highest risk for acquisition of an antibiotic-resistant organism such as methicillin-resistant *staphylococcus aureus* (MRSA) or vancomycin-resistant enterococcus (VRE) is having been hospitalized in either an acute care or long-term care facility. These patients may require follow-up or routine care in a physician's office. It is therefore important to recognize that these organisms can be transmitted and that precautions are required to minimize their spread.



¹ Currently an N95 respirator, as well as droplet and contact precautions are recommended for patients with SARS (Health Canada Outbreak Guidelines, December 2003).

*HCW – Health Care Worker.

To prevent health care workers from inadvertent self-inoculation with MRSA, some experts recommend that health care workers also wear surgical masks when in contact with patients colonized or infected with MRSA.

Methicillin-resistant *Staphylococcus aureus* (MRSA)

S. aureus is a gram positive bacterium and is a common cause of serious bacterial infections. *S. aureus* is spread by contact usually from the hands of health care providers.

S. aureus is part of the normal flora of human beings, colonizing the nose and skin of 10-40% of the population. MRSA are resistant to all penicillins and cephalosporins. MRSA, in general, remains susceptible to a few antibiotics (e.g., vancomycin, linezolid) although this may already be changing.

Eradication of colonization of MRSA may be considered for selected patients. An infectious diseases physician can be contacted for further information.

Vancomycin-resistant Enterococcus (VRE)

Enterococci constitute part of the normal flora of the human intestine. The major concerns with VRE are the limited number of therapeutic options, and the potential for the resistance gene to spread to other organisms.

VRE are spread by contact, usually from the hands of health care providers, but they are also very likely to be spread by contaminated patient care equipment or environmental surfaces.

iv) Prevention of the Development of Antibiotic-Resistant Organisms

Although routine practices and contact precautions are important strategies in preventing the spread of antibiotic-resistant organisms, judicious antibiotic use is a critical measure to prevent their development. All antibiotic management should be evidence-based and physicians should resist the temptation to succumb to patient pressure.

References:

1. Guideline for Hand Hygiene in Health-Care Settings, Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Centers for Disease Control and Prevention, 2002.
2. Infection Control Guidelines – Hand Washing, Cleaning, Disinfection and Sterilization in Health Care. Health Canada Steering Committee on Infection Control Guidelines. Available on-line at: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/98pdf/cdr24s8e.pdf>.
3. Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care. Health Canada, Volume 25S4, July 1999.
4. Guidelines for Preventing the Transmission of Tuberculosis in Canadian Health Care Facilities and Other Institutional Settings. Health Canada, 1996. Available on-line at: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/96vol22/22s1/index.html>.
5. Frequently Asked Questions, including air exchange information, available on-line at the Francis J. Curry National Tuberculosis Center website: http://www.nationaltbcenter.edu/resources/tb_control_faq.cfm

HEALTH CARE WORKERS

Section 2

OCCUPATIONAL HEALTH CONSIDERATIONS

As the employer, implement reasonable measures to minimize the risk of your employees acquiring or spreading infection.

Immunization of Personnel

Medical office workers will be exposed to communicable diseases, and should be immune to vaccine preventable illness.

In the best interests of your patients and employees, strongly encourage your staff to know their immunization status and have their immunizations up-to-date. Schedules and indications for vaccines available for medical office workers are as follows:

POLIOMYELITIS: All medical office workers in close contact with individuals who may be excreting wild or vaccine strains of poliovirus should have completed a primary course of immunization against poliovirus. If a primary course has not been completed, the series should be completed with IPV (inactivated polio vaccine) regardless of the time interval since the last inoculation.

MEASLES: In Ontario, vaccination against measles (rubeola) is recommended for all adults born after 1956 who do not have a documented record of measles immunization or who are known to be seronegative.

RUBELLA: Female office workers of child-bearing age should be immune to rubella. Those without documented immunity should be vaccinated with MMR (measles, mumps, rubella) vaccine unless there are contraindications. Females should avoid pregnancy for one month after vaccination. Vaccination should also be offered to susceptible individuals of either sex, who may, through close contact, expose pregnant women to rubella.

INFLUENZA: All health care workers are strongly encouraged to be vaccinated annually against influenza. For those with a contraindication to vaccination (e.g., anaphylactic egg allergy), antiviral medications can be taken after close, unprotected contact with an infected individual.

HEPATITIS B (HBV): Immunization against HBV is recommended for all health care workers who may be exposed to blood, blood products, or sharps injuries. Post-immunization testing for anti-HBs one to six months after the last dose, is indicated for all health care workers. This will establish antibody response to determine the need for reimmunization should sufficient immunity not have developed after the first course. Procedures for health care workers who have sustained a percutaneous or mucous membrane exposure to blood are outlined on page 28.

TETANUS AND DIPHTHERIA TOXOIDS: This vaccine should be given once every ten years to all adults who have received a basic immunization series unless a significant exposure necessitates earlier administration.

Hepatitis B vaccination is a three dose series at zero, one and six months (for 11 to 15-year-olds, a two dose series at zero and four-six months is adequate).

PERTUSSIS VACCINE: Adults who have not previously received a dose of the new acellular pertussis vaccine should use the combined diphtheria-tetanus-acellular pertussis (dTdap) vaccine for their next booster shot. Currently, only one dose of this combined booster is recommended.

PNEUMOCOCCAL VACCINE: Indications for pneumococcal vaccine are irrespective of occupation. For adults they include, persons 65 years of age and over, adults with asplenia, splenic dysfunction or sickle-cell disease, and adults with the following conditions: chronic cardio-respiratory disease, cirrhosis, alcoholism, chronic renal disease, nephrotic syndrome, diabetes mellitus, chronic cerebrospinal fluid leak, HIV infections, and other conditions associated with immunosuppression.

VARICELLA VACCINE: Varicella vaccine (two doses given at least 28 days apart) is recommended for susceptible health care workers (history negative, IgG negative) unless the individual is immunocompromised or pregnant. A non-injection site rash can develop in approximately 5% of patients post-injection. In such cases, if the rash cannot be covered, the health care worker should not work with high risk (e.g., immunocompromised) patients, or alternatively, should not work until the rash has crusted or healed.

***Two-Step Tuberculin Skin**

Test: The two-step TST is used to differentiate patients with waned immunity to TB or prior Bacillus Calmette-Guerin (BCG) from those who have recently converted. An initial TST is given by injecting 5TU PPD intradermally on the volar aspect of the arm. The result is read within 48-72 hours. Results must be documented in the patient's chart in mm. Do not record as positive or negative. If the test result is 0 - 9 mm. **of induration**, a second test is given in the opposite arm between one and four weeks after the first. A skin test result of 10 mm. or more of induration is considered to be significant, and indicative of old TB or BCG. For individuals who are known to be HIV positive, or household contacts of a patient with infectious tuberculosis, 5 mm. or more of induration are considered significant. Public health should be informed of all significant reactions.

Tuberculin Skin Test (TST)

A TST using the two-step skin test* is recommended at the beginning of employment for all persons who work in the medical office, if there is no documentation of a previous negative test within the past 12 months. Persons who are known tuberculin positive, or who test positive with the two-step method should have medical follow-up to rule out active disease. Further skin tests in these individuals are of no benefit. Routine follow-up skin testing for health care workers with negative or insignificant TST is indicated in the health care setting under the following circumstances:

- a) Exposure to known case of infectious tuberculosis;
- b) As supportive evidence if there are clinical symptoms suggesting active tuberculosis; or
- c) Annually, if workers are at risk of contact with patients or specimens with tuberculosis, or more frequently if practice is in a community with high prevalence of TB.

The local Medical Officer of Health can advise on the need for routine skin testing, which depends on the prevalence of tuberculosis in the community and in your practice.

Personnel Health

The Health Care Worker Acquiring Disease

Those working in an office setting are usually concerned about contracting illnesses from patients. You should be able to minimize such occurrences by practicing the principles discussed in this guideline, including:

1. Triaging your patients appropriately.
2. Practicing routine practices, including hand hygiene, before and after each patient contact.
3. Using transmission-based precautions, where indicated.
4. Washing and/or disinfecting your office space and medical equipment appropriately (refer to the General Housekeeping of the Office section).
5. Discarding sharps promptly at point of use, and not recapping needles.
6. Ensuring adequate and appropriate immunization of all employees.

Unique situations that might warrant particular attention by a health care worker include:

A. Dermatitis

The protective skin barrier is broken in people with chapped hands or eczema, and puts one at increased risk of acquiring and transmitting infection through this exposed area. Practice good skin care and cover any dermatitis with occlusive bandages. Wear gloves if you anticipate exposure to blood or other body fluids.

B. Immunocompromised Staff

Recognize that immunocompromised staff members are at increased risk of acquiring, or may have more severe consequences from acquiring infection from patients. Immunocompromised staff may also be at risk of shedding viruses (e.g., influenza) for prolonged periods. Assess whether immunocompromised staff in your practice are at higher risk, and where feasible, tailor job description and exposures accordingly.

The Infected Health Care Worker

It is beyond the scope of this guideline to review all infectious diseases, but a brief comment on the common ones will capture general principles. As a first statement, if you are sick, use your best judgement about working. If you have a fever, that is usually a good indication you should be at home. If this is not feasible, use the best information available to prevent patients from becoming infected. Scrupulous hand hygiene is essential to prevent transmission of infection.

- a) **The Common Cold:** Rhinoviruses are contagious through both droplets and contaminated hands, e.g., after blowing your nose or sneezing. Practice hand hygiene after any contact with nasal secretions. Avoid seeing immunocompromised patients during this time. If you must work, wear a surgical mask and wash hands frequently.

- b) **Influenza:** Influenza is also spread through droplets and contaminated hands. Fever and systemic symptoms (headache, malaise, myalgia) favour a diagnosis of influenza over the common cold. If you have influenza or an influenza-like illness, refrain from working until well. If you must work, wear a surgical mask, wash hands frequently, and take particular care with high risk patients (e.g., immunocompromised, chronic cardiac or pulmonary disease). Annual vaccination is the best form of prevention.
- c) **Herpes Simplex Virus Infections:**
- i) **The cold sore:** Fresh lesions contain numerous infectious particles of Herpes simplex virus. If possible, keep the lesion covered during patient visits, especially when seeing immunocompromised patients. Avoid touching your face and wash your hands frequently.
- ii) **Herpetic whitlow (herpetic finger infection):** Herpetic whitlow may present as single or multiple vesicular skin lesions, or as a swollen discoloured area resembling a paronychia. It should not be incised. All persons with herpetic whitlow **MUST** be excluded from direct patient contact until the lesion is resolved, as gloves will not provide adequate protection for the patient.
- iii) **Shingles:** A susceptible patient exposed to a health care worker with shingles may get chickenpox. Dermatomal zoster is much less infectious than chickenpox and the risk of transmission is minimized if the lesions are covered. Health care workers may work, in most cases, if the lesions can be covered and good hand washing technique is used. Health care workers with shingles must not work with high risk patients (e.g., newborns, immunocompromised patients) until lesions are crusted.
- d) **Enteric infection:** Health care workers with vomiting and diarrhea should stay home because of the contagion of these illnesses.
- e) **Tuberculosis:** Health care workers with pulmonary or laryngeal tuberculosis should be excluded from work until symptoms are improved on compliant therapy and three consecutive sputum specimens collected on different days have smears negative for acid-fast bacilli. If infection is smear negative, two weeks of compliant therapy with clinical improvement should be adequate. Your local health unit will routinely assess any patient with TB for infectiousness, and let them know if it is safe to return to work. If you are uncertain about when it is safe for a staff member to return to work, consult your local Medical Officer of Health. Health care workers with extrapulmonary and extralaryngeal tuberculosis do not usually require work restrictions.

Contact your local Medical Officer of Health for more information (see page 50).

Viruses can be shed in stool even when symptoms are resolved. It is prudent for health care workers to stay off work for 24 hours after resolution of symptoms of gastroenteritis.

Blood Borne Infections

The policy *Physicians with Blood Borne Pathogens* outlines the College's expectations of physicians who have a blood borne infection (HIV, HBV or HCV) and perform exposure-prone procedures. It is available on-line at www.cpso.on.ca under the "Policies" section. Although the risk of transmission is low, it is not zero, thus certain precautions must be taken.

The essential points in the policy are the following:

- Health care providers who perform procedures in which there is a risk of transmission have a duty to know their serologic status.
- Individuals have fundamental human rights that limit the choice of measures to reduce the risk of transmission such as the right to privacy and individual autonomy.
- Information about the serological status of individuals must be treated in strictest confidence.
- All physicians performing exposure-prone procedures are ethically obligated to know their personal serologic status with regard to HBV, HIV and HCV. Physicians should know their status for their own health and to prevent exposing patients to unacceptable risks. Periodic testing is smart medicine.
- If a physician who performs exposure-prone procedures learns that he or she is positive for HBV, HIV or HCV, he or she is ethically obligated to get advice on their medical practice. An expert panel knowledgeable about the issues should give this advice.

By stating that it is the physician's ethical obligation to follow these steps if he or she is performing exposure-prone procedures, the College is making clear its expectation that physicians who do not follow these steps are behaving unethically.

References:

1. Canadian Immunization Guide, Health Canada, Sixth Edition, 2002. Available on-line at: <http://www.phac-aspc.gc.ca/publicat/cig-gci/index.html>.
2. Public Hospitals Act, 1990, Revised Statutes of Ontario: Regulation 965.
3. National Advisory Committee on Immunization. Prevention of pertussis in adolescents and adults. Canada Communicable Disease Report Vol. 29;ACS-5, September 1, 2003.
4. Centre for Infectious Disease Preparedness, UC Berkeley School of Public Health. For more information, visit www.idready.org.
5. Communicable Diseases Surveillance Protocols can be accessed on-line at www.oha.com.
6. Centers for Disease Control and Prevention, Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health-Care Facilities; 1994. MMWR 1994; 43 (No. RR-13).
7. Guidelines for Preventing the Transmission of Tuberculosis in Canadian Health Care Facilities and Other Institutional Settings, Health Canada, 1996. Available on-line at: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/96vol22/22s1/index.html>.
8. Canadian Tuberculosis Standards, 5th Edition, Canadian Lung Association/Canadian Thoracic Society and Health Canada, 2000. Available on-line at: <http://www.phac-aspc.gc.ca/publicat/cts-ncla00/index.html>.
9. Prevention and Control of Occupational Infections in Health Care. Health Canada, 2002. Available on-line at: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/02vol28/28s1/index.html>
10. Physicians with Blood Borne Pathogens, College of Physicians and Surgeons of Ontario, 1998. Available on-line at: www.cpso.on.ca.

Employee Protocol Following Significant Exposure to Blood

Options Under the *Health Protection and Promotion Act*

Where the health care worker has been potentially exposed to a blood borne pathogen and the patient does not consent to be tested, the health care worker may have remedies under the *Health Protection and Promotion Act*. If the potential exposure occurred while the health care worker was providing emergency services to that patient, the health care worker may apply to the Medical Officer of Health, who may make an order requiring the patient to be tested to determine whether the patient carries a virus that causes a prescribed communicable disease.

For further information, see www.health.gov.on.ca/english/providers/legislation/bill_105/105_qa.pdf

Blood borne infections of concern include hepatitis B (HBV), hepatitis C (HCV), and human immunodeficiency virus (HIV). Hopefully, all health care workers will have been vaccinated for HBV and will be considered immune. However, a prompt and organized approach is still required when staff members are accidentally exposed to blood or body fluids through percutaneous (needle stick) or mucous membrane (splash) accidents. In particular, a decision will have to be made about the need to initiate post-exposure prophylaxis for HIV.

1. Provide Immediate First Aid

After sharps injuries, encourage bleeding, then wash the area thoroughly but gently with soap and warm water. Do not scrub. If blood or body fluid is splashed in the eyes, flush out the eyes well for at least 10 minutes with cold water. If splashed in the mouth, flush mouth for at least 10 minutes.

2. Obtain Patient Consent for Testing

Have another health care worker, i.e., not the one who had the exposure, obtain patient consent for patient testing for blood borne pathogens. Document the consent process in the chart.

3. Baseline and Follow-up Serology

The individual who has had a significant exposure to blood or body fluids will require baseline and follow-up serology to HBV, HCV, and HIV. This should be arranged in conjunction with your consultant or upon the advice of public health.

4. Document the Incident

The Workplace Safety and Insurance Board's report form must be completed immediately. Record the date and time of the incident, what the worker was doing, what protective measures were being employed at the time, and what action was taken after exposure.

5. Provide HIV Prophylaxis as Indicated

Post-exposure prophylaxis for HIV infection should be administered as soon as possible, preferably within hours of exposure. High risk exposures must be differentiated from low risk exposures (refer to Appendices 6 to 9). Have a plan in place about whom to contact should there be an incident, ideally someone experienced in the use of anti-HIV medication. Refer the exposed individual for assessment and management to this specialist, to the nearest emergency room, or contact your local public health department.

Have a plan in place about whom to contact should there be an incident.

6. Provide Hepatitis B Prophylaxis as Indicated

The risk of acquiring hepatitis B infection after percutaneous exposure can be as high as 25%, depending on the infectious status of the source case. Ideally, all health care workers will have been immunized and proven immune, post-immunization. However, for situations where such is not the case, hepatitis B prophylaxis should be initiated as soon as possible after the incident, and depends on the following variables: vaccination status of the staff member, anti-HBs level, and HBsAg status of the source. Current recommendations of the National Advisory Committee on Immunization are outlined in Appendix 10.

Refer to Appendix 10 for course of action for health care workers' possibly exposed to hepatitis B.

7. Hepatitis C

The risk of transmission following percutaneous exposure is about 3%. Exposed health care workers should be monitored for acquisition of hepatitis C. If infection is acquired, an expert should be consulted regarding treatment. **Immunoglobulin is of no proven efficacy.**

Refer to Appendix 11 for course of action for health care workers' possibly exposed to hepatitis C.

References:

1. Canadian Immunization Guide, Sixth Edition, 2002.
2. MMWR. June 29, 2001. Vol. 50, No. RR-11 Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Post-exposure prophylaxis.
3. Gerberding, JL, Occupational Exposure to HIV in Health Care Settings. N. Engl. J. Med. 2003; 348-826-833.

Section 3

THE ENVIRONMENT

General Housekeeping of the Office

Surfaces in the office such as in public areas, exam tables, counter tops, floors and toilets need to be cleaned immediately when they are visibly soiled.

Detergent disinfectants clean and disinfect.

Phenols leave films and can depigment the skin. Do not use them on surfaces that will be in contact with infants as the phenolic can be absorbed and have neurological side effects. Many commercially available products, which can be purchased in a grocery store, might have phenol as the active ingredient. Check all labels when selecting products.

Note about bleach:

Sodium hypochlorite solutions should be prepared weekly and stored at room temperature in an opaque container to ensure the concentration is maintained. Bleach solutions are inactivated by the presence of organic matter and are not cleaning agents, so they should only be used after the item has been cleaned with a detergent.

Medical offices should be cleaned at the end of every day, unless a situation arises such as a visibly soiled surface that warrants immediate attention. General housekeeping routines involve cleaning and disinfecting surfaces, toys and objects with a low-level disinfectant. Cleaning of body fluid spills requires special consideration. Try to keep the examining rooms in your office as minimally cluttered as possible. This will facilitate cleaning.

i) Materials and Practices

The following disinfectants are suggested for use in the daily cleaning and disinfection of all surfaces in the office:

- quaternary ammonium compounds
- sodium hypochlorite (household bleach) (1:100 dilution prepared weekly)
- hydrogen peroxide-based product
- phenolic

All are detergent disinfectants except for bleach (see sidebar). These products come as a liquid, although some are available as disinfectant-impregnated wipes. Always have either a bottle of appropriately diluted disinfectant or disinfectant wipes available.

Can the Detergent Disinfectant be Used on Everything?

Yes, it can be used on:

- baby scales
- table tops
- floors
- sinks
- toilets

Examination tables: Uncovered examination tables should be cleaned between patients. Table covers, linen, paper, plastic, etc., should be changed between patients. If there is a body fluid spill, clean and disinfect the table after removing the cover, (see Spot Cleaning of Body Fluid Spills) otherwise clean the table daily.

Toys: Frequently touched toys should be cleaned daily with a freshly prepared 1:100 bleach solution or appropriately diluted hydrogen peroxide solution. Let them air dry. Phenolics should not be used. If the toys are visibly soiled, wash them first with soap and water, and then disinfect. Do not have cloth or plush toys as they cannot be cleaned or disinfected properly.

Computers: If computers are in exam rooms, it is strongly recommended that you cover the keyboard with a cover to facilitate cleaning. The keyboard

and mouse should be included in the routine cleaning protocol.

Magazines/Books: Throw out regularly.

ii) Spot Cleaning of Body Fluid Spills

1. Wear household gloves while cleaning.
2. Wipe up as much of the visible material as possible with disposable towelling and discard in a lined, covered garbage container. For disposal of this garbage, refer to Waste Disposal section (page 33).
3. Clean the spill area with the prepared detergent disinfectant. Rinse and dry with a disposable towel.
4. After the spills are wiped up and cleaned, disinfect the surface with the 1:100 dilution of bleach (1:10 dilution if large blood spill) by putting a small amount of the solution on the area and wiping it with a paper towel.

Carpets are not recommended for high traffic areas. If spills occur on carpets, remember that bleach may damage the carpet and so another agent should be used. In certain cases, cleaning carpets may not be sufficient, and replacement and disposal of carpeting may be required.

Sharps, including broken glassware, should be picked up with a dustpan and scraper. Discard in a safe manner to avoid injuries (see Waste Disposal section). Wash dustpan and scraper, if soiled.

iii) Equipment and Material Maintenance Practices

A. Medication/Vaccination Refrigerator

In order to ensure that the vaccines given to patients are fully effective, physicians are expected to do the following:

- Always be aware of the recommendations for storage and handling issued by the medication/vaccine's manufacturer.
- Always keep vaccines refrigerated within the temperature range recommended by the vaccine's manufacturer.
- Wherever possible, store vaccines on the middle shelf of the refrigerator. Never store vaccines on the door shelves.
- Never leave vaccines out of the refrigerator, except when preparing the syringe.
- Never prepare vaccine doses in advance of seeing the patient by pre-filling syringes or leaving syringes ready on the counter.
- Check vaccine expiry dates regularly, and only order a one to three-month supply of vaccine. Always check expiry date before use.
- Always return expired vaccines to the vaccine-ordering source.
- Discard outdated medications. Designate an annual time to review medications in the refrigerator.

Be Prepared! Keep ice packs in the freezer and cooler bags on hand to transport or store medications in the event of a power failure or fridge malfunction.

- Call the local public health department or the vaccine's manufacturer for advice if there is reason to suspect that the vaccine may be spoiled.
- All refrigerators used to store vaccines should be equipped with a maximum-minimum thermometer to ensure that the vaccines have not been exposed to a temperature that is outside the allowable range. For more information, contact your local public health department.
- Temperatures should be recorded twice a day in a vaccine temperature logbook, which can be obtained from local public health units.
- To avoid malfunction, defrost refrigerator as often as necessary, or when there is ice build up of one centimetre or more. Vaccines should be maintained in a working refrigerator and the temperature monitored during defrosting.
- Disinfectant used for environmental cleaning can be used to clean the refrigerator.

B. Multidose Vials

- See the product leaflet for recommended duration of use after entry of multidose vial (e.g., PPD 1 month, some influenza vaccines 10 days).
- Mark the product with the date it was first used to facilitate discarding at the appropriate time.
- Use strict aseptic technique when administering parenteral medications/vaccines. Limit access to select trained individuals, if possible.
- Refrigerate medications only if directed by manufacturer.
- Discard medication vials if contamination is suspected (if vaccine, return to local public health unit).

C. Sterile Irrigation Solutions

- Discard open bottles at the end of each day.
- Use small bottles, if possible, and store according to manufacturer's recommendations.

D. Ophthalmology Ointments and Drugs

- Check expiration date of medications before each use.
- Discard multi-use eye drops and ointments when manufacturer's expiration date is reached.
- Replace tops of ointments and drops immediately after use.
- Discard ophthalmic medications immediately if there is any possibility that they have been contaminated.

References:

1. Vaccine Storage and Handling Guidelines, MOHLTC, 2003, www.health.gov.on.ca.
2. Vaccine Storage, College of Physicians and Surgeons of Ontario, 2004. Available on-line at www.cpsso.on.ca.

The use of multidose vials is discouraged. Multidose vials have been implicated in the outbreak of blood borne pathogens; single dose vials are always preferable. Never re-enter a vial with a used needle or syringe.

The tip of the ophthalmic tube/dispenser should not touch the patients' conjunctiva or come into contact with tears. If this happens, consider the item to be contaminated and discard.

Waste Disposal

Waste from any health care facility is divided into two categories: biomedical and general. Legislation dictates that biomedical waste be handled and disposed of in a manner that avoids transmission of potential infections. It is necessary to understand the differences between these types of waste so that clinics and private offices can separate the waste, and make arrangements for appropriate disposal of biomedical waste.

Biomedical Waste

The Ontario Ministry of the Environment's Guideline C-4, The Management of Biomedical Waste in Ontario, addresses waste generated from professional offices and includes:

Anatomical waste consisting of tissues, organs and body parts, not including teeth, hair and nails, and;

Non-anatomical waste consisting of:

- i) Human liquid blood or semi-liquid blood and blood products; items contaminated with blood that would release liquid or semi-liquid blood, if compressed; any body fluids contaminated with blood, and body fluids excluding urine and feces removed in the course of surgery or treatment;
- ii) Sharps including needles, needles attached to syringes, and blades; or
- iii) Broken glass or other materials capable of causing punctures or cuts which have come into contact with human blood or body fluids.

Store waste safely until transported to an appropriate facility for disposal by incineration, autoclaving, chemical treatment or other means, as approved by the Ministry. By law, only a licensed biomedical waste company can transport biomedical waste for disposal, but trained, non-licensed personnel may transport small amounts of waste to a hospital or laboratory for disposal.

Consult your district Ministry of the Environment office and/or Works Department for transport regulations in your jurisdiction. The Management of Biomedical Waste in Ontario guidelines are available at:

<http://www.ene.gov.on.ca/envision/gp/425e.htm>.

The Ministry's recommendation for colour-coding non-anatomical waste as per the above-cited definition is **YELLOW**. Anatomical waste should go in a **RED** bag. Ensure that the wastebasket, which is designated to contain the biomedical waste, is lined with the appropriate coloured bag.

General Waste

General office waste includes all other garbage that does not fit into the above-cited category, and requires no special disposal methods other than careful containment of waste during disposal and removal.

Soiled diapers or perineal pads can be discarded as 'general waste'.

General Recommendations for All Types of Waste

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

Medical Instruments

General Principles

Medical instruments are important tools of the profession. All equipment should be in good working order with preventative maintenance as required. Whether a product is reusable or designated as single-use has important infection control implications. Reusable items must be cleaned and disinfected or sterilized after use, according to manufacturer's instructions.

Single-Use Medical Devices

Many items used in the health care industry are designated by the manufacturer to be single-use only, e.g., syringes, plastic vaginal specula, mouthpieces for pulmonary function testing. Items labeled "for single-use only" should not be reused.

Cleaning, Disinfection and Sterilization of Medical Instruments

Medical instruments must be cleaned, and then either disinfected or sterilized after each use. The cleaning step is actually the most important, as residual organic debris will compromise the disinfection and sterilization process. In addition to generic guidelines for reprocessed medical equipment, the manufacturer's guidelines for specific instruments should also be consulted and followed.

A classification system was developed to categorize medical instruments according to whether they contact sterile tissue, mucous membranes or intact skin. They are classified into one of three categories according to Spaulding: "critical", "semi-critical" or "non-critical". This classification determines their reprocessing requirements.

Third party reprocessing of single-use devices (SUD) occurs in some Ontario hospitals. Reprocessing is performed by third party reproprocessors approved by the Food and Drug Administration (FDA). Since 2000, the FDA has set strict regulations which require reproprocessors of SUDs to meet the same requirements as the original manufacturer of the device. They are required to provide scientific validation data, to track device use, to report adverse events, etc. for each device which is reprocessed. In essence, the reprocessed single-use device must be proven to be as good as new.

SPAULDING'S CLASSIFICATION OF MEDICAL INSTRUMENTS (modified)

CLASS	USE	REPROCESSING (minimum requirement)
Critical	Enters sterile body site or vascular system.	Cleaning followed by sterilization.
Semi-Critical	Comes in contact with intact mucous membranes or non-intact skin.	Cleaning followed by high-level disinfection.*
Non-Critical	Comes in contact with intact skin.	Cleaning followed by low or intermediate-level disinfection.

*For some semi-critical instruments (e.g., thermometers, ear syringe nozzle), intermediate-level disinfection can be used (refer to Table 4).

i) Cleaning of Instruments

- Staff must be protected when performing these activities. Personal protective equipment such as face protection, gloves and gowns are recommended.
- Instruments should be cleaned as soon as possible after use so that organic material will not dry. Organic material must be removed before disinfection or sterilization procedures are initiated as it interferes with these processes.
- Placing the instrument in a pre-soak of water or a solution of instrument detergent/enzymatic will help prevent drying of secretions and help facilitate the cleaning process.
- Instruments should be cleaned with an instrument detergent/enzymatic diluted in water according to the manufacturer's directions or alternatively, by ultrasonic machines also using instrument detergents.
- Careful attention must be paid to delicate or lumened instruments. Appropriate cleaning tools must be employed and care used to clean every surface. The cleaning tools must also be appropriately cleaned and disinfected.
- If possible, one designated staff person should be assigned the responsibility for cleaning and disinfection of equipment. Appropriate education or continuing education is strongly recommended for this person with regard to all equipment and when new equipment is purchased.
- The manufacturer's instructions should be followed and documented for each instrument reprocessed. This will provide references for orientation and training of staff, ensure consistency in reprocessing and can be used

Thorough cleaning of instruments to mechanically remove all organic material is of the utmost importance prior to either sterilization or disinfection. Organic matter, if present, will inactivate or interfere with the sterilization or disinfection process.

Do not use hand soap to clean instruments as emollients in soap could remain on the surface of the instrument and interfere with the disinfection or sterilization process.

Instruments that are considered to be critical items require sterilization (see Table 2).

to develop quality improvement activities. Written procedures should be kept near the reprocessing area. Procedures should be reviewed and revised regularly (see sample template format for procedure in Appendices 12 and 13).

ii) Sterilization and Disinfection: General

Factors which interfere with sterilization and disinfection, include:

- organic material, such as mucous, blood, pus, feces, saliva, etc.;
- nature of the microbial contamination and the number of organisms present;
- incorrect dilution (improper mixing) of the disinfectant;
- inadequate exposure (contact) time between instruments and sterilant/disinfectant;
- dilution of the sterilant/disinfectant, e.g., addition of wet instruments;
- loss of strength due to expired date;
- inadequate penetration of the sterilant/disinfectant into the instrument, e.g., channelled scopes;
- incorrect pH or temperature of the disinfectant;
- water hardness;
- incompatible detergents;
- presence of materials such as rubber and plastic.

iii) Sterilization

Sterilization completely kills all forms of microbial life including the most resistant forms, e.g., bacterial spores.

1. Steam Sterilization

Steam sterilization is the most practical and economical method for sterilizing medical instruments. Small tabletop steam sterilizers that are carefully maintained can be used for many years and are highly recommended for clinic and office settings.

GUIDELINES FOR STERILIZATION WITH STEAM AUTOCLAVES

Unwrapped instruments Non-porous, no lumen	3 minutes exposure	132-135°C
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Small wrapped packs	30 minutes	121-132°C
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Small autoclaves, similar in size to microwave ovens, are ideal for office use. Distilled water is recommended as the water source to prevent scale deposits on the instruments. It should be noted that microwave ovens are NOT appropriate for sterilization.

Unwrapped instruments should be used immediately so as not to contaminate the item; otherwise instruments should be wrapped (see Packaging on page 40).

The table below outlines suggested decontamination procedures for selected office instruments. The availability and utilization of institutional central sterilization departments by some physicians may influence the choice of reprocessing for some critical and semi-critical items. **Remember all items must be cleaned prior to disinfection or sterilization.**

Table 2 - Suggested decontamination procedures for selected office instruments

Instrument or item	Category	Requirements	Suggested Procedures
Acupuncture needle	C	ST	Sterilize or disposables preferred.
Alligator forceps	SC	HLD	High-level disinfectant or sterilize.*
Anal/nasal speculum	SC	HLD	High-level disinfectant or sterilize.*
Baby scales and/or work surfaces	NC	ILD/LLD	Wipe down with a low-level disinfectant (not phenolic when children exposed).
Biopsy forceps/pinches	C	ST	Sterilize or disposables preferred.
Blood pressure cuff, reflex hammers	NC	ILD/LLD	Wipe down with a low-level disinfectant (not phenolic when children exposed).
Colposcopy equipment	C	ST	Sterilize.
Cryosurgery tips	SC	HLD	Immerse the tip according to manufacturer's instructions.
Ear cleaning equipment, ear cures, otoscope tips	SC	HLD/ILD	Sterilize or boil 20 minutes or immerse in household bleach 1:100 (if plastic), or alcohol (70-90% ethyl) for 20 minutes. Clean the otoscope handle regularly. Disposable tips preferred.
Electrocautery tip for use on skin needle electrode (for electrodesiccation)	C	ST	Sterilize.
Endocervical curvettes	C	ST	Sterilize.
Fish hook cutters	C	ST	Sterilize.
Flexible fiberoptic endoscopes** (i.e., gastrointestinal, bronchoscopic, nasal)	SC	HLD	Clean all surfaces and channels carefully and immerse in HLD as recommended by manufacturer. Rinse well with water (preferably sterile), then 70% alcohol and hang to dry.
Flexible fiberoptic endoscope accessories (i.e., brushes, biopsy forceps)	C	ST	Sterilize.
Foot care instruments	C	ST	Sterilize.
Glucometers	NC	LLD	Establish routine cleaning procedure, and follow manufacturer's instructions for safe use.
Kimura spatula	C	ST	Sterilize or disposable spatula preferred.

Continued...

*For semi-critical items, high-level disinfection is the minimum standard for reprocessing. If sterilization is more accessible, it is preferred.

**Flexible fiberoptic endoscopes are particularly difficult to reprocess, given their lumens and delicate connections. Written policies for cleaning and disinfection should be available, and dedicated staff trained for these tasks. Refer to published guidelines for further information.

LEGEND:

C=Critical

SC=Semi-Critical

NC=Non-Critical

ST=Sterilization

LLD=Low-Level Disinfection

ILD=Intermediate-Level Disinfection

HLD=High-Level Disinfection

**Table 2 continued - Suggested decontamination procedures
for selected office instruments**

Instrument or item	Category	Requirements	Suggested Procedures
Laryngoscope blades	SC	HLD	Also assure laryngoscope handle is thoroughly washed after each use.
Laryngeal mirror	SC	HLD	Sterilize or high-level disinfectant.*
Neurologic test pin	C	ST	Sterilize or disposables preferred.
Peak Flow Meters	SC	HLD	Use disposable mouthpiece and disposable filters. Clean whole instrument in hot water and mild detergent/disinfectant, immerse in 1:50 dilution household bleach for 20 minutes. Rinse in tap water.
Pessary and diaphragm fitting ring	C	ST	Sterilize.
Respiratory therapy equipment (mouthpieces, nasal prongs, etc.)	SC	HLD	Disposables preferred.
Rigid metal sigmoidoscope, proctoscope, nasal endoscope, laryngoscope and laryngoscope blades	SC	HLD	Clean all surfaces and channels carefully, and sterilize or high-level disinfectant.
Scalpels	C	ST	Disposables preferred.
Stethoscope, bandage scissors	NC	ILD/LLD	Wipe with alcohol frequently (stethoscope: diaphragm and bell), ideally after each use.
Stitch cutter	C	ST	Sterilize or disposables preferred.
Surgical instruments	C	ST	Sterilize.
Suture removal equipment	C	ST	Sterilize or disposables preferred.
Tonometer, contact lenses	SC	HLD	Immerse in 1:50 dilution household bleach (1,000 ppm free chlorine) or 3% hydrogen peroxide for 10 minutes. Rinse in water and dry well.
Thermometer (glass)	SC	ILD	Immerse in 70-90% ethyl alcohol for 20 minutes or disposables, sheaths, or electronic thermometers preferred.
Ultrasound probes (skin contact)	NC	LLD	After each use, wipe gel off and clean thoroughly with LLD.
Ultrasound probes (mucous membrane contact, vaginal probes)	SC	HLD	After each use, wipe with detergent disinfectant, and then high-level disinfectant. Always use a probe cover.
Vaginal speculum (metal)	SC	HLD	High-level disinfectant or sterilize.* Disposable specula available.
Vaginal tenaculum	C	ST	Sterilize.

*For semi-critical items, high-level disinfection is the minimum standard for reprocessing. If sterilization is more accessible, it is preferred.

LEGEND:

C=Critical

SC=Semi-Critical

NC=Non-Critical

ST=Sterilization

LLD=Low-Level Disinfection

ILD=Intermediate-Level Disinfection

HLD=High-Level Disinfection

2. Dry Heat Sterilization (hot air ovens)

Dry heat should be used only for the materials that cannot be sterilized by steam. The principle advantage of dry heat sterilization is its penetrating power. The disadvantages are that heating is slow, and long exposure times and high temperatures are required, which could damage materials.

Time-temperature relationships for sterilization with hot air are:

170°C (340°F).....60 minutes

160°C (320°F).....120 minutes

150°C (300°F).....150 minutes

140°C (285°F).....180 minutes

These temperatures relate to the time of exposure after the attainment of the specific temperature. The time does not include the heating lag.

Monitoring the Sterilization Process

It is imperative that the sterilization process be monitored to ensure the integrity of the process.

Manual indicators on the machines, such as time, temperature and pressure gauges, must be monitored and recorded.

- Temperatures must reach a specific level and be maintained for specific periods to kill microorganisms. The greater the temperature, the less time required.
- Pressure is necessary to create the steam. Manufacturers set the pressure gauge.
- Steam must be saturated for effective sterilization. For tabletop autoclaves, water must be manually added.

Chemical indicators, such as tape that changes colour, are useful for distinguishing between processed and unprocessed items. Chemical indicators do not, however, imply that sterilization has taken place. Tapes are usually placed on wrapped products.

Biological indicators (BI) must be used regularly (see sidebar) to ensure that sterilization has occurred. All biological indicators must be used according to the manufacturer's instructions and records should be kept of these results. If biological testing indicates that sterilization has not been achieved, sterility of the instruments cannot be assured. It is very important that a process be in place in the event of a failure. If this occurs it is important to have a record describing the cause of the failure, corrective action and any recall of items.

What to do if the failure is a positive BI:

- Repeat the test. If practical, do not release any items that were processed since the last negative test. If this repeat test is negative, and there is not an indication of a system malfunction – continue as normal.
- If the repeat BI is positive again, review all items that were processed since the last negative test. Review the process to ensure this is not a

A logbook should be kept for each load.

How often should you use biological indicators? Although some guidelines say a minimum of weekly, the Canadian Standards Association (CSA) recommends daily biological indicator (BI) testing. The frequency of use of the sterilizer might be considered when deciding the frequency of testing.

Check with your sterilizer manufacturer to determine which biological indicator is appropriate for the specific sterilizer.

false positive. Complete a report that includes time, date, load description, results of mechanical and chemical monitoring, contact the manufacturer, and after repair and maintenance, rechallenge the autoclave with the BI. Resterilize the recalled items once the results of the BI are negative.

- Have a procedure for patient notification if instrument(s) were used on patient(s).
- Have a back up procedure to ensure your equipment will be sterilized as required, e.g., set of disposable devices, arrangement with a colleague to use their autoclave.

References:

1. Effective Sterilization in Health Care Facilities by the Steam Process, Z314.3-01. CSA International.
2. Lea and Febiger. Disinfection, Sterilization and Preservation, ed Block, 4th edition, Philadelphia, 1991.
3. Ontario Hospital Association. Reuse of Single-Use Medical Devices, January 12, 2004.
4. Reuse of Single-Use Devices, U.S. Food and Drug Administration. Available on-line at: <http://www.fda.gov/cdrh/reuse/index.html>.

Preventative Maintenance

Regular preventative maintenance and cleaning is required to assure the effectiveness of the machine. Records should be kept of any preventative maintenance and repairs performed. Use the instruction manual or contact the manufacturer. Assure distilled water is filled to the correct level and drained according to manufacturer's recommendations. Check the gasket for defects and deterioration. Assure proper placement of packs, and do not overload the chamber.

Packaging and Storage of Instruments

There are many types of packaging materials available, each with advantages and disadvantages. The following criteria must be kept in mind.

The packaging material:

- must allow the sterilant to enter the pack;
- must maintain the sterility of the contents and be impervious to the environment; and
- should minimize the contamination risk when the package is opened.

The most useful wrapping materials in the physician's office are plastic/peel pouches. They are easy to use, often with features such as self-sealing closures and chemical indicator strips, and come in a variety of sizes that can accept single or small groups of instruments. Be sure to mark the date the product was sterilized on the product wrapping.

Storing Instruments After Sterilization

It is critical that steam-sterilized packs be subject to a drying cycle prior to handling for storage. Wrapped packs should be carefully stored in clean, dry, dust-free areas (closed shelves), not at floor level, and should be away from debris, drains, moisture and vermin to prevent contamination and maintain sterility until the time of use. All stored equipment and instruments should be

Do not soak any sterile instruments in solutions before use. Keep all devices in sterile packs until use.

Inventory control and rotation should be used to avoid long storage.

left undisturbed as much as possible since handling may draw contaminants in through a bellows effect.

Check the following to determine if the integrity of the package has been compromised:

- Is the seal still intact?
- Is the package free from tears, dust, soil and dampness?
- Have the chemical indicators on the pack changed to the appropriate colour?

Shelf Life of Sterile Items

For items reprocessed in the office, if the integrity of the package has been maintained, the item remains sterile. A plastic dust jacket may greatly extend the shelf life of the package and should be used on muslin or crepe wrapped packs. If a sterile tray/package has been purchased and has an expiry date/label, follow manufacturer's guidelines and discard when outdated.

Time does not contaminate - events do.

References:

1. Drummond, DC. The Prevention of Cross Infection in the Physician's Office. College of Physicians and Surgeons of British Columbia, 1992.
2. Freidman C, Peterson K. Infection Control in Ambulatory Care, 2004, An Official APIC publication.
3. Well Being: A Guide to Promote the Physical Health and Safety and Emotional Well Being of Children in Care Centres and Family Daycare Homes. Canadian Pediatric Society, 2nd Edition, 1996.

iv) Disinfection

Disinfection is a relative term. Disinfection is a process that kills or destroys nearly all disease-producing microorganisms. Disinfectants are used on inanimate objects. There are three levels of disinfection depending on the resistance of the organism to inactivation.

The following list ranks the spectrum of microbial life in terms of resistance to destruction by heat or chemicals:

Microbes in Order of Increasing Resistance to Destruction

Bacterial spores (e.g., *Clostridium difficile*, *Bacillus anthracis*)



Mycobacteria (e.g., TB)



Non-lipid or small viruses (e.g., polio virus, coxsackie)



Fungi (e.g., candida, aspergillus)



Lipid or medium sized virus (e.g., herpes, HIV, Hepatitis B/C)



Vegetative bacteria (e.g., *staphylococcus*, *pseudomonas*)

Note: Prions, the cause of Creutzfeldt-Jakob disease (CJD) and variant CJD, are more resistant to sterilization than spores.

Disinfection Procedures

1. High-Level Disinfection (HLD)

Instruments that are considered **semi-critical** items must be subjected to high-level disinfection at a minimum.

Sterilization is always the preferred mode of reprocessing semi-critical medical equipment. However, for items that cannot tolerate sterilization, high-level disinfection should be used.

Thorough cleaning of instruments to mechanically remove all organic material is of the utmost importance prior to either sterilization or disinfection. Organic matter will inactivate or interfere with the sterilization or disinfection process, if present.

Instruments that contact mucous membranes are considered to be semi-critical items and must be high-level disinfected, as a minimum requirement. High-level disinfection kills vegetative bacteria, fungi, lipid and non-lipid viruses, and mycobacteria.

Disinfectants used should have a DIN number, and/or be hospital grade.

a) **Boiling:** Boiling offers a cheap and readily accessible form of high-level disinfection. It can be accomplished by using a “hot water disinfectant” which lowers a trivet of instruments into boiling water. Plain tap water can be used; if scale develops, a descaling agent can be added. It is essential that the contact time be at least 20 minutes after boiling has started.

Important points include:

- change water at least daily;
- keep water level full during the day;
- ensure all parts of the instruments are in contact with boiling water (i.e., open scissors, forceps);
- wash and dry the boiling vessel at the end of each day.

b) **Chemicals:** High-level disinfection with chemicals has been referred to as “cold sterilization”.

Some high-level disinfectants are also labeled as “sterilants”. Sterilization with these compounds requires many hours of contact. Use only according to manufacturer’s recommendations.

2. Intermediate-Level Disinfection

Intermediate-level disinfectants do not kill large numbers of bacterial spores in six to 12 hours, but can kill all other organisms in the preceding list. Small, non-lipid viruses (e.g., enteroviruses) may be resistant.

Running medical equipment through a dishwasher cycle can sometimes be used for the cleaning stage of reprocessing. It cannot be used for devices with lumens. Disinfection or sterilization must follow.

3. Low-Level Disinfection

Equipment that does not touch mucous membranes and only touches intact skin, e.g., stethoscopes, blood pressure cuffs, and baby scales require cleaning with low-level disinfectants. Such chemicals cannot be relied upon to destroy bacterial spores and tubercle bacilli, and often fail to kill many fungi and viruses. Germicidal activity is variable, depending on the concentration of the active ingredient.

References:

1. Rutala, WA. APIC Guideline for Selection and Use of Disinfectants. *AmJ Infect Control*, 1996; 24: 313-342.
2. Freidman, C, Petersen, K. *Infection Control in Ambulatory Care*, An Official APIC Publication, Jones and Bartlett Publishers, Sudbury, Mass., 2004.
3. Ontario Hospital Association, Reused Single-Use Medical Devices Ad-Hoc Working Group Report, January 12, 2004.

Table 3 - High-Level Disinfectants (HLD)

Chemical	Action	Application	Exposure Time	Comments
Glutaraldehyde	Sterilant HLD	Semi-critical devices	>20 minutes for HLD >10 hours for sterilization (or according to manufacturer's recommendations)	<ul style="list-style-type: none"> • Toxic. Rinse well. • Shelf life limited. • Requires well-ventilated room and safe work practices. Health care workers may be exposed to elevated vapour if equipment is processed in rooms with inadequate ventilation, when spills occur, or when there is an open immersion bath. The ceiling exposure value (CEV) is the maximum airborne concentration of a biological or chemical agent to which a worker is exposed at any time. The current occupational exposure limit that the Ontario Ministry of Labour has set for glutaraldehyde is a ceiling exposure value of 0.05 ppm. • The recommended in-use concentration of each preparation should be maintained for the product to maintain its effectiveness, therefore monitoring the concentration of glutaraldehyde is required. Follow manufacturers' recommendations.
Ortho-phthalaldehyde 0.55%	HLD	Semi-critical devices	12 minutes	<ul style="list-style-type: none"> • Shelf life limited. • Less occupational risks. • Rinse well.
Sodium hypochlorite 1,000 parts per million (ppm) (1:50 dilution of household bleach)	HLD	Limited application on semi-critical devices	>20 minutes	<ul style="list-style-type: none"> • Corrosive to metals. • Rinse well. • Does not clean. • If stored in opaque container can be prepared weekly. Otherwise, prepare daily.
Boiling	HLD	Semi-critical items that can be subjected to moisture and heat	>20 minutes	<ul style="list-style-type: none"> • Change water daily. • Clean vessel daily. • Keep water level full.

Table 4 - Intermediate/Low-Level Disinfectants (I/LLD)

Chemical	Action	Application	Exposure Time	Comments
Sodium hypochlorite, 500 ppm (1:100 dilution of household bleach)	I/LLD	Environmental surfaces	10 minutes	<ul style="list-style-type: none"> • Clean surface first, then disinfect. • Store in opaque container away from light – can be prepared weekly.
Alcohol, iso-propyl 60-90%	ILD	Environmental surfaces	Allow to dry	<ul style="list-style-type: none"> • Clean surface first, then disinfect.

Table 5 - Low-Level Disinfectants (LLD)

Chemical	Action	Application	Exposure Time	Comments
<ul style="list-style-type: none"> • Quaternary ammonium compounds • Accelerated hydrogen peroxide products • Sodium hypochlorite (1:100 dilution of household bleach) • Phenolics 	LLD	Daily cleaning and disinfection of all surfaces in the office		<ul style="list-style-type: none"> • Sodium hydrochlorite is a disinfectant agent and has no cleaning properties. • Phenols may leave a film; may depigment skin; do not use on items that will be used with infants.

WHMIS

The Workplace Hazardous Materials Information System (WHMIS) is a national hazard communication standard. There are three key elements:

- i) Cautionary labelling of containers of hazardous substances, called “controlled products”, e.g., disinfectants;
- ii) Providing material safety data sheets (MSDS); and
- iii) Worker education programs in Ontario.

WHMIS is implemented through two pieces of legislation:

- The Occupational Health and Safety Act; and
- WHMIS Regulation, Ontario Regulation 860.

Employers are obligated to uphold WHMIS standards in their workplace. Every physician should therefore familiarize himself or herself with the legislation. *WHMIS: A Guide to the Legislation* is a useful resource and is available at the Ministry of Labour website: www.gov.on.ca/LAB/english/hs/whmis.

Office Design/Renovations

Before you lease or renovate, or even when designing the internal set up of your office, review the questions you asked yourself at the beginning of this guideline to identify your needs and add to them the following:

- Am I serving a high risk population?
- Do I need clean or soiled storage rooms?
- Am I storing sterile supplies near, under or on surfaces that can get wet easily?
- Do I need more closed cupboards to store medical equipment?
- Can I have my reprocessing/sterilization room as a separate room clearly designed to separate the dirty side from the clean side, with enough counter space?
- Are there sufficient freestanding hand hygiene facilities available (sinks and/or waterless product dispensers)? Are they in each examination room, washroom, laboratory area, medication preparation area, and soiled and clean utility room?
- Are the hand hygiene facilities conveniently located near the entrance to the room?
- Is the waiting room big enough so that potentially infectious patients can be segregated?
- Is the environment/furniture easy to clean?
- Is the garbage bin near the door?

Conclusion

These guidelines have been developed to educate the medical community on current infection control practices necessary for an office practice. Some components are derived from legislation and regulations, and explicitly state what is expected of physicians. Other sections of the guidelines outline best practices developed to raise awareness and minimize the risk of transmission. Professional judgement and the realities of medical practices in Ontario will always inform how each best-practice recommendation is used by each doctor.

In the event that Ontario experiences a serious infectious disease outbreak, these best practices may be superseded by directives from the Ministry of Health and Long-Term Care, Public Health, the College, or another designated national or provincial organization. The risks of such a situation will hopefully be mitigated by careful consideration of these guidelines by all physicians and their teams in community health practices.

The following Appendices provide additional information on such topics as basic office supplies for infection, prevention and control; examples of signage; and contact information for medical officers of health and health units. A glossary of terms and useful resources also follow.

APPENDICES

Appendix 1: Basic Office Supplies for Infection, Prevention and Control

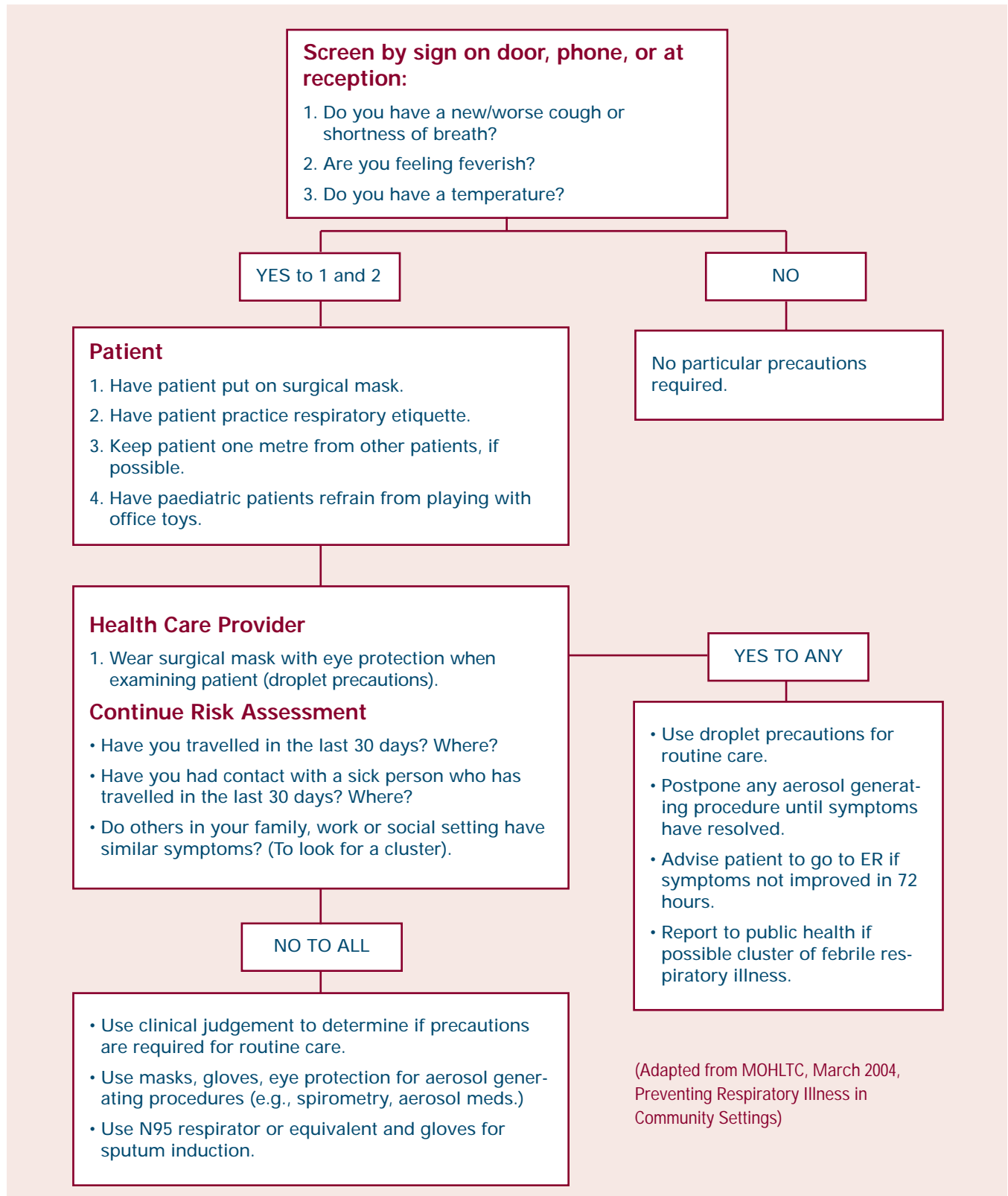
The following should be available in all offices:

- Hand hygiene agents.
- Personal protective equipment (PPE), including:
 - gloves;
 - surgical masks;
 - N95 or equivalent respirators;
 - gowns;
 - eye protection (i.e., goggles or face shield - eye glasses do not provide adequate protection);
 - disposable cardiopulmonary resuscitation devices or pocket masks.
- Antiseptics, cleaning agents, and disinfectants with WHMIS labels.
- WHMIS guidelines.
- Material safety data sheets (MSDS) book.
- Policy and procedure book(s).

The nature of your practice will determine the quantity of supplies you should have in stock. For example, a family physician will require more PPE than a psychiatrist.

Other pieces of equipment will depend on your practice. If you do minor procedures such as biopsies, you will need to have a sterilizer, as well as chemical and biological indicators for monitoring.

Appendix 2: Algorithm for Detection and Management of Patients with Febrile Respiratory Illness



Appendix 3: Examples of Signage

STOP

Contact Precautions



Wear gown
when entering room



Wear gloves
when entering room



Wash hands before
entering and leaving room

Wipe medical equipment after use

STOP

Droplet Precautions



Wear surgical face mask
when entering room



Wash hands before entering
and after exiting patient room



Wear eye protection
when entering room

Wipe medical equipment after use

STOP

Airborne Precautions



Wear N95 or equivalent
respirator when entering room



Keep door closed!



Wash hands before
entering and leaving room

Appendix 4: Public Health

Physicians contribute in numerous ways to the effective implementation of a sound public health program. An important function is to fulfill a role in community surveillance by recognizing and reporting to the public health department those patients with communicable diseases seen in your practice. Every doctor may only see one patient with a particular illness, but through the public health lens, an outbreak might be recognized. A list of the reportable diseases is outlined below.

Reportable Diseases:

The following specified reportable diseases (Ontario Regulations 559/91 and amendments under the Health Protection and Promotion Act) are to be reported to the local Medical Officer of Health.

AIDS	*Meningitis, acute
Amoebiasis	i. *Bacterial
*Anthrax	ii. Viral
*Botulism	iii. Other
*Brucellosis	*Meningococcal disease, invasive
Campylobacter enteritis	Mumps
Chancroid	Ophthalmia neonatorum
Chickenpox (Varicella)	*Paratyphoid Fever
Chlamydia trachomatis infections	Pertussis (Whooping Cough)
Cholera	*Plague
*Cryptosporidiosis	*Poliomyelitis, acute
*Cyclosporiasis	Psittacosis/Ornithosis
Cytomegalovirus infection, congenital	*Q Fever
*Diphtheria	*Rabies
*Encephalitis, including:	*Respiratory infection outbreaks in institutions
i. *Primary, viral	Rubella
ii. Post-infectious	Rubella, congenital syndrome
iii. Vaccine-related	Salmonellosis
iv. Subacute sclerosing panencephalitis	*SARS
v. Unspecified	*Shigellosis
*Food poisoning, all causes	*Smallpox
*Gastroenteritis, institutional outbreaks	*Streptococcal Infections, Group A, invasive
*Giardiasis	Streptococcal Infections, Group B neonatal
Gonorrhea	Streptococcus pneumoniae, invasive
*Haemophilus influenzae b disease, invasive	Syphilis
*Hantavirus Pulmonary Syndrome	Tetanus
*Hemorrhagic fevers, including:	Transmissible Spongiform Encephalopathy, including:
i. *Ebola virus disease	i. Creutzfeldt-Jakob Disease, all types
ii. *Marburg virus disease	ii. Gastmann-Straussler-Scheinker Syndrome
iii. *Other viral causes	iii. Fatal Familial Insomnia
*Hepatitis, viral	iv. Kuru
i. *Hepatitis A	Trichinosis
ii. Hepatitis B, C, D (Delta Hep)	Tuberculosis
Herpes, neonatal	*Tularemia
Influenza	Typhoid Fever
*Lassa Fever	*Verotoxin-producing E. coli infection indicator conditions including Haemolytic Uraemic Syndrome (HUS)
*Legionellosis	*West Nile Virus Illness,
Leprosy	i. West Nile fever
*Listeriosis	ii. West Nile neurological manifestations
Lyme Disease	*Yellow Fever
Malaria	Yersiniosis
*Measles	

Note: Diseases marked with an asterisk (*), and respiratory infection outbreaks in institutions, should be reported immediately to the Medical Officer of Health by telephone. Other diseases are to be reported by the next working day by fax or mail.

Appendix 4: Contact Information for Medical Officers of Health and Health Units

THE DISTRICT OF ALGOMA HEALTH UNIT

Sixth Floor, Civic Centre
99 Foster Drive
Sault Ste. Marie ON P6A 5X6
Tel: (705) 759-5287
Fax: (705) 759-1534
After Hours: (705) 254-6611

BRANT COUNTY HEALTH UNIT

194 Terrace Hill Street
Brantford ON N3R 1G7
Tel: (519) 753-4937
Fax: (519) 753-2140
After Hours: (519) 753-4937

GREY-BRUCE HEALTH UNIT

920 First Avenue West
Owen Sound ON N4K 4K5
Tel: (519) 376-9420
Fax: (519) 376-0605
After Hours: (519) 376-5420

CHATHAM-KENT HEALTH UNIT

435 Grand Avenue West
P. O. Box 1136
Chatham ON N7M 5L8
Tel: (519) 352-7270
Fax: (519) 352-2166
After Hours: (866) 446-8207

DURHAM REGIONAL HEALTH UNIT

Suite 210, Lang Tower
1615 Dundas Street East
Whitby ON L1N 2L1
Tel: (905) 723-8521
Toronto Line: (905) 686-2740
Fax: (905) 723-6026
After Hours: (905) 576-9991

EASTERN ONTARIO HEALTH UNIT

1000 Pitt Street
Cornwall ON K6J 5T1
Tel: (613) 933-1375
Fax: (613) 933-7930
After Hours: (613) 933-1375

ELGIN-ST. THOMAS HEALTH UNIT

99 Edward Street
St. Thomas ON N5P 1Y8
Tel: (519) 631-9900
Fax: (519) 633-0468
After Hours: (519) 631-9900

HALDIMAND-NORFOLK HEALTH UNIT

12 Gilbertson Drive
P.O. Box 247
Simcoe ON N3Y 4L1
Tel: (519) 426-6170
Fax: (519) 426-9974

HALIBURTON, KAWARTHA, PINE RIDGE DISTRICT HEALTH UNIT

200 Rose Glen Road
Port Hope ON L1A 3V6
Tel: (905) 885-9100
Fax: (905) 885-9551
After Hours Toll Free: 1 (888) 255-7839

HALTON REGIONAL HEALTH UNIT

1151 Bronte Road
Oakville ON L6M 3L1
Tel: (905) 825-6060
Fax: (905) 825-8588
After Hours: (905) 825-6000

CITY OF HAMILTON SOCIAL AND PUBLIC HEALTH SERVICES

1 Hughson Street North, 4th Fl.
Hamilton ON L8R 3L5
Tel: (905) 546-2424 Ext. 3505
Fax: (905) 546-4075
After Hours: (905) 546-3500

HASTINGS & PRINCE EDWARD COUNTIES HEALTH UNIT

179 North Park Street
Belleville ON K8P 4P1
Tel: (613) 966-5500
Fax: (613) 966-9418
After Hours: (613) 391-0564

HURON COUNTY HEALTH UNIT

Health and Library Complex
77722B London Road
R.R. #5

Clinton ON N0M 1L0

Tel: (519) 482-3416

Fax: (519) 482-7820

After Hours: (519) 482-7077

KINGSTON, FRONTENAC AND LENNOX & ADDINGTON HEALTH UNIT

221 Portsmouth Avenue
Kingston ON K7M 1V5

Tel: (613) 549-1232

Fax: (613) 549-7896

After Hours: (613) 541-3330

COMMUNITY HEALTH SERVICES DEPT.**LAMBTON HEALTH UNIT**

160 Exmouth Street
Point Edward ON N7T 7Z6

Tel: (519) 383-8331

Fax: (519) 383-7092

After Hours: (519) 383-8331

LEEDS, GRENVILLE & LANARK DISTRICT HEALTH UNIT

458 Laurier Blvd.
Brockville ON K6V 7A3

Tel: (613) 345-5685

Fax: (613) 345-2879

After Hours: (613) 345-5685

MIDDLESEX-LONDON HEALTH UNIT

50 King Street
London ON N6A 5L7

Tel: (519) 663-5317

Fax: (519) 663-9581

After Hours: (519) 675-7523

MUSKOKA-PARRY SOUND HEALTH UNIT

5 Pineridge Gate
Gravenhurst ON P1P 1Z3

Tel: (705) 684-9090

Fax: (705) 684-9959

After Hours: (705) 787-3006
(on-call pager)

REGIONAL NIAGARA PUBLIC HEALTH**DEPARTMENT**

573 Glenridge Avenue
P.O. Box 3040

St. Catharines ON L2T 4C2

Tel: (905) 688-3762/1 (800) 263-7248

Fax: (905) 682-3901

After Hours: (905) 984-3690 or
1 (877) 552-5579

NORTH BAY & DISTRICT HEALTH UNIT

681 Commercial Street
North Bay ON P1B 4E7

Tel: (705) 474-1400

Fax: (705) 474-8252

After Hours: (705) 474-1400
(answering service)

NORTHWESTERN HEALTH UNIT

21 Wolsley Street
Kenora ON P9N 3W7

Tel: (807) 468-3147

Fax: (807) 468-4970

After Hours: (807) 468-3147 or
(807) 468-7109

OTTAWA PUBLIC HEALTH

495 Richmond Road, 2/F West
Ottawa ON K2A 4A4

Tel: (613) 580-6744

Fax: (613) 724-4130

After Hours: (613) 580-2424
(call centre)

OXFORD COUNTY HEALTH UNIT

410 Buller Street
Woodstock ON N4S 4N2

Tel: (519) 539-9800

Fax: (519) 539-6206

After Hours: (519) 533-7488

PEEL REGIONAL HEALTH UNIT

44 Peel Centre Drive, Suite 102
Brampton ON L6T 4B5

Tel: (905) 791-7800 Ext. 4850

Fax: (905) 789-1604

After Hours: (905) 791-7800

PERTH DISTRICT HEALTH UNIT

653 West Gore Street
Stratford ON N5A 1L4
Tel: (519) 271-7600
Fax: (519) 271-2195
After Hours: (519) 274-7363
(pager # leave message, will call
back in one hour)
Listowel Residents 1 (877) 271-7348

PETERBOROUGH COUNTY-CITY HEALTH UNIT

10 Hospital Drive
Peterborough ON K9J 8M1
Tel: (705) 743-1000
Fax: (705) 743-2897
After Hours: (705) 760-8127
(answering service)

PORCUPINE HEALTH UNIT

169 Pine Street South
P.O. Bag 2012
Timmins ON P4N 8B7
Tel: (705) 267-1181
Fax: (705) 264-3980
After Hours: (705) 267-1181

RENFREW COUNTY & DISTRICT HEALTH UNIT

7 International Drive
Pembroke ON K8A 6W5
Tel: (613) 732-3629
Fax: (613) 735-3067
After Hours: (613) 735-9926

SIMCOE COUNTY DISTRICT HEALTH UNIT

15 Sperling Drive
Barrie ON L4M 6K9
Tel: (705) 721-7330
Fax: (705) 721-1495
After Hours Emerg.: 1 (888) 225-7851

SUDBURY & DISTRICT HEALTH UNIT

1300 Paris Street
Sudbury ON P3E 3A3
Tel: (705) 522-9200
Fax: (705) 677-9606
After Hours: (705) 688-4366
After Hours Emerg: 1 (888) 563-4827

THUNDER BAY DISTRICT HEALTH UNIT

999 Balmoral Street
Thunder Bay ON P7B 6E7
Tel: (807) 625-5900
Fax: (807) 623-2369
After Hours: (807) 623-7451
(answering service)

TIMISKAMING HEALTH UNIT

39A Hessle Street
New Liskeard ON P0J 1P0
Tel: (705) 647-4305
Fax: (705) 647-5779
After Hours: (705) 647-3033

TORONTO PUBLIC HEALTH

5th Floor, 277 Victoria Street
Toronto ON M5B 1W2
Tel: (416) 392-7401
Fax: (416) 392-0713
After Hours: (416) 690-2142

WATERLOO REGIONAL HEALTH UNIT

P.O. Box 1633
99 Regina Street South
Waterloo ON N2J 4V3
Tel: (519) 883-2000
Fax: (519) 883-2241
After Hours: 1 (888) 709-5889 or
(519) 654-4622

WELLINGTON-DUFFERIN-GUELPH HEALTH UNIT

205 Queen Street East
Fergus ON N1M 1T2
Tel: (519) 843-2460
Fax: (519) 843-2321
After Hours: (519) 821-2370 or
1 (800) 265-7293

WINDSOR-ESSEX COUNTY HEALTH UNIT

1005 Ouellette Avenue
Windsor ON N9A 4J8
Tel: (519) 258-2146
Fax: (519) 258-6003
After Hours: (519) 973-4510

YORK REGION HEALTH SERVICES

17250 Yonge Street
Newmarket ON L3Y 6Z1
Tel: (905) 895-4511
Fax: (905) 895-3166
After Hours: (905) 895-4511

Appendix 5: Steps a Physician Should Take in the Event of Death Due to Infectious Diseases

Physicians need to be aware that deaths due to infectious diseases should be reported to the local Coroner under the following circumstances:

- If the death may be part of an outbreak of a communicable disease (e.g., influenza or SARS).
- If the death could be considered a sentinel event (e.g., due to contaminated drugs, devices, products, or nosocomial infection).
- If the death is considered to be sudden and unexpected.
- If anyone raises concerns about any aspect of the death.
- If the death may be due to criminal activity, suicide or accident.

Appendix 6: Chemoprophylaxis After Occupational Exposure to HIV

The risk of acquiring HIV after percutaneous exposure to infected blood is on average 0.3%. A recent study examining cases of health care workers exposed to infected blood, identified three risk factors associated with their seroconversion to HIV:

1. Volume of blood injected (e.g., deep injury, procedure involving a needle placed directly into source patient's vein or artery, and visible contamination of the sharp with patient blood);
2. HIV with high plasma viral load in source patient; and
3. Non-use of zidovudine post-exposure prophylaxis. Zidovudine use was associated with about an 80% reduction in the risk of HIV seroconversion, and is now recommended for high risk exposures.

The superiority of combination antiretroviral therapy, as treatment for HIV-infected patients, has been extrapolated to prophylaxis regimens for high risk situations. Three-drug therapy is recommended for percutaneous exposures involving both a large volume of blood, and a source patient with HIV disease with a high plasma viral load. Current guidelines for post-exposure prophylaxis (PEP) are outlined in Appendices 7 and 8.

In general, PEP is only indicated for exposure to a known HIV-positive source. PEP for occupational HIV exposure should be started **as soon as possible** and continued for four weeks. If the HIV status of the source is unknown, decisions to initiate prophylaxis must be individualized. The source case, if known, should be informed of the incident and asked to be tested for HIV. Informed consent is vital, and should be documented.

An expert experienced in the use of anti-HIV medication should be consulted when initiating post-exposure prophylaxis, and/or if management is uncertain. Counselling and follow-up serological testing, at three and six months, are best done by an expert.

Physicians should have a policy in their office regarding what to do in the event of a needle stick exposure that should include whom to contact for PEP advice, how to access the drugs, serology, counselling and follow-up.

Appendix 7: Recommended HIV Post-exposure Prophylaxis for Percutaneous Injuries

Infection Status of Source					
Exposure Type	HIV-Positive Class 1*	HIV-Positive Class 2*	Source of Unknown HIV Status†	Unknown Source§	HIV-Negative
Less severe¶	Recommend basic two-drug PEP	Recommend expanded three-drug PEP	Generally, no PEP warranted; however, consider basic two-drug PEP** for source with HIV risk factors††	Generally, no PEP warranted; however, consider basic two-drug PEP** in settings where exposure to HIV-infected persons is likely	No PEP warranted
More severe§§	Recommend expanded three-drug PEP	Recommend expanded three-drug PEP	Generally, no PEP warranted; however, consider basic two-drug PEP** for source with HIV risk factors	Generally, no PEP warranted; however, consider basic two-drug PEP** in settings where exposure to HIV-infected persons is likely	No PEP warranted

* HIV-Positive Class 1: Asymptomatic HIV infection or known low viral load (e.g., <1,500 RNA copies/ml). HIV-Positive Class 2: Symptomatic HIV infection, AIDS, acute seroconversion, or known high viral load. If drug resistance is a concern, obtain expert consultation. Initiation of post-exposure prophylaxis (PEP) should not be delayed pending expert consultation, and, because expert consultation alone cannot substitute for face-to-face counselling, resources should be available to provide immediate evaluation and follow-up care for all exposures.

† Source of Unknown HIV Status - (e.g., deceased source person with no samples available for HIV testing).

§ Unknown Source - (e.g., a needle from a sharps disposal container).

¶ Less severe - (e.g., solid needle and superficial injury).

** The designation "consider PEP" indicates that PEP is optional and should be based on an individualized decision between the exposed person and the treating clinician.

†† If PEP is offered and taken and the source is later determined to be HIV-negative, PEP should be discontinued.

§§ More severe (e.g., large-bore hollow needle, deep puncture, visible blood on device, or needle used in patient's artery or vein).

Reference:

U.S. Department of Health and Human Services Centers for Disease Control and Prevention (CDC), Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis, Morbidity and Mortality Weekly Report, June 29, 2001 (50), RR-11.

Appendix 8: Recommended HIV Post-exposure Prophylaxis for Mucous Membrane Exposures and Non-intact Skin Exposures

Infection Status of Source					
Exposure Type	HIV-Positive Class 1 [†]	HIV-Positive Class 2 [†]	Source of Unknown HIV Status [*]	Unknown Source [¶]	HIV-Negative
Small volume	Consider basic two-drug PEP	Recommend basic two-drug PEP	Generally, no PEP warranted; however, consider basic two-drug PEP ^{**} for source with HIV risk factors ^{††}	Generally, no PEP warranted; however, consider basic two-drug PEP ^{**} in settings where exposure to HIV-infected persons is likely	No PEP warranted
Large volume	Recommend basic two-drug PEP	Recommend expanded three-drug PEP	Generally, no PEP warranted; however, consider basic two-drug PEP ^{**} for source with HIV risk factors ^{§§}	Generally, no PEP warranted; however, consider basic two-drug PEP ^{**} in settings where exposure to HIV-infected persons is likely	No PEP warranted
<p>[†] HIV-Positive Class 1: Asymptomatic HIV infection or known low viral load (e.g., <1,500 RNA copies/ml). HIV-Positive Class 2: Symptomatic HIV infection, AIDS, acute seroconversion, or known high viral load. If drug resistance is a concern, obtain expert consultation. Initiation of post-exposure prophylaxis (PEP) should not be delayed pending expert consultation, and, because expert consultation alone cannot substitute for face-to-face counselling, resources should be available to provide immediate evaluation and follow-up care for all exposures.</p> <p>[*] Source of Unknown HIV Status - (e.g., deceased source person with no samples available for HIV testing).</p> <p>[¶] Unknown Source - (e.g., a needle from a sharps disposal container).</p> <p>^{**} The designation "consider PEP" indicates that PEP is optional and should be based on an individualized decision between the exposed person and the treating clinician.</p> <p>^{††} If PEP is offered and taken and the source is later determined to be HIV-negative, PEP should be discontinued.</p> <p>^{§§} For skin exposures, follow-up is indicated only if there is evidence of compromised skin integrity (e.g., dermatitis, abrasion, or open wound).</p>					

Reference:

U.S. Department of Health and Human Services Centers for Disease Control and Prevention (CDC), Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis, Morbidity and Mortality Weekly Report, June 29, 2001 (50), RR-11.

Appendix 9: Anti-HIV Medications for Post-Exposure Prophylaxis

The regimen selected for PEP should be based on possible drug resistance of the source. Each and every case should be discussed with an expert.

Basic Two-Drug Regimen

Zidovudine 600 mg/day divided into two or three doses, PLUS lamivudine 150 mg bid,

OR

Lamivudine 150 mg bid, PLUS stavudine 40 mg (30 mg if body weight < 60 kg) bid.

Expanded Three-Drug Regimen

Any of the regimens above PLUS:

- Kaletra (Lopinavir/ritonavir) three capsules bid; **or**
- Indinavir 800 mg q8h; **or**
- Nelfinavir 750 mg tid; **or**
- Efavirenz 600 mg hs.

For information on the administration and adverse effects of individual drugs, consult the *Compendium of Pharmaceuticals and Specialties*.

Appendix 10: Course of Action for Health Care Workers Possibly Exposed to Hepatitis B

The following are recommended actions for possible exposure to hepatitis B according to the vaccination and antibody status of the exposed person. The source may be known to be infected or may be in a risk group for infection, or the infectious status of the source may not be known, either because the source has not been identified or has not been tested. The recommendations assume the real possibility of exposure in ways in which HBV is known to be transmitted. (Note: ≥ 10 IU/L = immune; < 10 IU/L = non-immune).

Vaccination and Antibody Status of the Exposed Person

- a) Immunized with three doses of vaccine, documented protective anti-HBs at any time or documented as immune because of previous natural infection:
 - No action required.
- b) No anti-HBs response to two previous courses of vaccine:
 - Administer two doses of HBIG, one immediately, and the second dose, one month later;
 - Assess for HBV infection at least two months after the exposure.
- c) Two or more doses of vaccine; anti-HBs status not known:
 - Test for anti-HBs and simultaneously administer third dose of vaccine*;
 - If within 48 hours the anti-HBs level is ≥ 10 IU/L, consider the individual immune for the future;
 - If within 48 hours the anti-HBs level is ≤ 10 IU/L, give HBIG as soon as possible and test for anti-HBs two months later. If ≥ 10 IU/L, consider the individual immune for the future. If ≤ 10 IU/L, administer second course of vaccine;
 - If the anti-HBs results are not available in 48 hours, administer HBIG as soon as possible. When results known, follow as above.
- d) One dose of vaccine or non-responder to one course of vaccine:
 - Test for anti-HBs and simultaneously administer HBIG and one dose of the vaccine;
 - Complete course of vaccination and measure serostatus when complete.
- e) Unvaccinated:
 - Test for anti-HBs and simultaneously administer HBIG and one dose of the vaccine;
 - If the anti-HBs level is ≥ 10 IU/L, consider the individual immune for the future;
 - If the anti-HBs level is ≤ 10 IU/L, complete the course of vaccination.

***Note:** If the source is known not to be infected or known to be at negligible risk for HBV, the only required action is to ensure that the worker receive the usual pre-exposure course of vaccine and antibody testing, if these actions have not already been completed.

Adapted from the Canadian Immunization Guide, 6th Edition, 2002. For further details, consult the Canadian Blood Services, an expert in Infectious Diseases, or your local Medical Officer of Health.

Appendix 11: Course of Action for Health Care Workers Possibly Exposed to Hepatitis C

There is no prophylactic treatment currently available for a person exposed to the blood of a patient with hepatitis C virus infection. Available data does **not** support the use of immune globulin (IG) or antiviral agents in this situation, and they should not be given.

Counsel the exposed health care worker about the risk of becoming infected. (Risk is poorly quantified at present, but appears to be lower than that for hepatitis B virus, approximately 3-10%).

Counsel the exposed health care worker to report any signs of hepatitis-like illness.

Health care workers exposed to hepatitis C virus should be tested as soon as possible after exposure for antibody to hepatitis C virus and, if negative, again three and six months later. Baseline liver function testing (i.e., ALT) should also be done and repeated at three and six months. If the exposed health care worker is positive for anti-hepatitis C, refer for medical assessment and follow-up. If seroconversion occurs during the follow-up period, report to the WSIB and the local Medical Officer of Health.

Adapted from the Blood-Borne Diseases Surveillance Protocol for Ontario Hospitals. Developed by the Ontario Hospital Association and the Ontario Medical Association Joint Communicable Diseases Surveillance Protocols Committee. Published and distributed by the OHA, June 1990, Revised September 1996, May 2000, December 2002, May 2004. Publication #206.

For further details, consult the Canadian Blood Services, an expert in Infectious Diseases, or your local Medical Officer of Health.

Glossary

Aerosolization: The process of creating very small droplets of moisture (droplet nuclei) that may carry microorganisms. The aerosolized droplets can be light enough to remain suspended in the air for short periods of time and facilitate inhalation of the microorganisms.

Airborne transmission: Occurs by dissemination of either airborne droplet nuclei or evaporated droplets (sub micron particles) containing microorganisms that remain suspended in the air for long periods of time. These microorganisms can be widely dispersed by air currents and may be inhaled by persons even when standing a distance away from the source patient.

Alcohol-based hand sanitizer: An alcohol (60-90% isopropyl or ethanol) containing preparation for waterless application to reduce microorganisms on the hands. Can replace soap and water as long as hands are not physically soiled, in which case soap and water must be used.

Antimicrobial soap: Soap containing an antiseptic agent (e.g., triclosan, chlorhexidine).

Antiseptic: A chemical that either inhibits the growth of microorganisms or destroys them; this term refers to agents used on living tissue. Manufacturers develop antiseptics and disinfectants for specific uses; therefore, it is not advisable to use antiseptics on inanimate objects or, conversely, to use disinfectants on living tissue.

Cleaning: The removal of all visible dust, soil, and other foreign material, usually done using water with soaps, detergents or enzymatic products along with physical action, such as brushing. Meticulous cleaning must precede disinfection or sterilization of medical instruments.

Decontamination: The process of removing disease-producing microorganisms and rendering an object safe for handling.

Disinfection: A process that kills or destroys nearly all disease-producing microorganisms. Disinfectants are used on inanimate objects. There are three levels of disinfection, defined by the hardiness of microorganisms that are to be killed or inactivated:

- High-level disinfection kills vegetative bacteria, tubercle bacillus, fungi, lipid, and non-lipid viruses, but not necessarily high numbers of bacterial spores.
- Intermediate-level disinfection kills vegetative bacteria, most fungi, tubercle bacilli, and most viruses; it does not kill resistant bacterial spores.
- Low-level disinfection kills most vegetative bacteria, some fungi, and some viruses, but cannot be relied on to kill mycobacteria or bacterial spores.

Exposure-prone procedures¹:

1. Digital palpation of a needle tip in a body cavity (a hollow space within the body or one of its organs) or the simultaneous presence of the health

care worker's fingers and a needle or other sharp instrument or object in a blind or highly confined anatomic site, e.g., during major abdominal, cardiothoracic, vaginal and/or orthopaedic operations;

2. Repair of major traumatic injuries; or
3. Manipulation, cutting or removal of any oral or perioral tissue, including tooth structures, during which blood from a health care worker has the potential to expose the patient's open tissue to a blood borne pathogen.

¹Laboratory Centre for Disease Control.

Instrument detergent: Enzymatic detergents are formulated to remove organic matter but do not contain disinfectant properties.

Material Safety Data Sheets (MSDS): Material Safety Data Sheets are produced by the manufacturer with details of the substance, including first aid measures if there is exposure. Employers must have MSDS from the manufacturer of "controlled products" used in the office. For further information, consult the Ministry of Labour.

N95 or equivalent respirators: These are protective devices that filter particles one micron in size or smaller, have a 95% filter efficiency and provide a tight facial seal (less than a 10% leak).

Plain soap/emollient soap: Soap with no antiseptic agent.

Respiratory etiquette: New paradigm coined during the SARS outbreak to describe "good health manners" to be used to minimize transmission of respiratory infections (see sidebar on page 19).

Routine practices: The Health Canada term used to describe the system of infection prevention recommended to prevent transmission of infections in health care settings. These practices describe prevention strategies to be used with all patients during all patient care (see page 10).

Sterilization: A process by which all forms of microbial life, including bacteria, viruses, spores, and fungi are destroyed or eliminated, most commonly accomplished in the ambulatory health care setting by steam under pressure.

Surgical mask: Covers the user's nose and mouth and provides a physical barrier to fluids and particulate matter. Because the seal is not tight, there can be edge leakage of between 5-40% of exhaled air. As the mask becomes wet from exhalation, the resistance to airflow can increase resulting in more edge leakage.

Transmission-based precautions: Those precautions that must be added to routine practices for managing patients with specific infections. Includes airborne, droplet and contact precautions (see page 18).

Two-Step Tuberculin Skin Test: The two-step tuberculin skin test is used to differentiate patients with waned immunity to TB or prior Bacillus Calmette-Guerin (BCG) from those who have recently converted (see page 24).

Workplace Hazardous Materials Information System (WHMIS): Federal and provincial legislation has been enacted to ensure safety in the workplace with respect to hazardous products (see page 44).

Resources

1. Effective Sterilization in Health Care Facilities by the Steam Process, Z314.3-01. CSA International, Canadian Standards Association. Available on-line at: <http://www.cssinfo.com/info/csa.html>.
2. Handbook on Infection Control in Office-Based Health Care and Allied Services, April 2004, CSA PLUS 1112, Canadian Standards Association. Available on-line at: <http://www.cssinfo.com/info/csa.html>.
3. Centers for Disease Control and Prevention, www.cdc.gov.
4. Community and Hospital Infection Control Association – Canada, www.chica.org.
5. Health Canada, Public Health Agency of Canada, www.phac-aspc.gc.ca.
6. Infection Control Guidelines – Hand Washing, Cleaning, Disinfection and Sterilization in Health Care. Health Canada Steering Committee on Infection Control Guidelines. Available on-line at: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/98pdf/cdr24s8e.pdf>.
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About the College

The College of Physicians and Surgeons of Ontario is the self-regulating body for the province's 23,000 doctors. It issues certificates of registration to doctors to allow them to practise medicine, monitors and maintains standards of practice through peer assessment and remediation, investigates complaints against doctors on behalf of the public, and disciplines doctors who have committed an act of professional misconduct or are incompetent.

The privilege to self-regulate is given to the medical profession by society on the understanding that the profession will exercise its authority in the public interest. In actuality, the College is a professionally led organization working in partnership with the public.

Just more than half of the governing Council of the College are physicians, 16 elected by the profession and three appointed by universities. The other 13-15 Councillors are public members, appointed by the government. They bring a variety of experience and come from regions across Ontario.

The role and authority of the College is set out in the *Regulated Health Professions Act (RHPA)*, the *Health Professions Procedural Code*, the *Medicine Act*, and the regulations made under these Acts. Council, directly and through its committees, sets policy and supervises College activities.

The College's Strategic Plan

The strategic plan focuses on the College's core function – regulating the practice of medicine in Ontario in the public interest – and commits us to a high standard of accountability and transparency.

College Vision

The best quality care for the people of Ontario by the doctors of Ontario.

Goals

The College's vision will be implemented by:

Advocating for quality health care in partnership with other stakeholders;

Integrating the roles of clinical education, evidence-based clinical practice, and regulatory responsibilities to improve patient care at the individual and system level;

Evaluating and improving the effectiveness and efficiency of the current investigative and disciplinary processes, and identifying potential alternatives;

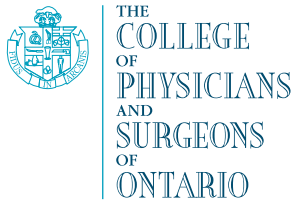
Accelerating efforts to find creative ways to address physician resource needs without compromising registration standards;

Providing publicly accessible regulatory information about physicians;

Engaging stakeholders in a public debate about the limits of medicine and focusing on what patients can expect from their physicians;

Establishing a comprehensive and effective communication plan to improve recognition of the College by its stakeholders;

Establishing an effective and transparent governance model for the College.



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