Manitoba Health, Seniors
and Active Living

Routine Practices
and Additional Precautions:

Preventing the Transmission of Infection in Health Care

Manitoba

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*Manitoba Guidelines for Routine Practices and Additional Precautions: Preventing the Transmission of Infection in Health Care

Introductory Statement

Manitoba Health Seniors and Active Living (MHSAL) develops provincial infection prevention and control guidelines to provide evidence-based recommendations from both the national level, including The Public Health Agency of Canada (PHAC), and the international level, including the Centers for Disease Control and Prevention (CDC) and the Health Care Infection Control Practice Advisory Committee (HICPAC).

The principle source for Manitoba's guideline is the PHAC R*outine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings* guideline, with modifications appropriate to use in Manitoba. The *Routine Practices and Additional Precautions Assessment and Educational Tools* (RPAP Tools) guideline is a supplement of PHAC's *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings* and *Hand Hygiene Practices in Healthcare Settings* guidelines. These guidelines assist in promoting and applying Routine Practices and Additional Precautions by health care workers to prevent the transmission of infection in health care settings.

Although not regulatory in scope, these guidelines support infection prevention and control (IP&C) professionals, health care organizations and health care providers in developing, implementing and evaluating IP&C policies, procedures and programs to improve the quality and safety of health care and patient outcomes. They may also assist in standardizing IP&C practices throughout the province. Regional health authorities (RHAs) and provincial health services organizations (PHSOs) are expected to develop regional policies and procedures based on these guidelines.

These guidelines have been developed by a working group of IP&C, infectious diseases and public health specialists with expertise in acute, tertiary, hospital, long term and community-based care.

The purpose of this guideline – ***Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*** – is to provide a framework for the development of policy and procedures to ensure that Routine Practices and Additional Precautions are effectively used.

The guiding principles used in developing these guidelines included:

- to support programs that limit transmission of infection within the health care settings
    1. to reaffirm Routine Practices as the foundation for preventing the transmission of microorganisms during patient care in all health care settings
    2. to update the appropriate use, when required, of Additional Precautions, in addition to Routine Practices
- to provide evidence-based and best practice recommendations

This guideline, whenever possible, has been based on evidence from research findings. Where there is insufficient published research, consensus by experts in the field has been used to provide recommendations specific to practices.

The information in this guideline was current at the time of publication. Scientific knowledge and technology are constantly evolving. Revisions of these guidelines will be necessary as further experience and advances in the field provide new information.

Although the guidelines will be updated periodically, practitioners are responsible to ensure the most current knowledge and practice is applied for each case.

Abbreviations

ABHR(s)	Alcohol-based hand rub(s)
ACH	Air changes per hour
AIIR(s)	Airborne infection isolation room(s)
AGMP(s)	Aerosol-generating medical procedure(s)
AP	Additional Precautions
ARO(s)	Antimicrobial-resistant organism(s)
BBPs	Bloodborne pathogens
CDC	Centers for Disease Control and Prevention
CDI	*Clostridioides* (formerly *Clostridium*) *difficile* infection
CJD	Creutzfeldt-Jakob disease
CSA	Canadian Standards Association
CNISP	Canadian Nosocomial Infection Surveillance Project
CoV	Coronavirus
CPE	Carbapenemase-producing *Enterobacteriaceae*
CPO	Carbapenemase-producing Organisms
CRE	Carbapenemase-Resistant *Enterobacteriaceae*
DIN	Drug identification number
EMS	Emergency Medical Services
ESBL	Extended spectrum beta-lactamase
FRI	Febrile respiratory illness
HAI(s)	Health care associated infection(s)
HEPA	High Efficiency Particulate Air
HCW(s)	Health care worker(s)
HHV-6	Human herpes virus 6
HIV	Human immunodeficiency virus
HSCT	Haematopoietic stem-cell transplant
HSV	Herpes simplex virus
HVAC	Heating, ventilation and air conditioning
IP&C	Infection prevention and control
ICP(s)	Infection control practitioner/ professional(s)
ICU(s)	Intensive care unit(s)
ILI	Influenza –like illness
KPC	*Klebsiella pneumoniae carbapenemase*
LTC	Long term care
MDR TB	Multi-drug-resistant Tuberculosis
MERS-CoV	Middle East respiratory syndrome coronavirus
MMRV	Measles/Mumps/Rubella/Varicella
MRSA	Methicillin-resistant *Staphylococcus aureus*
NDM-1	New Delhi metallo-beta-lactamase-1
NICU(s)	Neonatal intensive care unit(s)
NIOSH	National Institute for Occupational Safety and Health (US)
OH	Occupational Health
ORA	Organizational risk assessment
PHAC	Public Health Agency of Canada
PCRA	Point of Care Risk Assessment
PHIA	Personal Health Information Act
PPE	Personal protective equipment
RP	Routine Practices
RRP	Respiratory Protection Program
RSV	Respiratory Syncytial Virus
SARS	Severe acute respiratory syndrome
SARI	Severe acute respiratory infection
SSI	Surgical Site Infection
SUDs	Single use device(s)
TB	Tuberculosis
VRE	Vancomycin-resistant Enterococci
XDR TB	Extensively Drug-resistant Tuberculosis

Definitions

Additional Precautions	These are additional measures implemented when Routine Practices alone may not interrupt transmission of an infectious agent. They are used in addition to Routine Practices (not in place of) and are initiated based on condition and clinical presentation (syndrome) and on specific etiology (diagnosis).
Aerosols	Aerosols are solid or liquid particles suspended in the air, whose motion is governed principally by particle size, which ranges from 10μm-100μm. See aerosol-generating medical procedures below. Note: Particles less than 10 μm (i.e., droplet nuclei) can also be found in aerosols. However, their motion is controlled by other physical parameters.
Administrative controls	These are measures put in place to reduce the risk of infection to health care workers and patients (e.g., IP&C policies and procedures, and education and training).
Aerosol-generating medical procedures	Aerosol-generating medical procedures (AGMPs) are medical procedures that can generate aerosols as a result of artificial manipulation of a person's airway. There are several types of AGMPs that have been associated with a documented increased risk of tuberculosis (TB) or SARS transmission: • intubation and related procedures (e.g., manual ventilation, open endotracheal suctioning) • cardiopulmonary resuscitation • bronchoscopy • sputum induction • nebulized therapy • autopsy • non-invasive positive pressure ventilation (CPAP, BiPAP) There is debate whether other medical procedures may result in the generation of aerosols through cough induction and lead to transmission of infection. However, to date, there is no evidence of the transmission of respiratory infections, including TB, SARS or influenza, by these methods. Examples of these procedures include: • high-frequency oscillatory ventilation • tracheostomy care • chest physiotherapy • obtaining nasopharyngeal swabs or aspirates
Airborne exposure	This refers to exposure to aerosols capable of being inhaled.
Airborne infection isolation room (AIIR)	This was formerly referred to as a negative pressure isolation room. An AIIR is a single occupancy patient care room, used to isolate persons with a suspected or confirmed airborne infectious disease. Environmental factors are controlled in AIIRs to minimize the transmission of infectious agents that are usually transmitted from person to person by droplet nuclei associated with coughing or aerosolization of contaminated fluids. AIIRs should provide negative pressure in the room (so that no air flows out of the room into adjacent areas) and direct exhaust of air from the room to the outside of the building or recirculation of air through a HEPA filter before returning to circulation.

Airborne Precautions	These precautions are used in addition to Routine Practices for clients, patients and residents known or suspected of having an illness transmitted by the airborne route (i.e., by small droplet nuclei that remain suspended in the air and may be inhaled by others).
Airborne transmission	This refers to the transmission of microorganisms via inhaled aerosols that results in an infection in a susceptible host.
Antimicrobial-resistant organism (ARO)	See the MHSAL Guidelines for the Prevention and Control of Antimicrobial-Resistant Organisms. Available at: www.manitoba.ca/health/publichealth/cdc/docs/ipc/aro.pdf
Alcohol	Alcohol is an organic chemical containing one or more hydroxyl groups. Alcohols can be liquids, semisolids or solids at room temperature.
Alcohol-based hand rub	This refers to an alcohol-containing (60 to 90 per cent) preparation (liquid, gel or foam), designed for application to the hands to kill or reduce the growth of microorganisms. Such preparations contain one or more types of alcohol with emollients and other active ingredients (see the PHAC Infection Control Guidelines *Hand Hygiene Practices in Healthcare Settings* http://publications.gc.ca/collections/collection_2012/aspc-phac/HP40-74-2012-eng.pdf.
Asepsis	Asepsis is the absence of pathogenic (disease-producing) microorganisms.
Aseptic technique	This technique is the purposeful prevention of transfer of microorganisms from the patient's body surface to a normally sterile body site, or from one person to another, by keeping the microbe count to an irreducible minimum. It is also referred to as the sterile technique.
Biomedical waste	This is waste generated within a health care facility that requires special handling and disposal because it presents a potential risk of disease transmission. Material shall be considered biomedical waste if: a) They are contaminated with blood or body fluids containing visible blood. b) When compressed, they release liquid.
Carbapenemase	This is a class of enzymes that inactivate carbapenem antibiotics by hydrolysing them. In almost all instances, these enzymes hydrolyse not only carbapenem antimicrobials, but also first- , second- and third-generation cephalosporins and penicillins (e.g., piperacillin-tazobactam). The genetic information to produce carbapenemases is often located on a mobile genetic element (e.g., plasmid and transposon), which frequently also carries resistance to other classes of antimicrobials, such as fluoroquinolones and aminoglycosides.
Carbapenemase- producing Enterobacteriaceae (CPE)	See the MHSAL Guidelines for the Prevention and Control of Antimicrobial-Resistant Organisms. Available at: www.manitoba.ca/health/publichealth/cdc/docs/ipc/aro.pdf
Carbapenem-resistant Enterobacteriaceae (CRE)	See the MHSAL Guidelines for the Prevention and Control of Antimicrobial-Resistant Organisms. Available at: www.manitoba.ca/health/publichealth/cdc/docs/ipc/aro.pdf
Carbapenemase- producing organisms (CPO)	See the MHSAL Guidelines for the Prevention and Control of Antimicrobial-Resistant Organisms. Available at: www.manitoba.ca/health/publichealth/cdc/docs/ipc/aro.pdf

Cleaning	This refers to the physical removal of foreign material (e.g., dust, soil, organic material such as blood, secretions, excretions and microorganisms). Cleaning physically removes rather than kills microorganisms. It is accomplished by using water and detergents in conjunction with mechanical action.
Colonization	Colonization is the presence of microorganisms in or on a host with growth and multiplication, but without tissue invasion or cellular injury.
Cohort	Cohort refers to physically separating (e.g., in a separate room or ward) two or more patients exposed to or infected with the same microorganism from other patients who have not been exposed to or infected with that microorganism.
Cohort staffing	This is the practice of assigning specific personnel to care only for patients known to be exposed to or infected with the same organism. These personnel would not participate in the care of patients who have not been exposed to or infected with that organism.
Contact exposure	This refers to transmission where exposure occurs through physical contact between an infected source and a host, or through the passive transfer of the infectious agent to a host via an intermediate object (fomite).
Contact Precautions	Contact Precautions are used in addition to Routine Practices to reduce the risk of transmitting infectious agents through contact with an infectious person or their environment.
Contact transmission (direct or indirect)	This is transmission that occurs when exposure leads to an infectious dose of viable microorganisms from an infected or contaminated source, resulting in colonization or infection of a susceptible host. **Direct contact** This is the transfer of microorganisms via direct physical contact between an infected or colonized individual and a susceptible host (body surface to body surface). Transmission may result in infection. **Indirect contact** This is the passive transfer of microorganisms from an infected or colonized individual to a susceptible host via an intermediate object (e.g., contaminated hands that are not cleaned between episodes of patient care; contaminated instruments that are not cleaned between patients or uses; other contaminated objects in the patient's immediate environment).
Continuum of care	This refers to care provided across all health care sectors, including settings where emergency (including pre-hospital) care is provided, hospitals, complex continuing care, rehabilitation hospitals, long-term care homes, outpatient clinics, community health centres and clinics, physician offices, dental offices, offices of other health professionals, public health and home health care.
Cough etiquette	See respiratory hygiene.
Critical items	Critical items are instruments and devices that enter sterile tissues, including the vascular system. Reprocessing critical items, such as surgical equipment or intravascular devices, involves meticulous cleaning, followed by sterilization.
Decontamination	Decontamination is the removal of microorganisms to leave an item safe for further handling.
Designated hand washing sink for health care workers	This is a sink used only for hand washing for healthcare workers. Referred to as hand hygiene sink in Canadian Standards Association *Canadian Healthcare Facilities Z8000-11* (current edition). See the hand hygiene sink definition.

Designated sink for patients	This is a sink used for the patient. Refer to Canadian Standards Association *Canadian Healthcare Facilities Z8000-11* (current edition).
Direct care	Direct care refers to providing hands-on care (e.g., bathing, washing, turning client/patient/resident, changing clothes, continence care, dressing changes, care of open wounds and lesions, and toileting).
Disinfectant	Disinfectant is a product used on inanimate objects to reduce the quantity of microorganisms to an acceptable level. Hospital-grade disinfectants require a drug identification number (DIN) for sale in Canada.
Disinfection	Disinfection is the inactivation of disease-producing microorganisms with the exception of bacterial spores. Hospital-grade disinfectants are used on inanimate objects and require a drug identification number (DIN) for sale in Canada. **High level disinfection** This level of disinfection is required when processing semi-critical items. High level disinfection processes destroy vegetative bacteria, mycobacteria, fungi and enveloped (lipid) and non-enveloped (non-lipid) viruses, but not necessarily bacterial spores. **Low level disinfection** This level of disinfection is required when processing non-critical items and some environmental surfaces. Low level disinfectants kill most vegetative bacteria and some fungi as well as enveloped (lipid) viruses (e.g., influenza, hepatitis B and C, and HIV). Low level disinfectants do not kill mycobacteria or bacterial spores.
Droplet	Droplets are solid or liquid particles suspended in the air, whose motion is governed principally by gravity. Particle size is greater than 10 µm. Droplets are usually generated by an infected source by coughing, sneezing or talking.
Droplet exposure	Droplet exposure may occur when droplets that contain an infectious agent are propelled a short distance (within 2 metres) through the air and are deposited on the mucous membranes of the eyes, nose or mouth of a host.
Droplet nucleus	A droplet nucleus is the airborne particle resulting from a potentially infectious (microorganism-bearing) droplet from which most of the liquid has evaporated, allowing the particle to remain suspended in the air. Note: droplet nuclei can also be found in aerosols. However, their motion is controlled by physical parameters, including gravity and air currents.
Droplet Precautions	Droplet Precautions are used in addition to Poutine Practices for patients known or suspected of having an infection that can be transmitted by large infectious droplets.
Droplet transmission	This is transmission that occurs when the droplets that contain microorganisms are propelled a short distance (within 2 metres) through the air and are deposited on the mucous membranes of another person, leading to infection of the susceptible host. Droplets can also contaminate surfaces and contribute to contact transmission (see also contact transmission).
Drug identification number	This is the number located on the label of prescription and over-the-counter drug products that have been evaluated by the Therapeutic Products Directorate and approved for sale in Canada.
Emerging respiratory infections	These are acute respiratory infections of significant public health importance, including infections caused by either emergence of new variants of known respiratory pathogens (e.g., novel influenza viruses and SARS) or emergence of as yet unknown pathogens. www.phac-aspc.gc.ca/eri-ire/index-eng.php

Engineering controls	Engineering controls are physical or mechanical measures put in place to reduce the risk of infection to health care workers or patients (e.g., heating, ventilation and air conditioning systems, room design, and placement of designated hand washing sinks).
Exposure	This refers to having contact with a microorganism or an infectious disease in a manner such that transmission may occur.
Facial protection	Facial protection includes masks and eye protection, face shields, or masks with a visor attachment.
Facilities	See health care facility.
Facility approved disinfectant	This is a disinfectant cleaner that has been approved by the facility or organization. It must achieve manufacturer's recommended contact time on all surfaces to ensure appropriate disinfection. Contact time is the time the surfaces must continue to be wet with disinfectant.
Febrile respiratory illness	This term is used to describe a wide range of droplet and contact spread respiratory infections, which usually present with symptoms of a fever > 38°C and new or worsening cough or shortness of breath. Neonates, the elderly, and those who are immunocompromised may not have fever in association with a respiratory infection.
Fit check	See seal check.
Fit testing	Fit testing is the use of a qualitative or a quantitative method to evaluate the fit of a specific manufacturer, model and size of respirator on an individual. See also seal check.
Fomites	Fomites are inanimate objects in the environment that may become contaminated with microorganisms and serve as vehicles of transmission.
Hand antisepsis	This is a process for the removal or killing of transient microorganisms on the hands, using an antiseptic. It is also referred to as antimicrobial or antiseptic handwash, antiseptic hand-rubbing, disinfection or decontamination.
Hand care program	A hand care program for staff is a key component of hand hygiene and includes hand care assessment, health care worker education, occupational health assessment if skin integrity is an issue, provision of hand moisturizing products and provision of alcohol-based hand rub that contains an emollient.
Hand hygiene	This is a comprehensive term that applies to hand washing, hand antisepsis and to actions taken to maintain healthy hands and fingernails.
Hand hygiene sink	Referred to in Canadian Standards Association *Canadian Healthcare Facilities Z8000-11* (current edition), this is a sink dedicated exclusively for use by HCWs for the purpose of hand hygiene only. The design of a hand hygiene sink includes the placement of soap and towel dispensers and a garbage can. A washroom sink or other sink that is used for general purposes is not a hand hygiene sink. Hand hygiene sinks shall be dedicated to that purpose and not used for any other purpose. Sinks used for cleaning of equipment and disposal of waste fluids (e.g., IV fluids, lipids, used antiseptics) shall not be used for hand hygiene.
Hand washing	Hand washing is a process for the removal of visible soil and organic material and transient microorganisms from the hands by washing with soap and water. It is also referred to as hand cleansing.
Hand washing sink	See designated hand washing sink for health care workers and hand hygiene sink.

Hazard	Hazard is a term used to describe a condition that has the potential to cause harm. Work-related hazards faced by HCWs and other staff are classified in categories: biologic and infectious, chemical, environmental, mechanical, physical, violence and psychosocial.
Health care associated infection (HAI)	These are infections that are transmitted within a health care setting (also referred to as nosocomial) during the provision of health care.
Health care environment	This refers to the people and items which make up the care environment (e.g., objects, medical equipment, health care workers and patients) of a hospital, clinic or ambulatory setting, outside the immediate environment of the patient. Also see *Patient Environment*.
Health care facilities	These include acute care hospitals, emergency departments, rehabilitation hospitals, mental health hospitals and LTC facilities.
Health care setting	This is any location where health care is provided, including emergency care, prehospital care, hospital, LTC, home care, ambulatory care, and facilities and locations in the community where care is provided (e.g., infirmaries in schools, patient or correctional facilities). Note: Some settings provide a variety of care (e.g., chronic care or ambulatory care provided in acute care, complex care provided in LTC). **Prehospital care** This is acute emergency patient assessment and care delivered in a variety of settings (e.g., street, home, LTC and mental health) at the beginning of the continuum of care. Prehospital care workers may include paramedics, fire fighters, police and other emergency first responders. **Acute care definition:** This refers to a facility where a variety of inpatient services are provided, which may include surgery and intensive care. For the purpose of this document, acute care also includes ambulatory care settings such as hospital emergency departments, and free-standing ambulatory (day) surgery or other invasive day procedures (e.g., endoscopy units, hemodialysis and ambulatory wound clinics). **Ambulatory care definition:** This refers to a location where health services are provided to patients who are not admitted to inpatient hospital units, including outpatient diagnostic and treatment facilities (e.g., diagnostic imaging, phlebotomy sites and pulmonary function laboratories), community health centres and clinics, physician's offices, dental offices and offices of allied health professionals, (e.g. physiotherapy). **Long term care** This refers to a facility that includes a variety of activities, types and levels of skilled nursing care for individuals requiring 24-hour surveillance, assistance, rehabilitation, restorative or medical care in a group setting that does not fall under the definition of acute care. **Home care** Home care is the delivery of a wide range of health care and support services to patients in a variety of settings for health restoration, health promotion, health maintenance, respite, palliation and to prevent or delay admission to long term patient care. Home care is delivered where the patient resides (e.g., homes, retirement homes, group homes and hospices).

Health care organizations	These are the organizational entities that are responsible for establishing and maintaining health care services provided by HCWs and other staff in one or more health care settings throughout the health care continuum.
Health care providers	Any person delivering care to a client/patient/resident is a health care provider. This includes but is not limited to the following: • emergency service workers • physicians • dentists • nurses • respiratory therapists and other health professionals • personal support workers • clinical instructors • students • home health care workers. In some non-acute settings, volunteers might provide care and would be included as health care providers. See also, Staff.
Health care workers	This includes individuals who provide health care or support services to patients, such as: • nurses • physicians • dentists • nurse practitioners • paramedics and sometimes emergency first responders • allied health professionals • unregulated health care providers • students • volunteers • housekeeping staff
HEPA filter	This is a high efficiency particulate air filter with an efficiency of 99.97 per cent in the removal of airborne particles 0.3 microns or larger in diameter.
Hierarchy of controls	There are three levels/tiers of IP&C and OH controls to prevent illness and injury in the workplace: engineering controls, administrative controls and PPE.
Immunocompromised	This term refers to patients with congenital or acquired immunodeficiency or immunodeficiency due to therapeutic agents or hematologic malignancies. This includes but is not limited to the following patients: • those who are undergoing immunosuppressive therapy • individuals with leukemia or lymphoma or other malignant disease • individuals on medications that suppress the immune system, such as high-dose systemic steroids or chemotherapeutic agents • individuals with cellular immune-deficiencies or other immune system conditions
Infection	Microorganisms multiply within the body and cause a response from the host's immune defences. Infection may or may not lead to clinical disease.

Infection control professional/ practitioner	This refers to a health care professional (e.g., nurse or medical laboratory technologist) with responsibility for functions of the IP&C program. This individual, who must have specific IP&C training, is referred to as an infection control professional/practitioner or ICP.
Infectious agent	This terminology is used to describe a microorganism or a pathogen capable of causing diseases (infection) in a source or a host. It is synonymous with microorganism for the purposes of this document.
Infectious waste	See biomedical waste.
Influenza-like illness	This refers to a constellation of symptoms, which may be exhibited by individuals prior to the confirmation of influenza.
Inoculum size	This refers to the number of microorganisms transmitted to the host.
Mask	A mask is a barrier to prevent droplets from an infected source from contaminating the skin and mucous membranes of the nose and mouth of the wearer, or to trap droplets expelled by the wearer, depending on the intended use. The mask should be durable enough so that it will function effectively for the duration of the given activity. The term mask in this document refers to surgical or procedure masks, not to respirators.
Methicillin-resistant Staphylococcus aureus (MRSA)	See the MHSAL Guidelines for the Prevention and Control of Antimicrobial-Resistant Organisms. Available at: www.manitoba.ca/health/publichealth/cdc/docs/ipc/aro.pdf
Microorganisms	See infectious agent.
Mode of transmission	Mode of transmission is the mechanism by which an infectious agent is spread (e.g., via contact, through droplets or aerosols).
N95 respirator	The N95 is a disposable, particulate respirator (Note: most respirators used for health care purposes are disposable filtering face pieces, covering the mouth, nose and chin). Airborne particles are captured from the air on the filter media by interception, inertial impaction, diffusion and electrostatic attraction. The filter is certified to capture at least 95 per cent of particles at a diameter of 0.3 microns, which is the most penetrating particle size. Particles of smaller and larger size are collected with greater efficiency. The 'N' indicates a respirator that is not oil-resistant or oil-proof. N95 respirators are certified by the National Institute for Occupational Health and Safety (NIOSH –organization based in the United States) and must be so stamped on each respirator (see also Respirator).
Natural ventilation	This refers to the use of natural forces to introduce and distribute outdoor air into a building. These natural forces can be wind pressure or pressure generated by the density difference between indoor and outdoor air.
Non-critical items	These are items that touch only intact skin, but not mucous membranes. Reprocessing of non-critical items involves thorough cleaning and/or low level disinfection.
Nosocomial infection	See health care associated infection.
Occupational health	For the purposes of this document, this phrase refers to the disciplines of occupational health medicine and nursing, occupational hygiene and occupational health and safety.

Occupational health and safety	This is a legal term that is defined in legislation, regulation and workplace (e.g., union) contracts that impact a variety of disciplines concerned with protecting the safety, health and welfare of people engaged in work or employment. The use of the phrase occupational health and safety(OHS) invariably refers back to legislation or regulations that influence workplace safety practices. The definition, and therefore, the content encompassed by OHS legislation, varies between and within jurisdictions in Canada.
Occupational health professional	This term refers to medical health care workers (e.g., nurses and physicians) who care for the employees as their health relates to their job functions.
Outbreak	An outbreak is an excess over the expected incidence of disease within a geographic area during a specified time period, synonymous with epidemic.
Organizational risk assessment	This is an activity, whereby a health care organization identifies: a. a hazard b. the likelihood and consequence of exposure to the hazard c. the likely means of exposure to the hazard d. the likelihood of exposure in all work areas in a facility/office/practice setting; and then e. evaluates available engineering, administrative and PPE controls needed to minimize the risk of the hazard
Patient	For the purposes of this document, the term patient will include those receiving health care, including patients, clients and residents.
Pathogenicity	This refers to the ability of the microorganism to cause disease (i.e. to harm the host).
Patient environment	This term refers to the inanimate objects in the proximate environment of the patient that may be a source of microorganisms for the patient or may be contaminated by the patient and be a source of microorganisms for others. The immediate space around a patient may be touched by the patient and may also be touched by the health care provider when providing care. In a single room, the patient environment is the room. In a multi-bed room, the patient environment is the area inside the individual's curtain. In an ambulatory care setting, the patient environment is the area that the patient may come into contact with in their cubicle. In a nursery or neonatal setting, the patient environment includes the inside of the bassinette or incubator, as well as the equipment outside the bassinette or incubator used for that infant (e.g., ventilator or monitor). See also, *Health Care Environment*.
Personal protective equipment (PPE)	This is one element in the Hierarchy of Controls. Personal protective equipment consists of gowns, gloves, masks, facial protection (i.e. masks and eye protection, face shields or masks with visor attachment) or respirators that can be used by an HCW or other staff to provide a barrier that will prevent potential exposure to infectious microorganisms.
Plain soap	Plain soap refers to basic detergent products that do not contain antimicrobial agents, or contain very low concentrations of antimicrobial agents, which are effective solely as preservatives.
Point of care	Point of care refers to place where a patient receives health care from a HCW or other staff. Point of care incorporates three elements being present at the same time: the patient, the HCW and an interaction that could result in transmission of an infectious agent.

Point of care risk assessment (PCRA)	A PCRA is an activity whereby a HCW (in any health care setting across the continuum of care): 1) Evaluates the likelihood of exposure to an infectious agent a. for a specific interaction b. with a specific patient c. in a specific environment (e.g., single room, hallway) d. under available conditions (e.g., no designated hand hygiene sink) 2) Chooses the appropriate actions or PPE needed to minimize the risk of exposure for the specific patient, other patients in the environment, the HCW, other staff, visitors or contractors, etc.
Precautions (including source control measures)	Precautions are interventions to reduce the risk of transmission of microorganisms between persons in health care settings, including patient to patient, patient to HCW, and HCW to patient.
Respirator	A respirator is a device that is tested and certified by procedures established by testing and certification agencies recognized by the authority having jurisdiction. It is used to protect the user from inhaling a hazardous atmosphere. The most common respirator used in health care is a N95 half-face piece filtering respirator. The term respirator refers to a half-face, non-powered air purifying respirator. It is a personal protective device that fits tightly around the nose and mouth of the wearer, and is used to reduce the risk of inhaling hazardous airborne particles and aerosols, including dust particles and infectious agents. See also N95 Respirator, Respiratory Protection, Fit testing, Seal check.
Respiratory hygiene/cough etiquette	This refers to a combination of measures to be taken by an infected source designed to minimize the transmission of respiratory microorganisms (e.g., influenza).
Respiratory protection	Respiratory protection requires the use of a respirator with NIOSH-approved N95 or higher filtration to prevent inhalation of airborne microorganisms.
Risk	Risk is the probability of an event and its consequences.
Risk assessment	This is an evaluation of the interaction of the health care provider, the client, patient, or resident, and the client, patient, or resident environment, to assess and analyze the potential for exposure to infectious agents.
Routine Practices	This refers to a comprehensive set of IP&C measures that have been developed for use in the routine care of all patients at all times in all health care settings. Routine Practices aim to minimize or prevent HAIs in all individuals in the health care setting, including patients, HCWs, other staff, visitors, contractors, etc.
Safety engineered medical devices	This refers to a non-needle sharp or a needle device used for withdrawing body fluids, accessing a vein or artery, or administering medications or other fluids, with a built-in safety feature or mechanism that effectively reduces exposure incident risk. Safety-engineered devices are licensed by Health Canada.
Severe acute respiratory infection (SARI)	Refer to Severe Acute Respiratory Infection (SARI) and Emerging Respiratory Pathogens Protocol available at: www.manitoba.ca/health/publichealth/cdc/protocol/sari.pdf

Seal check	A seal check is a procedure the wearer performs each time a respirator is worn. This procedure is performed immediately after putting on the respirator to ensure there is a good facial seal. Seal check has been called fit check in other IP&C documents. See Appendix A of CSAZ94.4-02 Selection, Use and Care of Respirators. (See also Fit Test).
Semi-critical items	These are items that come in contact with non-intact skin or mucous membranes, but ordinarily do not penetrate them. Reprocessing semi-critical items involves thorough cleaning, followed by high level disinfection.
Severe respiratory infection	Refer to MHSAL Severe Acute Respiratory Infection (SARI) and Emerging Respiratory Pathogens Protocol available at www.manitoba.ca/health/publichealth/cdc/protocol/sari.pdf
Sharps	Sharps are objects capable of causing punctures or cuts (e.g., needles, syringes, blades and clinical glass).
Source	The source is a person, animal, object or substance that may contain an infectious agent or microorganism that can be passed to a susceptible host.
Source control measures	These are methods to contain infectious agents from an infectious source, including signage, separate entrances, partitions, triage and early recognition, AIIRs, diagnosis and treatment, respiratory hygiene (including masks, tissues, hand hygiene products and designated hand hygiene sinks) process controls for AGMPs and spatial separation.
Staff	Staff refers to any employee conducting activities in settings where health care is provided, including health care providers. See also, *Health Care Providers*.
Sterile technique	See aseptic technique.
Sterilization	Sterilization is the destruction of all forms of microbial life, including bacteria, viruses, spores and fungi.
Susceptible host	A susceptible host is an individual without sufficient resistance against a particular infectious agent to prevent contracting infection or disease when exposed to the agent (synonymous with non-immune).
Terminal cleaning	Terminal cleaning refers to the process for cleaning and disinfection of a patient accommodation, undertaken upon discharge of any patient or on discontinuation of Contact Precautions. The patient room, cubicle or bedspace, bed, bedside equipment and environmental surfaces and sinks and bathroom should be thoroughly cleaned before another patient is allowed to occupy the space. The bed linens should be removed before cleaning begins.
Transmission	This is the process whereby an infectious agent passes from a source and causes infection.
Utility sink	A utility sink is one used for non clinical purposes. It is not appropriate to use for hand washing.
Virulence	Virulence refers to the ability of the infectious agent to cause severe disease (e.g., Ebola: high; rhinovirus: low).

PART A – OVERVIEW OF ROUTINE PRACTICES AND ADDITIONAL PRECAUTIONS

I. Introduction

Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care represent the IP&C practices to be used consistently in all health care settings in Manitoba, and the expected processes and practices of care. The objective of this guideline is to identify and promote IP&C practices and precautions for preventing the transmission of infection in all health care settings. This guideline is designed primarily for use by infection control professionals (ICPs). Where individuals who lack IP&C expertise are required to implement this guideline, it is recommended they seek the expertise of ICPs in their region.

This guideline promotes the consistent application of Routine Practices and Additional Precautions across the continuum of care. It also outlines modifications of the application of Additional Precautions outside of acute care. This guideline should be used to develop specific recommendations for use within the RHAs, taking into consideration local conditions such as the type of facilities available, risk of acquisition of infection, type of health care setting, type of care, and level of education and awareness of the HCWs providing the care. Included in this document are the principles necessary to prevent transmission of microorganisms from patient to patient, patient to HCW and HCW to patient across the continuum of care. For the purposes of this document, the term patient will be used to include those individuals who are receiving health care, and who are traditionally and routinely referred to as patients, clients or residents. Principles of transmission, as well as Routine Practices and Additional Precautions are outlined for acute care, LTC, ambulatory care, prehospital care and home care settings. For the purpose of this document, acute care also includes ambulatory care settings such as emergency departments, hospital-based and stand-alone clinics and ambulatory surgery centres.

A. Principles Upon Which This Document is Based

This document recognizes certain principles:

- Consistent application of Routine Practices is expected for the care of all patients at all times across the continuum of care.
- Adherence to Routine Practices can reduce the transmission of microorganisms in all health care settings.
- Individual components of Routine Practices are determined by a risk assessment (e.g., an assessment of the task or care to be performed, the patient's clinical presentation, physical state of the environment and the health care setting).
- Alcohol-based hand rubs (ABHR) play a critical role in mass behaviour change and health improvement. HCWs should use ABHR at the point of care as the preferred method of hand hygiene in all health care settings, unless exceptions apply, such as when hands are visibly soiled with organic material, or during *Clostridioides difficile (C. difficile* – formerly called *Clostridium difficile*) outbreaks or in a hyperendemic (sustained high rates) setting). ABHR is appropriate to use when caring for patients with *C. difficile*, except in outbreak or hyperendemic settings, when handwashing with soap and water is recommended.
- Single inpatient rooms with a toilet and designated handwashing sink for HCWs are recommended, rather than multi-patient rooms with designated private toilets and sinks for patients and designated hand washing sinks for HCW.
- Implementing respiratory hygiene is necessary across the continuum of care as a strategy involving a combination of measures designed to minimize the transmission of respiratory pathogens.

- The preferred spatial separation between a patient with a suspected or confirmed droplet transmissible respiratory infection, who is coughing (infected source) and a patient without that infection (susceptible patient) is from one metre to two metres apart. One metre may be sufficient for young children and others whose cough is not forceful enough to propel the droplets as far as two metres.
- In multi-patient rooms, the Centers for Disease Control and Prevention recommends one metre of spatial separation to reduce the opportunities for inadvertent sharing of items between the infected or colonized patient and other patients.
- It is recommended that strategies be implemented to reduce aerosols when performing AGMPs on patients with signs and symptoms of suspected or confirmed tuberculosis, SARS, MERS-CoV, SARI or other emerging pathogens, for which transmission characteristics are not yet known. Strategies to reduce aerosol generation should also be implemented when AGMPs are necessary for patients with viral hemorrhagic fevers. See PART A, II, C, 2. c. Aerosol-generating Medical Procedures. See Part B, Section III, 3.e. Strategies to Reduce Risk from Aerosol Generation of Microorganisms. Routine Practices are generally sufficient for AGMPs performed on patients with no signs or symptoms of suspected or confirmed TB, SARS or other emerging respiratory infections. However, there may be instances where Additional Precautions are indicated as specified in Tables 5 and 6 (e.g., Droplet and Contact Precautions for RSV).
- Adult as well as pediatric patients with known or suspected viral respiratory infections should be placed on Droplet and Contact Precautions.
- HCWs must follow aseptic technique for invasive procedures and in the handling and delivery of parenteral medications and intravenous systems.
- Health care organizations are expected to perform an organizational risk assessment (ORA) to evaluate the health care environment and identify the risk of exposure to microorganisms, and then implement appropriate control measures (e.g., health care facility design, and cleaning, disinfection and sterilization of patient care equipment).
- HCWs are expected to perform a PCRA prior to each patient interaction, taking into consideration the patient, patient environment and nature of the interaction.
- Microorganisms may be transmitted from both symptomatic and asymptomatic individuals, emphasizing the importance of adhering to Routine Practices at all times, for all patients, in all health care settings.
- Additional Precautions are required for patients with suspected or known infections or colonization with microorganisms, for which Routine Practices are not sufficient to prevent transmission.
- Patients known or suspected to be infected or colonized with certain microorganisms will require Routine Practices and Additional Precautions based on the modes of transmission of these microorganisms.
- Application of Additional Precautions may vary between acute care, LTC, ambulatory care, prehospital care and home care settings. Consider local epidemiology in the application of Additional Precautions.
- Additional Precautions must be used empirically, based on clinical presentation when the specific infecting organism has not been confirmed. This may need to be modified or discontinued once a specific microorganism is identified.
- The primary goal of IP&C programs is to reduce the risk of acquiring a HAI to the minimum possible level. Zero risk is not attainable in every circumstance, but should nevertheless be the ultimate goal. The consequences of cross-transmission of microorganisms must be balanced against the consequences (adverse effects and cost) of precautions taken.

Major changes and issues with this revision include:

- Inclusion of the *4 Moments for Hand Hygiene* is based on the World Health Organization (WHO) *5 Moments for Hand Hygiene*. The *4 Moments for Hand Hygiene* was developed by Public Health Ontario for the HCW Just Clean Your Hands hygiene program, and later endorsed and adopted by the Canadian Patient Safety Institute (CPSI) *Hand Hygiene Challenge*. The 4 Moments for *Hand Hygiene* outline the four indications or moments to perform and monitor HCW adherence to hand hygiene. These indications incorporate the principles of when to perform hand hygiene that are outlined in the PHAC *Hand Hygiene Practices in Healthcare Settings* document.

  Available at: http://publications.gc.ca/collections/collection_2012/aspc-phac/HP40-74-2012-eng.pdf
- Antimicrobial-resistant organisms (AROs) are an increasing problem and public health challenge. The AROs of most significant concern in Canada are MRSA and CPE. CPE has caused major outbreaks world wide, with associated morbidity and mortality. Although numbers of CPE in Canada have been small compared to incidence in other countries, we have started to see an increase. Another antimicrobial-resistant organism of concern is multi-drug resistant *Candida auris*.
- Emerging or novel respiratory pathogens that cause acute respiratory infections are a potential impact to public health. These infections include Severe Acute Respiratory Infection (SARI), Middle East Respiratory Syndrome Coronavirus (MERS-CoV), avian influenza and pandemic influenza.

B. Routine Practices

Routine Practices are the IP&C practices for use in the routine care of ALL patients at ALL times in ALL health care settings and are determined by patient characteristics, the environment and the task to be performed.

Performing an ORA (see PART A, Section III, B, 1 below) and addressing any deficiencies identified provides the framework to ensure that appropriate components in the Hierarchy of Controls related to Routine Practices are in place to minimize the risk of exposure to, and transmission of, microorganisms within health care settings.

A PCRA (see PART A, Section III, C, 1 below) is performed by HCWs to determine the appropriate control measures required to provide safe patient care (i.e., protect the patient from transmission of microorganisms) and to protect the HCW from exposure to microorganisms (e.g., from sprays of blood, body fluids, respiratory tract or other secretions or excretions and contaminated needles and other sharps).

Routine Practices include:

- point of care risk assessment
- hand hygiene (including point of care ABHR)
- source control (triage, early diagnosis and treatment, respiratory hygiene and spatial separation)
- patient accommodation, placement and flow
- aseptic technique
- use of personal protective equipment
- sharps safety and prevention of bloodborne transmission
- management of the patient environment, including:
  - o cleaning of the patient environment
  - o cleaning and disinfection of non-critical patient care equipment
  - o handling of waste and linen
- education of patients, families and visitors
- visitor management

C. Additional Precautions

Additional Precautions are implemented when the natural transmission characteristics or impact of infection with a specific microorganism means Routine Practices may not be sufficient to prevent transmission (e.g., microorganisms with a low infectious dose, such as *Shigella* spp.; microorganisms spread by the droplet route, such as respiratory syncytial virus (RSV); and epidemiologically significant microorganisms, such as antibiotic resistant organisms (AROs). Additional Precautions may also be required when medical procedures increase the risk of transmission of a specific agent (e.g., AGMPs) or because of the clinical situation (e.g., care of a young child, incontinent adult or cognitively impaired individual). The application of Additional Precautions is specific to the care setting: acute care, ambulatory care, prehospital care, LTC and home care. **The application of Routine Practices always continues, even with the use of Additional Precautions.**

Additional Precautions are conventionally divided into:

- Contact Precautions, for microorganisms of low infective dose or situations where heavy contamination of the patient's environment is anticipated
- Droplet Precautions, for microorganisms primarily transmitted by the large droplet route
- Airborne Precautions, for microorganisms transmitted by small particles through the air over extended time and distance

Some infections can be transferred by more than one route and require a combination of Additional Precautions.

Performing an ORA (see PART A, Section III, B, 1. below) and addressing deficiencies provides the framework to ensure that appropriate components in the Hierarchy of Controls (see PART A, Section III, A, below) related to Additional Precautions are in place to minimize the risk of exposure to and transmission of infectious agents within health care settings. Ensure health care workers are made aware of the ORA.

Protective Environment and Precautions:

Immunocompromised patients vary in their susceptibility to health care associated infections, depending on the severity and duration of their immune compromised state. These patients are generally at increased risk for bacterial, fungal, parasitic and viral infections from their own (endogenous) and exogenous sources. Generally, immunocompromised patients can be cared for in the same environment as other patients. However, it is always advisable to minimize exposure to other patients with highly transmissible infections, such as respiratory and gastrointestinal infections. It is critical that HCWs and others who are acutely ill with a communicable infection do not enter the room of immunocompromised patients and follow Routine Practices at all times.

There are other patients that are at increased risk for numerous types of opportunistic infections while receiving health care. Examples of patients and conditions include but are not limited to:

- congenital or acquired immunodeficiency
- immunodeficiency due to chemotherapeutic agents
- immunodeficiency due to hematologic malignancies or solid organ transplants
- neutropenic patients

A protective environment is designed to minimize fungal spore counts in the air and reduce the risk of invasive environmental fungal infections. A protective environment includes a high efficiency particulate air (HEPA) filtered positive pressure environment. Protective environment/precautions would be needed for allogeneic hematopoietic stem cell transplant patients, as well as those patients with significantly compromised immune functions, specifically those patients whose absolute neutrophil count (ANC) is expected to fall or is less than 0.5 x 10^9/L (500 cell/µl). Organizations with these types of patients should develop specific protocols to outline the precautions required.

D. Changing Populations and Health Care Delivery Systems

Health care systems are constantly evolving and going through restructuring. The patient population in acute care hospitals continues to shift towards a group at higher risk for HAIs. New technologies and aggressive treatments, many of which compromise host defences, have permitted patients with previously fatal diseases to survive. Organ and hematopoietic stem cell transplants, HIV, and an aging population have increased the number of high-risk patients. This has resulted in:

- increased acuity of illness in acute care facilities
- increased level of acuity in LTC (providing care such as intravenous therapy, hemodialysis or ventilation therapy)
- performance of invasive procedures and complex treatments in day treatment or outpatient settings exposing this population to the risk of HAIs
- transfer of care for many similar conditions or treatments to the home or outpatient settings

In addition, an aging population which is living longer and are increasingly reliant on prosthetic and indwelling devices increases the demand for health care services.

HAI occurs across the continuum of care, from prehospital care to acute care hospitals, rehabilitation centers, LTC facilities, nursing homes, adult patient care, ambulatory care centres and home care. Transfers of patients between facilities and across different levels of care within facilities, as well as transfers back to Canada of patients exposed to infectious agents in foreign countries (e.g., injured returning soldiers or patients with hospitalization while in a foreign country) occurs frequently and increases the risk for transmission of antimicrobial resistant microorganisms.

E. Burden of Health Care Associated Infections

Health care associated infections (e.g., surgical site infections and intravascular catheter-associated blood stream infections) result in a substantial burden of disease in Canadians and are an important public health problem. They remain a patient safety issue, represent a significant adverse outcome of Canada's health care system and a barrier to timely access to care for all Canadians.

There has been no comprehensive survey of the occurrence of HAIs in Canada. However, it is estimated that five to 10 per cent of hospitalized Canadians will develop a HAI. A survey of sentinel Canadian hospitals in February 2002, by Gravel et al. found that 10.5 per cent of adult inpatients and 9.1 per cent of pediatric inpatients had an HAI during the survey. In a repeat survey in 2009, including a similar hospital group, Gravel et al. found that 12.3 per cent of adult patients and 7.2 per cent of pediatric patients had a HAI on the survey day. Between the two surveys, a 12 per cent increased prevalence of HAI (from 11.1 per cent to 12.4 per cent) was noted and the number of patients on isolation precautions had nearly doubled from 7.7 per cent to 14.8 per cent, largely due to the impact of *C. difficile* infection (CDI) and AROs [Personal Communication, CNISP 2010].

Extrapolating from U.S. data, Zoutman et al. estimated that approximately 220,000 HAIs occur annually in Canada and more than 8,000 deaths occur each year, attributable to HAIs. **This translates into approximately 285 deaths per year in Manitoba.** Health care associated infections vary in type, frequency and severity. For example, health care associated urinary tract infections (UTI) are amongst the most common of all HAIs, but result in less serious patient impact. In contrast, ventilator associated pneumonia (VAP) is less common, but has a case mortality rate exceeding 10 per cent.

Health care associated infections are also costly to treat. They have a significant impact on health care spending as a result of prolonged hospital stay and wait times, readmissions, longer staff hours, additional treatments, laboratory testing and antimicrobial use, increased surveillance activities, single room accommodation for IP&C purposes, PPE, cleaning supplies, outbreaks, increasing consumption of costly resources and occasionally, legal and litigation costs (1). According to the U.S. Centers for Disease Control and Prevention, the overall annual, direct medical costs of HAIs to hospitals in the U.S. ranges from US$35.7 to US$45 billion (2).

The emergence of AROs has also resulted in increased cost to the health care system. It is estimated that AROs increase the annual direct and indirect costs to patients by an additional $40 million to $52 million in Canada (1). In a study to determine the incremental cost attributable to methicillin-resistant *Staphylococcus aureus* (MRSA) in

a Canadian hospital, patient specific hospitalization costs for a cohort of patients with hospital acquired MRSA and a matched comparison group of uninfected patients were investigated. The median total hospitalization cost per nosocomial MRSA patient (colonized and infected) was $14,841, while the corresponding cost for those in the uninfected comparison group was $5,844, an incremental cost of $8,997 per nosocomial MRSA patient.

Daily living is often significantly affected for many patients with HAIs. For all HAIs, except SSI, many patients experienced being seen as dirty and shameful, resulting in stigmatization and fear of contamination. In turn, this influenced relationships, resulting in a distancing from family, friends and colleagues at work, with many patients afraid to disclose their diagnosis for fear of rejection. Unlike most other medical conditions for which HCWs responses toward patients tend to be supportive, they may be concerned to distance or protect themselves from contagious patients (3).

It has been shown that patients with HAI remain in hospital longer on average than patients without infection, with the longest hospital stay and highest costs associated with multiple infections (1). Patients with HAIs have prolonged hospital stays (e.g., health care acquired surgical site infections prolong hospital stay by a mean of 25.7 days) and investigation and treatment of these infections consumes other health care resources. The fear of acquiring an HAI may also impact the patient and community's confidence in the delivery of health care (1). Health care associated infections are therefore a significant barrier to access to care for other health conditions of Canadians.

All health care interventions have potential risks, including risk of infection, as well as potential benefits. Currently, not all HAIs are preventable. However, HAIs are not inevitable. Systematic approaches to HAI prevention are highly effective in reducing their frequency. The gap between HAIs that can be prevented and those that are currently being prevented is attributable to a lack of awareness and implementation of prevention strategies by front line HCWs, and inadequate prioritization of HAI prevention strategies by health care managers and administrators.

Application of *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care* is an important component of a comprehensive approach to HAI prevention. By adopting the recommendations in this document across the continuum of care, the burden of HAIs in Manitoba can be reduced.

F. Balancing Risk and Benefit in Preventing Cross-Transmission

Ideally, care should be provided in a manner that maximizes the likelihood that all transmission of potential microorganisms from all patients asymptomatically colonized, as well as symptomatic in all health care settings, will be prevented. However, transmission of microorganisms in the health care setting cannot always be prevented, and attempts to do so would entail additional costs and restrictive measures that interfere with the quality of life for the patient or restrict beneficial medical procedures or interventions. Thus, IP&C practices must be tailored to the level of care that is being provided and the inherent risk to the individual and the population if infection occurs. Precautions that may be justified in terms of risk-benefit in an intensive care unit (ICU) or acute care ward may not be of equal benefit or indicated for a patient in LTC.

Unnecessary use of Additional Precautions is to be avoided. Isolation practices can be stigmatizing and psychologically damaging, which may adversely affect the quality of health care delivered (e.g., increased medical errors). Furthermore, unnecessary isolation practices are expensive and consume limited health care resources that could be used for other purposes to benefit other patients. Consequently, only IP&C isolation practices clearly indicated in the care setting should be implemented, and these should be discontinued as soon as appropriate.

In most instances, the precautions to apply are clear-cut, based on the evidence available. In other situations, certain measures may need to be modified for different types of health care settings, based on assessment of risks and benefits. The benefit of reducing risk of transmission must be balanced against the cost (in quality of life, adequacy of medical care, and monetary outlay) of the precautions required to achieve this reduction in risk.

II. Principles of Transmission of Microorganisms

A. Chain of Infection

Epidemiologic analysis is essential to prevent disease by describing the distribution of illness (in terms of person, place and time) and identifying modifiable factors that affect occurrence and outcomes. It provides the rationale for control measures that minimize transmission of microorganisms, and ultimately reduce the incidence of HAIs in patients and occupational infections in HCWs.

Transmission of microorganisms may result in transient carriage or long-term colonization, asymptomatic infection or clinical disease. The presence of microorganisms in or on a host, with growth and multiplication, but without tissue invasion or cellular injury, is referred to as colonization. Infection is the condition in which microorganisms multiply within the body, and there is a response from the host's immune defences. Infection may or may not lead to clinical disease (symptomatic infection). The establishment of infection involves complex interrelationships between the source of the infectious agent (microorganism), the susceptible host, and the environment and requires the transmission of microorganisms from the source to a susceptible host. One framework for understanding this complex relationship is the chain of infection, which can have six links (Figure 1a), including the:

- infectious agent
- reservoir
- portal of exit
- mode of transmission
- portal of entry
- susceptible host

Breaking any one of the links in the chain of infection will prevent infection from occurring (Figure 1b).

Figure 1a and 1b Chain of Infection

Figure 1a

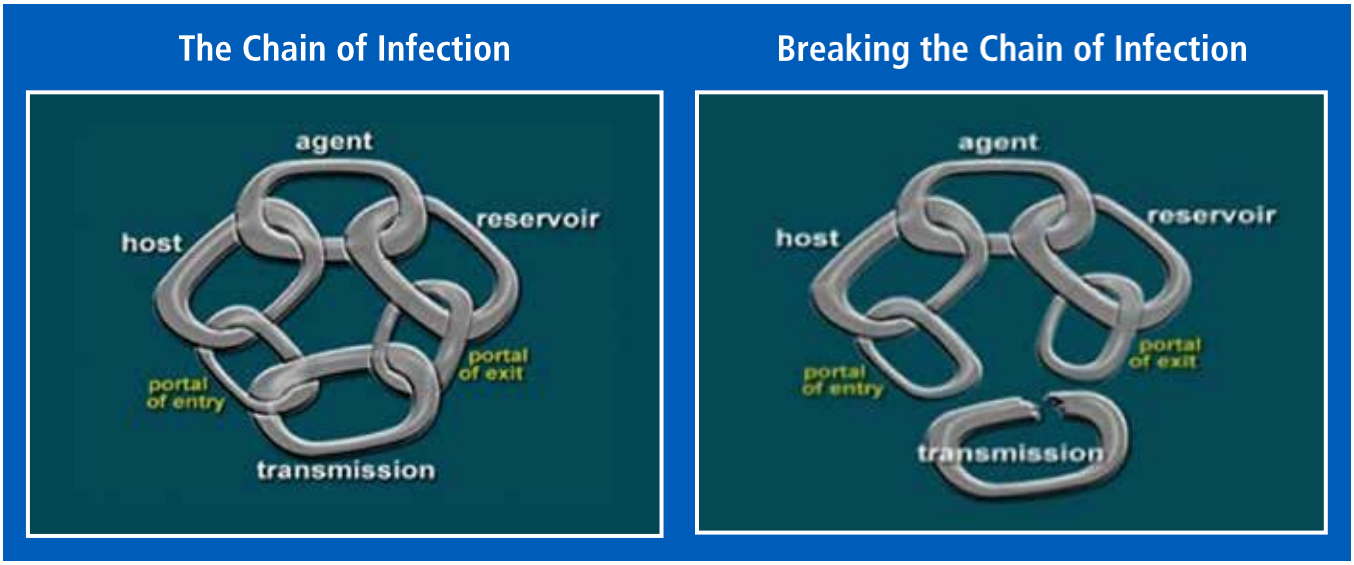


Figure 1b

A brief explanation of each link follows:

1. Infectious Agents (microorganisms)

These are bacteria, viruses, fungi, parasites and prions and can be either endogenous flora (i.e., patient's own microorganisms) or exogenous flora (i.e., microorganisms external to the patient, for example from other individuals, plants or inanimate objects). Regardless of source, they are transient if they are temporarily carried by the patient. (See PART A, Section II, B). Antimicrobials, disinfectants and hand hygiene with ABHRs kill microorganisms, thereby breaking this link in the chain of infection. The characteristics of a particular microorganism affect the ease of its transmission. Microorganisms that can survive environmental conditions and remain viable on inanimate objects, such as patient care equipment, are more likely to be transmitted.

2. Reservoirs in Health Care

Humans, animals and the environment are reservoirs of infectious agents (microorganisms) relevant to health care. Hand hygiene following contact with individuals or their environment, preoperative skin preparation and cleaning the environment all reduce numbers of microorganisms present in a reservoir, breaking this link in the Chain of Infection (See PART A, Section II, B).

3. Routes of Transmission

Routes of transmission of infectious agents (microorganisms) are conventionally categorized into five routes. These are:

- contact
- droplet
- airborne
- common vehicle
- vectorborne

Transmission of the many varieties of microorganisms cannot always be circumscribed within a limited number of transmission modes. Nevertheless these transmission categories have proven useful in describing the spread of microorganisms in populations. The routes of transmission vary with the microorganisms involved. Some microorganisms can be transferred by more than one route (See Part A, Section II, C). The appropriate use of barriers and adherence to hand hygiene break this link in the chain of infection.

4. Portals of Entry

A portal of entry is the route by which an infectious agent enters the host. Examples include mucous membranes of the respiratory tract, the gastrointestinal tract, the urinary tract, breaks in the skin (e.g., wounds) and devices such as intravenous lines. This link in the chain of infection can be broken by:

- protecting portals of entry by covering wounds
- wearing PPE
- reducing breaches in the mechanical barriers of the skin and mucous membranes
- using sterilized equipment when required
- performing hand hygiene so that hands do not transfer microorganisms to a portal of entry

5. Portals of Exit

Portal of exit are the route by which an infectious agent (microorganism) leaves the reservoir (not all reservoirs have an obvious portal of exit, e.g., the environment). Infectious agents are contained in blood, body fluids, excretions, secretions and skin of human reservoirs, depending on the agent, and leave the reservoir through the respiratory, gastrointestinal or integumentary (skin and mucous membranes) system. Reduction of excretions or secretions, or covering portals of exit (e.g. dressings on wounds, masks) break this link in the chain of infection.

6. Susceptible Host

An individual must be susceptible to the infectious agent (microorganism) for an infection to occur. Humans do not become infected with most animal viruses because they do not have the appropriate cell receptors, and individuals with circulating antibodies to vaccine-preventable diseases do not develop infection because the immune response prevents the infectious agent from multiplying (See PART A, Section II, D). This link in the chain of infection can be broken by ensuring host defences are maximized (e.g., through immunization, optimal nutrition, reduction of smoking and control of diabetes).

B. Sources or Reservoirs of Infectious Agents (microorganisms)

The sources or reservoirs of infectious agents transmitted in health care may be human, animal or environmental. Portals of exit vary by reservoir and infectious agent.

1. Human Sources

Source individuals may have active clinical disease, be in the asymptomatic or incubation period of an infection, or may be transiently or indefinitely colonized with microorganisms, particularly on the skin and mucous membranes. Human reservoirs include patients, HCWs, household members and other visitors.

Transmission of microorganisms in health care is increased by the presence of:

- patients who visibly soil the environment or cannot maintain appropriate hygiene, including respiratory hygiene
- patients who are cognitively impaired
- patients with uncontained secretions or excretions
- patients with wound drainage that cannot be contained by a dressing
- patients with fecal incontinence, if stools cannot be contained in incontinence products or diapers
- patients with viral respiratory or gastrointestinal infections, especially infants

2. Animal Sources

This is not a common mode of transmission of HAI in most care settings. The advent of pet therapy in acute care and presence of companion animals in home and LTC provides some opportunity for zoonotic infection. Recently, researchers have demonstrated transfer of MRSA and *C. difficile* to canine visitors, emphasizing the importance of hand hygiene and environmental cleaning before and after contact with animals in health care settings.

3. Environmental Sources

Environmental factors may either assist or impede the transmission of microorganisms. The environment may play a larger role in the survival and growth of certain microorganisms than previously appreciated, reinforcing the importance of minimizing environmental contamination by patient secretions and excretions, avoiding unnecessary hand contact with environmental surfaces and ensuring high standards for environmental cleaning are maintained.

Respiratory viruses, rotavirus, norovirus, and *C. difficile* spores persist for prolonged periods in the environment. The role of the environment is increasingly recognized as an important source of patient to patient transmission of AROs.

The mobile environment (e.g., equipment and items that are shared between patients, if not cleaned between uses), may be contaminated following exposure to one patient and be a source of transmission to other patients. Examples of items implicated in the transmission of infection or known to be an environmental source of contamination are listed in Table 1.

Table 1: Examples of Environmental Sources of Contamination

	Patient care items contaminated but not clearly implicated in the transmission
• Contaminated blood pressure cuffs in the transmission of *C. difficile* and *Klebsiella* spp. • Contaminated thermometers in the transmission of VRE and *C. difficile* • Ultrasonic nebulizers in the transmission of MRSA • Reusable finger stick blood sampling devices in the transmission of hepatitis B • Environmental surfaces near infant bedside such as countertops, crib sides, pacifiers, toys in the transmission of RSV • Toys in the transmission of multi-drug resistant *Pseudomonas aeruginosa*	• Call bells contaminated with VRE • Bedside tables, bedrails and furniture contaminated with VRE and contaminated with MRSA • Tourniquets, monitoring devices, otoscopes, stethoscopes • Computers, computer keyboards and faucets • Furnishings, mattresses, curtains and linen • Apparel, neckties and medical charts

C. Exposure to and Routes of Transmission of Infectious Agents

1. Exposure to Infectious Agents (microorganisms)

Exposure occurs when a susceptible host comes into contact with an infected source or contaminated environment (e.g., inanimate or animate object, or via particles in the air). Not all exposures lead to transmission and infection. The probability of transmission and infection is dependent on factors including:

- host susceptibility
- presence of host receptors for the microorganism
- microorganism inoculum size
- viability and virulence
- effectiveness of the Hierarchy of Controls (see PART A, Section III, A) utilized by an organization
- individual barriers worn by a HCW

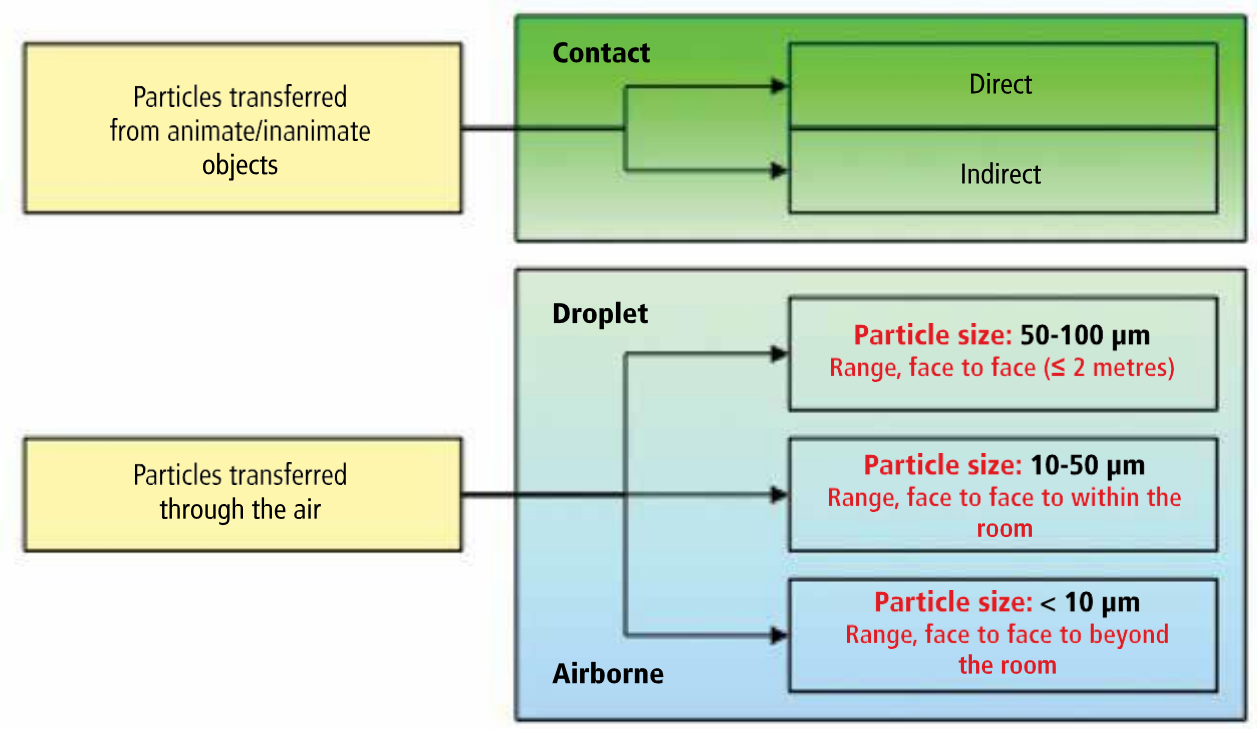


Figure 2: Exposure to Fomite Particles

Figure 2 illustrates the continuum of infectious agent exposure specific to the contact, droplet or airborne routes that may be relevant to a susceptible host with contact with an infected source or a contaminated environment (physical or passive, face-to-face contact or close contact within two metres from an infected coughing source) and when a susceptible host inhales a microorganism (as an aerosol or droplet). Research has demonstrated that both droplet and airborne-sized particles can be found in the air at close proximity (up to two metres) to a coughing or sneezing source. In addition, a portion of larger particles (droplets) may desiccate and become smaller while in the air, becoming in effect, droplet nuclei. Particles with a diameter of 1 µm to 10 µm may penetrate as far as the alveolar ducts (beyond the vocal cords) but may also be deposited at any point in the respiratory tract, as shown in Figure 3.

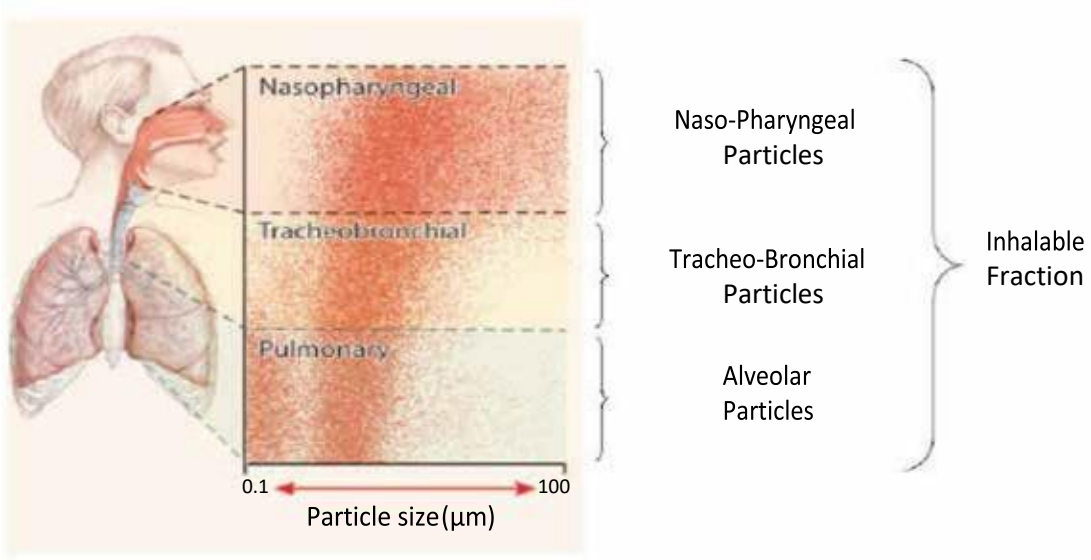


Figure 3. Deposition regions of the respiratory tract for the various particle sizes

Continuum of Droplet and Airborne Exposure

The probability of airborne exposure to an infectious aerosol is influenced by several factors in addition to the proximity of the infected source to the host. These include the particle sizes containing the infectious agent, the viability of the infectious agent, and the animate and inanimate environment of a room (e.g., the concentration of the viral particles in droplet nuclei, the concentration of aerosol in the room, the relative humidity, the direction of air flow and the number of air changes per hour in the room).

Particles of a variety of sizes are expelled from the human airway during coughing, sneezing, talking and medical procedures. The size of these particles and the distance they will be propelled is dependent on the force generated by the individual or the procedure. Large particles (greater than 10 μm) will fall quickly (in a few seconds) to the ground. However, smaller particles may remain suspended for a significantly longer time: tens of seconds for a droplet of 10 μm diameter and minutes or hours longer for small droplet nuclei. The particles that remain aloft for minutes or hours (less than 10 μm diameter) can be carried by air currents over a measurable distance, including beyond the room, and are considered to represent an airborne exposure.

2. Routes of Transmission

Routes of transmission of microorganisms have conventionally been classified as contact, droplet, airborne, common vehicle and vectorborne. The routes of transmission vary with the microorganisms involved. For most microorganisms, transmission may primarily be by one route, such as direct or indirect contact (e.g., rotavirus or *C. difficile*), droplet route (e.g., pertussis) or airborne route (e.g., *Mycobacterium tuberculosis)*. Some infectious agents, however, may be transmitted by more than one route (e.g., RSV can be transmitted by both the droplet and contact routes).

Figure 4: Direct contact where there is skin to skin contact between two persons

a. Contact Exposure and Transmission

Contact exposure occurs when microorganisms are transferred through physical contact between an infected source and a host, or through the passive transfer of the microorganisms to a host, via an intermediate object. Hands can be contaminated by contact with an infected source, or by contact with contaminated inanimate surfaces, or objects in the immediate environment of an infected source.

Contact exposure includes both direct contact and indirect contact:

i) Direct contact exposure occurs when the transfer of microorganisms results from direct physical contact between an infected or colonized source and a host (body surface to body surface, without barriers) such as shaking hands (as shown in Figure 4).

ii) With indirect contact exposure there is passive transfer of microorganisms to a host via an intermediate object, such as contaminated hands not cleaned between episodes of patient care, contaminated patient care equipment (e.g., commodes, wheelchairs, base of electronic thermometers, BP cuffs or monitoring equipment), surfaces such as bedrails that are not appropriately cleaned and disinfected between patients, or devices that have manufacturing defects that impede appropriate reprocessing.

Other inanimate objects in the patient's environment that may also be involved include computers, toys and electronic recreational devices that are not cleaned and disinfected between patients (as shown in Figure 5).

Figure 5: Indirect contact where there is contact with an inanimate object, which may serve as the vehicle for transmission of pathogens

Contact transmission occurs when contact exposure leads to an infectious dose of viable microorganisms from an infected or contaminated source, resulting in colonization or infection of a susceptible host.

Microorganisms transmitted by the contact route include many of the epidemiologically significant microorganisms in health care settings, such as *C. difficile*, AROs (e.g., MRSA and CPE), and the viruses that cause gastroenteritis (see Appendix I). Other infectious agents, especially respiratory viruses (e.g., RSV, influenza, parainfluenza and rhinovirus) that are expelled in large droplets, remain viable in droplets that settle on objects in the immediate environment of the patient and survive long enough on surfaces to contaminate the hands of patients or HCWs.

See Part C, Tables 5 and 6 for the complete list of microorganisms transmitted by the contact route. Prevention and control of infectious agents transmitted by the contact route requires adherence to Routine Practices and Contact Precautions.

b. Droplet Exposure and Transmission

Droplet exposure may occur when droplets that contain microorganisms are propelled a short distance (within two metres) through the air and are deposited on the mucous membranes of a host. Droplets may also contaminate the immediate environment when they settle on surfaces and may contribute to contact transmission (as shown in Figure 6).

Figure 6: Droplet transmission where large respiratory particles travel up to 2 metres

Droplets are generated naturally from an infected source primarily during coughing, sneezing and talking, or artificially through AGMPs. Aerosol-generating medical procedures may also result in the generation of smaller infectious droplets that can travel further than those generated spontaneously from patients (see PART A, Section II, C(2)c, for further discussion on AGMPs). The coughs and sneezes of some individuals (e.g., young children or frail elderly) may not be forceful enough to propel droplets as far as two metres.

Droplets of various sizes (see Figure 2) may contaminate the immediate environment when they settle on surfaces. Some microorganisms may remain viable for extended periods of time and contribute to contact transmission (e.g., many respiratory viruses). Large aerosol particles (greater than 10 μm diameter) will fall to the surface in a few seconds, and droplet exposure can only occur if the source and host are in close proximity (within two metres). Some microorganisms expelled in large droplets are very fragile and do not survive outside the human host or on surfaces (e.g., *Bordetella pertussis* and meningococcus).

Droplet transmission occurs when the droplets that contain an infectious dose of viable particles are propelled a short distance (less than two metres) through the air and are deposited on the mucous membranes of the eyes, nose or mouth of a susceptible host, and overcome host defences.

Microorganisms transmitted by the droplet route include viruses that cause respiratory tract infections (e.g., RSV, influenza, parainfluenza, rhinovirus and adenovirus), rubella, mumps, and *B. pertussis*. See Part C, Tables 5 and 6 for a complete list of microorganisms transmitted by the droplet route.

Prevention and control of infections transmitted by the droplet route involves immunization for those that are vaccine preventable and adhering to Routine Practices and Droplet Precautions.

c. Airborne Exposure and Transmission

Airborne exposure may occur if small particles (i.e., aerosols containing droplet nuclei) with viable microorganisms are generated and propelled over short or long distances, and inhaled. Aerosols containing viable microorganisms are generated naturally from an infected source during coughing, sneezing and talking, or artificially through AGMPs. Airborne exposure may result immediately after generation (i.e., the direct projection of an aerosol containing viable amounts of microorganisms through the air, and directly captured by a susceptible host's respiratory system) or after a longer period of time. Droplet nuclei can remain suspended in the air for a period of time before settling out of the air, during which time a susceptible host may inhale the suspended aerosol (as shown in Figure 7).

Figure 7: Airborne transmission whereby small particles travel long distances

Airborne transmission may occur when viable microorganisms contained in aerosolized secretions from an infected source are propelled a short distance (within two metres) through the air, are inhaled, come into contact with receptors in a susceptible host's airway, overcome host defences and cause disease. For transmission of infection to occur, the microorganisms contained in the particles must be capable of remaining viable in the air for a prolonged period of time and the susceptible host must be exposed to a sufficient concentration (infectious dose) of these viable microorganisms. Infection can result only if the appropriate receptors for the infectious agents are present at the site of exposure. Figure 3 depicts the regions of the respiratory tract with the size classification of particles and their corresponding region of deposition.

Varicella zoster virus (chickenpox), *M. tuberculosis*, rubeola virus (measles), smallpox, monkeypox, viral hemorrhagic fever viruses and some other pathogens are transmitted by the airborne route. Measles transmission has been reported up to 90 minutes after the index case has left the room.

Part C, Tables 5 and 6 provide a complete list of microorganisms transmitted by the airborne route.

Prevention and control of infections transmitted by the airborne route includes vaccination for vaccine preventable diseases, and adhering to Routine Practices and Airborne Precautions, as outlined in Part B, Section IV, sub-section (iii). Specific requirements related to Airborne Precautions recommend that immune HCWs work with patients who have chickenpox/shingles or measles and that airflow is controlled. Control of airflow ensures ventilation systems with adequate rates of air exchange and appropriate pressure differentials to maintain direction of flow as required for an airborne infection isolation room (AIIR).

Appendix III provides information regarding the length of time it takes for the removal of airborne contaminants in an empty room with no ongoing aerosol-generating source. This is the time required to ensure the room is safe to use for a new patient, or for health care workers to enter without a N95 respirator.

Aerosol-generating Medical Procedures

Aerosol-generating medical procedures can generate aerosols as a result of artificial manipulation of a patient's airway. Several types of AGMPS have been associated with an increased risk of tuberculosis (TB), Severe Acute Respiratory Syndrome (SARS), and Middle East Respiratory Syndrome (MERS-CoV) transmission. While there is some evidence for the spread of infections via droplets and aerosols by these procedures, further research is needed to quantify the risk. Infection transmission may increase during AGMPs because of the potential to generate a high volume of respiratory aerosols that may be propelled over a longer distance than with natural dispersion. Examples of AGMPs include:

- intubation and related procedures (e.g., manual ventilation, open endotracheal suctioning)
- cardiopulmonary resuscitation
- bronchoscopy
- sputum induction
- nebulized therapy
- autopsy
- non-invasive positive pressure ventilation (CPAP, BiPAP)

Other medical procedures may result in the generation of aerosols, but there is no evidence that documents transmission of respiratory infections, including TB, SARS or influenza. Examples of these procedures include:

- high-frequency oscillatory ventilation
- tracheostomy care
- chest physiotherapy
- obtaining nasopharyngeal swabs or aspirates

Patients should be carefully assessed for signs or symptoms of suspected or confirmed TB, SARS or other emerging respiratory infections, prior to performing AGMPs. Strategies to reduce aerosol generation are required when performing AGMPs on patients with signs and symptoms of suspected or confirmed infectious tuberculosis, SARS, MERS CoV, SARI or other emerging pathogens, for which transmission characteristics are not yet known. Refer to Part B, Section IV, sub-section (iii) 1(b). For novel influenza viruses or emergence of as yet unknown pathogens, refer to the PHAC website www.canada.ca/en/public-health/services/diseases/pandemic-flu/health-professionals.html for specific guidance documents.

Routine Practices are generally sufficient for AGMPs performed on patients with no signs or symptoms of suspected or confirmed TB, SARS or other emerging respiratory infections. However, there may be instances where Additional Precautions are indicated as specified in Tables 5 and 6 (e.g., Droplet and Contact Precautions for RSV).

d. Common Vehicle Transmission

Common vehicle transmission is infection acquired by multiple people from a single contaminated source, such as food, multi-dose vials, intravenous fluids or equipment, etc. Control is achieved by maintaining appropriate standards in the preparation of food and medications, and in decontamination of shared equipment (see Figure 8).

Figure 8: An example of common vehicle transmission is a contaminated multi-dose vial

e. Vectorborne Transmission

Vectorborne transmission is transmission by insect vectors and is prevented by appropriate hospital construction and maintenance, closed or screened windows and proper housekeeping. Such transmission has rarely, if ever, been reported in Canadian health care settings (see Figure 9).

Figure 9: Disease transmitted by insects is an example of vectorborne transmissions

D. Host Factors

Microorganisms must gain access to a susceptible host by a receptive portal of entry for transmission to occur. The risk of transmission is influenced by the susceptibility of the host. The host's defences, if normal, may be able to eliminate a few microorganisms, but be overwhelmed by a large number, while an immunocompromised host may not be able to eliminate even a small number of organisms. Host defences, both non-specific (e.g., normal flora, intact skin, neutrophils and macrophages) and specific (antibodies and cell-mediated responses), may be altered by extremes of age, underlying disease (e.g., diabetes, HIV, malignancy or transplantation), genetic factors or medications. Additional factors that facilitate acquisition of microorganisms are:

- invasive/surgical procedures
- radiation therapy
- breaks in the skin and breaching of normal barriers, such as occurs with the presence of invasive medical devices (e.g., endotracheal tubes, indwelling urethral catheters and intravascular devices)
- provision of wound care

E. Outcomes of Transmission of Infectious Agents (Microorganisms)

Whether or not transmission results in colonization, asymptomatic infection or clinical disease depends on the pathogenicity and virulence of the infectious agent (microorganism), the inoculum size and the integrity of host defences (see Section II, D, above). Some microorganisms are inherently pathogenic and cause disease in any susceptible host (e.g., varicella). whereas others are opportunists causing infection only under special circumstances (e.g., coagulase-negative staphylococci in people who have prosthetic devices). Factors which contribute to the virulence of a microorganism may include:

- toxin production
- invasiveness
- presence of capsule
- adherence mechanisms
- ability to survive in host cells

For example, Ebola virus has high virulence and rhinovirus has low virulence. Some microorganisms are highly pathogenic and need only a low inoculum to cause disease (e.g., *Shigella*).

1. Colonization

The presence of microorganisms in or on a host with growth and multiplication, but without tissue invasion or cellular injury, is referred to as colonization. For most microorganisms, colonization is far more frequent than clinical disease. Colonization of the nasopharynx with aerobic Gram negative rods occurs with increased

severity of illness, malnutrition, major surgery, alcoholism and diabetes. Colonization with *Staphylococcus aureus* is common in normal healthy persons. Some patient populations are heavily colonized with *S. aureus* (e.g., hemodialysis patients, injection drug users, and patients with diabetes mellitus or skin disorders).

Disturbance of the normal flora by antimicrobials enhances overgrowth of endogenous aerobic Gram negative rods and enterococci, and increases risk of colonization with exogenous microorganisms, including antimicrobial resistant bacteria and yeast. The presence of normal or endogenous bowel flora is a defence mechanism against colonization of the gastrointestinal tract by exogenous microorganisms. The endogenous flora (e.g., bacteria residing in the respiratory or gastrointestinal tract) are also a cause of HAIs. Once acquired, prolonged carriage of antimicrobial resistant organisms (AROs) is common in some patient populations, such as colonization with resistant strains of *Pseudomonas aeruginosa* or *Burkholderia cepacia* in persons with cystic fibrosis or persistent MRSA colonization in dialysis and other patient populations.

2. Asymptomatic Infection/Clinical Disease

Infection may or may not lead to clinical disease (illness). Infection may cause cellular and tissue changes that may be detectable in the absence of overt signs and symptoms. This is a subclinical or asymptomatic infection. When sufficient cellular and tissue changes occur to produce overt signs and symptoms, the individual has clinical disease, which may range from mild to severe, depending on the microorganism and the health status of the host.

III. Control Measures to Reduce Health Care Worker Exposure to and Transmission of Microorganisms

A. Hierarchy of Controls to Reduce Exposure to and Transmission of Infectious Agents

Collaboration between IP&C/OH professionals and health care building engineers has led to better understanding and application of a tiered framework of measures and interventions that enables health care organizations to comprehensively evaluate the risk of HCW (including volunteers) exposure to microorganisms and other hazards in the workplace, and the effectiveness of the health care organization's mitigation responses.

The approach to containment of a hazard is to implement a hierarchy of controls. The first level of control is engineering interventions. If this level of control is not possible or adequate, then administrative interventions are used. Last in the hierarchy of controls is PPE. PPE is not the first control measure, as the use is dependent on variables of worker adherence. An understanding of the engineering, administrative (including patient care practices), and PPE controls enables health care organizations to determine how the health care environment in each setting (e.g., infrastructure, equipment, processes and practices) increases or decreases a susceptible host's (e.g., patient, HCW or visitor) likelihood of exposure to a microorganism or infected source within the health care setting.

1. Engineering Controls

The engineering control tier reduces the risk of exposure to an infectious agent or infected source hazard by applying building structure or ventilation strategies. Engineering controls do not depend on an individual's compliance with exposure prevention strategies. These controls are usually established and controlled within the building structure, thereby eliminating an individual's choice about their application and reducing the opportunity for individual error. As such, they provide more effective protection.

2. Administrative Controls

The administrative control tier provides an infrastructure of policies and procedures and patient care practices intended to prevent exposure to, and transmission of, microorganisms to a susceptible host during the provision of health care. To be effective, administrative controls must be implemented at the point of first encounter with an infected source and be continued until the infected source leaves the health care setting or is no longer infectious. Inherent in the development of administrative controls to prevent transmission of infection is the commitment by the health care organization to provide the necessary resources to implement the controls.

3. Personal Protective Equipment

Although the use of PPE controls are the most visible in the hierarchy of controls, PPE controls are the weakest tier in the hierarchy and should not be relied on as a stand-alone primary prevention program. The PPE tier provides a physical barrier between the uninfected and an infectious agent or infected source. These barriers include:

- gloves
- gowns
- masks
- facial protection
- eye protection (including face shields, masks with visor attachments)
- N95 respirators

The health care organization must ensure the availability of appropriate PPE for use by patients, HCWs, visitors, contractors, etc., to prevent exposure to an infectious agent or infected source.

Focusing only on availability and use of various PPE to the exclusion of other tiers in the hierarchy of controls will result in suboptimal protection of all persons in the health care setting, including patients, HCWs and other staff. The effective and appropriate use of PPE is the control that is most reliant on the user's adherence and competence and is, therefore, the control most easily compromised (resulting in ineffective protection from an infectious agent or infected source). The use of PPE is the final step in the hierarchy of controls to minimize exposure and subsequent transmission. See Appendix IV, *Technique for Putting on and Taking off PPE.*

Table 2: Examples of Control Measures According to Hierarchy of Controls

TIER 1: Examples of Engineering Controls
• Source control o single rooms with private toilets, designated sink for patient use, designated hand washing sinks for health care workers o airborne infection isolation rooms (AIIRs) o signage to direct patients to separate entrances (during community outbreaks) for patients symptomatic with respiratory infections o physical barriers (e.g., partitions in triage areas to prevent exposure to patients symptomatic with respiratory infections) o appropriate spatial separation (in patient rooms, waiting areas and in the home) o appropriate ventilation, which may include natural ventilation in the home, when appropriate • Installation of o point of care ABHR o point-of-use sharps containers o appropriately functioning, accessible dispensers for hand hygiene products (ABHR, soap, lotion, paper towels) and respiratory hygiene and cough etiquette products o designated hand washing sinks for HCW use • appropriate number of commodes • appropriate supply of and accessibility of PPE • appropriate number of accessible hands-free receptacles for disposal of paper towels, tissues, masks, gloves, etc.

TIER 2: Examples of Administrative Controls

- appropriate resources for diagnosis and treatment of infection or colonization and for immunization of patients and health care workers
- organizational support for effective IP&C and OH services and for management of outbreaks
- appropriate OH and safety policies, including pre-placement assessment, work restrictions, respiratory protection program, sharps safety and prevention of exposure to BBPs and immunization programs
- education of HCWs
- policies, procedures and resources to support the application of:
  - o point of care risk assessment (PCRA)
  - o point of care ABHR as the standard of care in all health settings
  - o Routine Practices as the standard of care for all patients in all health care settings, including:
    - source control (instructions for patients)
    - patient placement, transport and movement
    - aseptic technique
    - dedicated patient care equipment and cleaning of non-critical equipment between patients
    - reprocessing (cleaning, disinfection and sterilization) of reusable patient care equipment
    - environmental cleaning
    - management of linen and waste
    - management of visitors
- patient placement, accommodation and flow
- Additional Precautions, when PCRA determines Routine Practices are not sufficient (e.g., AIIR and respiratory protection)

TIER 3: Examples of Personal Protective Equipment to Prevent Exposure of Patients, HCWs and other Staff

Following PCRA, personal protective equipment for the appropriate application of Routine Practices and Additional Precautions may include:

- gloves
- gowns
- masks (surgical or procedure masks used by HCW or infectious source)
- facial protection (masks and eye protection, face shields, masks with visor attachment)
- respirators (e.g., N95)

B. Organizational Responsibilities to Reduce Exposure to and Transmission of Infectious Agents

1. Organizational Risk Assessment (ORA)

This ORA is central to any health care organization's preparation and planning to protect all individuals (e.g., patient, HCW, visitor and contractor) from HAIs in all health care settings. Organizations have a responsibility to provide information and train HCWs regarding the organization's ORA and its impact on their practice. For example, the availability of functioning AIIRs may impact when and where AGMPs are performed and may influence the PCRA performed by HCWs.

An ORA should be conducted on an annual basis and re-evaluated when major reorganization or restructuring, or building and renovation takes place. The need for an ORA applies to all levels of health care settings, including prehospital care, acute care, LTC, ambulatory care and home care settings. Ongoing systematic evaluation of the ORA will be required to ensure that policies, procedures and programs:

- are consistent across the organization
- achieve their stated objectives
- are in compliance with current applicable regulations

The ORA will characterize the organization's patient population, level and intensity of health care provided and resources available, including skilled workers. It will need to evaluate the effectiveness of present control measures and the breadth of the hierarchy of controls in order to prevent HAIs.

To conduct the ORA, an organization will need to:

- Determine situations and conditions where infectious microorganisms might exist.
- Evaluate the potential for exposure to or transmission of the microorganism.
- Determine the consequences of exposure to the microorganism.
- Determine the severity of illness caused by the microorganism.
- Determine the consequences of transmission of the microorganism for individuals, organizations and the community.
- Assess available control measures (e.g., engineering, administrative and PPE) to mitigate exposure to or transmission of the microorganism in the specific health care setting.

2. Organizational Control Measures

Once the ORA is completed, control measures should be implemented to address any areas of concern. Such control measures can be at one or more of the three levels of the hierarchy of controls. Appropriate ventilation and hospital design (e.g., AIIRs and single-patient rooms) are engineering controls, while education of HCWs, Routine Practices and Additional Precautions and OH (e.g., respiratory protection programs) are administrative controls.

2.1 Engineering Controls

a. Health Care Facility Design, Renovation and Construction

Facility design is an example of engineering control. Room design, ventilation systems, room air flow and human traffic patterns, positioning of ABHR dispensers, designated hand washing sinks, and physical barriers to separate patients in multi-bed wards in waiting areas, etc., are examples of engineering controls. Adherence to spatial separation requirements (i.e., preferably a high proportion of single-patient rooms, or alternatively, two metre separation between patient spaces) when designing new health care facilities, planning renovations to existing facilities or re-organizing patient care areas will enhance a health care organization's ability to prevent transmission of infections.

Health care facility design related to IP&C also includes appropriate number, location, and type of AIIRs; location(s) of special ventilation and filtration, such as emergency department triage and waiting areas; air handling and ventilation needs in surgical services and laboratories; local exhaust systems for hazardous agents and other special areas; water systems to limit *Legionella* species and waterborne opportunistic pathogens and consideration of preferred surface characteristics (of the ideal product), such as:

- ease of maintenance, repair and cleanability
- does not support microbial growth
- nonporous – smooth
- durable
- sustainable
- ease of installation, demolition and replacement
- seamless
- resilient and impact resistant

Infection control professionals should be included from the beginning of projects (i.e, when designing new health care facilities, planning renovations to existing facilities or reorganizing patient care areas) until the project ends.

Collaboration between IP&C/OH professionals and health care building engineers has led to better understanding and application of a tiered framework of measures and interventions that enable health care organizations to comprehensively evaluate the risk of exposure of HCWs (including volunteers) to microorganisms and other hazards in the workplace and the effectiveness of the health care organization's mitigation responses.

b. Heating, Ventilation and Air Conditioning (HVAC) in Health Care Facilities.

To ensure optimal performance of ventilation systems for removal of particulates, and elimination of excess moisture, organizations have a responsibility to design, construct, install and maintain ventilation systems in accordance with engineering's and manufacturers' recommendations.

Health care settings that provide or potentially provide care for patients with suspected or confirmed airborne transmissible infections require an adequate number of AIIRs (also called negative pressure rooms). The ORA should determine the appropriate number of AIIRs required. Airborne infection isolation rooms are recommended for placement in the following areas in health care facilities, including: emergency rooms, critical care settings, medical units, bronchoscopy and autopsy suites. Specifications for newly constructed and existing AIIRs are outlined in several publications. Air changes per hour (ACH) for new or renovated AIIRs and for autopsy rooms, sputum induction rooms and bronchoscopy suites should follow current standards. A continuous negative air pressure differential of 7.5 Pa should be maintained. Refer to Canadian Standards Association Z317.2 *Special Requirements for heating, ventilation and air-conditioning (HVAC) systems in health care facilities* (current edition) for requirements for AIIRs.

Specific requirements for HVAC in operating room settings are beyond the scope of this document. Refer to Canadian Standards Association Z317.2 Special Requirements for heating, ventilation and air-conditioning (HVAC) systems in health care facilities (current edition) for these requirements.

c. Source Control

Source control measures are used to contain microorganisms from dissemination from an infectious source. Patients and other persons with symptoms require direction at the point of initial encounter in any health care setting (e.g., triage in emergency departments, acute assessment settings, reception and waiting areas in emergency departments, outpatient clinics and physician offices) and in strategic places (e.g., elevators and cafeteria) within ambulatory and inpatient settings. Policies and procedures (administrative controls) should be implemented to develop a program for source control.

Source control measures may include but are not limited to:

- signage at entrances to health care settings for early recognition of symptoms (e.g., syndromic screening)

- separate entrances and waiting areas
- spatial separation
- physical barriers for acute assessment
- early identification, diagnosis and treatment of infection
- respiratory hygiene
- hand hygiene
- patient placement (e.g., patient care areas and single rooms/AIIRs)
- strategies to reduce aerosols during AGMPs (see Part B, Section IV, sub-section (iii) 1(b))

i) Spatial Separation

Appropriate spatial separation and spacing requirements are necessary to decrease exposure to microorganisms for patients and visitors in clinical and waiting areas. A two-metre spatial distance between a coughing or sneezing infected source (e.g., symptomatic individual with an acute respiratory illness) and an unprotected susceptible host (e.g., patients, HCWs, visitors or contractors) is now recommended to prevent the transmission of droplet borne infectious particles.

Spatial separation requirements should be included when designing new health care facilities or planning renovations to existing facilities (see PART A, Section III, B, 2).

ii) Respiratory Hygiene

Respiratory hygiene refers to a combination of measures designed to minimize the transmission of respiratory pathogens. These source control measures are targeted to all individuals with symptoms of respiratory infection, starting at the initial encounter in a health care setting and maintained throughout every encounter in the health care setting (e.g., triage in emergency departments, reception in ambulatory clinics or health care provider offices, strategic places such as elevators and the cafeteria). Respiratory hygiene involves educating and encouraging all individuals (e.g., patients, HCWs and visitors) who have the physical and cognitive abilities to do so, to practice respiratory hygiene. Specific measures may include instructional signs, education programs and provision of materials for respiratory hygiene (e.g., tissues, hands-free plastic lined waste receptacles and ABHR). Further information is available in the PHAC *Infection Control Guideline for the Prevention of Healthcare–Associated Pneumonia*.

Available at: http://publications.gc.ca/collections/collection_2012/aspc-phac/HP40-54-2010-eng.pdf

iii) Hand Hygiene

Organizational barriers related to engineering controls, such as a lack of accessibility to and maintenance of hand hygiene facilities, and poor access to hand hygiene products, negatively impact adherence to hand hygiene. Organizations have the responsibility to ensure such barriers are addressed. Refer to PHAC *Hand Hygiene Practices in Healthcare Settings.*

Available at: http://publications.gc.ca/collections/collection_2012/aspc-phac/HP40-74-2012-eng.pdf

iv) Patient Placement

In an effort to increase access to limited inpatient beds and reduce Emergency Department crowding, some Canadian hospitals have developed overcapacity or full capacity protocols (i.e., admitting patients to inpatient units that are already at maximum capacity). The Canadian Patient Safety Institute (CPSI) has noted concerns that such protocols may expose inpatients to increased risks of hospitalization, including risk of health care acquired infection, such as MRSA. CPSI advises that hospitals should take every necessary step to avoid use of overcapacity protocols and that an overcapacity protocol should not be considered the norm in the delivery of hospital services. Hospitals that may require short term use of overcapacity or full capacity protocols should develop and implement policies and practices that minimize risk of spread of infection through overcrowding and understaffing.

v) Strategies to Reduce Aerosols During Aerosol-Generating Medical Procedures

See PART A, Section II, C, 2(c) for discussion on AGMPs and Part B., Section IV, sub-section (iii) 1(b), for strategies to reduce the risk of aerosol generation.

3. Administrative Control Measures

a. Occupational Health Program

An objective of an occupational health (OH) program is to identify risk situations with the potential for occupational exposure or transmission of a microorganism, either to or from the HCW and other individuals. Components of an OH program that support the use of Routine Practices and Additional Precautions to prevent exposure or transmission of microorganisms can be found in the PHAC Infection Control Guidelines *Prevention and Control of Occupational Infections in Health Care*. Refer also to Manitoba Workplace Safety and Health www.manitoba.ca/labour/safety/ and The Workplace Safety and Health Act at: http://web2.gov.mb.ca/laws/statutes/ccsm/w210e.php for additional information. Program components may include:

- pre-placement assessment (at time of employment)
- ensuring immunity to vaccine preventable infectious diseases
- tuberculosis screening (pre-placement and screening as per organizational policies)
- annual influenza immunization
- policies for management of HCWs with infections
- management of latex and other glove component allergies
- prevention of exposure to BBPs, including a sharps safety program (see i below)
- management of HCWs who cannot wear PPE (e.g., respirators)
- respiratory protection program (see ii below)

For management of HCWs unable to comply with hand hygiene recommendations, refer to PHAC IP&C guideline *Hand Hygiene Practices in Healthcare Settings* http://publications.gc.ca/collections/collection_2012/aspc-phac/HP40-74-2012-eng.pdf.

i) Sharps Safety and Prevention of Exposure to Bloodborne Pathogens

The prevention of sharps injury and HCW exposure to BBPs is a component of Routine Practices.

Users of sharps require education and training about how to safely handle sharp devices to prevent injuries to themselves and to others who may encounter the device during or after procedures. Safety programs should include a formal incident investigation for every sharp injury occurring in the work setting. The CDC workbook for designing, implementing and evaluating a sharps injury prevention program is available at: www.cdc.gov/sharpssafety/resources.html.

Use of safety engineered devices, such as using protected needle devices, needle-free systems with self-sealing ports, and syringes with safety features, have been reported to reduce needlestick injuries. Their use has been identified as a priority in risk-reduction strategies. In some jurisdictions, these safety devices are required under regulation. Refer to local regulations for more information. The choice of specific needleless devices for a health care organization should be considered carefully, as some models have demonstrated a risk for patients. Refer to Canadian Standards Association Z316 *Sharps injury protection - Requirements and test methods - Sharps Containers* (current edition).

ii) Respiratory Protection Program (RPP)

Respiratory protection requires the use of a respirator classified as N95 or higher filtration to prevent inhalation of aerosols containing infectious particles. Respirators are required for the care of patients with airborne respiratory pathogens (e.g., TB, measles) and in some situations when AGMPs are performed. (see Part B, Section IV, sub-section (iii) 7, below). Health care organizations that use respirators should have a respiratory protection program (RPP) in place. The RPP should provide

health screening, fit testing and re-testing, and training to all HCWs who may wear a respirator. The organization should be committed to developing, implementing, maintaining and evaluating the RPP.

Health care organizations are responsible for choosing specific respirator brands, models and sizes to be used by their workforce, while taking into consideration the diversity of their workforce and patient population. Organizations are to ensure their workforce has access to recommended respirator models and sizes as required by local Labour Code and Occupational Health requirements. Refer to Canadian Standards Association Z94-2 *Selection, Use and Care of Respirators* (current edition) and SAFE Work Manitoba website at: https://www.safemanitoba.com/Pages/default.aspx

Organizations should consider the following:

- When respirators are being selected by the organization, those with inherently good fit characteristics are preferred.
- Respirators from more than one manufacturer may be required to fit the range of ethnic groups and facial structures represented within the organization's workforce.
- Fit testing is used to evaluate how well a given respirator fits a given person by assessing leakage around the face seal. Published literature regarding fit-testing respirators in the health care setting is inconclusive. However, most Canadian jurisdictions require formal fit testing for HCWs to determine their ability to obtain a satisfactory seal when using respirators. Most jurisdictions require that fit-testing be repeated on a set schedule (e.g., at least every two years, as per the CSA standard, or as defined by jurisdictional regulations), or more frequently if facial conditions change (e.g., weight gain or loss, or dental work). As a result, HCWs are referred to jurisdictional regulations regarding fit testing. In the absence of such regulation, consult your provincial or territorial public health authorities.
- If an organization chooses to change the brand or model of respirators available for use, it should be aware that fit testing results are not transferable between respirator brands or models.
- Health care organizations should develop policies for HCWs who are unable to form a tight facial seal when wearing a respirator (e.g., facial deformities and men with beards for religious reasons).

Health care workers should consider the following:

- Health care workers should only use respirators to which they were fit tested.
- Health care workers and other staff should be knowledgeable about the applications, advantages, limitations and proper use of the specific respirator model(s) for which they have been fitted.
- Each time HCWs put on a respirator they are to perform a fit seal check (elsewhere referred to as a user" seal check) to enable proper functioning of the respirator.

Refer to Canadian Standards Z94 *Selection, Use and Care of Respirators* (current edition) and SAFE Work Manitoba website at: https://www.safemanitoba.com/Pages/default.aspx

b. Education of Health Care Workers

Education and training on IP&C policies and procedures should be provided to all HCWs during their training in health professions, during employment orientation, as a result of special circumstances (e.g., outbreaks, or new equipment and information) and on a regular basis. Health care organizations have the responsibility to provide the training and HCWs have the responsibility to take advantage of educational opportunities. Planning and evaluating educational programs for an adult learner is complex and appropriate resources should be consulted (e.g., Community and Hospital Infection Control Association – Canada, IP&C core competencies for HCWs, and planning programs for adult learners). It is important that topics, methods and materials for education and training are appropriate to the level of the HCW understanding and responsibility. Content for Routine Practices and Additional Precautions education and training sessions should include:

- point of care risk assessment
- transmission of microorganisms (chain of infection)
- prevention of exposure to microorganisms

- importance of immunization
- knowledge of immune status to vaccine preventable diseases (e.g., varicella)
- indications for hand hygiene
- indications for and appropriate application of aseptic technique
- safe use and disposal of sharps
- cleaning and disinfection of non-critical patient care equipment between patients
- patient and visitor education
- indications for and appropriate use of PPE
- implementation of Additional Precautions
- modification of practices during outbreaks
- how to use Part C Table 5 to implement Additional Precautions empirically
- how to use Part C Table 6 to modify or discontinue Additional Precautions

c. Reprocessing of Patient Care Equipment

i) Processing and Reuse of Reusable Medical Devices

The appropriate reprocessing (i.e., cleaning, disinfection and sterilization) of reusable medical devices (e.g., equipment and instruments) is important in preventing the transmission of microorganisms, and must be performed according to published guidelines and standards.

Spaulding developed a system to classify the cleaning, disinfection and sterilization requirements for equipment used in patient care. This system divides medical devices, equipment and surgical materials into three categories (i.e., non-critical, semi-critical and critical) based on the potential risk of infection involved in their use. Health care workers need to be able to identify semi-critical and critical items that require reprocessing by high level disinfection or sterilization. Health care workers also need to be able to identify non-critical equipment and ensure it has been appropriately cleaned before use (see d. below).

Reprocessing of reusable medical devices can occur within a hospital or regional health facility, or it can be contracted to a third-party reprocessor. When third-party reprocessors are contracted, provincial and territorial regulations should apply. Reusable devices need to be reprocessed by trained personnel, under the supervision of specially trained individuals. To the greatest extent possible, reprocessing should be in a centralized location and audited on a regular basis. Where this is not possible, single-use disposable devices are preferred.

Identification and reprocessing of prion contaminated equipment (agents responsible for transmissible spongiform encephalopathies [TSE] e.g., CJD) require more rigorous and highly specific processes. Refer to:

PHAC Classic Creutzfeldt-Jakob Disease in Canada: Quick Reference Guide 2007
www.canada.ca/content/dam/phac-aspc/migration/phac-aspc/nois-sinp/pdf/cjd-eng.pdf

ii) Reprocessing and Reuse of Single-Use Devices {SUD}

Medical devices designed and sold for single-use are not intended for reprocessing and reuse. Concerns related to reprocessing SUDs include the increased risk of patient adverse events, legal liability, ethical concerns and the cost-effectiveness of reprocessing. When SUDs are reprocessed, cleaning, functional testing, repacking, relabeling, testing for pyrogenic substances and disinfection or sterilization must be appropriate. Health care organizations contracting third-party reprocessors for this purpose must adhere to provincial or territorial legislation. Currently, there is no process to regulate third-party reprocessors of SUDs in Canada. For this reason, facilities that choose to reprocess SUDs must contract with Food and Drug Administration (FDA) regulated facilities in the U.S.

iii) Cleaning and Disinfection of Non-Critical Patient Care Equipment

Contamination of patient care equipment, items in the patient environment and the patient's environment has been implicated in transmission of infection. Used or potentially contaminated items that have contact with a patient's intact skin should always be cleaned before use with another patient.

d. Environmental Cleaning

Measures to minimize exposure to environmental contamination include:

- dedicating non-critical medical equipment to a single patient
- assigning responsibility and accountability for routine cleaning of patient care equipment
- ensuring environmental cleaning follows a set procedure and frequency, documented and supervised by adequately trained dedicated personnel
- ensuring surfaces are constructed of materials that can be easily cleaned at the point of use
- increasing the frequency of cleaning and disinfecting frequently-touched surfaces
- monitoring adherence to recommended environmental cleaning practices
- ensuring rooms are terminally cleaned following patient discharge and after discontinuing precautions (see Appendix II)
- determining what product to use for routine environmental cleaning

When continued transmission of selected microorganisms (e.g., norovirus, rotavirus or *C. difficile*) occurs, use of specific disinfectant products may need to be considered. In outbreak situations or when there is continued transmission, rooms of CDI patients should be decontaminated and cleaned with specific sporicidal agents. For other diarrheal illnesses (e.g., norovirus) ensure the disinfectant product is effective against the pathogen.

Additional information is available in the:

PHAC *Clostridium (Clostridioides) difficile* Infection Prevention and Control Guidance for Management in Acute Care Settings. Available at: www.canada.ca/en/public-health/services/infectious-diseases/nosocomial-occupational-infections/clostridium-difficile-infection-prevention-control-guidance-management-acute-care-settings

PHAC *Clostridium (Clostridioides) difficile* Infection Prevention and Control Guidance for Management in Long Term Care Settings. Available at: www.canada.ca/en/public-health/services/infectious-diseases/nosocomial-occupational-infections/clostridium-difficile-infection-prevention-control-guidance-management-long-term-care-facilities.html

Clinical Practice Guidelines for *Clostridium difficile* Infection in Adults and Children: 2017 Update by the Infectious Diseases Society of America (IDSA) and Society for Healthcare Epidemiology of America (SHEA). Available at:

https://www.idsociety.org/globalassets/idsa/practice-guidelines/clinical-practice-guidelines-for-clostridium-difficile.pdf

e. Waste

Most waste generated in health care settings is no more hazardous than household waste. Local regulations may require special handling of sharps and some biomedical waste (e.g., sponges, dressings or surgical drapes soaked with blood or secretions). Waste receptacles should be conveniently located, and preferably, hands-free.

Additional information is available in the Canadian Standards Association Z317 (current edition) *Handling of health care waste materials*.

f. Linen

Linen in health care facilities may become contaminated with pathogens, but risk of disease is negligible. Care should be taken in the handling of soiled linen to prevent dispersal of microorganisms. Special handling of linen from patients on Additional Precautions is not required.

If laundry chutes are used, they should be properly designed, maintained, and used in a manner to minimize dispersion of aerosols from contaminated laundry. Clean linen should be transported and stored in a manner to prevent inadvertent handling or contamination by dust, which may contain fungal spores harmful to immunocompromised patients.

Additional information is available in the CDC/HICPAC *Guideline for Disinfection and Sterilization in Healthcare facilities, 2008*

www.cdc.gov/hicpac/pdf/guidelines/Disinfection_Nov_2008.pdf and the CDC's *Guidelines for Environmental Infection Control in Healthcare Facilities*, 2003 www.cdc.gov/mmwr/preview/mmwrhtml/rr5210a1.htm

g. Management of Deceased Bodies

There are no special requirements when handling deceased bodies, preparing bodies for autopsy or transferring bodies to mortuary services. Routine Practices, properly and consistently applied, and the Additional Precautions (contact or airborne), as indicated prior to death, is sufficient. Droplet Precautions are an exception and are not necessary post mortem.

Refer to MHSAL Public Health Act, Dead Bodies Regulation:
www.canlii.org/en/mb/laws/regu/man-reg-27-2009/latest/part-1/man-reg-27-2009-part-1.pdf

h. Management of Pets and Service Animals

The use of pet therapy in health care may have benefits to patients. Policies and procedures for animal health screening and IP&C for animal-assisted interventions in health care facilities are an organizational responsibility. Recommendations for IP&C practices related to animal health screening and interventions in health care facilities have been published.

C. Health Care Worker Responsibilities

1. Point of Care Risk Assessment

Prior to every patient interaction, all HCWs have a responsibility to assess the infectious risk posed to themselves and other patients, visitors and HCWs by a patient, situation or procedure. The PCRA is an evaluation of the variables (risk factors) related to the interaction between the HCW, the patient and the patient's environment. The purpose is to assess and analyze their potential for exposure to infectious agents and identify risks for transmission. This PCRA is based on judgement about the clinical situation and current information on how the specific health care organization has designed and implemented engineering and administrative controls, availability and use of PPE. Control measures are based on the evaluation of the variables (risk factors) identified.

Health care workers should consistently perform PCRAs throughout the day and apply control measures for their safety and the safety of patients and other persons in the health care environment.

For example, a PCRA is performed when a HCW evaluates a patient and situation to:

- Determine the possibility of exposure to blood, body fluids, secretions and excretions, and non-intact skin, and select appropriate control measures (e.g., PPE) to prevent exposure.
- Apply strategies to reduce aerosol generation during AGMPs (see Part B, Section IV, sub-section (iii), 1(b),).
- Determine the need for Additional Precautions when Routine Practices are not sufficient to prevent exposure.
- Determine the priority for single rooms or for roommate selection if rooms are to be shared by patients.

a. Variables (risk factors) Affecting Control Measures

Control measures to prevent exposure or transmission may differ for different microorganisms, patients or procedures, and different settings. For example, measures to reduce the transmission of respiratory infections will differ from those to reduce the transmission of gastrointestinal infections. Certain patients (e.g., young children, incontinent adults or cognitively impaired individuals) or specific procedures for certain patients may increase the risk of transmission, thereby requiring different control measures. HCWs are at higher risk of exposure to respiratory viruses when providing care to patients who have copious respiratory secretions or a frequent cough, and are unable to perform self-care, including respiratory hygiene and hand hygiene. AGMPs have been shown to increase the transmission of TB, SARS, MERS-CoV and SARI and therefore require specific control measures (see Part B, Section IV, sub-section (iii), 1(b).

Some infections may be more readily transmitted in pediatric settings, compared to adult settings. Infection is a frequent reason for health care utilization by young children, who often harbour microorganisms, especially respiratory and gastrointestinal viruses that they may shed, even if asymptomatic. Young children are also susceptible to many infections, as they may not yet have developed immunity to many microorganisms. The close proximity of large numbers of infectious persons and susceptible hosts favours transmission, as do behavioural characteristics of young children, such as incontinence, inadequate hygiene, frequent mouthing of hands and toys or other objects, drooling, and direct contact between children during play. In addition, basic care requires frequent hands-on contact from HCWs and parents. Shared toys, playrooms and visiting siblings also contribute to the transmission risk.

The risk varies in different settings (e.g., prehospital, acute, LTC, ambulatory and home care). Therefore, control measures may need to be modified, depending on the health care setting, rather than imposing the same level of precautions in each setting. The usual care model of LTC is to provide a home-like setting with participation in activities of daily living. There should be a balanced approach, offering a safe environment without undue restrictive measures that could be detrimental to the individual's overall well-being or quality of life. For prehospital care there is a potential for increased risk of transmission, as it is an uncontrolled environment.

The risk of transmission between patients increases when patients share rooms rather than being accommodated in a single-patient care room.

b. Knowledge and Skills Required for Point of Care Risk Assessment

Health care workers require the knowledge, skills and resources to perform a PCRA before every interaction with a patient, so they can apply appropriate precautions. To perform a PCRA, each HCW needs to understand the following:

- the links in the chain of infection
- variables that influence transmission of microorganisms, such as type of exposure, size of inoculum and host susceptibility, as well as control methods that reduce risk
- characteristics of the microorganisms, including reservoirs, infectivity, mode of transmission, incubation period, period of communicability and virulence
- how to apply a risk assessment appropriate to their level of education and the specific job and responsibilities
- patient care practices that contribute to exposure to microorganisms
- exposure risks specific to the health care setting
- environmental circumstances
- the level of risk and the appropriate control measures to reduce the risk of transmission of microorganisms
- how to consult with IP&C with concerns or questions
- control measures that may differ with different microorganisms and in different health care settings

c. Application of Point of Care Risk Assessments

When performing a PCRA, each HCW considers questions to determine the risk of exposure and potential for transmission of microorganisms during patient interactions. Examples of such questions are:

- What contact will the HCW have with the patient?
- What task(s) or procedures(s) is the HCW going to perform? Is there a risk of splashes or sprays?
- If the patient has diarrhea, are they continent? If incontinent, can stool be contained in a diaper or adult incontinent product?
- Is the patient able and willing to perform hand hygiene?
- Is the patient in a shared room?

Tables 3 and 4 provide an overview of a PCRA, using *C. difficile* and influenza as examples of some variables (risk factors) identified in the questions above to consider when applying a PCRA. The tables outline how the risk of exposure and potential transmission changes, depending on variables in the infected source, environment and susceptible host.

Table 3: Variables (risk factors) Influencing Transmission Risk using C. difficile as an Example of Contact Spread

	Higher Transmission Risk	Lower Transmission Risk
Infected source	• Frequent diarrhea • Incontinent • Poor Hygiene • Not capable of self-care due to physical condition, age or cognitive impairment	• Formed stools • Continent • Good hygiene • Capable of self-care
Environment	• High patient-nurse ratio • Shared bathroom, shared sink • Shared commode without cleaning between patients • No hand hygiene at point of care • No designated hand washing sink for health care workers or sink is used for other purposes or sink is dirty • Inadequate housekeeping	• Low patient to nurse ratio • Single room, private in room toilet, designated sink for patient • Designated commode • Hand hygiene at point of care • Accessible, designated, clean hand washing sink for staff • Appropriate housekeeping
Host/Susceptible Host	• Requires direct patient care • Poor personal hygiene	• Capable of self-care • Good personal hygiene

Table 4. Variables (risk factors) Influencing Transmission Risk using Seasonal Influenza as an Example of Droplet Spread

	Higher Transmission Risk	Lower Transmission Risk
Infectious Agent/ Infected Source	• Copious respiratory secretions • Frequent cough or sneeze • Poor compliance with respiratory hygiene • Early stage of illness • Not capable of self-care • Infants and children (potential prolonged viral shedding and environmental contamination) • Immunocompromised (potential prolonged viral shedding) • Inadequate patient placement or cohorting	• Minimal respiratory secretions • Infrequent cough or sneeze • Compliance with respiratory hygiene practices • Convalescent stage of illness • Capable of self-care • Adults • Immunocompetent • Adequate patient placement, cohorting
Environment	• High patient-nurse ratio • Prolonged/frequent contact to infected source • Shared patient care equipment without cleaning between episodes of patient care • Inadequate spatial separation between infected source and susceptible host (less than two metres) • Non-compliance with cleaning and disinfection standards	• Low patient-nurse ratio • Limited contact with infected source • Single room and washroom • Appropriate housekeeping • Dedicated equipment or cleaning and disinfection of equipment between uses • Adequate spatial separation between infected source and susceptible host (at least two metres) • Compliance with cleaning and disinfection standards
Susceptible Host (Patient)	• Not capable of self-care • Underlying disease • Susceptible • Immunocompromised	• Capable of self-care • No underlying disease • Immunized or recovered from disease • Immunocompetent

	Higher Transmission Risk	Lower Transmission Risk
Susceptible Host – HCWs or other staff	• Inadequate application of engineering, administrative and PPE controls • Inadequate hand hygiene • Infected source actively coughing and sneezing and unable to contain secretions • Not immunized against the circulating strain of influenza virus • Immunocompromised	• Performs PCRA and chooses PPE appropriate to risk • Compliance with appropriate hand hygiene • Immunized against the circulating influenza virus more than 2 weeks prior to exposure • Immunocompetent
Host/Susceptible Host	• Requires direct patient care • Poor personal hygiene	• Capable of self-care • Good personal hygiene

The PCRA in the above examples in Tables 3 and 4 provides information regarding:

- **An infected source:** the PCRA should evaluate the changing nature of the infected source's symptoms and environment to determine the appropriate PPE for HCW, other staff members and visitors. The PCRA should also determine if there is a need to move the patient to a single room with a private bathroom and any other practice changes required to address a change in a patient's condition.
- **A susceptible host:** (other patients, HCWs, visitors, contractors, etc.): a PCRA should evaluate whether the susceptible host has developed an infection such as CDI (e.g., cross-infection from a roommate or HCW) or whether the risk posed by an infected source has increased or decreased (e.g., diarrhea has increased or stools are now formed). The PCRA should lead to a determination of appropriate PPE required to care for the patient in various situations. Examples include: changing diaper products, taking BP or delivering meal trays without patient or environmental contact, whether there is a need to move the patient or the roommates to another area, whether there is a need for enhanced housekeeping and any other care practices required as a result of the change in risk for *C. difficile* acquisition.

d. Applying Control Measures following PCRA

Additional Precautions are applied, consistent with organizational policies and procedures. The PCRA of the circumstances of the patient, the environment and task to be performed, determine the control measures required. Control measures are at the level of HCW patient care practices and PPE in the Hierarchy of Controls, and may include:

- hand hygiene, ensuring point of care ABHR is available and used (the standard of care for all HCWs in all health care settings)
- patient placement and accommodation, giving priority to patients with uncontained wound drainage or uncontained diarrhea into a single room, or placing a patient with suspected or confirmed airborne infection into an AIIR with the door closed
- treatment of active infection
- roommate selection for shared rooms, or for transport in shared ambulances (and other types of transportation (e.g., air ambulances and taxis), considering the immune status of patients who will potentially be exposed to certain infections (e.g., measles, mumps, rubella and varicella)
- patient flow, restricting the movement of symptomatic patients within the specific patient care area or facility, or outside the facility as appropriate for the suspected or confirmed microbial etiology

- work assignment, considering the immune status of HCWs who will potentially be exposed to certain infections (e.g., measles, mumps, rubella and varicella)
- personal protective equipment selection, applying PPE appropriate to the suspected or confirmed infection or colonization
- cleaning and disinfecting non-critical patient care equipment and the patient environment
- handling of linen and waste
- restricting visitor access where appropriate
- reassessment of the need for continuing or discontinuing Additional Precautions

2. Health Care Worker Control Measures to Reduce Exposure to and Transmission of Infectious Agents.

a. Routine Practices

Routine Practices are a comprehensive set of IP&C measures that have been developed for use in the routine care of all patients, at all times, in all health care settings. Routine Practices aim to minimize or prevent HAIs in all individuals in the health care setting, including patients, HCWs, visitors, contractors, etc. Routine Practices address infectious agent and infected source control, susceptible host protection and environmental hygiene, utilizing aspects from all components of the Hierarchy of Controls.

All HCWs (physicians, nurses, allied HCWs, students, volunteers and others) are responsible for complying with Routine Practices and for tactfully calling infractions to the attention of offenders. No one is exempt from complying with Routine Practices.

Patients and visitors have a responsibility to comply with Routine Practices where indicated. Teaching patients and visitors basic principles, such as hand hygiene, use of PPE, etc., is the responsibility of all HCWs.

i) Hand Hygiene

The efficacy of hand disinfection in reducing nosocomial infection, as recognized by Semmelweis in 1847, has been repeatedly reaffirmed. Use of ABHR has been shown to reduce HAI rates. Hand hygiene with point of care ABHR is the standard of care expected in all health care settings and of all HCWs.

A consistent trend demonstrating a reduction in infection rates related to improved hand hygiene has been reported. However, sustaining improved hand hygiene rates and the reduction of HAIs is difficult, as a return to prestudy rates often occurs once the study is completed and interventions to promote hand hygiene are discontinued.

Refer to the PHAC Hand Hygiene Practices in Healthcare Settings 2012.
http://publications.gc.ca/collections/collection_2012/aspc-phac/HP40-74-2012-eng.pdf

ii) Patient Placement and Accommodation

Accommodation of inpatients in single rooms facilitates IP&C activities. Single rooms with a private toilet, designated sink for the patient and designated hand washing sink for health care workers may reduce opportunities for cross transmission between patients, particularly when the patient has poor hygiene, contaminates the environment or cannot comply with IP&C measures because of age or decreased cognitive abilities.

iii) Patient Flow

Patient flow refers to patient transfer or transport within and outside of the facility, and patient activity. There is a potential for exposure to and transmission of microorganisms as a result of patient activity and transport, due to inadvertent contact with other patients, patient care items and environmental surfaces. Patients should not be transported between patient care units, departments or facilities, unless medically essential. Frequent patient transfers should be avoided, as this increases

the number of interactions with staff and other patients, providing opportunities for transmission to occur. The HCW, including bed and accommodation coordinators, are responsible for selecting the most appropriate accommodation, based on the PCRA, and for prioritizing use of single rooms and AIIRs, if these are scarce. When in doubt regarding accommodation, consult the IP&C professional.

iv) Aseptic Technique for Injections, Intravascular and Other Invasive Procedures

Aseptic technique is the purposeful prevention of transfer of microorganisms from the patient's body surface to a normally sterile body site or from one person to another, by keeping the organism count to an irreducible minimum. It is sometimes referred to as sterile technique. Aseptic technique refers to practices designed to render the patient's skin, medical supplies and surfaces as maximally free from microorganisms. These practices are required when performing procedures that expose the patient's normally sterile sites (e.g., intravascular system, spinal canal, subdural space and urinary tract), to minimize contamination with microorganisms. Components of aseptic technique prior to a procedure may involve the following:

- preparing the patient's skin with an antiseptic
- hand hygiene, preferably with ABHR, or if not accessible, an antimicrobial soap
- sterile gloves
- gowns
- masks
- sterile drapes
- maintaining a sterile field

Drapes are used to prevent transferring microorganisms from the environment to the patient while the procedure is being performed. Masks are worn to prevent microorganisms carried in the HCWs' nose and mouth from contaminating the sterile field.

Infections may result from failure to use proper skin antisepsis prior to injection of medications, vaccines or venipuncture. Chlorhexidine in alcohol inactivates microorganisms on the skin more effectively than most other antiseptics and is the preferred antiseptic for skin preparation prior to insertion of central venous catheters and pulmonary artery catheters. Maximal aseptic barriers (including a head cap, mask, long sleeved sterile surgical gown, sterile gloves, and large (full bed) sterile drape during insertion) reduce infection rates associated with insertion of central venous catheters.

Meningitis reported after myelography and other spinal procedures is usually caused by respiratory flora of the person performing the procedure. The failure of the operator to properly wear a face mask during the procedure has been implicated. Aseptic technique for sterile procedures, such as placing a catheter or injecting material into the spinal canal or subdural space (e.g., during myelograms, lumbar puncture, intrathecal chemotherapy, and spinal or epidural anesthesia) includes hand hygiene with ABHR, preparation of the site with an antiseptic, use of a mask, use of sterile gloves, and maintaining a sterile field.

Appropriate aseptic technique for the insertion of urinary catheters includes sterile equipment (e.g., gloves, drapes, sponges and catheters), a sterile or antiseptic solution for cleaning the meatus and a single-use packet of sterile lubricant jelly for insertion.

Aseptic technique for the withdrawal of medication or other sterile substances from any vial or other containers includes: hand hygiene, the use of alcohol to prepare the rubber stopper or injection port (waiting for alcohol to dry), single-use sterile needles and syringes and following manufacturer's instructions. Transmission of hepatitis B and hepatitis C virus and other agents has been related to the reuse of needles and syringes for withdrawing from multiuse vials. As well it has been linked to inappropriate use of glucose monitoring equipment and to the reuse of single needle and syringe to administer medications to multiple patients.

Recommendations for injection safety include:

- Never administer medications from the same syringe to more than one patient, even if the needle is changed.
- Consider a syringe or needle contaminated after it has been used to enter or connect to a patient's intravenous infusion bag or administration set.
- Do not enter a vial, bag or bottle with a syringe or needle that has been previously used.
- Never use medications packaged as single-use vials for more than one patient.
- Assign medications packaged as multi-use vials to a single patient whenever possible.
- Do not use bags or bottles of intravenous solution as a common source of supply for more than one patient.
- Follow proper IP&C practices during the preparation and administration of injected medications.

v) Personal Protective Equipment

Personal protective equipment consists of barriers worn by HCWs to protect the patient from transmission of microorganisms and to protect the HCW from exposure to bloodborne and other microorganisms (e.g., sprays of blood, body fluids, respiratory tract or other secretions or excretions). Health care organizations are responsible for ensuring that HCWs have access to the PPE appropriate to the work and patient care being provided, and have received training on its use (as previously described in Organizational Responsibilities, see PART A, Section III, B, above).

Health care workers should be fully knowledgeable of the application and limitations of the specific PPE available for their use and be able to determine what is needed by assessing the risk of exposure to blood, body fluids, secretions and excretions, mucous membranes, or non-intact skin during patient care interactions. The PCRA identifies hazards and enables the HCW to select PPE compatible with the hazard likely to be encountered during the patient care interaction. The selected PPE should maximize protection, dexterity and comfort.

Performing a risk assessment to determine whether PPE is necessary is also important to avoid over-reliance on PPE, misuse or waste. Over-reliance on PPE may result in a false sense of security. Misapplication or incorrect removal of PPE can result in inadvertent exposure of the HCW or the patient to infectious agents, or contamination of the patient's environment. Wasting PPE can be avoided by maximizing the provision of clinical care during each entry into the patient's room.

The effectiveness of PPE is highly dependent on appropriate and proper use. Appropriate and proper use of PPE includes:

- point of care risk assessment to determine need for PPE
- correct technique for putting on and taking off PPE (see Appendix IV)
- correct technique when wearing PPE (e.g., not to self-contaminate)
- discarding into designated receptacles immediately after use, followed by hand hygiene, preferably with ABHR

Gloves

The use of gloves is not a substitute for hand hygiene, but an additional measure of protection. For Routine Practices, glove use is dependent on a risk assessment of the patient, the environment and the interaction. Gloves are used to reduce the transmission of microorganisms from one patient to another or from one body site to another, and to reduce the risk of exposure of HCWs to blood, body fluids, secretions and excretions, mucous membranes, draining wounds or non-intact skin, and for handling items or touching surfaces visibly or potentially soiled. Gloves do not completely eliminate hand contamination, as hands can become contaminated during the wearing of gloves through glove defects, or during glove removal. **Therefore, hand hygiene is necessary after the removal of gloves.** Use of gloves, may provide a false sense of security, leading to decreased hand hygiene.

It is important to assess and select the most appropriate glove to be worn for the circumstances. Glove selection should include assessment of its durability during use, the rigor and duration of

the procedures being performed, the potential for exposure to infectious microorganisms or other hazardous substances, and ultimately, the safety of the user (e.g., including latex allergies). Factors such as comfort, fit and whether the gloves are powdered to facilitate putting them on are important considerations.

Nonsterile disposable medical gloves for routine patient care are made from nitrile, latex and vinyl. Powdered latex gloves have been associated with latex allergy. Latex-free alternatives must be used by persons with type I hypersensitivity to natural rubber and for care of patients with this latex allergy. Because of risk to patients and HCWs, many hospitals now use medical supplies and products that are latex-free.

The barrier quality of medical examination gloves is influenced by glove material, production quality and stress during use. Higher failure rates have been observed with vinyl gloves as compared to latex or nitrile gloves, when tested under simulated and actual clinical conditions

The integrity of latex gloves may be affected by the use of petroleum based lotions or creams. Some ABHRs may interact with powder remaining on HCWs' hands following the removal of powdered gloves, and may produce gritty particles on the hands. Gloving hands that have not yet dried following the use of an ABHR may result in significant increase in glove perforations.

Single-use gloves must never be washed with soap, chlorhexidine gluconate (CHG) or alcohol and then reused, as washing affects their integrity and has not been shown to be effective in removing inoculated microorganisms.

The use of gloves to prevent the transmission of BBPs is discussed in the PHAC Infection Control Guidelines *Prevention and Control of Occupational Infections in Health Care*.

Long Sleeved Gowns and Other Apparel

Long sleeved gowns are worn for Routine Practices as indicated by the risk assessment, to protect uncovered skin and clothing during procedures and patient care activities that are likely to produce soiling or generate splashes or sprays of blood, body fluids, secretions or excretions. Gowns should be cuffed and cover the front and back of the HCW from the neck to mid thigh. Gowns include isolation gowns – reusable or disposable, fluid repellent, or sterile. The type of gown selected is based on the:

- anticipated degree of contact with infectious material
- potential for blood and body fluid penetration of the gown (fluid repellence when heavy liquid contamination is anticipated (e.g., operating theatre and dialysis)
- requirement for sterility (e.g., operating theatre and central line insertion)

There is no evidence the routine use of gowns for all patient care is beneficial in the prevention of HAIs, even in high risk units (e.g., neonatal intensive care unit [NICU], ICU, haematopoietic stem cell transplant [HSCT] unit or burn unit). Universal gown use has had no effect on HAI rates in neonatal or pediatric ICUs, or on rates of neonatal colonization on postpartum wards.

In the laboratory setting, wearing of laboratory coats is considered PPE to minimize the risk of exposure to pathogens. PPE worn inside the laboratory setting should not be worn outside the laboratory containment area (e.g., cafeteria, lunch room or patient areas). Outside the laboratory, non-PPE apparel, such as uniforms, laboratory coats or scrub suits, may be worn by HCWs for purposes of comfort, convenience or identity, but do not have a role in the prevention of infection (i.e., they are not considered PPE).Please refer to the Canadian Biosafety Standard and Canadian Biosafety Handbook (current edition).

For aesthetic purposes and professional etiquette, HCW apparel and uniforms should be clean. It is safe to launder HCWs uniforms at home.

Facial Protection

Transmission of hepatitis C and HIV has been reported by splashes of blood to the mucous membranes of the face. A study to investigate the risk of contamination of radiologist's eyes during invasive vascular procedures determined 6.7 per cent of procedures resulted in splashes. Facial protection includes masks and eye protection, face shields, or masks with visor attachment. Eye

protection may include masks with built-in eye protection, safety glasses or face shields as necessary. The need for facial protection during routine patient care is determined by the risk assessment of the patient interaction and the task to be performed. Interactions involving activities likely to generate coughing, splashes or sprays of blood, body fluids, secretions or excretions, and procedures that potentially expose the mucous membranes of the eyes, nose or mouth require facial protection. Masks include surgical or procedure masks. No specific mask has been shown to be superior to another for achieving the purpose of facial protection. Masks have several uses:

- as a barrier to protect from sprays or splashes
- as a barrier for infectious sources
- as a barrier when performing aseptic or sterile procedures
- as a barrier to protect susceptible hosts when within two metres of patients on Droplet Precautions

vi) Management of Visitors

Visiting policies must balance the risk of transmission of infectious diseases and the promotion of patient and family-centred care. Visitors have been documented to transmit infections, including TB, pertussis, and respiratory viruses in health care settings. Exclusion of those with signs and symptoms of transmissible infections should reduce this risk. For essential visits, the visitor with an infection should be instructed on measures to take to reduce the risk of transmission, such as:

- wearing a mask for a respiratory tract infection
- performing appropriate hand hygiene
- remaining in the patient's room
- avoiding public areas
- avoiding contact with other patients or with patient care equipment

b. Additional Precautions

Additional Precautions are applied when the natural transmission characteristics of specific microorganisms (e.g., epidemiologically significant organisms, see Appendix I) or syndromes are not fully addressed by Routine Practices. Additional Precautions may also be required when medical procedures increase the risk of transmission of a specific microorganism or because of the clinical situation (e.g., young child, incontinent adult or cognitively impaired individual). Additional Precautions are specific to the care setting (e.g., acute care, ambulatory care, prehospital care, LTC and home care). Additional Precautions are conventionally divided into:

- Contact Precautions, for microorganisms of low infective dose or situations where heavy contamination of the patient's environment is anticipated
- Droplet Precautions, for microorganisms transmitted by the large droplet route
- Airborne Precautions, for microorganisms transmitted over extended time and distance by small particles

i) Implementing and Discontinuing Additional Precautions

Additional Precautions are to be implemented as soon as disease or risk factors are suspected or identified. A confirmed diagnosis is not necessary for Additional Precautions to be applied. The organization is responsible for:

- designating the personnel responsible on a day-to-day basis for implementing Additional Precautions
- specifying the notification processes required once precautions have been initiated
- identifying the person responsible for modifying or discontinuing precautions
- identifying the person who has ultimate authority to make decisions regarding precautions and bed allocation

The HCW is responsible for:

- ensuring that appropriate Additional Precautions are taken for specific patients
- ensuring patients are not subjected to unnecessary Additional Precautions
- ensuring that precautions are reviewed daily, adjusted if indicated by new information, and discontinued when no longer indicated

To minimize the transmission of microorganisms, patients should be assessed for evidence of infection or potential infections on admission (if an inpatient setting) or at the initial point of patient encounter, and regularly throughout their stay as per the PCRA. The results of the assessment should be communicated to other personnel providing care and be documented in the patient record. In situations where a patient has or is suspected of having a disease requiring Additional Precautions above and beyond Routine Practices, these precautions must be implemented as soon as indicated by triggering mechanisms such as diagnosis, symptoms of infection, laboratory information, or assessment of risk factors. It is not necessary to wait for a specific diagnosis or microbiologic confirmation before initiating Additional Precautions when patient assessment clearly indicates a clinical syndrome or risk factors related to a potentially transmissible infection.

All HCWs (physicians, nurses, allied HCWs, students, volunteers and others) are responsible for complying with Additional Precautions (in addition to Routine Practices) and for tactfully calling infractions to the attention of offenders. No one is exempt from complying with Additional Precautions. Patients and visitors have a responsibility to comply where indicated. Teaching the basic principles of Additional Precautions is the responsibility of all HCWs.

ii) Accommodation

When availability of single rooms is limited, priorities for placement of patients in single rooms are determined by the PCRA. Priority for single rooms goes to patients:

- requiring Additional Precautions
- identified as high risk for transmission of microorganisms (e.g., stool incontinence and uncontained secretions)
- identified as being at higher risk of acquisition and adverse outcomes resulting from transmission of microorganisms (e.g., immunosuppression, open wounds, indwelling catheters, or an anticipated prolonged length of stay)
- requiring dependence on HCWs for activities of daily living

When single rooms are not available and rooms must be shared, factors to be considered with shared rooms include:

- selecting appropriate roommates
- avoiding placing patients who would be at high risk of complications should they become infected, in rooms with patients with transmissible infections, diarrhea or open wounds
- delineating the boundary of the potentially contaminated patient area within the shared room
- preventing transmission risks through sharing of sinks and toilets
- assessing activities of the roommates and their visitors

Assigning patients known to be infected with the same microorganisms to the same room (cohorting) or specified ward has been successful in controlling transmission of some microorganisms. The specific benefit of using cohorting for managing ARO outbreaks, including MRSA, Gram negative resistant organisms and outbreaks due to other infectious agents is difficult to determine as multiple other control measures were implemented during published outbreaks.

iii) Airborne Infection Isolation Rooms(AIIRs)

AIIRs are designed with negative pressure ventilation (i.e., with air flow from the outside corridor into a room through the doorway and exiting directly to the exterior of the building or filtered before

recirculation) for accommodation of patients suspected or confirmed to have an infection transmitted by the airborne route.

An AIIR is also required for patients with an airborne infection, or when performing AGMPs on patients with SARS, MERS-CoV, viral hemorrhagic fever and other emerging pathogens for which transmission characteristics are not yet known (see Appendix I, 4).

In settings where AIIRs are limited, the following process should be used to assess the accommodation or continued accommodation, along with clinical judgement and risk benefit analysis. This will be used to determine the patient's risk of infectivity and risk of transmission or disease and exposure to patients and staff. This risk assessment should be done in collaboration with IP&C, Public Health or designated other key health care professionals involved with the patient's care.

Factors to be included in the risk assessment are:

- degree of transmissibility of the infectious disease
- presence of communicable symptoms (transmission)
- potential and level of the patient's infectivity
- stage of the patient's convalescence
- immune status of patients and staff

Priority for these rooms would include (not listed in order of priority):

- severe acute respiratory infection (SARI) and emerging respiratory infections and pathogens

  See the MHSAL Communicable Disease Management Protocol. Available at: http://www.gov.mb.ca/health/publichealth/cdc/protocol/sari.pdf
- viral hemorrhagic fever
- smallpox or monkeypox
- proven or suspected infectious respiratory (including pleural or laryngeal) tuberculosis, including MDR and XDR

In situations when AIIRs are not available, following a risk assessment of the factors identified above, the patient can be temporarily housed in a single room with the door closed, a surgical or procedure mask on, and away from high risk patients. Patients should be transferred as soon as medically feasible to a facility or unit with AIIRs. If AIIRs in other facilities are not available, a decision should be made following the risk assessment above to determine if it will be safe to accommodate or treat the patient in the facility, as well as if the patient should continue to be masked while in the room.

If a patient is suspected or confirmed to have respiratory tuberculosis and an AIIR is not available, some factors to be considered to determine risk to patients and staff should include:

- Smear positivity
  - Negative to not applicable: Minimal risk
  - 3+ or 4+: Higher risk
- Chest x-ray
  - Normal/calcified granuloma: Minimal risk
  - Cavitation: Higher risk
- For further information or detail, refer to Toronto Public Health Contact Screening Parameters Tool at: http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/protocols_guidelines/Tuberculosis_Program_Guideline_2018.pdf. This is an evidence based tool widely used in the province of Ontario to prioritize contact investigations. It can be obtained by contacting Toronto Public Health at Targettb@toronto.ca.

If a patient is suspected or confirmed with a vaccine preventable disease (e.g., measles, varicella or disseminated zoster), the need for an AIIR and the risk of transmission should be assessed in relation to the presence of non-immune or unknown immune patients or HCWs, as well as the unit or ward the patient is on (e.g., pediatric unit).

HCWs who are immune to measles or varicella should provide direct care for patients with these infections. Non-immune or unknown immune HCWs should not work with patients with measles, varicella or disseminated zoster. Unknown immune or non-immune HCWs should not enter the room unless it is essential, and when necessary, must wear a N95 respirator. Non-immune or unknown immune patients should not share rooms with patients with measles, varicella or zoster.

- Prehospital care: patients should wear a mask and be transported separately. When transporting multiple patients, the risk of transmission should be considered as noted above and control measures applied as necessary (e.g., personnel in the ambulance should be restricted to only those medically necessary, there should be an open window in the ambulance, and a closed window between the driver and the patient area of the ambulance).
- Ambulatory care: patients should defer their appointment if possible or enter through a separate entrance. Upon arrival, patients should be asked to wear a mask, perform hand hygiene and be placed in an examining room with the door closed as soon as possible.
- Home care settings: family members who have not been exposed or are not immune should avoid sharing airspace with the patient. Natural ventilation (e.g., open windows) will help disperse the microorganisms from the room.

iii) Patient Flow

When Additional Precautions are necessary, patients should leave their rooms for medically necessary purposes only. Communication between the transporting area and the receiving area is important to ensure consistency of precautions and to decrease unnecessary waiting time in public areas. Source control measures (e.g., requesting patient to perform hand hygiene before leaving their room, cover skin lesions, and wear a mask) should be applied.

iv) Personal Protective Equipment

Gloves

Gloves are used for all care of patients on Contact Precautions. When worn appropriately, gloves are effective to prevent contamination of HCWs' hands, thereby reducing the potential transfer of microorganisms from colonized or infected patients to HCWs, and from patient to patient via HCWs' hands. A prospective controlled trial of vinyl gloves to prevent the transmission of *C. difficile* demonstrated a significant decrease in the incidence of *C. difficile*-associated disease during a six-month intervention period. In one study, an outbreak of MRSA was controlled with the use of gloves for all contact with patients and their immediate environment. Gloves become contaminated during use and, if used inappropriately, can result in transmission of microorganisms. Transmission of *C. difficile*, MRSA and *Acinetobacter* spp. has been associated with failure to change gloves between patients. Failing to change gloves between care activities and procedures with the same patient after contact with materials that may contain high concentrations of microorganisms (e.g., after handling an indwelling urinary catheter, or suctioning an endotracheal tube), may result in contamination of clean body sites or the patient's environment.

Long Sleeved Gowns

The benefits of using gowns as a control measure to prevent transmission is difficult to determine as the use of gowns and multiple other interventions (e.g., gloves, increased emphasis on hand hygiene, isolation and cohorting) are often implemented concurrently and the individual benefits of these measures could not be identified.

Gowns are used for Contact Precautions if direct contact with the clothing of the patient or with contaminated environmental surfaces is anticipated. Although gowns may become contaminated with potential pathogens after caring for an infected or colonized patient (e.g., MRSA and *C. difficile*), there is no evidence gowns have been involved in the transmission of these pathogens to others.

Facial Protection

Facial protection includes masks and eye protection, face shields, or masks with visor attachment. Facial protection is worn when HCWs are within two metres of a coughing or sneezing patient with a suspected or confirmed transmissible respiratory infection.

The eye is an important portal of entry for some pathogens. Pathogens may be introduced into the eye directly via respiratory droplets generated during coughing or suctioning, or by self inoculation if the eyes are touched with contaminated fingers. Wearing eye protection during all care of children with RSV has been shown to reduce the acquisition of this infection by HCWs, probably by preventing hand-eye contact.

Respiratory Protection

Respiratory protection from airborne infection requires the use of a respirator with NIOSH-approved N95 or higher filtration to prevent inhalation of microorganisms. Respiratory protection may be necessary as a component of Airborne Precautions or recommendations for performing AGMPs on certain patients. The need for respiratory protection is determined by a PCRA. Factors to be considered are the specific infectious agent, known or suspected infection status of the patient involved, the patient care activity to be performed, the immune status of the HCW and the patient's ability to perform respiratory hygiene. Refer to PART A, Section III. C(1).

v) Management of Visitors

Visitors could be at risk for serious diseases should they acquire the patient's infection (e.g., acquisition of a respiratory virus by a visitor with chronic lung disease, or exposure of a non-immune visitor to varicella), and should be capable of complying with the necessary precautions to prevent indirect transmission to other patients (e.g., hand hygiene and not sharing personal items).

Generally, visitors should have access to the same PPE as health care workers when providing direct patient care.

Evidence to support the use of PPE by visitors is lacking. The following should be considered when requesting visitors to wear PPE:

- PPE may not be necessary if they have likely been exposed to the infection preadmission.
- PPE may be appropriate for visitors who visit multiple patients in the facility.

PART B – RECOMMENDATIONS FOR ROUTINE PRACTICES AND ADDITIONAL PRECAUTIONS

I. Organizational Responsibilities

A major responsibility of any health care organization is to minimize the risk of exposure to and transmission of infections within health care settings. The following should form the basis of policies, procedures and programs to achieve this responsibility. It should be consistent across the organization and be in compliance with current regulations. These should include:

1. Provide sufficient expert human resources (e.g., hospital epidemiologist, infection control professional(s) and clerical staff) and sufficient financial resources to ensure an effective IP&C program that is appropriate to the organization's mandate and consistent with current recommendations.

2. Implement a comprehensive occupational health program, including ensuring health care worker immunity to vaccine-preventable diseases (including annual influenza immunization), tuberculosis screening, provision of a respiratory protection program, sharps safety and prevention of exposure to blood-borne pathogens, management of ill health care workers and of health care workers exposed to communicable infections consistent with current recommendations and publications.

3. Perform ongoing organizational risk assessments to evaluate the workplace risk of exposure to microorganisms. The organizational risk assessment will include
   - facility health care design
   - renovation and construction
   - ventilation requirements
   - source control
   - occupational health
   - education of health care workers
   - cleaning, disinfection and sterilization of reusable patient care equipment
   - environmental cleaning
   - management of waste and linen
   - regular audits of the application of Routine Practices and Additional Precautions

4. Promote and facilitate adherence to hand hygiene recommendations, including multi-modal strategies. Multi-modal strategies (e.g., administrative support, role models, education, audit and feedback, patient and family involvement) should be used to improve adherence to hand hygiene. Use alcohol-based hand rub as the preferred method of hand hygiene at the point of care and at other locations as indicated in the PHAC Infection Control Guidelines Hand Hygiene Practices in Health Care.

5. Promote the application of the point of care risk assessment prior to every patient interaction as an organizational priority and an expectation of all health care workers.

6. Develop and implement policies and procedures for the application of Routine Practices for the care of all patients at all times in all health care settings and for Additional Precautions when required.

7. Promote adherence to aseptic technique for invasive procedures, including insertion of central lines and handling of intravenous systems, spinal procedures and safe injection practices (including the use of multidose vials).

8. Develop and implement appropriate policies and procedures for preventing the transmission of Creutzfeldt-Jakob Disease.

9. Develop and implement policies and procedures to ensure that patients colonized or infected with microorganisms, including antibiotic resistant organisms, are not denied appropriate care.

10. Ensure personal protective equipment appropriate to the care setting is available, sufficient, and located in convenient and accessible areas. The selected personal protective equipment should maximize protection, dexterity and comfort.

Refer to Manitoba Workplace Safety and Health www.manitoba.ca/labour/safety/ and The Workplace Safety and Health Act http://web2.gov.mb.ca/laws/statutes/ccsm/w210e.php

11. Develop and implement policies and procedures to reduce exposure to latex in health care workers and patients.

12. Include infection control professionals in planning when designing newly constructed health care facilities or areas, or renovations to existing health care facilities.

13. Ensure facilities are designed and maintained in accordance with the most current infection prevention and control specifications as outlined by the Canadian Standards Association Z317.13 *Infection Control during Construction, Renovation and Maintenance of Health Care Facilities* (current edition) and Canadian Standards Association Z8000 *Canadian Health Care Facilities* (current edition) including:

    i) single rooms for the routine care of inpatients (with in-room private toilets, designated sinks for the patient, alcohol-based hand rub dispensers and designated hand washing sinks for health care workers)

    ii) appropriate number and location of AIIRs (including critical care units, inpatient, emergency departments and ambulatory care clinics) based on the organizational risk assessment

    iii) appropriate ventilation requirements for AIIRs (see 14. and 15. below)

    iv) appropriate spatial separation and spacing requirements in clinical and waiting areas, including nurseries

    v) appropriate number and placement of hand hygiene product dispensers and designated hand washing sinks

    vi) selecting surfaces that are easy to clean

14. Ensure AIIRs are designed and maintained to meet the most current infection prevention and control specifications.

    i) Ensure a monitoring schedule is in place for airborne infection isolation rooms (e.g., air changes per hour, pressure differentials and filtration efficiencies) and establish an action plan to review, and where necessary, upgrade the ventilation systems of facilities to meet the requirements.

    ii) There is a minimum requirement for the number of air changes per hour for AIIRs.

Refer to Canadian Standards Z317.2 *Special Requirements for heating, ventilation and air-conditioning (HVAC) systems in health care facilities* (current edition) for requirements for AIIRs.

Refer to Appendix III- Air exchanges Per Hour and Time in Minutes

Refer to Canadian Standards Z317.2 *Special Requirements for heating, ventilation and air-conditioning (HVAC) systems in health care facilities* (current edition) for requirements for bronchoscopy suites, autopsy suites and rooms used for sputum induction.

15. Have and apply strategies to prevent overcapacity (i.e., providing care for more patients than current bed infrastructure normally permits). If overcapacity is unavoidable for short periods, ensure appropriate triage of patients and choose locations for overcapacity patient care areas that have convenient access to alcohol-based hand rub dispensers and appropriate personal protective equipment.

16. Provide adequate resources to develop, implement and maintain a source control program for the management of potentially infectious persons, including:

    - signage at initial points of patient encounter (e.g., entrances to hospitals, ambulatory care and long term care settings, and reception areas in outpatient settings)

- physical barriers at triage in emergency departments and acute assessment settings
- spatial separation
- respiratory hygiene (provide masks, tissues, hand hygiene products and designated hand washing sinks, and hands free receptacles)
- airborne infection isolation rooms
- strategies to reduce production of aerosols during aerosol-generating medical procedures

17. Develop, implement and maintain systems to screen visitors who are not immune to chickenpox or measles and who visit defined high-risk populations (e.g., neonatal intensive care units, infants less than one year old, oncology patients and other severely immunocompromised patients) for recent contact with these other transmissible infections.

18. Include infection control professionals in selection of new patient care equipment and devices that require cleaning, disinfection or sterilization.

19. Establish, maintain and audit standards for cleaning, disinfection and sterilization of reusable patient care equipment, as outlined in the most current published guidelines or as regulated in some jurisdictions. Provide disposable, single-use, semi-critical and critical devices when access to appropriate reprocessing is not available.

20. Develop a process for evaluation and management of actual and potential disinfection and sterilization failures in disinfection and sterilization processes.

21. Develop and implement policies and procedures for routine scheduled environmental cleaning, including procedures for assigning responsibility and accountability for cleaning as indicated by the level of patient contact and degree of soiling, including event-related cleaning of environmental surfaces and increased cleaning following Additional Precautions.

22. Ensure adequate numbers, training and supervision of housekeeping staff.

23. Develop education and training for those responsible for environmental cleaning and perform evaluation of policies, procedures and practices, including audits to determine effectiveness of environmental cleaning.

24. Develop and implement routine policies and procedures, including assigning responsibility for cleaning and disinfection of all non-critical patient care items that are moved in and out of patient care areas (e.g., mobile devices, multi-use electronics, intravenous poles, toys and electronic games).

25. Use detergent disinfectants with a Drug Identification Number (DIN) that have microbiocidal (i.e., killing) activity against the pathogens most likely to contaminate the patient environment. The IP&C program should approve the products purchased. The product should be used in accordance with manufacturer's instructions.

26. Develop and implement standards for laundry as outlined in the most current publications. If laundry chutes are used, ensure that they are properly designed, maintained and used in a manner to minimize dispersion of aerosols from contaminated laundry (e.g., securely bagged).

27. Develop and implement standards for waste management as outlined in the most current publication.

28. Follow municipal or regional regulations and bylaws when developing and implementing treatment and disposal policies for biologic waste, including sharps.

29. Develop and implement policies and procedures for safe delivery of any pet therapy program in the facility.

II. Health Care Worker Responsibilities

Health care workers have a responsibility to minimize the risk of exposure to and transmission of microorganisms within health care settings. The following recommendations are applicable to health care workers in all health care settings.

1. Perform a point of care risk assessment before each patient interaction to determine the appropriate Routine Practices and Additional Precautions required for safe patient care. Health care workers should have sufficient knowledge, skills and resources to perform a point of care risk assessment, taking into consideration the level of care they are providing, their level of education and their specific job and responsibilities.

2. Use alcohol-based hand rub at the point of care as the preferred method of hand hygiene to prevent the transmission of microorganisms in the health care setting.

3. Adhere to Routine Practices, including the application of aseptic technique when necessary (see Part B, Section III, (6)) during the care of all patients at all times in all settings.

4. Apply Additional Precautions (see Part B, Section IV) as indicated by the point of care risk assessment, in addition to Routine Practices.

5. Know and follow the policies and procedures related to Routine Practices and Additional Precautions and who to contact for questions and concerns related to infection prevention and control.

6. Know the applications, advantages and limitations of the personal protective equipment available within the organization or facility.

7. Provide education to patients, their families and visitors regarding respiratory hygiene, hand hygiene and when necessary, the reason for precautions required for their care.

8. Ensure medical, psychological and safety needs of patients on Additional Precautions are met.

9. Adhere to pre-placement immunization recommendations and screening of health care workers for vaccine preventable infections, including but not limited to hepatitis B, measles, mumps, rubella, pertussis, varicella, and combined tetanus and diphtheria. In addition, receive annual influenza vaccination unless valid medical contraindications exist. Health care workers should be aware of their immune status. Comply with organizational tuberculosis protocols related to the assessment of health care workers tuberculosis status.

10. Adhere to policies and procedures related to the organization's respiratory protection program.

11. Stay away from work when you are symptomatic with an infection that may have important consequences if transmitted, including acute conjunctivitis, acute respiratory infection, gastroenteritis with vomiting or diarrhea, varicella or extensive zoster that cannot be kept covered, or open infected skin lesions or herpetic skin lesions on the hands. Inform your immediate supervisor or Occupational Health if you worked when symptomatic.

12. Communicate to Occupational Health or a delegate responsible for occupational health, information about personal infections that may be a risk to others.

13. Report any potential occupational exposure to a communicable infection to an immediate supervisor and Occupational Health or an Occupational Health delegate.

14. Know and follow the policies and procedures regarding management of exposures to communicable infections (e.g., percutaneous or mucosal exposures to blood, body fluids, pulmonary tuberculosis or varicella).

15. Report clusters of similar illnesses (i.e., occurring in the same time or place) in patients or health care workers to a supervisor and Occupational Health or an Occupational Health delegate.

16. Follow policies and procedures for containing, transporting and handling used patient care equipment, medical instruments and devices, including wearing personal protective equipment when handling used items if indicated by the point of care risk assessment.

17. Identify semi-critical and critical items that require reprocessing (i.e., cleaning, disinfection or sterilization) and do not use until appropriately reprocessed.

18. Identify used, non-critical patient care equipment and other items, such as toys and electronic games. Do not allow use by another patient until these items are appropriately cleaned and disinfected.

19. Discard personal care items (e.g., tissues, lotions, soaps and razors) and disposable equipment, such as containers used for blood collection or tourniquets left in the room following transfer, terminal cleaning or discharge.

20. Use single-patient medications, such as multidose inhalers, sprays, topical anesthetics or other topical agents used on the skin, eye or other mucous membranes, on one patient only.

21. Refrain from taking the patient care record or chart into the patient room, cubicle or designated bed space in a shared room and perform hand hygiene after handling the record or chart.

22. Refrain from eating or drinking in areas where direct patient care is provided or in reprocessing or laboratory areas.

III. Recommendations for Routine Practices in all Health Care Settings

The recommendations that follow are for all health care settings unless otherwise stated.

1. Point of Care Risk Assessment

Perform a point of care risk assessment before each patient interaction to determine the appropriate Routine Practices required for safe patient care.

2. Hand Hygiene

Adhere to recommendations as outlined in the Public Health Agency of Canada Infection Control Guidelines *Hand Hygiene Practices in Healthcare Settings* http://publications.gc.ca/collections/collection_2012/aspc-phac/HP40-74-2012-eng.pdf and as specified by Accreditation Canada.

3. Source Control

Adhere to the following source control measures:

a. Triage

i. For emergency rooms and acute assessment settings:

- Post signs to direct patients with symptoms of acute infection (e.g., cough, fever, vomiting, diarrhea, coryza, rash or conjunctivitis) to specific waiting areas.
- Ensure a physical barrier (e.g., plastic partition at triage desk) is located between infectious sources (e.g., patients with symptoms of a respiratory infection) and others.
- Place patients with respiratory infections directly into an examining room or an airborne infection isolation room, as indicated by the respiratory infection suspected.
- Place patients with an acute diarrheal illness into a single examining room whenever possible.

ii. For community or outpatient settings:

- Identify patients with symptoms of an acute infection when scheduling appointments for routine clinic visits. If possible, ask that they defer routine clinic visits until the symptoms of their acute infection have subsided.
- Inform patients who cannot defer their routine clinic visit (i.e., those that require assessment of their symptoms or condition) to follow hand hygiene and respiratory hygiene recommendations appropriate for their symptoms. Direct these patients into an examining room as soon as they arrive, or schedule their appointment for a time when other patients are not present.
- Post signs at the entrance to the clinic reminding symptomatic patients to perform hand hygiene and respiratory hygiene appropriate for their symptoms.

b. Early Diagnosis and Treatment

i. Ensure symptomatic patients are assessed in a timely manner and that any potential communicable infection is considered (e.g., tuberculosis, norovirus, RSV or pertussis).

c. Respiratory Hygiene

i. Encourage respiratory hygiene for patients and accompanying individuals who have signs and symptoms of an acute respiratory infection, beginning at the point of initial encounter in any health care setting (e.g., prehospital, triage, reception and waiting areas in emergency departments, outpatient clinics and physician offices). Respiratory hygiene includes:

- Use tissues to contain respiratory secretions to cover the mouth and nose during coughing or sneezing, with prompt disposal of these into a hands-free waste receptacle.

- Cover the mouth and nose against a sleeve or shoulder during coughing or sneezing, if a tissue is not available.
- Wear a mask when coughing or sneezing.
- Turn the head away from others when coughing or sneezing.
- Maintain a spatial separation of two metres between patients symptomatic with an acute respiratory infection (manifested by a new cough, shortness of breath and fever) and those who do not have symptoms of a respiratory infection. If this cannot be achieved, the patients must be at least one metre apart and the symptomatic patient must wear a mask. One metre may be sufficient for young children and others whose cough is not forceful enough to propel the droplets as far as two metres.

d. Spatial Separation

i. Ensure a minimum two metre separation between patients who may have a respiratory infection and are symptomatic with a cough, fever or shortness of breath, and those who do not have symptoms.

ii. One metre may be sufficient for young children and others whose cough is not forceful enough to propel the droplets as far as two metres.

e. Strategies to Reduce Risk from Aerosol Generation of Microorganisms

i. Assess patients for signs or symptoms of suspected or confirmed tuberculosis, severe acute respiratory syndrome or other emerging respiratory infections, prior to performing an aerosol-generating medical procedure.

ii. Apply strategies to reduce the level of aerosol generation, as listed in Part B, Section IV, Sub-section iii, (1b) for aerosol-generating medical procedures performed on patients with signs and symptoms of suspected or confirmed tuberculosis, severe acute respiratory syndrome or emerging respiratory infections. Strategies to reduce aerosol generation should also be implemented when aerosol-generating medical procedures are necessary on patients with viral hemorrhagic fevers.

iii. Routine Practices are generally sufficient for aerosol-generating medical procedures performed on patients with no signs or symptoms of suspected or confirmed tuberculosis, severe acute respiratory syndrome or emerging respiratory infections. However, there may be instances where Additional Precautions are indicated, as specified in Tables 5 and 6 (e.g., Droplet and Contact Precautions for RSV).

4. Patient Placement and Accommodation

a. Determine options for patient placement and room sharing if single rooms are limited, using the point of care risk assessment, based on:

i. presence or absence of known or suspected infection (e.g., need for Additional Precautions).

ii. route(s) of transmission of the known or suspected infectious agents (e.g., airborne infections require an airborne infection isolation room):

- Contact (single room is preferred)
- Droplet (single room ispreferred)
- Airborne (airborne infection isolation room required)

iii. risk factors for transmission from the infected patient.

iv. susceptibility of other patients in the room to an adverse outcome from a health care associated infection.

v. patient options for room sharing (e.g., cohorting patients infected with the same organism)

vi. ability of patient, roommate(s) and visitors to comply with infection prevention and control measures

b. Give priority for placement in single rooms to patients who pose an increased risk for transmission of a microorganism to others. The following patients should have priority. If AIIRs are not available, refer to PART A, Section III, C, 2 (b) iii.

vii. Patients on Additional Precautions:

- Contact (single room is preferred)
- Droplet (single room is preferred)
- Airborne (airborne infection isolation room required) **OR**

viii. Patients who visibly soil the environment or who cannot maintain appropriate hygiene, including respiratory hygiene **OR**

ix. Patients with uncontained secretions or excretions **OR**

x. Patients with wound drainage that cannot be contained by a dressing **OR**

xi. Patients with fecal incontinence if stools cannot be contained in incontinent products or infant diapers

In prehospital settings:

i. Single-patient transport is preferred.

ii. If multi-patient transport is required, consider b., i-v. above to determine priority for single-patient transport.

5. Patient Flow

a. Avoid transfer of patients within facilities, unless medically indicated.

6. Aseptic Technique

a. Use aseptic technique when performing invasive procedures and handling injectable products. Aseptic technique includes:

i. Perform hand hygiene, preferably with alcohol-based hand rub, prior to opening supplies.

ii. When alcohol-based hand rub is not accessible, perform hand hygiene with antimicrobial soap and water for invasive procedures (e.g., placing central intravascular catheters or catheters for injecting into the spinal canal or subdural spaces).

iii. Open tray and supplies only when ready to use to ensure a sterile field.

iv. Perform hand hygiene prior to putting on single-use clean gloves, sterile gloves, sterile gown or mask, as indicated by the specific procedure.

v. Prepare the patient's skin with an appropriate antiseptic before performing an invasive procedure.

vi. Use the appropriate size drape when a drape is required, to maintain a sterile field.

vii. Do not administer medications or solutions from single-dose vials, ampules or syringes to multiple patients or combine leftover contents for later use.

viii. Use single-dose medication vials, prefilled syringes, and ampules in clinical settings. If the product is only available as multi-dose vial, see b. below.

ix. Use a sterile, single-use disposable needle and syringe for each medication or fluid withdrawal from vials or ampules.

x. Clean the stoppers or injection ports of medication vials, infusion bags, etc. with alcohol, before entering the port, vial or bag.

b. When a product is only available for purchase in multi-dose vials:

   i) Restrict the multi-dose vial to single-patient use whenever possible.

   ii) Prepare syringes from multi-dose vials from a centralized medication preparation area (e.g., do not take multi-dose vials to the patient).

   iii) Store the multi-dose vial to restrict access (e.g., in a secure location away from the patient bedside and where access is restricted, such as a medication room or locked cart).

   iv) Use a sterile, single-use needle and syringe each time the multi-dose vial is entered.

   v) Do not re-enter the multi-dose vial with a previously used needle or syringe.

   vi) Store the multi-dose vial in accordance with manufacturer's recommendations.

   vii) Label the multi-dose vial with date of first opening.

   viii) Discard the multi-dose vial according to the manufacturer's expiry date or organizational policy, whichever is the shorter time.

   ix) Inspect the multi-dose vial for clouding or particulate contamination prior to each use, and discard the multi-dose vial if clouding or particulate contamination is present.

   x) Discard the multi-dose vial if sterility or product integrity is compromised.

c. Use single-patient, multi-use devices (e.g., glucose sampling devices and fingerstick capillary blood sampling devices) for only one patient. If it is not feasible to assign glucometers to individual patients, clean and disinfect before use between patients.

d. Use aseptic technique (Part B, Section III, 6a. above), which includes the use of a mask and sterile gloves when placing a catheter or injecting material into the spinal canal or subdural space (e.g., during lumbar puncture, myelogram, and spinal or epidural anesthesia).

e. Adhere to aseptic technique for storage, assembly or handling components of intravenous delivery systems.

   i. Use intravenous bags, tubing and connectors for one patient only and dispose appropriately after use.

   ii. Consider a syringe, needle or cannula as contaminated once it has been used to enter or connect to one patient's intravenous infusion bag or administration set, and do not reuse.

   iii. Do not assemble sterile components until time of need, with the exception of the emergency department, operating room, intensive care unit or prehospital settings, where it may be essential to maintain one system primed and ready for emergency use. If so, store the primed system in a clean and dry area, secure from tampering, and label with the date of priming. Replace if not used within 24 hours.

   iv. Store sterile intravenous equipment components in a clean, dry, secure environment.

f. Use aseptic technique for insertion of central venous catheters.

   i. Use maximal aseptic barriers (as outlined in Part B, Section III 6a. above), in addition to a cap, mask, long sleeved sterile surgical gown, sterile gloves and a large full body sterile drape. In addition, prepare the skin with chlorhexidine in alcohol or an equally effective alternative for inserting any central venous catheters and pulmonary arterial catheters.

   ii. When inserting peripheral venous catheters or peripheral arterial lines, as a minimum, perform hand hygiene, prepare the skin with an antiseptic and wear clean disposable gloves.

   iii. Use skin antisepsis and single-use disposable needles for acupuncture and for the use of lancets, blood sampling devices or other items that will be contaminated with blood.

7. Use of Personal Protective Equipment

a. Adhere to proper technique for putting on and taking off personal protective equipment (Appendix IV).

b. Gloves (clean single-use, non sterile)

i. Gloves are not a substitute for other elements of hand hygiene.

ii. Gloves are not required for routine patient care activities, when contact is limited to a patient's intact skin.

iii. Wear gloves as determined by the point of care risk assessment:

- for anticipated contact with blood, body fluids, secretions and excretions, mucous membranes, draining wounds or non-intact skin (including skin lesions or rash)
- for handling items or touching surfaces visibly or potentially soiled with blood, body fluids, secretions or excretions
- while providing direct care, if the health care worker has an open cut or abrasions on the hands

Appropriate Glove Use:

- Perform hand hygiene prior to putting on gloves for tasks requiring clean, aseptic or sterile technique.
- Put gloves on directly before contact with the patient, or just before the tasks or procedure requiring gloves.
- Wear gloves with fit and durability appropriate to the task (see Appendix IV). Use of powder-free gloves is preferred.
- Wear disposable medical examination gloves or reusable utility gloves for cleaning the environment or medical equipment.
- Remove gloves and perform hand hygiene immediately after patient care activities that involve contact with materials that may contain large amounts of microorganisms (e.g., after contact with mucous membranes, after handling an indwelling urinary catheter, or after open suctioning of an endotracheal tube or changing a dressing) before continuing care of that patient. If gloves are still indicated, replace with a clean pair.
- Remove gloves and dispose into a hands-free waste receptacle immediately following their intended use. Do not reuse single-use gloves, clean them with alcohol-based hand rub or wash for reuse.
- Perform hand hygiene following the removal of gloves, before leaving the patient's environment and before touching clean environmental surfaces.
- Do not use the same pair of gloves for the care of more than one patient.

c. Long sleeved gowns

i. Use of gowns is not routinely indicated to enter high risk units (e.g., burn unit, intensive care unit, neonatal intensive care unit or hematopoietic stem cell unit).

ii. Wear long-sleeved, cuffed gowns as determined by the point of care risk assessment:

- to protect uncovered skin
- to prevent soiling of clothing
- during procedures and patient care activities likely to soil clothing or generate splashes or sprays of blood, body fluids, secretions or excretions

iii. Gowns should be cuffed and cover the front and back of the HCW, from the neck to mid-thigh. The type of gown is based on:

- anticipated degree of contact with infectious material
- potential for blood and body fluid penetration of the gown (fluid repellence when heavy liquid contamination is anticipated, such as in an operating theatre or during dialysis)
- requirement for sterility (e.g., operating theatre or central line insertion)

iv. Adhere to organizational policy regarding the laundering of scrub suits and uniforms supplied by the organization.

Appropriate Gown Use:

- Perform hand hygiene before gowning.
- Ensure the gown is long enough to cover the front and back of the health care worker, from the neck to mid-thigh and the sleeves no shorter than just above the wrist.
- Put the gown on with the opening at the back, with edges overlapping, thus covering as much clothing as possible.
- Ensure the cuffs of the gown are covered by gloves.
- Tie the gown at the waist and neck.
- Remove the gown by undoing the neck and waist ties, starting with neck ties, and remove the gown without touching the clothing or agitating the gown unnecessarily. Then turn the gown inside on itself, and roll it up.
- Remove the gown immediately after the indication for use and place in a hands-free waste receptacle. Perform hand hygiene before leaving the patient's environment.
- Remove wet gowns immediately to prevent a wicking action that facilitates the passage of microorganisms through the fabric.
- Do not reuse gowns once removed, even for repeated contacts with same patient.
- Do not wear the same gown between successive patients.

d. Facial Eye Protection

i. Educate health care workers to avoid touching their faces with their hands during patient care.

ii. Wear facial protection (e.g., masks and eye protection, face shields or masks with visor attachment) as determined by the point of care risk assessment:

- to protect the mucous membranes of the eyes, nose and mouth during procedures and patient care activities likely to generate splashes or sprays of blood, body fluids, secretions or excretions, including respiratory secretions
- when caring for a coughing or sneezing patient.

iii. Wear disposable eye protection or face shields only once to avoid self-contamination and do not position them on the head or around the neck for later use.

iv. Remove eye protection or face shields immediately after use, place promptly into a hands-free waste receptacle, and perform hand hygiene. Remove gloves after removing eye protection. Refer to Appendix IV– Technique for Putting On and Taking off PPE.

v. If eye protection or face shields are reusable, clean and disinfect them as per organizational policy, before reuse.

vi. When eye protection is required, wear it over prescription glasses. Prescription glasses by themselves are not adequate for eye protection.

Appropriate Use of Facial Eye Protection:

- Perform hand hygiene prior to putting facial protection on.
- Wear facial protection as instructed by the manufacturer.
- Wear and discard facial protection appropriately to prevent self-contamination.
- Ensure your nose, mouth and chin are covered when wearing a mask.
- Avoid self-contamination by not touching facial protection on its external surface during use and disposal.
- Remove facial protection carefully by the straps or ties.
- Discard facial protection immediately after the intended use into a hands-free waste receptacle (i.e., disposed of as soon as removed from the face) and perform hand hygiene.
- Do not dangle a mask around the neck when not in use. Do not reuse a mask.
- Change the mask if it becomes wet or soiled (from the wearer's breathing or due to an external splash).
- Change the mask if breathing becomes difficult.
- In cohort settings, Additional Precautions must be applied individually for each patient within the cohort and within the individual patient environment.

8. Sharps Safety and Prevention of Exposure to Bloodborne Pathogens

a. Follow provincial or territorial regulations regarding the use of safety engineered sharp devices.

b. Use safety engineered sharp devices wherever possible. Consider the safety of both patients and HCWs when selecting safety engineered sharp devices.

c. Do not recap used needles. Dispose of used needles and other used single-use sharp items immediately into designated puncture-resistant containers readily accessible at the point of care.

d. Have health care workers cover open skin areas or lesions on hands or forearms with a dry dressing at all times. Consult Occupational Health or an Occupational Health designate if adherence to hand hygiene recommendations is impeded by the dressing.

e. Protect the eyes, nose and mouth (using facial protection) when splashes with blood or body fluids are anticipated.

f. Perform first aid immediately if exposed to blood or body fluids.

   i. Thoroughly rinse the site of a percutaneous injury with running water and gently clean any wound with soap and water.

   ii. Flush mucous membranes of the eyes, nose, or mouth with running water if contaminated with blood, body fluids, secretions or excretions.

   iii. Thoroughly rinse non-intact skin with running water if contaminated with blood, body fluids, secretions or excretions.

g. Report immediately to the employer after first aid and seek immediate medical attention.

9. Cleaning and Disinfection of Non-Critical Patient Care Equipment

a. Clean and perform low level disinfection of reusable, non-critical equipment that has been in direct contact with a patient or in that patient's environment, before use in the care of another patient.

b. Clean and perform low level disinfection of items such as toys and electronic games that have been in direct contact with a patient or in that patient's environment, before use by another patient.

c. Clean non-critical patient care equipment dedicated to an individual patient, according to a regular schedule.

d. Dedicate bedpans and commodes for single-patient use and label appropriately. Clean and perform low level disinfection before use by another patient. The use of disposable bedpans is acceptable.

e. Follow manufacturer's written instruction for use of products for cleaning and disinfecting.

f. Store sterile and clean supplies in a designated and separate clean dry area, protected from dust. Do not store under sinks or near plumbing, as leaks may occur.

In home care settings:

- Educate patients about the importance of environmental cleaning.
- Limit the amount of disposable and non-disposable patient care equipment and supplies brought into the home.
- Advise patients to purchase items such as thermometers and scissors for personal use.
- Whenever possible, leave reusable patient care equipment in the home until the patient is discharged from home care services.
- Clean and low level disinfect non-critical patient care equipment (e.g., stethoscope) that cannot remain in the home, before taking them from the home.
- Alternatively, place contaminated reusable items in a plastic bag for transport and subsequent cleaning and disinfection.
- Discard or leave unused disposable equipment or supplies in the home following discharge from home care services (do not reuse for other patients).

In prehospital care:

- Use of disposable items is preferred where practical.
- Clean and disinfect patient care equipment touched or potentially touched by patients and personnel following transport.

10. Environmental Cleaning

a. Clean and disinfect surfaces that are likely to be touched or used on a more frequent schedule compared to other surfaces. This includes surfaces that are in close proximity to the patient (e.g., bedrails, overbed tables and call bells) and frequently-touched surfaces in the patient environment, such as door knobs, surfaces in the patient's bathroom and shared common areas for dining, bathing or toileting.

In prehospital care:

- Perform a terminal clean following patient care and transport.
- Clean and disinfect response bags following use, and if heavily soiled or contaminated with blood or body fluids, remove from service and launder as per organizational policy.

11. Handling of Deceased Bodies

a. Routine Practices properly and consistently applied should be used when handling deceased bodies or preparing bodies for autopsy or transfer to mortuary services.

b. Refer to MHSAL Public Health Act, Dead Bodies Regulation www.canlii.org/en/mb/laws/regu/man-reg-27-2009/latest/part-1/man-reg-27-2009-part-1.pdf

12. Handling of Linen, Waste, Dishes and Cutlery

a. Linen

i. Change patient bed linen regularly and when soiled, upon discontinuation of Contact Precautions and following patient discharge.

ii. Handle soiled linen from health care settings in the same way for all patients, without regard to their infection status. Place soiled linen in an appropriate receptacle at the point-of-use.

iii. Handle soiled linen with a minimum of agitation to avoid contamination of air, surfaces and persons.

iv. Sort and rinse linen outside of patient care areas, with the exception of specialized items and personal clothing in specific health care settings.

v. Roll or fold heavily soiled linen to contain the heaviest soil in the centre of the bundle. Do not remove large amounts of solid soil, feces or blood clots from linen by spraying with water. Use a gloved hand and toilet tissue, then place into a bedpan or toilet for flushing.

vi. Perform hand hygiene after handling soiled linen.

vii. Transport and store clean linen in a manner that prevents its contamination and ensures its cleanliness.

viii. Maintain separation of clean and soiled linen during transport and storage.

ix. Wash reusable linen bags after each use. They may be washed in the same cycle as the linen contained in them.

In ambulatory care:

- Change linen following every patient treatment or procedure.

In prehospital care:

- Change patient linen following every patient treatment or transport.

b. Waste

i. Contain biomedical waste (e.g., sponges, dressings, or surgical drapes soaked with blood or secretions) in impervious waste-holding bags or double bags according to municipal or regional regulations.

ii. Dispose of blood, suctioned fluids, excretions and secretions in a sanitary sewer or septic system, according to municipal or regional regulations.

iii. Handle used needles and other sharp instruments with care to avoid injuries during disposal. Dispose of used medical sharps immediately in designated puncture-resistant containers located at the point-of-use.

In home care settings:

- Advise patients to dispose of medical sharps (e.g., hypodermic needles used by patients) in accordance with municipal or regional regulations.
- Inform patients to place sharps into an impervious container (e.g., coffee can). Some local pharmacies provide sharps containers.

c. Dishes

There are no indications for the use of disposable dishes, other than when dishwashing equipment is non-functioning.

13. Education of Patients, Families and Visitors

a. Health care workers should provide instructions to patients, families and visitors regarding hand hygiene and respiratory hygiene.

14. Visitor Management

a. Visitors with symptoms of acute infection (e.g., cough, fever, vomiting, diarrhea, coryza, rash or conjunctivitis) should not visit unless the visit is essential (e.g., parent, guardian or primary caretaker). In that case, they should be instructed and supervised in precautions to take to minimize transmission of infection.

IV. Recommendations for Additional Precautions in All Health Care Settings and Modifications for Precautions in Specific Health Care Settings

IN ADDITION TO ROUTINE PRACTICES FOR THE CARE OF ALL PATIENTS, IN ALL SETTINGS, THE RECOMMENDATIONS THAT FOLLOW APPLY TO THE CARE OF PATIENTS ON ADDITIONAL PRECAUTIONS

Sub-section (i) Contact Precautions for ALL Care Settings

And
Modifications for Specific Health Care Settings

Routine Practices properly and consistently applied should prevent transmission by the contact route. For certain situations that may result in extensive contamination of the environment, or for microorganisms with a very low infectious dose, Contact Precautions may be indicated.

Refer to PART C, Table 5 Transmission Characteristics and Empiric Precautions/Clinical Presentations

Refer to PART C, Table 6 Transmission Characteristics and Precautions by Specific Etiology

1. Source Control

a. Develop a system to identify patients with known or suspected infections that require Contact Precautions.

   i) Implement Contact Precautions empirically for patients with conditions listed in Table 5, without waiting for the etiology to be determined.

   ii) Follow precautions in Table 6 if the etiology has been established.

   iii) Some indications for Contact Precautions may differ for pediatric (e.g., children who are incontinent or unable to comply with hygiene) and certain adult patients (e.g., incontinent or cognitively impaired).

   iv) Note that some diseases and conditions require two precautions categories (e.g., Droplet and Contact).

   v) Place a sign at the entrance to the patient room or other visible locations to identify Contact Precautions.

   vi) Restrict patients on Contact Precautions from participating in pet therapy programs.

2. Hand Hygiene

a) Hand hygiene using soap and water, instead of alcohol-based hand rub, should be used during outbreaks or in settings with high transmission of *C. difficile* infection or with suspected or documented exposure to *B. anthracis*-contaminated items.

3. Patient Accommodation and Placement

a. Single Room

   i) Place patients requiring Contact Precautions into a single room with a private toilet (or designated commode chair), designated sink for the patient and a designated hand washing sink for health care workers. It may be difficult to maintain physical separation related to shared spaces and equipment (e.g., toilets and sinks) in a shared room.

   ii) The room door may remain open.

b. When single-patient rooms are limited, perform a risk assessment to determine patient placement and suitability for cohorting. Use prioritization as in Routine Practices.

   i) Give priority to patients with conditions that may facilitate cross-transmission of microorganisms (e.g., uncontained drainage, stool incontinence, young age and cognitive impairment) for single-patient room placement.

   ii) Cohort patients who are infected or colonized with the same microorganism and are suitable roommates.

   iii) Select roommates for their ability and the ability of their visitors to comply with required precautions.

c. When cohorting is not feasible:

   i) Avoid placing a patient requiring Contact Precautions in the same room as a patient who is at high risk for complications if infection occurs or with conditions that may facilitate transmission (e.g., immunocompromised or open wounds).

   ii) In a shared room, a patient with diarrhea should not share a toilet with another patient. Assign a designated toilet or commode to the patient with diarrhea.

   iii) In shared rooms, roommates and all visitors should be aware of the precautions to follow. Select roommates for their ability and the ability of their visitors to comply with required precautions.

   iv) If possible, close the privacy curtain between beds to minimize opportunities for direct contact.

   v) In multi-patient rooms, one metre spatial separation between beds is recommended to reduce the opportunities for inadvertent sharing of items between the infected or colonized patient and other patients.

   vi) Ensure Contact Precautions can be applied in nursery settings, including providing the required spacing between infant stations to minimize opportunities for direct contact. If multiple infants are kept in a single room, ensure a 1.2-2.4 metre space between infant stations (depending on care requirements), and ensure that family members or designated visitors are able to comply with the required precautions.

4. Patient Flow

a. Ensure, assisting as necessary, that the patient performs hand hygiene before leaving their room.

b. Allow the patient out of their room as required for their care plan. Supervise the patient if compliance with precautions is inadequate.

c. Provide the patient with clean bedclothes and bedding, contain draining wounds with clean dressings and ensure infected areas of the patient's body are covered and body substances are contained when transfer or movement in health care facilities is necessary.

d. Inform personnel in the area to which the patient is to be transported of precautions to follow. Request that the patient be seen promptly to minimize time in waiting areas and reduce time spent outside the room by the patient.

e. Avoid transfer within facilities unless medically indicated. If transfer is necessary, advise the transferring service, receiving unit, or facility or home care agency of the necessary precautions.

f. Remove and dispose of personal protective equipment and perform hand hygiene prior to transporting patients.

g. Put on clean personal protective equipment to handle the patient if necessary during transport and at the transport destination.

5. Personal Protective Equipment

a. Provide personal protective equipment for Contact Precautions outside the patient room (or when available, the anteroom), cubicle or patient's designated bedspace in shared rooms.

b. In addition to the use of personal protective equipment as per Routine Practices:

i) Gloves

- Wear gloves to enter the patient room, cubicle or patient's designated bedspace in shared rooms.
- Remove gloves and dispose into a hands-free waste receptacle and perform hand hygiene on exit from the room or patient bedspace.

ii) Long sleeved gowns

- Wear a long sleeved gown if it is anticipated that clothing or forearms will be in direct contact with the patient, or with environmental surfaces or objects in the patient environment.
- If a gown is to be worn, put it on upon entry into the room, cubicle or patient's designated bedspace in shared rooms.
- Remove the gown and dispose into a hands-free receptacle immediately after the indication for use and perform hand hygiene before leaving the patient's environment.

c. Do not wear the same personal protective equipment for more than one patient. Change personal protective equipment and perform hand hygiene between contacts with all patients in the same room.

6. Cleaning and Disinfection of Non-Critical Patient Care Equipment

a. All equipment and supplies should be identified and stored in a manner that prevents use by or for other patients.

b. Dedicate non-critical patient-care equipment (e.g., thermometers and blood pressure cuffs) to the use of one patient and clean and disinfect following Routine Practices before reuse with another patient or use a single use device and dispose immediately after use.

c. Do not share toys, electronic games or personal effects between patients.

7. Cleaning of the Patient Environment

a. Additional cleaning measures or frequency may be required in situations when continued transmission of specific infectious agents (e.g., *C. difficile*, norovirus and rotavirus) is occurring. Assess the efficacy of disinfectants being used, and if indicated, select a more effective disinfectant. Clean all horizontal and frequently touched surfaces at least twice daily and when soiled.

b. When precautions are discontinued or the patient is moved, terminal cleaning of the room or bedspace and bathroom, changing of privacy curtains, and cleaning or changing of string or cloth call bells or light cords is required. See Appendix II.

8. Education of Patients, Families and Visitors

a. Educate patients, their visitors, families and decision makers about the precautions being used, the duration of precautions, as well as the prevention of transmission of disease to others with a particular focus on hand hygiene.

b. Instruct visitors who are participating in patient care about the indications for and appropriate use of personal protective equipment (barriers). In the adult setting, visitors who assist with patient care should use the same personal protective equipment as health care workers. This may not be necessary for parents carrying out their usual care of young children.

9. Management of Visitors

a. Instruct visitors to speak with a nurse before entering the patient room, to evaluate the risk to the health of the visitor, the risk of the visitor transmitting infection, and the ability of the visitor to comply with precautions.

b. Only essential visitors (e.g., parent, guardian or primary caretaker) should be allowed. Restrict visitors to visiting only one patient. If the visitor must visit more than one patient, instruct the visitor to use the same barriers as the health care workers and perform hand hygiene before going to the next patient room.

10. Duration of Precautions

a. Discontinue Contact Precautions after signs and symptoms of infection have resolved, and consistent with the pathogen specific recommendations in PART C, Table 6.

b. Determine the duration of precautions on a case-by-case basis for patients with prolonged symptoms or who are immunosuppressed. Re-evaluate a patient with persistent symptoms for other potential causes. Repeated microbiological testing may sometimes be indicated.

c. Discontinue precautions only after the room or bedspace and bathroom have been terminally cleaned.

11. Handling of Deceased Bodies

Routine Practices, properly and consistently applied, should be used in addition to Contact Precautions for handling deceased bodies, preparing bodies for autopsy or transfer to mortuary services.

Refer to MHSAL Public Health Act, Dead Bodies Regulation. Available at:
www.canlii.org/en/mb/laws/regu/man-reg-27-2009/latest/part-1/man-reg-27-2009-part-1.pdf

12. Waste, Laundry, Dishes and Cutlery

No special precautions are required. Routine Practices are sufficient.

13. Special Considerations for Antimicrobial-Resistant Organisms in All Health Care Settings

- In acute care inpatient facilities, Routine Practices and Contact Precautions are recommended for infection or colonization (i.e., patient is asymptomatic) with organisms resistant to a wide spectrum of antibiotics (as determined by the IP&C service of the facility) (PART C, Table 6). In addition, some facilities and organizations may choose to include precautions for persons at risk of colonization, pending screening results, particularly in outbreak situations.
- Wear masks consistent with Routine Practices for patients with MRSA.
- There is insufficient data at present on which to base recommendations for discontinuation of precautions for patients colonized with antimicrobial-resistant organisms. Decisions will need to be made locally, considering the specific microorganism, the patient population, and local experience with duration of colonization. These policies should be updated periodically.
- Avoid policies and practices that result in stigmatization of patients with antibiotic resistant organisms (e.g., disease-specific signage) or increase the patients' sense of isolation. Recognize that patients placed on Contact Precautions may have fewer contacts with health care providers, and this may reduce their quality of care. Take steps to mitigate this impact on care.

14. Modifications for Contact Precautions for Long Term Care, Ambulatory Care, Home Care, Prehospital.

Routine Practices (as per Part B, Section III) and Contact Precautions should be followed for all health care settings (as per Part B, Section IV) sub-section i) and modified as noted below:

For Long Term Care

a. Patient Placement, Accommodation and Activities

- Perform a point of care risk assessment to determine patient placement, removal from a shared room or participation in group activities on a case-by case basis, balancing infection risks to other patients in the room, the presence of risk factors that increase the likelihood of transmission, and the potential adverse psychological impact on the infected patient.
- Participation in group activities should be restricted only when wound drainage or diarrhea cannot be contained.
- Ensure patient performs hand hygiene or is assisted as necessary before participation with group activities.

b. Use of Personal Protective Equipment

- Wear gloves if direct personal care contact with the patient is required or if direct contact with frequently touched environmental surfaces is anticipated.
- Wear gowns for direct hands-on care.

c. Cleaning of Patient Environment

- In outbreaks, consider more frequent cleaning and cleaning with disinfectants. This includes bathing and toileting facilities, recreational equipment and horizontal surfaces in the patient room, and in particular, areas and items that are frequently touched (e.g., hand and bedrails, and light cords).

Special Considerations for the Care of Patients with Antibiotic Resistant Organisms in Long Term Care Settings

In addition to Routine Practices (as per Part B, Section III) and Contact Precautions for all care settings (as per Part B, Section IV, subsection i) and modifications for Contact Precautions in LTC mentioned above, the following apply to antimicrobial-resistant organisms in the LTC setting:

- Policies for managing antibiotic-resistant organisms, including initiation and discontinuation of precautions, should be in place. They should reflect the local experience with particular antimicrobial-resistant organisms and be flexible enough to accommodate the characteristics of different antimicrobial-resistant organisms. It is important to collaborate with other local health care organizations to design a comprehensive and consistent program.
- Management strategies should take into consideration risk-benefits for both the patient and the facility or organization, based on individual patient assessment and point of care risk assessment. Controlling transmission is primarily the responsibility of direct caregivers through hand hygiene and appropriate use of gloves. Ability to maintain hygiene by the patient and caregivers, individualized activity restrictions, selection of low-risk roommates, and environmental cleanliness also require consideration.

For Ambulatory Care

Follow Routine Practices (as per PART B, Section III., above) and Contact Precautions recommended for all health care settings (PART B, Section IV., sub-section (i), above), and apply the following modifications:

a. Source control

Triage

- Minimize contact between symptomatic patients and others by minimizing time spent in waiting rooms.
- Schedule symptomatic patients at a time when they are less likely to encounter other patients.
- Place symptomatic patients in a separate room as soon as possible.

b. Cleaning and Disinfection of Non-Critical Patient Care Equipment and Patient Environment

- Clean equipment and surfaces in direct contact with the patient or infective material (e.g., respiratory secretions, stool or skin exudates) before the room is used for another patient. Place contaminated, reusable, non-critical patient care equipment in a plastic bag for transport to a soiled utility area for reprocessing.
- Clean all horizontal surfaces, frequently touched surfaces and visibly soiled areas in the room, prior to use by another patient. The same cleaning measures should be performed when the current patient is staying in the room, when extensive environmental contamination has occurred from the patient (diarrhea or fecal incontinence not contained by diapers, copious wound drainage, copious uncontrolled respiratory secretions or sputum).

Special Considerations for the Care of Patients with Antimicrobial-Resistant Organisms in Ambulatory Care Settings

- Do not use Contact Precautions for asymptomatic carriers (i.e., colonized only) of antimicrobial-resistant organisms. Routine Practices, properly and consistently applied, are sufficient.
- Adhere to modifications of Contact Precautions for ambulatory care, as above.
- Requiring proof of screening for antimicrobial-resistant organisms before service is not advised. When referring a patient known to have an antimicrobial-resistant organism to a health care facility or service communicate with them (preferably with IP&C personnel) to ensure appropriate precautions are implemented. If asymptomatic, Routine Practices, properly and consistently applied, are sufficient.
- Collaborate with local or regional public health departments and infection control professionals to help design and implement a comprehensive infection and prevention control program.

Modifications of Contact Precautions for Home Care

Routine Practices (as per PART B, Section III) and Contact Precautions should be followed for all health care settings (as per PART B, Section IV, subsection i) and modified as noted below:

a. Accommodation

Advise symptomatic patients to:

- Rest away from others, in a separate room if available.
- Use a designated bathroom, whenever possible.
- Clean the bathroom frequently, especially frequently touched surfaces.
- Avoid sharing towels or other personal items.

b. Patient Flow

- Do not exclude asymptomatic patients from group or social activities.
- Educate symptomatic patients about how to contain secretions and excretions to minimize the risk of transmission to others (e.g., contain draining wounds with an intact dressing) and to perform hand hygiene prior to group activities.
- Advise symptomatic patients to exclude themselves from group and social activities when experiencing acute symptoms and when secretions or excretions cannot be contained.
- Reschedule care and services (e.g., appointments at foot care clinics, volunteer visiting and volunteer transportation) that are not medically necessary, until patients are asymptomatic.

c. Personal Protective Equipment

- Wear gloves and gowns when direct contact is anticipated with a symptomatic patient or equipment and environmental surfaces in the patient's immediate environment.

d. Duration of Precautions

- Discontinue precautions when the patient is asymptomatic.

Special Considerations for the Care of Patients with Antimicrobial-Resistant Organisms in Home Care

- Requiring proof of screening for antimicrobial-resistant organisms before service is not advised. When referring a patient known to have an antimicrobial-resistant organism to a health care facility or service, communicate with them (preferably with IP&C personnel) to ensure appropriate precautions are implemented. For asymptomatic patients, Routine Practices, properly and consistently applied, are sufficient.
- Do not use Contact Precautions for patients who are asymptomatic, including asymptomatic carriers of antibiotic resistant organisms. Routine Practices, properly and consistently applied, are sufficient.
- Collaborate with local or regional public health departments and infection control professionals to design and implement a comprehensive infection prevention and control program. In some jurisdictions, such collaboration may also be appropriate with the local funder of home care services.

Modifications of Contact Precautions for Prehospital Care

Routine Practices (as per PART B, Section III) and Contact Precautions should be followed for all health care settings (as per PART B, Section IV, subsection i) and modified as noted below:

a. Limit the number of personnel attending the patient when possible.

b. Put gloves and gowns on at the point of care.

c. Remove gloves and gowns when patient care is broken and completed, then immediately discard and perform hand hygiene.

d. Wrap the patient in a sheet in the examining room, to minimize contact with personnel and the environment.

e. When a transfer to a health care facility is necessary, provide clean bed clothes and bedding to the patient, contain draining wounds with clean dressings, cover infected areas of the patient's body and contain body substances.

f. Single-patient transport is preferred.

g. Multi-patient transport requires a risk assessment. Consider conditions as listed in Routine Practices for priority for single transport.

h. Notify the receiving hospital or facility if precautions are required.

i. Clean and disinfect equipment and surfaces and change linen after every patient.

Special Considerations for the Care of Patients with Antimicrobial-Resistant Organisms in Prehospital Care

- Adhere to modifications of Contact Precautions for prehospital care, as described above.
- Do not use Contact Precautions for patients who are asymptomatic, including asymptomatic carriers of antibiotic resistant organisms. Routine Practices, properly and consistently applied, are sufficient.

Sub-section (ii) Droplet Precautions in ALL Care Settings

IN ADDITION TO ROUTINE PRACTICES FOR THE CARE OF ALL PATIENTS, IN ALL SETTINGS, THE RECOMMENDATIONS THAT FOLLOW APPLY TO THE CARE OF PATIENTS ON DROPLET PRECAUTIONS

And
Modifications for Specific Health Care Settings

Refer to PART C, Table 5 Transmission Characteristics and Empiric Precautions/Clinical Presentations. Refer to PART C, Table 6 Transmission Characteristics and Precautions by Specific Etiology.

1. Source Control

a. Develop a system to identify patients with known or suspected acute infections that require Droplet Precautions.

   i) Implement Droplet Precautions empirically for patients with conditions listed in Table 5, without waiting for the etiology to be determined.

   ii) Refer to Table 6 if the etiology has been established.

   iii) Note: some indications for Droplet Precautions may differ for certain pediatric patients (e.g., epiglottitis or cellulitis in children under five years of age, or scarlet fever in children) and adult patients.

   iv) Note: some conditions or specific etiologies require two categories of precautions (e.g., Droplet and Contact).

   v) Instruct patients to adhere to respiratory hygiene. When a mask is worn, the patient can remove the mask once accommodated in the room.

   vi) Direct patients with acute respiratory symptoms to a separate waiting area, or place the patient in a single room, or pull the privacy curtain in a multi-bed room (see 3, Patient Placement, below).

   vii) Place a sign at the entrance to the patient room or other visible locations to identify Droplet Precautions.

2. Personnel Restrictions

a. Health care workers should avoid touching the mucous membranes of their eyes, nose and mouth with their hands to prevent self-contamination.

b. Droplet Precautions, in addition to Routine Practices, are sufficient for aerosol-generating medical procedures when performed on patients on Droplet Precautions who have no signs or symptoms of suspected or confirmed tuberculosis, severe acute respiratory syndrome or respiratory infection with an emerging pathogen for which transmission characteristics are not yet known.

c. HCWs who are immune to mumps or rubella should provide direct care for patients with these infections. Non-immune HCWs should not work with patients with mumps or rubella. Unknown immune or non-immune HCWs should not enter the room unless it is essential, and when necessary, must wear facial protection.

3. Patient Placement and Accommodation

a. In inpatient facilities, a single room with an in-room designated toilet and sink is preferable, as it may be difficult to maintain the recommended spatial separation of two metres between patients.

   i) The room door may remain open.

   ii) When single-patient rooms are not available, perform a risk assessment to determine suitability for room sharing.

   iii) Give priority for single-patient room placement to patients who cannot be confined to their bed or bed area.

b. If sufficient single rooms are not available, cohort patients who are known to be infected with the same pathogen and are suitable roommates.

c. When the room must be shared and cohorting patients with the same pathogen is not possible:

   i) Avoid placing patients on Droplet Precautions in the same room with patients who, if they were to become infected, would be at high risk for complications or who may facilitate transmission (e.g., elderly, patients with cardio pulmonary disease or immunocompromised).

   ii) Roommates and all visitors should be aware of precautions to follow.

   iii) The ability of roommates and visitors to comply with precautions should be a factor considered in roommate selection.

   iv) Ensure that patients are physically separated (i.e., at least two metres apart) from each other. Draw the privacy curtain between beds to minimize opportunities for droplet spread.

   v) Ensure Droplet Precautions can be applied in nursery settings, including providing the required spacing between infant stations to minimize opportunities for droplet contact. Ensure family members or designated visitors are able to comply with the required precautions.

4. Patient Flow

a. Ensure, assisting as necessary, that the patient performs hand hygiene before leaving the room.

b. Allow the patient out of the room as required for their care plan. Provide supervision of the patient if compliance with precautions is inadequate.

   i) Patient should wear a mask if tolerated and comply with respiratory hygiene during transport.

c. Personnel in the area to which the patient is to be transported should be aware of the status of the patient and of the precautions to follow.

5. Use of Personal Protective Equipment

a. Provide personal protective equipment for Droplet Precautions outside the room or in the anteroom.

b. Transport personnel should wear facial protection if the patient cannot follow respiratory hygiene.

c. Wear and discard facial protection to prevent self-contamination, as outlined in Routine Practices.

d. In addition to the use of personal protective equipment described in Routine Practices:

   i) Wear facial protection (i.e., masks and eye protection, face shields or masks with visor attachment):

   - for care of patients with symptoms of acute respiratory viral infection
   - when within two metres of a patient who is coughing at the time of interaction
   - if performing procedures that may result in coughing.

   ii) For care of patients with rubella or mumps, facial protection is not needed if the health care worker is immune. Unknown immune or non-immune HCWs (rubella, mumps) should not enter the room unless it is essential, and when necessary, must wear facial protection.

e. In a cohort of patients infected with the same microorganisms, Additional Precautions must be applied individually for each patient within the cohort.

6. Cleaning of Patient Care Equipment

Follow Routine Practices, unless Contact Precautions are also required, then follow Contact Precautions.

7. Cleaning of Patient Environment

Follow Routine Practices, unless Contact Precautions are also required, then follow Contact Precautions.

8. Education of Patient and Family

a. Educate patients, their visitors, families and their decision makers about the precautions being used, with a particular focus on hand hygiene, the duration of precautions, and the prevention of transmission of disease to others.

b. Instruct visitors participating in patient care about the indications for, and appropriate use of, personal protective equipment (barriers). In the adult setting, visitors who assist with patient care should use the same personal protective equipment as health care workers. This may not be necessary for parents providing their usual care of young children.

9. Management of Visitors

a. The number of visitors should be kept to a minimum. Instruct visitors to speak with a nurse before entering the patient room. In the case of acute viral respiratory infection, household members need not wear facial protection (as they may have already been exposed). On a case-by-case basis, other visitors should be instructed in the appropriate use of a mask and other precautions.

b. Exceptions to the need for facial protection include:

   i) For patients with suspected or confirmed *H. influenzae* type b infection, visitors need to wear facial protection only if they will subsequently have extensive close contact with non-immune infants or children less than five years of age.

   ii) For patients with rubella or mumps, facial protection is not needed if the visitor is immune. Unknown or non-immune visitors should only enter the room when it is essential, and when necessary, must wear facial protection.

10. Duration of Precautions

a. Discontinue Droplet Precautions after signs and symptoms of the infection have resolved or as noted in the disease-specific recommendations in Table 6.

b. Determine duration of precautions on a case-by-case basis when patient symptoms are prolonged or when the patient is immunosuppressed. Re-evaluate the patient with persistent symptoms for other potential diagnoses. Repeat microbiological testing may sometimes be warranted.

11. Handling Deceased Bodies

Routine Practices, properly and consistently applied, should be used for handling deceased bodies, preparing bodies for autopsy or transfer to mortuary services. Droplet Precautions are not necessary.

Refer to Manitoba Health, Seniors and Active Living Public Health Act, Dead Bodies Regulation: www.canlii.org/en/mb/laws/regu/man-reg-27-2009/latest/part-1/man-reg-27-2009-part-1.pdf

12. Waste, Laundry, Dishes and Cutlery

No special precautions are required. Routine Practices are sufficient.

13. Modifications for Long Term Care, Ambulatory Care, Home Care, Prehospital Care.

Routine Practices (as per PART B, Section III) and Droplet Precautions should be followed for all health care settings (as per PART B, Section IV, subsection ii) and modified as noted below:

Modifications of Droplet Precautions in Long Term Care

a. In long term care and other patient settings, perform a point of care risk assessment to determine patient placement, considering infection risks to other patient(s) in the room and available alternatives.

b. If a two-metre spatial separation is not possible, manage the patient in their bed space, with privacy curtains drawn.

c. Participation in group activities may need to be restricted while the patient is symptomatic.

d. During an outbreak in a facility, restrict social activities to units and areas.

e. Restrictions in the number of visitors may be advisable during community or facility outbreaks of respiratory infections.

Modifications of Droplet Precautions in Ambulatory Care

a. Place the patient directly into a single room, especially if they have known or suspected influenza, meningococcal infection, rubella, mumps or pertussis. If this is not possible, place the patient in an area of the waiting room separated from other patients by at least two metres, and minimize time spent in the waiting room.

b. If this cannot be achieved, the patients must be at least one metre from other patients and the symptomatic patient must wear a mask.

c. Consider separate waiting rooms or areas for well child visits and for children with acute respiratory infection, especially during community outbreaks.

Modifications of Droplet Precautions in Home Care

a. Ask the patient to self-screen for acute respiratory illness and inform the home care agency prior to the health care worker visit, scheduled appointment or attendance at a group program.

b. Advise the patient to exclude themselves from group programs when experiencing acute symptoms of respiratory illness.

c. Health care workers should screen patients for febrile illness by phone, prior to the home care visits, whenever possible. Healthcare workers should screen patients upon entry into clinics or group programs and for home visits, if advance telephone screening is not possible.

d. Ensure medically necessary care is provided. Defer care (e.g., foot care clinics) and services (e.g., volunteer visitors and volunteer transportation) that are not medically necessary when patients are experiencing acute respiratory symptoms.

Modifications of Droplet Precautions in Prehospital Care

a. Develop practices to promptly identify patients with known or suspected infections that require Droplet Precautions.

b. Limit the number of personnel attending to the patient.

c. Single-patient transport is preferred.

d. Place a mask on the patient if tolerated.

e. Notify the receiving facility of the precautions required.

f. If the disease is known to be of droplet transmission, a procedure or surgical mask should be used. However, if an assessment suggests disease caused by airborne transmission cannot be ruled out, then Airborne Precautions should be used.

Sub-section (iii) Airborne Precautions in ALL Care Settings

IN ADDITION TO ROUTINE PRACTICES FOR THE CARE OF ALL PATIENTS, IN ALL SETTINGS, THE RECOMMENDATIONS THAT FOLLOW APPLY TO THE CARE OF PATIENTS ON AIRBORNE PRECAUTIONS

And
Modifications for Specific Health Care Settings

Refer to PART C, Table 5 Transmission Characteristics and Empiric Precautions/Clinical Presentations.

Refer to PART C, Table 6 Transmission Characteristics and Precautions by Specific Etiology.

1. Source Control

a. Have in place practices to identify patients with known or suspected infections that require Airborne Precautions (i.e., infectious tuberculosis, measles, varicella or disseminated zoster).

   i) Note that some airborne diseases and conditions require two precaution categories (e.g., airborne and contact).

   ii) An AIIR is required for patients with an airborne infection, as well as when performing AGMPs on patients with emerging pathogens for which transmission characteristics are not yet known (see Appendix I, 4).

   iii) Direct the patient to put a mask on if tolerated (not a respirator) when not in an airborne infection isolation room.

   iv) Place patients known or suspected to have an airborne infection directly into an AIIR, with the door closed. The room must meet engineering controls for AIIRs.

   v) Allow the patient to remove their mask once they are in the airborne infection isolation room (see 2, Patient Placement and Accommodation, below).

   vi) Place the patient into a single room if an AIIR is unavailable. The patient should wear a mask in the room and the door must remain closed.

   vii) In situations where AIIRs are not available, following a risk assessment for the potential risk of transmission (see PART A, Section III, C, 2 (b) iii), the patient can be temporarily housed in a single room with the door closed, away from high risk patients. The patient should wear a mask in the room and the door must remain closed. Patients should be transferred as soon as medically feasible to a facility or unit with AIIRs.

   viii) If AIIRs are limited, a risk assessment should be done on patients with airborne infectious diseases, to determine priority. See PART A, Section III, C, 2 (b) iii.

   ix) If a patient is suspected or confirmed to have respiratory tuberculosis and an AIIR is not available, factors need to be considered to determine risk to patients and staff. See PART A, Section III, C, 2(b) iii.

   x) If a patient is suspected or confirmed to have a vaccine preventa ble disease (measles, varicella or disseminated zoster), the need for an AIIR and the risk of transmission may be assessed in relation to the presence of non-immune or unknown immune patients or HCWs, as well as the unit the patient will be on (e.g., pediatric unit).

   xi) Place a sign at the entrance to the patient room or other visible location to identify Airborne Precautions.

b. Apply the following strategies to reduce the level of aerosol generation when performing aerosol-generating medical procedures for patients with suspected or confirmed severe acute respiratory syndrome, tuberculosis and emerging pathogens for which transmission characteristics are not yet known. Strategies to reduce aerosol generation should also be implemented when aerosol-generating medical procedures are necessary on patients with viral hemorrhagic fevers:

   i) Only medically necessary, aerosol-generating medical procedures should be undertaken.

ii) Anticipate and plan for aerosol-generating medical procedures.

iii) Use appropriate patient sedation.

iv) Limit the number of personnel in the room when aerosol-generating medical procedures are performed.

v) Perform aerosol-generating medical procedures in airborne infection isolation rooms whenever feasible.

vi) Maintain appropriate ventilation (i.e., level of air filtration and direction of air flow).

vii) Use a single room (with the door closed and away from high risk patients if feasible), when an airborne infection isolation room is unavailable.

viii) Ensure respirators (N95 or higher) are worn by all personnel present in the room during the procedure.

ix) Use closed endotracheal suction systems whenever possible.

Note: When responding to a code (cardiac arrest) for a patient with an airborne infection who is not in an airborne infection isolation room and transfer to a single room or airborne infection isolation room is not feasible: pull the privacy curtain and ensure all personnel in the room or within the privacy curtain area are wearing appropriate personal protective equipment. Remove visitors and other patients (if feasible).

c. Intubated and ventilated patients.

i) Ensure an appropriate bacterial filter is placed on the endotracheal tube to prevent contamination of the ventilator and the ambient air.

ii) Perform endotracheal suctioning using a closed suction apparatus where possible.

2. Patient Placement and Accommodation

See Source Control (1(a), above)

a. Ensure the airborne infection isolation room has an in-room toilet, sink and bathing facility for the patient, and designated hand washing sink for the health care worker.

b. Patients known to be infected with the same virus (measles or varicella) may share a room. Non-immune or unknown immune patients should not share rooms with patients with measles, varicella or zoster.

c. Patients with tuberculosis may not share rooms as strains and levels of infectivity may differ.

d. Monitoring.

i) Check the pressure differential in an airborne isolation room using visual indicators (smoke tubes or flutter strips) or portable manometers, prior to placing a patient requiring Airborne Precautions in the room.

ii) Recheck with visual indicators or portable manometers regularly, preferably daily, when airborne infection isolation rooms are in use, irrespective of the presence of continuous differential pressure sensing devices.

iii) Document the results of monitoring.

iv) Do not inactivate visual or audible alarms.

3. Patient Flow

a. Restrict the patient to the room, except for medically essential procedures. The patient should be accompanied by a health care worker whenever outside the room.

b. The patient must wear a mask (if tolerated) if they leave the room. See (d) below if patient cannot wear a mask.

c. Cover skin lesions of patients with varicella or smallpox or nonpulmonary draining lesions due to *M. tuberculosis* with a clean sheet to prevent aerosolization of the infectious agent if the patient leaves the room.

d. If the patient must be transported for medically essential purposes and cannot wear a mask, plan transport to limit the exposure of other individuals (e.g., no waiting in the reception areas) and communicate the need for precautions to all areas of the facility that are affected. If transport is in a confined space (e.g., ambulance), the transport personnel should wear a respirator during transport.

e. If the patient has proven or suspected tuberculosis, viral hemorrhagic fever, smallpox or monkeypox, the transport personnel should wear a respirator during transport.

f. For other conditions (e.g., measles or varicella), the transport personnel should be immune so they will not require a respirator. Unknown immune or non-immune HCWs must wear an N95 respirator if it is essential and necessary to transport.

4. Personnel

a. Health care workers should be aware of their immune status to measles and varicella.

b. All health care workers should be immune to measles and varicella. A health care worker who is not immune or whose immunity is unknown, should not provide care for a patient with measles, varicella or zoster or for a susceptible exposed patient who is in the incubation period.

c. Unknown immune or non-immune HCWs should not enter the rooms of patients known or suspected to have measles, varicella (chickenpox) or disseminated zoster, or the room of a susceptible, exposed patient in the incubation period for these conditions, unless it is essential. When it is necessary, HCWs must wear an N95 respirator. See 7, below, Personal Protective Equipment.

d. Immune health care workers do not require respirators when caring for patients known or suspected to have measles (rubeola), varicella (chickenpox) or disseminated zoster.

5. Management of Case Patients with Airborne Infections

a. For varicella:

- The patient should remain in the room until all lesions have crusted.
- Unknown immune or non-immune personnel and visitors should not enter the room. If entering the room is absolutely necessary, they must wear a respirator.
- The patient should leave the room for medically essential purposes only, unless it is established that all other patients and all health care workers are known to be immune to varicella.
- The patient should wear a mask, have skin lesions covered, and have clean bedclothes and bedding (as required) when out of the room.

b. For measles:

- The patient should remain in the room until four days after onset of rash or, if immunocompromised, for the duration of illness.
- Unknown immune or non-immune personnel and visitors should not enter the room. If entering the room is absolutely necessary, they must wear a respirator.
- The patient should leave the room for medically essential purposes only, unless all other patients and all health care workers are known to be immune to measles. The patient should wear a mask when out of the room.

6. Management of Exposed Susceptible Roommates and Other Close Contacts

a. For varicella:

- Determine the immune status of exposed roommates and other close contacts. If an exposed, susceptible contact cannot be discharged, they should be placed in an airborne infection isolation room from seven days after the first possible exposure, until 21 days after the last exposure.

- Refer to the most recent National Advisory Committee on Immunization recommendations to determine whether varicella-zoster immune globulin or varicella vaccination is recommended for exposed susceptible contacts at risk of severe disease. If given, precautions should be extended to 28 days after exposure.
- Offer varicella vaccine to exposed susceptible individuals within 72 hours after first contact, when there are no contraindications to the vaccine.
- Precautions for exposed individuals are to be followed, regardless of the administration of varicella-zoster immune globulin or vaccine.

b. For measles:

- Determine the immune status of exposed roommates and other close contacts.
- Provide susceptible contacts with prophylaxis (i.e., measles vaccine or Immunoglobulin) as per the most recent National Advisory Committee on Immunization recommendations.

Refer to MHSAL Communicable Disease Management Protocol: www.manitoba.ca/health/publichealth/cdc/protocol/measles.pdf.

- Place exposed susceptible contacts in single airborne infection isolation rooms from five days after the first possible exposure until 21 days after the last exposure, regardless of vaccine administration.

7. Personal Protective Equipment

a. Health care workers must wear respirators when caring for a patient with suspected or confirmed respiratory tuberculosis. Health care workers should wear respirators when there are draining infectious tuberculosis skin lesions and procedures are performed that would aerosolize viable organisms (e.g., irrigation, incision and drainage).

b. Unknown immune or non-immune HCWs must wear respirators when caring for a patient with vaccine preventable airborne infections (i.e., varicella and measles).

c. Health care workers should wear respirators when performing or assisting with aerosol-generating medical procedures (see Part B, Section IV, sub-section (iii), 1(b)) for patients with signs and symptoms of emerging pathogens for which transmission characteristics are not yet known. For novel influenza viruses or emergence of as yet unknown pathogens, refer to the PHAC website for specific guidance documents. Strategies to reduce aerosol generation should also be implemented when aerosol-generating medical procedures are necessary on patients with viral hemorrhagic fevers.

Refer to http://www.phac-aspc.gc.ca/eri-ire/index-eng.php

d. Health care workers should wear respirators when caring for a patient with suspected or confirmed viral hemorrhagic fever.

e. Health care workers should wear respirators when caring for a patient with suspected or confirmed monkeypox or smallpox.

f. HCWs should only wear respirators for which they have been fit tested.

g. Health care workers should remain clean shaven in the area of the mask seal to ensure facial seal.

Appropriate Respirator Use:

- Perform hand hygiene prior to putting on the respirator.
- Perform a seal (fit) check immediately after putting on the respirator.
- Avoid self-contamination. Do not touch the respirator on its external surface during use and disposal.
- Remove respirators carefully by the straps.
- Do not dangle a respirator around the neck when not in use. Do not reuse disposable respirators.
- Change the respirator if it becomes wet or soiled (from the wearer's breathing or due to an external splash).
- Change the respirator if breathing becomes difficult.
- Discard the disposable respirator immediately after its use (i.e., dispose of when removed from the face), into a hands-free waste receptacle, and perform hand hygiene. Follow organization policy for reusable respirators, placing into an appropriate receptacle for reprocessing.

8. Management of Patient Care Equipment

Follow Routine Practices. When Contact Precautions are also required, follow Contact Precautions.

9. Cleaning of Patient Environment

Follow Routine Practices. When Contact Precautions are also required, follow Contact Precautions.

10. Education of Patient, Family and Visitors

a. Educate patients, their visitors, families and caretakers about the precautions being used and the duration of the precautions, as well as the prevention of transmission of disease to others.

b. Instruct patients with known or suspected airborne infections to wear a mask and to cover skin lesions (due to varicella, smallpox, or non-respiratory draining lesions due to *Mycobacterium tuberculosis*) with a dry dressing if, for medical reasons, they leave the airborne infection isolation room.

c. Visitors who are participating in patient care should be instructed about the indications for and appropriate use of personal protective equipment. Instruct visitors to wear the same personal protective equipment as health care workers, unless they are known to be immune to the specific disease or condition requiring patient precautions. Visitors should be instructed to perform a fit seal check if they are wearing a respirator.

11. Management of Visitors

a. For tuberculosis:

- Restrict visitors to immediate family or guardian.
- Screen close contact visitors (e.g., household members, those who routinely have visited the patient's home) for the presence of cough and refer coughing visitors for tuberculosis assessment immediately. Until they are assessed, they should visit only if it is essential and they should wear a mask while in the facility.

b. For other airborne infections:

- Instruct visitors to speak with a nurse before entering the patient room.
- Visitors of patients on Airborne Precautions must be confirmed to be immune to the specific infection for which the patient is on precautions, unless there are exceptional circumstances, (e.g., the patient is terminally ill) or the visit is otherwise essential (e.g., parent, guardian or primary caretaker)).
- If a visit is essential, non-immune visitors must wear appropriate personal protective equipment.

12. Duration of Precautions

Discontinue Airborne Precautions after signs and symptoms of the infection have resolved or following the disease-specific recommendations in Table 6.

13. Handling of Deceased Bodies

Routine Practices, properly and consistently applied, in addition to Airborne Precautions, should be used for handling deceased individuals and preparing bodies for autopsy or transfer to mortuary services. Airborne Precautions should be continued for the handling of a deceased patient with infectious respiratory tuberculosis, measles or varicella, until the appropriate time has elapsed to remove airborne contaminants in the room (see Appendix III).

Refer to MHSAL Public Health Act, Dead Bodies Regulation: www.canlii.org/en/mb/laws/regu/man-reg-27-2009/latest/part-1/man-reg-27-2009-part-1.pdf

14. Upon Discharge or Discontinuation of Airborne Precautions

a. Allow sufficient time for ventilation to clear the air of aerosolized droplet nuclei (see Appendix III) before housekeeping performs terminal cleaning. If a housekeeper enters the room before the appropriate time has elapsed, they are required to wear a respirator.

Modifications for Airborne Precautions in Specific Health Care Settings

1. Follow Routine Practices (PART B, Section III.) and Airborne Precautions recommendations for all health care settings (PART B, Section IV., sub-section (iii), and apply the following modifications:

Modifications of Airborne Precautions for Long Term Care

a. Tuberculosis (infectious, respiratory (pleural or laryngeal))

i) Determine the tuberculosis infection status of patients in LTC facilities at the time of admission.

ii) If an airborne infection isolation room is not available in the long term care setting, arrange for transfer to a facility with airborne infection isolation rooms. When transfer is delayed, reduce the risk of transmission of tuberculosis by the following:

- Place the patient in a single room with the door closed, preferably without recirculation of air from the room and as far away from rooms of other patients as possible.
- Limit the number of people entering the room (e.g., no non-essential visitors).

b. Varicella, disseminated herpes zoster or localized herpes zoster that cannot be kept covered, or measles:

i) Determine the immune status (measles or varicella) of patients in LTC facilities at the time of admission and offer immunization, if appropriate.

ii) If an airborne infection isolation room is not available in the long term care setting, arrange for transfer to a facility with airborne infection isolation rooms. If transfer is delayed, reduce the likelihood of transmission by the following:

- Place the patient in a single room with the door closed, preferably without recirculation of air from the room and as far away from rooms of other patients as possible.
- Limit the number of people entering the room (e.g., no non-essential visitors).
- If all personnel and all other patients in the facility are immune and if non-immune visitors can be excluded, transfer to a facility with an AIIR may not be essential.

iii) Do not place infectious patients on units where there are susceptible immunocompromised patients.

Modification of Airborne Precautions for Ambulatory Care

a. Develop a system (e.g., triage or signage) at the entry to ambulatory settings, or when making telephone appointments to identify patients with known or suspected infections that require Airborne Precautions (e.g., infectious tuberculosis, measles, varicella or disseminated zoster). If feasible, the visit should be scheduled at a time to minimize exposure of other patients, such as at the end of the day.

b. Direct patients with suspected airborne infection to put on a mask on entry to the facility.

c. Place patients known or suspected to have airborne infection directly into an airborne infection isolation room.

d. Place the patient into a single room only if an airborne infection isolation room is unavailable. Ensure the patient keeps the mask on and the door remains closed.

e. Allow the patient to remove their mask, once they are in an airborne infection isolation room.

f. Follow recommendations for personnel, patient flow and personal protective equipment.

g. Upon discharge, allow sufficient time for the ventilation to clear the air of aerosolized droplet nuclei before using the room for another patient (tuberculosis), or for a nonimmune patient (measles or varicella). The duration will depend on the rate of air exchange in the room (see Appendix III).

Modifications of Airborne Precautions for Home Care

a. Develop a system to screen patients prior to appointments, to identify those patients with known or suspected infections that require Airborne Precautions (i.e., infectious tuberculosis, measles, varicella or disseminated zoster).

b. Home care agencies should consult with Public Health to determine if the patient with respiratory tuberculosis is infectious and requires Airborne Precautions.

Modifications of Airborne Precautions for Prehospital Care

a. A system to identify patients with a known or suspected infection that warrants Airborne Precautions (i.e., infectious tuberculosis, measles, varicella or disseminated zoster) should be developed.

b. Whenever possible, first responders should perform a point of care risk assessment and put on required personal protective equipment, prior to entering the home or location of the patient.

c. Where available, use the vehicle ventilation system to create a negative pressure environment. If not available, use natural ventilation (e.g., open vehicle windows).

d. The patient should wear a mask during transport, if tolerated. If the patient requires oxygen, a filtered oxygen mask should be used.

PART C

Table 5 Transmission Characteristics and Empiric Precautions

PEDIATRIC PRECAUTIONS APPLY TO CHILDREN WHO ARE INCONTINENT OR TOO IMMATURE TO COMPLY WITH HYGIENE RP – Routine Practices.

Once Specific etiology is known, refer to Table 6.

Clinical Findings	Potential Pathogens	Empiric Precautions	Infective Material	Route of Transmission	Duration of Precautions	Comments
Abscess See draining wound						
Bronchiolitis	Respiratory syncytial virus (RSV), human metapneumovirus, parainfluenza virus, influenza and adenovirus	**Droplet and Contact**	Respiratory secretions	Large droplet, and direct and indirect contact	Duration of symptoms	Patient should not share room with high-risk roommates. Cohorting may be necessary during community outbreaks, but patient should not share a room with high-risk roommates.
Burns, infected See draining wound						
Cellulitis Draining: See draining wound Periorbital in child less than 5 years old without portal of entry	*H. influenzae* type b in non-immune child under two years of age; *Streptococcus pneumoniae,* Group A *Streptococcus, Staphylococcus aureus* and other bacteria.	**Droplet if H. influenzae type b is possible cause, otherwise RP**	Drainage from ulcers, wounds Respiratory secretions for periorbital cellulitis	Direct and indirect contact Large droplet, direct contact for periorbital cellulitis	*Until 24 hours of appropriate antimicrobial therapy received or if *H. influenzae* type b is ruled out	* If MRSA, refer to MRSA in Table 6.
Cold	Rhinovirus, RSV, human metapneumovirus, parainfluenza, adenovirus and coronavirus	**Droplet and Contact**	Respiratory secretions	Large droplet, and direct and indirect contact	*Duration of symptoms	Patient should not share room with high-risk roommates. *Discontinue precautions based on resolution of respiratory symptoms (non-ventilated patients) or clinical improvement (ventilated patients) for 48 hours and not based on duration of treatment or negative laboratory results. Chronic respiratory symptoms or post viral cough do not require maintenance of precautions.

Clinical Findings	Potential Pathogens	Empiric Precautions	Infective Material	Route of Transmission	Duration of Precautions	Comments
Conjunctivitis	Multiple microbial agents, adenovirus, enterovirus, chlamydia and *Neisseria gonorrhoeae*	**Contact***	Eye discharge	Direct and indirect contact	Until viral etiology ruled out; duration of symptoms, up to 14 days if viral	*RP if non-viral.
Cough, fever, acute upper respiratory tract infection	Rhinovirus, RSV, human metapneumovirus parainfluenza, influenza, adenovirus, coronavirus, pertussis and *Mycoplasma pneumoniae*	**Droplet and Contact**	Respiratory secretions	Large droplet, direct and indirect contact	*Duration of symptoms or until infectious etiology ruled out	Fever and asthma in child less than 2 years old should be considered viral infection. Patient should not share room with high-risk roommates. *Discontinue precautions based on resolution of respiratory symptoms (non-ventilated patients) or clinical improvement (ventilated patients) for 48 hours and not based on duration of treatment or negative laboratory results. Chronic respiratory symptoms or post viral cough do not require maintenance of precautions.
Cough, fever, pulmonary infiltrates in person at risk for tuberculosis	*Mycobacterium tuberculosis*	**Airborne**	Respiratory secretions	Airborne	Until infectious TB is ruled out For infected patients, until patient has received two weeks of effective therapy, and is improving clinically, and has three consecutive sputum smears negative for acid fast bacilli, collected eight to 24 hours apart. If multi-drug resistant TB, until sputum culture is negative	Tuberculosis in young children is rarely transmissible. Assess visiting family members for cough. See *Canadian Tuberculosis Standards-(current edition).* available at: https://www.canada.ca/en/public-health/services/infectious-diseases/canadian-tuberculosis-standards-7th-edition.html

Clinical Findings	Potential Pathogens	Empiric Precautions	Infective Material	Route of Transmission	Duration of Precautions	Comments
Croup	Parainfluenza, influenza, human metapneumovirus, RSV and adenovirus	**Droplet and Contact**	Respiratory secretions	Large droplet, direct and indirect contact	*Duration of symptoms or until infectious cause ruled out	Patient should not share room with high-risk roommates. *Discontinue precautions based on resolution of respiratory symptoms (non-ventilated patients) or clinical improvement (ventilated patients) for 48 hours and not based on duration of treatment or negative laboratory results. Chronic respiratory symptoms or post viral cough do not require maintenance of precautions.
Decubitus (pressure ulcer, draining) See draining wound						
Dermatitis See draining wound	Many (bacteria, viruses, fungi, parasites)	**Contact**	Pus, drainage from open skin	Direct and indirect contact	Until infectious etiology ruled out	If compatible with scabies, take appropriate precautions pending diagnosis.
Desquamation, extensive See draining wound	*Staphylococcus aureus*	**Contact**	Pus, drainage from open skin	Direct and indirect contact	Until contained or infection ruled out	
Diarrhea See gastroenteritis Acute diarrhea of likely infectious cause						
Draining wounds	*Staphylococcus aureus*, Group A *Streptococcus*, many other bacteria	**RP** ***Contact: Major wound (uncontained drainage)** ****** **Droplet and Contact**	Pus	Direct and indirect contact	Duration of drainage	*Major = drainage not contained by dressing. ** Droplet for first 24 hours of antimicrobial therapy if invasive Group A streptococcal infection is suspected.
Encephalitis	Multiple agents, including HSV, enterovirus and arbovirus (West Nile virus)	**ADULT: RP* PEDIATRIC: Contact***	Feces, respiratory secretions	Direct and indirect contact (fecal/oral)	Until specific etiology established or until enterovirus ruled out	*May be associated with other agents, including measles, mumps, varicella and *Mycoplasma pneumoniae*. If identified, use appropriate precautions for specific agent.
Endometritis	Group A *Streptococcus*; many other bacteria	***RP unless signs of toxic shock**				*Droplet and contact for the first 24 hours of antimicrobial therapy if invasive Group A *Streptococcus* is suspected.

Clinical Findings	Potential Pathogens	Empiric Precautions	Infective Material	Route of Transmission	Duration of Precautions	Comments
Enterocolitis **See diarrhea**						
Epiglottitis **In child < 5 years old**	*H. influenzae* type b; **possible in non-immune infant less than 5 years of age**, Group A *Streptococcus*, *Staphylococcus aureus*	**RP** **Droplet if H. influenzae type b is possible cause**	Respiratory secretions	Large droplet, direct contact	Until 24 hours of appropriate antimicrobial therapy received or until type b ruled out	
Erysipelas Draining: See draining wound	*Group A Streptococcus*	**RP**				
Febrile respiratory illness (FRI) Usually present with symptoms of fever greater than 38°C **and** new or worsening cough or shortness of breath.	Wide range of droplet-spread respiratory infections, such as colds, influenza, influenza-like illness (ILI) and pneumonia	**Droplet and Contact Precautions if viral etiology suspected**	Respiratory secretions	Droplet	*Duration of symptoms	Note: elderly people and people who are immunocompromised may not have a febrile response to a respiratory infection. *Discontinue precautions based on resolution of respiratory symptoms (non-ventilated patients) or clinical improvement (ventilated patients) for 48 hours and not based on duration of treatment or negative laboratory results. Chronic respiratory symptoms or post viral cough do not require maintenance of precautions.
Fever without focus (acute, in children)	Enterovirus and multiple other pathogens	**ADULT: RP* PEDIATRIC: Contact**	Feces, respiratory secretions	Direct or indirect contact (fecal/oral)	Duration of symptoms or until enteroviral infection ruled out	*If findings suggest a specific transmissible infection, take precautions for that infection, pending diagnosis.
Food poisoning	*Bacillus cereus, Clostridium perfringens, Staphylococcus aureus, Salmonella, Vibrio parahaemolyticus, Escherichia coli O157*, and others	**ADULT: RP*** **PEDIATRIC: Contact**	Food; Feces if *Salmonella* or *Escherichia coli* O157	Foodborne; ordirect and indirect contact (fecal/oral)		*Consider Contact Precautions for incontinent adults if stool cannot be contained, or for adults with poor hygiene who contaminate their environment. Pediatric precautions apply to children who are incontinent or unable to comply with hygiene.

Clinical Findings	Potential Pathogens	Empiric Precautions	Infective Material	Route of Transmission	Duration of Precautions	Comments
Furuncles See draining wound	*Staphylococcus aureus*					
Gas gangrene Draining: see draining wound	*Clostridium spp.*					
Gastroenteritis	Diarrhea or vomiting due to infection or toxin	**ADULT: RP*** **PEDIATRIC: Contact**	Feces	Direct and indirect contact (fecal/oral)	Duration of symptoms or until *C. difficile,* norovirus, rotavirus ruled out. In pediatrics, until stools normal or infectious etiology ruled out.	*Consider Contact Precautions for incontinent adults if stool cannot be contained, or for adults with poor hygiene who contaminate their environment. Use Contact Precautions until *C. diifficile*, norovirus, rotavirus ruled out. Pediatric precautions apply to children who are incontinent unable to comply with hygiene. See Table 6 for specific etiologies.
Gingivostomatitis	HSV, other causes including radiation therapy, chemotherapy, idiopathic (aphthous)	**Contact if primary and extensive HSV. Otherwise RP**	Mucosal lesions	Direct contact	While lesions present	
Guillain-Barré syndrome	Some cases associated with infection (e.g., *Campylobacter*)*					*Take appropriate precautions for disease identified.
Hand, foot and mouth disease	Enterovirus	**ADULT: RP** **PEDIATRIC: Contact**	Feces, respiratory secretions	Direct and indirect contact (fecal/oral)	Duration of symptoms	Pediatric precautions apply to children who are incontinent or unable to comply with hygiene.
Hemolytic uremic syndrome	Some associated with *E.coli* O157	**ADULT: RP*** **PEDIATRIC: Contact**	Feces	Direct and indirect contact (fecal/oral)	Until *E. coli* O157 ruled out	*Consider Contact Precautions for incontinent adults if stool cannot be contained, or for adults with poor hygiene who contaminate their environment. Pediatric precautions apply to children who are incontinent or unable to comply with hygiene.

Clinical Findings	Potential Pathogens	Empiric Precautions	Infective Material	Route of Transmission	Duration of Precautions	Comments
Hemorrhagic fever acquired in endemic or epidemic area	Ebola, Lassa, Marburg, Crimean-Congo and others	**Droplet and Contact** ***AGMP**	Blood and other body fluids ; respiratory secretions; skin if Ebola	Direct and indirect contact; possibly aerosol if pneumonia Ebola, Lassa-sexual transmission	Duration of symptoms or until hemorrhagic fever virus ruled out	Local public health authorities should be notified immediately. *If AGMP necessary, refer to strategies to reduce aerosol generation, refer to Part B, Section IV, subsection iii,1b.
Hepatitis of unknown etiology	HAV, HBV, HCV HEV, and others	**ADULT: RP*** **PEDIATRIC & INCONTINENT OR NON-COMPLIANT ADULTS:** **Contact**	Feces; blood and certain body fluids	Mucosal or percutaneous exposure to infective body fluids Sexual transmission Vertical; mother to child Direct and indirect contact (fecal/oral) for hepatitis A, E	For seven days after onset of jaundice or until hepatitis A and E excluded	*Consider Contact Precautions for incontinent adults if stool cannot be contained, or for adults with poor hygiene who contaminate their environment, unless hepatitis A and E are excluded. Pediatric precautions apply to children who are incontinent or unable to comply with hygiene.
Herpangina	Enterovirus	**ADULT: RP** **PEDIATRIC: Contact**	Feces, respiratory secretions	Direct and indirect contact (fecal/oral)	Duration of symptoms	Pediatric precautions apply to children who are incontinent or unable to comply with hygiene.
Impetigo See draining wound	*Group A Streptococcus, Staphylococcus aureus*					
Influenza-like illness	Influenza, other respiratory viruses	**Droplet and Contact**	Respiratory secretions	Large droplet, direct and indirect contact	*Duration of symptoms or until infectious etiology ruled out	*Discontinue precautions based on resolution of respiratory symptoms (non-ventilated patients) or clinical improvement (ventilated patients) for 48 hours and not based on duration of treatment or negative laboratory results. Chronic respiratory symptoms or post viral cough do not require maintenance of precautions.
Kawasaki disease (Mucocutaneous lymph node syndrome)	Unknown	**RP**				Not known to be transmissible.

Clinical Findings	Potential Pathogens	Empiric Precautions	Infective Material	Route of Transmission	Duration of Precautions	Comments
Meningitis	In child under five years of age Bacterial: *Neisseria meningitidis*, *H. influenzae* type b possible in non-immune infant <2 years of age, *Streptococcus pneumoniae*, Group B *Streptococcus*, *Listeria monocytogenes*, *E. coli* and other Gram negative rods	**ADULT: Droplet until Neisseria meningitidis ruled out, otherwise RP** **PEDIATRIC*: Droplet and Contact**	Respiratory secretions	Large droplet, direct contact	Until 24 hours of appropriate antimicrobial therapy received	*Pediatric: precautions for both bacterial and viral until etiology established. Droplet if viral etiology established. Pediatric precautions apply to children who are incontinent or unable to comply with hygiene.
	Mycobacterium tuberculosis	***RP**				*Rule out associated respiratory TB.
	Viral: enterovirus, arboviruses	**ADULT: RP*** **PEDIATRIC: Contact***	Feces, respiratory secretions	Direct or indirect contact	Until enterovirus ruled out	*May be associated with measles, mumps, varicella or RSV. If identified, take appropriate precautions for associated disease. Cohorting of ill patients on Contact Precautions may be indicated for clusters or outbreaks
	Fungus	**RP**				
Necrotizing enterocolitis	Unknown, probably many organisms	**RP***		Unknown if transmissable	Duration of symptoms	*Take Contact Precautions if outbreak suspected.
Osteomyelitis	*Staphylococcus aureus*, other bacteria *H. influenzae* *type b possible in non-immune infant <5 years of age	**ADULT: RP** **PEDIATRIC* Droplet if H. influenzae type b possible; otherwise RP**			*Until 24 hours of effective antimicrobial therapy or until *H. influenzae* type b ruled out	
Otitis, draining See draining wound						

Clinical Findings	Potential Pathogens	Empiric Precautions	Infective Material	Route of Transmission	Duration of Precautions	Comments
Paroxysmal cough, suspected pertussis	*B. pertussis,* *B. parapertussis*	**Droplet**	Respiratory secretions	Large droplets	Until pertussis ruled out or three weeks after onset of paroxysms if not treated or until five days of antimicrobial therapy received	See Table 6 for information regarding contacts. Close contacts (household and HCWs) may need chemoprophylaxis or immunization. If HCWs immunization not up to date, refer to OH or delegate. Refer to Canadian Immunization Guide for specific information available at: www.canada.ca/en/public-health/services/canadian-immunization-guide.html
Pharyngitis	Group A *Streptococcus* and viral, *Corynebacterium diphtheriae**	**Droplet and Contact**	Respiratory secretions	Direct and indirect contact; large droplets	Duration of symptoms; if Group A *Streptococcus* until 24 hours of antimicrobial therapy received	*If diphtheria suspected, see Table 6.
Pleurodynia	Enterovirus	**ADULT: RP** **PEDIATRIC: Contact***	Feces, respiratory secretions	Direct and indirect contact (fecal/oral)	Duration of symptoms	*Pediatric precautions apply to children who are incontinent or unable to comply with hygiene.
Pneumonia	Viruses, pertussis, Mycoplasma, *Streptococcus pneumoniae, H. influenzae type b, Staphylococcus aureus,* Group A *Streptococcus*, Gram negative enteric rods, *Chlamydia, Legionella, Pneumocystis*, other fungi; other agents	Adult: *RP Pediatric: **Droplet and Contact**	Respiratory secretions	Large droplets, direct and indirect contact	Until etiology established, then for specific organism; Contact Precautions for ARO pneumonia	*RP for adults unless clinical, epidemiologic or microbiologic data necessitates Droplet and Contact Precautions (e.g., on droplet and contact for viral etiologies). Minimize exposure of immunocompromised patients, patients with chronic cardiac or lung disease and neonates.
Pseudomembranous colitis	*Clostridioides difficile* (formerly *Clostridium difficile*)	**Contact**	Feces	Direct and indirect contact (fecal/oral)	Duration of symptoms	Until 72 hours after stool is normal.

Clinical Findings	Potential Pathogens	Empiric Precautions	Infective Material	Route of Transmission	Duration of Precautions	Comments
Rash compatible with scabies	*Sarcoptes scabiei*	**Contact***	Mites	Direct and indirect contact	If confirmed, until 24 hours after initiation of appropriate therapy	*For typical scabies, RP (use gloves and gown for direct patient contact only) See scabies, Table 6.
Rash (maculopapular) with fever and one of coryza, conjunctivitis or cough	Measles	**Airborne**	Respiratory secretions	Airborne	If confirmed, until four days after onset of rash	See measles, Table 6.
Rash (petechial/ purpuric) with fever	*Neisseria meningitidis*	**Droplet if N. meningitidis suspected, otherwise RP**	Respiratory secretions	Large droplets, direct contact	Discontinue if *Neisseria meningitidis* ruled out. If *N. meningitidis* confirmed, until 24 hours of appropriate antimicrobial therapy received	
Rash (vesicular) with fever	Varicella	**Airborne and Contact**	Respiratory secretions, skin lesion drainage	Airborne, direct and indirect contact	If confirmed, until all lesions are dry	See varicella, Table 6
Rash, vesicular/ pustular in appropriate epidemiologic context until smallpox, disseminated vaccinia and monkeypox ruled out	Smallpox, disseminated vaccinia and monkeypox	**Contact, Droplet and Airborne**	Respiratory secretions, skin lesions (monkeypox) Skin lesion exudate, oropharyngeal secretions (smallpox, disseminated vaccinia)	Airborne	Until smallpox, disseminated vaccine and monkeypox ruled out.	
Reye's syndrome	May be associated with viral infection, especially influenza and varicella					Precautions for known or suspected associated viral infection.
Scalded skin syndrome		**RP**				

Clinical Findings	Potential Pathogens	Empiric Precautions	Infective Material	Route of Transmission	Duration of Precautions	Comments
Septic arthritis	*Staphylococcus aureus*, *Streptococcus pneumoniae*, Group A *Streptococcus*, *N. gonorrhoeae*, other bacteria, *H. influenzae* type b possible in non-immune infant under two years of age	**ADULT: RP** **PEDIATRIC: Droplet if H. influenzae type b possible; otherwise RP**	Respiratory secretions for *H. influenzae* type b	Large droplet direct contact for *H. influenzae* type b	Until 24 hours of appropriate antimicrobial therapy received or until *H. influenzae* type b ruled out	
Severe respiratory illness See febrile respiratory illness						
Skin infection See cellulitis						
Toxic shock syndrome	*Staphylococcus aureus and* Group A *Streptococcus*	***Droplet** **RP**				*Droplet for first 24 hours of antimicrobial therapy if invasive Group A streptococcal infection suspected. See draining wound if drainage or pus.
Urinary tract infection	Many	**RP***				*Contact if ARO.
Vincent's angina, Trench mouth	Multiple bacteria	**RP**				
Wound infection See draining wound						

PART C

Table 6 Transmission Characteristics and Precautions by Specific Etiology

PEDIATRIC PRECAUTIONS APPLY TO CHILDREN WHO ARE INCONTINENT OR TOO IMMATURE TO COMPLY WITH HYGIENE

RP – Routine Practices.

Information in this table was revised September 11, 2018 to be consistent with MHSAL Communicable Disease Management Protocols. For updates after this date, refer to the MHSAL Communicable Disease Control-Infection Prevention and Control website: www.manitoba.ca/health/publichealth/cdc/ipc.html.

Refer to Manitoba Health Reporting of Diseases and Conditions Regulation for disease reporting requirements:

http://web2.gov.mb.ca/laws/regs/current/_pdf-regs.php?reg=37/2009.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Actinomycosis (*Actinomyces* spp.)	Cervicofacial, thoracic or abdominal infection	**RP**			Variable			Not person-to-person transmission. Normal flora; infection usually secondary to trauma.
Adenovirus Respiratory strains	Respiratory tract infection (pneumonia)	**Droplet and Contact**	Respiratory secretions	Large droplets; direct and indirect contact	One to 10 days	Shortly before and until symptoms cease	Duration of symptoms	Different strains responsible for respiratory and gastrointestinal disease. Patient should not share room with high-risk roommates Minimize exposure of immunocompromised patients, patients with chronic cardiac or lung disease, and neonates Symptoms may be prolonged in immunocompromised patients.
	Conjunctivitis	**Contact**	Eye discharge	Direct and indirect contact	Five to 12 days	Late in incubation period, until 14 days after onset	Duration of symptoms, up to 14 days	Careful attention to aseptic technique and reprocessing of ophthalmology equipment to prevent epidemic keratoconjunctivitis.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Adenovirus Enteric strain	Diarrhea	**ADULT: RP*** **PEDIATRIC: Contact**	Feces	Direct and indirect contact (fecal/ oral)	Three to 10 days	Until symptoms cease	Duration of symptoms	*Consider Contact Precautions for incontinent adults if stool cannot be contained, or for adults with poor hygiene who contaminate their environment. Pediatric precautions apply to children who are incontinent or unable to comply with hygiene.
Amebiasis *(Entamoeba histolytica)*	Dysentery and liver abscess	**ADULT: RP*** **PEDIATRIC-RP: Contact****	Feces	Direct and indirect contact (fecal/ oral)	Two to four weeks	Duration of cyst excretion	Duration of symptoms	*Consider Contact Precautions for incontinent adults if stool cannot be contained or for adults with poor hygiene who contaminate their environment. **Pediatric precautions apply to children who are incontinent or unable to comply with hygiene. Reportable Disease. *See Communicable Disease Management Protocol.* available at: www.manitoba.ca/health/publichealth/cdc/protocol/amebiasis.pdf
Anaplasmosis (Human Granulocytic Anaplasmosis) (*Anaplasma phagocytophilum*)	Fever, headache, myalgia, anemia, leukopenia and thrombocytopenia	**RP**		Tick-borne, blood transfusion transmission can occur but is rare	Five to 21 days			Reportable Disease. See *Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/anaplasmosis.pdf

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Anthrax (*Bacillus anthracis*)	Cutaneous Pulmonary	**RP**			Usually two to six days but ranges from a few hours to three weeks. Four to 11 days			Not person-to-person transmission. Acquired from contact with infected animals and animal products. Inhalation anthrax may occur as a result of occupational exposure to anthrax spores or as a result of bioterrorism. Decontamination and post exposure prophylaxis required for exposure to aerosols in laboratory exposures or biological terrorism. Reportable Disease. See *Communicable Disease Management Protocol*. Available at: www.manitoba.ca/health/publichealth/cdc/protocol/anthrax.pdf
Antimicrobial Resistant Gram Negative Bacilli (AMR-GNB)								Management on a case by case basis in discussion with IP&C, Public Health or delegate, and laboratory. *See Guidelines for the Prevention and Control of Antimicrobial-Resistant Organisms.* Available at: www.manitoba.ca/health/publichealth/cdc/docs/ipc/aro.pdf

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Antimicrobial Resistant Organisms (AROs) See MRSA, *Candida auris*, CPE, VRE, VISA, VRSA and AMR-GNB)								*See Guidelines for the Prevention and Control of Antimicrobial-Resistant Organisms.* Available at: www.manitoba.ca/health/publichealth/cdc/docs/ipc/aro.pdf Report emerging new antimicrobial-resistant organisms to Public Health See Appendix I, ARO
Arthropod borne virus* (arboviruses)	Encephalitis, fever, rash, arthralgia and meningitis	**RP**	Blood and tissues	Vector-borne (spread by mosquitoes and ticks)	Three to 21 days (varies with different arboviruses)			Not person-to-person transmission, except rarely by blood transfusion or organ transplantation. *Over one hundred different viruses, most limited to specific geographic areas. In North America: West Nile is most common; others include California, St. Louis, Western equine, Eastern equine, Powassan, Colorado tick, Snowshoe hare, and Jamestown Canyon.
Ascariasis (*Ascaris lumbricoides*) (roundworm)	Usually asymptomatic	**RP**						Not person-to-person transmission. Ova must hatch in soil to become infective.
Aspergillosis (*Aspergillus spp.*)	Skin, lung, wound or central nervous system infection	**RP**						Not person-to-person transmission. Spores in dust; infections in immunocompromised patients may be associated with construction.
Avian influenza- See influenza								

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Astrovirus	Diarrhea	**ADULT: RP*** **PEDIATRIC: Contact**	Feces	Direct and indirect contact (fecal/oral)	Three to four days	Duration of symptoms	Duration of symptoms	*Consider Contact Precautions for incontinent adults if stool cannot be contained, or for adults with poor hygiene who contaminate their environment.
Babesiosis *(Babesia* spp.*)*		**RP**	Blood	Tick borne	One to six weeks One to nine weeks transfusion			No person-to-person transmission, except rarely by blood transfusion from asymptomatic parasitemic donors. Reportable Disease. See *Communicable Disease Management Protocol*. Available at: www.manitoba.ca/health/publichealth/cdc/protocol/babesiosis.pdf
Bacillus cereus	Food poisoning nausea, vomiting, diarrhea, or abdominal cramps	**RP***		Foodborne				*Consider Contact Precautions for incontinent adults if stool cannot be contained, or for adults with poor hygiene who contaminate their environment.
Bedbugs *Cimex lectularius*)	Allergic reactions and itchy welts.	**RP**						Not known to transmit disease. If necessary, consult professional pest control for infestation. For information, refer to: www.epa.gov/bedbugs

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Blastomycosis (*Blastomyces dermatitidis*)	Pneumonia or skin lesions	**RP**		Inhalation from airborne spores Traumatic inoculation of skin	21 to 106 days			No person-to-person transmission. Acquired from spores in soil. Reportable Disease. See *Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/blastomycosis.pdf
Bocavirus Respiratory tract infection		**Droplet and Contact**						May cohort if infected with same virus. Patient should not share room with high-risk roommates.
Botulism (*Clostridium botulinum*) Refer to Food Poisoning	Flaccid paralysis; cranial nerve palsies	**RP**		Foodborne	Six hours to eight days			No person-to-person transmission. Reportable Disease. *See Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/botulism.pdf

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Brucellosis (*Brucella sp.*) Undulant, Malta or Mediterranean fever	Systemic bacterial disease of acute or insidious onset	**RP**			Weeks to months			Not transmitted person-to-person (rarely via banked spermatozoa and sexual contact). Acquired from contact with infected animals or from contaminated food, mostly dairy products. Brucella is hazardous to laboratory workers. Notify laboratory if diagnosis is suspected. Prophylaxis required following laboratory exposure. Reportable Disease. See *Communicable Disease Management Protocol*. Available at: www.manitoba.ca/health/publichealth/cdc/protocol/brucellosis.pdf
	Draining lesions	**MINOR: RP** **MAJOR: Contact***	Drainage from open lesions	Possibly direct contact	Weeks to months		Duration of drainage	*MAJOR: Contact precautions required only if wound drainage cannot be contained by dressings.
Burkholderia cepacia	Exacerbation of chronic lung disease in patients with cystic fibrosis	**Contact***					Until organism cleared as directed by ICP	*B. cepacia* can result in respiratory tract colonization or infection in patient with cystic fibrosis. *If other CF patients are on the unit. All interactions with other CF patients should be avoided.
Caliciviruses See Noroviruses								

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Candida auris	Infection or colonization (i.e., asymptomatic) of any body site	***Contact**	Infected or colonized secretions, excretions	Direct and indirect contact	Variable	Variable	As directed by ICP	Report to Public Health *When asymptomatic, precautions not required in long term care, prehospital and home care. *See Prevention and Control of Antimicrobial-Resistant Organisms.* Available at: www.manitoba.ca/health/publichealth/cdc/docs/ipc/aro.pdf See Appendix I, ARO.
Campylobacter spp.	Gastroenteritis	**ADULT:** **RP*** **PEDIATRIC** **Contact**	Contaminated food and feces	Direct and indirect contact (fecal/oral)	One to 10 days	Duration of excretion	Duration of symptoms	Person-to-person transmission is uncommon. *Consider Contact Precautions for adults if stool cannot be contained or for adults with poor hygiene who contaminate their environment. Treatment with effective antimicrobial shortens period of infectivity Contact Precautions apply to children who are incontinent or unable to comply with hygiene. Reportable Disease. *See Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/campylobacter.pdf
Candidiasis (*Candida spp.*)	Many	**RP**						Normal flora.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Carbapenem-Resistant Entero-bacteriaceae	Infection or colonization (i.e., asymptomatic) of any body site	***Contact**	Infected or colonized secretions and excretions	Direct and indirect contact	Variable	Variable	As directed by ICP	*When asymptomatic, precautions not required in long term care, prehospital and home care. *See Prevention and Control of Antimicrobial-Resistant Organisms.* Available at: www.manitoba.ca/health/publichealth/cdc/docs/ipc/aro.pdf See Appendix I, ARO.
Cat Scratch Disease (*Bartonella henselae*)	Fever and lymphadenopathy	**RP**			16 to 22 days			No person-to-person transmission. Acquired from animals (cats and others).
Chancroid (*Haemophilus ducreyi*)	Genital ulcers	**RP**		Sexual transmission	Three to 14 days	Until healed and as long as infectious agent persists in the original lesion		Reportable Disease. See *Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/chancroid.pdf
Chickenpox– See varicella								
Chlamydia Infections: *Chlamydia trachomatis*	Urethritis, cervicitis, pelvic inflammatory disease; neonatal conjunctivitis, infant pneumonia; trachoma	**RP**	Conjunctival and genital secretions	Sexual transmission mother to child at birth Trachoma: direct or indirect contact	Seven to 14 days	As long as organism present in secretions		Reportable Disease. *See Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/chlamydia.pdf
Chlamydia pneumoniae	Pneumonia	**RP**	Respiratory secretions	Unknown	Unknown	Unknown		Rare outbreaks of pneumonia in institutionalized populations

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Chlamydia psittaci (psittacosis, ornithosis)	Pneumonia and undifferentiated fever	**RP**	Infected birds		Seven to 14 days			No person-to-person transmission. Acquired by inhalation of desiccated droppings, secretions and dust of infected birds
Cholera (*Vibrio cholerae* 01, 0139)	Diarrhea	**ADULT:** **RP*** **PEDIATRIC**:** **Contact**	Feces	Direct and indirect contact (fecal/oral)	Few hours to five days	Duration of shedding	Duration of symptoms	*Consider Contact Precautions for adults if stool cannot be contained, or for adults with poor hygiene who contaminate their environment. **Contact Precautions apply to children who are incontinent or unable to comply with hygiene. Reportable Disease. *See Communicable Disease Management Protocol* available at: www.manitoba.ca/health/publichealth/cdc/protocol/cholera.pdf
Clostridioides difficile **(formerly called Clostridium difficile)**	Diarrhea and pseudo-membranous colitis	**Contact**	Feces	Direct and indirect contact (fecal/or oral)	Variable	Duration of shedding	Until asymptomatic for at least 48 hours.	Bacterial spores persist in the environment. Relapses are common. *See Communicable Disease Management Protocol*. Available at: www.manitoba.ca/health/publichealth/cdc/protocol/cdifficile.pdf During outbreaks, special attention should be paid to cleaning. For cleaning recommendations, see PHAC *Clostridium (Clostridioides) Difficile* Infection-Infection Prevention and Control Guidance for Management in Acute Care and Long-Term Care Settings. Refer to Appendix I.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Clostridium perfringens	Food poisoning	**RP**		Foodborne	Six to 24 hours			No person-to-person transmission.
	Gas gangrene, abscesses, and myonecrosis	**RP**			Variable			No person-to-person transmission.
Coccidioido-mycosis (*Coccidiodes immitis*)	Pneumonia and draining lesions	RP			One to four weeks			No person-to-person transmission. Acquired from spores in soil, dust in endemic areas.
Colorado tick fever See Arbovirus	Fever	**RP**		Tick-borne	Three to six days			No person-to-person transmission.
Congential rubella See Rubella								Reportable Disease. *See Communicable Disease Management Protocol:* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/rubella.pdf
Coronavirus (other than SARS-CoV and MERS-CoV) **MERS-CoV** See Middle East Respiratory Syndrome **SARS-CoV** See Severe acute respiratory syndrome	Common cold	**Droplet and Contact**	Respiratory secretions	Direct and indirect contact. Possible large droplet	Two to four days	Until symptoms cease	*Duration of symptoms	May cohort if infected with same virus. Patient should not share room with high-risk roommates. *Discontinue precautions based on resolution of respiratory symptoms (non-ventilated patients) and/or clinical improvement (ventilated patients) for 48 hours and not based on duration of treatment or negative laboratory results. Chronic respiratory symptoms and post viral cough do not require maintenance of precautions.
Coxsackievirus – See Enteroviral infections								

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Creutzfeldt-Jakob Disease (CJD)	Chronic encephalopathy	**RP ***	Contaminated neurosurgical instruments; tissue grafts from infected donors		Variable			No person-to-person transmission. *See PHAC *Classic Creutzfeldt-Jakob Disease in Canada: Quick Reference Guide.* Available at: www.canada.ca/en/publichealth/services/infectious-diseases/nosocomial-occupational-infections/creutzfeldt-jakob-disease/infection-control-guidelines.html Reportable Disease. *See Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/cjd.pdf
Crimean-Congo Fever See Viral Hemorrhagic Fevers								
Cryptococcosis (*Cryptococcus neoformans*)	Pneumonia, meningitis and adenopathy	**RP**			Unknown			No person-to-person transmission.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Cryptosporidiosis (*Cryptosporidium parvum*)	Diarrhea	ADULT: **RP*** **PEDIATRIC**: Contact**	Feces	Direct and indirect contact (fecal/oral)	1-12 days	From onset of symptoms until several weeks after resolution	Duration of symptoms	*Consider Contact Precautions for incontinent adults if stool cannot be contained, or for adults with poor hygiene who contaminate their environment. **Pediatric precautions apply to children who are incontinent or unable to comply withhygiene. Reportable Disease. *See Communicable Disease Management Protocol:* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/crypto1.pdf
Cysticercosis (*Taenia solium* larvae)	*T. solium* larval cysts in various organs	**RP**	Ova in feces	Direct contact (fecal/oral)	Months to years	While eggs present in feces		Transmissible only from humans with *T. solium* adult tapeworm in gastrointestinal tract (autoinfection occurs)
Cytomegalovirus	Usually asymptomatic; congenital infection, retinitis, mononucleosis, pneumonia, disseminated infection in immuno-compromised host	**RP**	Saliva, genital secretions, urine, breast milk, transplanted organs or stem cells, blood products	Direct * Sexual transmission Vertical mother to child in utero, at birth or through breast milk Transfusion, transplan-tation	Unknown	Virus is excreted in urine, saliva, genital secretions, breast milk for many months; may persist or be episodic for life		No Additional Precautions for pregnant HCWs. Requires close direct personal contact for transmission. * Disease often reactivation, rather than new infection.
Dengue (*arbovirus*)	Fever, arthralgia and rash	**RP**		Mosquito-borne	Three to 14 days	Not person-to-person		
Dermatophytosis See Tinea								

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Diphtheria (*Corynebacterium diphtheriae*)	Cutaneous (characteristic ulcerative lesion)	**Contact**	Lesion drainage	Direct or indirect contact	Two to seven days	If untreated, two weeks to several months	Until two cultures* from skin lesions are negative	*Cultures should be taken at least 24 hours apart and at least 24 hours after cessation of antimicrobial therapy. Close contacts should be given antimicrobial prophylaxis as per Canadian Immunization Guide (current edition). Available at: www.canada.ca/en/publichealth/services/canadian-immunization-guide.html Reportable Disease. *See Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/diphtheria.pdf
	Pharyngeal (adherent grayish membrane)	**Droplet**	Nasopharyn-geal secretions	Large droplets	Two to seven days	If untreated, two weeks to several months	Until two cultures* from both nose and throat are negative	
Ebola See Viral hemorrhagic fever								
Echinococcosis (Hydatidosis) (*Echinococcus granulosis, E. multilocularis*)	Cysts in various organs-liver most common	**RP**			Months to years			No person-to-person transmission. Acquired from contact with infected animals.
Echovirus See enterovirus								

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Enterobiasis (oxyuriasis, pinworm) (*Enterobius vermicularis*)	Perianal itching	**RP**	Ova in stool, perianal region	Direct, indirect contact*	Life cycle requires two to six weeks	As long as gravid females discharge eggs on perianal skin. Eggs remain infective indoors about two weeks.		Direct transfer of infective eggs by hand from anus to mouth of the same or another person; indirectly through clothing, bedding or other contaminated articles. *Close household contact may need treatment.
Enterococcus species (Vancomycin resistant only) – See Vancomycin-resistant enterococci		**RP**						
Enteroviral infections Echovirus, Coxsackievirus A, Coxsackievirus B Enterovirus Poliovirus **See poliomyelitis**	Acute febrile symptoms, aseptic meningitis, encephalitis, pharyngitis, herpangina, rash, pleurodynia, hand, foot and mouth disease	**ADULT: RP** **PEDIATRIC: Contact**	Feces, respiratory secretions	Direct and indirect contact (fecal/oral)	Three to five days		Duration of symptoms; if poliovirus, see poliomyelitis	
	Conjunctivitis	**Contact**	Eye discharge	Direct and indirect contact	One to three days		Duration of symptoms	
Epstein Barr virus	Infectious mononucleosis	**RP**	Saliva, transplanted organs or stem cells	Direct oropharyngeal route via saliva; transplantation	Four to six weeks	Prolonged; pharyngeal excretion may be intermittent or persistent for years		
Erythema infectiosum *See Parvovirus* B19								

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Escherichia coli (entero-pathogenic strains)	Diarrhea, food poisoning, hemolytic uremic syndrome (HUS), and thrombotic thrombocytopenic purpura	**ADULT: RP*** **PEDIATRIC: Contact**	Feces	Direct and indirect contact (fecal/oral) Foodborne	One to eight days	Duration of shedding	Duration of symptoms If HUS: until two stools negative for *E. coli* O157:H7 or 10 days from onset of diarrhea.	*Consider Contact Precautions for incontinent adults if stool cannot be contained, or for adults with poor hygiene who contaminate their environment. Reportable Disease. *See Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/vtec.pdf
Fifth disease See Parvovirus								
German measles See Rubella								
Giardia (*Giardia lamblia*)	Diarrhea	**ADULT: RP*** **PEDIATRIC: Contact**	Feces	Direct and indirect contact (fecal/oral)	Three to 25 days or longer	Entire period of infection; often months	Duration of symptoms	*Consider Contact Precautions for incontinent adults if stool cannot be contained, or for adults with poor hygiene who contaminate their environment. Reportable Disease. *See Communicable Disease Management Protocol:* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/giardiasis.pdf
Granuloma inguinale (Donovanosis) (*Calymmato-bacterium granulomatis*)	Painless genital ulcers, inguinal ulcers, nodules	**RP**		Sexual transmission	Unknown; probably between one-16 weeks	Unknown; probably for the duration of open lesions on the skin or mucous membranes.		

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Haemophilus influenzae (invasive infections)	Pneumonia, epiglottitis, meningitis, bacteremia, septic arthritis, cellulitis, and osteomyelitis in a child	**ADULT: RP** **PEDIATRIC: Droplet**	Respiratory secretions	Large droplets, direct contact	Variable	Most infectious in the week prior to onset of symptoms and during symptoms until treated	Until 24 hours of appropriate antimicrobial therapy has been received	Close contacts with children less than 48 months old and who are not immune, may require chemoprophylaxis. Household contacts of such children should receive prophylaxis. *Haemophilus influenzae* invasive disease is reportable. See *Communicable Disease Management Protocol.* Available at: wwwmanitoba.ca/health/publichealth/cdc/protocol/ihd.pdf
Hand foot and mouth disease See enteroviral infections								
Hansen's Disease See Leprosy								
Hantavirus (Hantavirus pulmonary syndrome)	Fever, pneumonia	**RP**	Rodent excreta	Presumed aerosol transmission from rodent excreta	A few days to six weeks.	Not well defined, person-to-person is rare (person to person documented for S. American strains)		Infection acquired from rodents. Reportable Disease. *See Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/hps.pdf
Helicobacter pylori	Gastritis, duodenal ulcer disease	**RP**		Probable ingestion of organisms; presumed fecal-oral/ oral-oral	Five to 10 days	Unknown		

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Hepatitis A, E	Hepatitis and anicteric acute febrile symptoms	**ADULT: RP*** **PEDIATRIC: Contact**	Feces	Direct and indirect contact (fecal/oral)	A: 15 to 50 days (average 28 days) E: 26 to 42 days	A: Two weeks before to one week after onset of jaundice Shedding is prolonged in the newborn. E: Not known; at least two weeks before onset of symptoms.	One week after onset of jaundice; duration of hospitalization if newborn	*Consider Contact Precautions for incontinent adults if stool cannot be contained, or for adults with poor hygiene who contaminate their environment. Post-exposure prophylaxis indicated for non-immune household contacts with significant exposure to hepatitis A, if within two weeks of exposure. Refer to Canadian Immunization Guide (current edition). Available at: www.canada.ca/en/public-health/services/canadian-immunization-guide.html Outbreaks of HAV in HCWs have been associated with eating and drinking in patient care areas. Hepatitis A-Reportable Disease. See *Communicable Disease Management Protocol*. Available at: www.manitoba.ca/health/publichealth/cdc/protocol/hepa.pdf

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Hepatitis B, C, D	Hepatitis, often asymptomatic; cirrhosis and hepatic cancer	**RP**	Blood, genital secretions, and certain other body fluids	*Mucosal or percutaneous exposure to infective body fluids Sexual transmission; Vertical mother to child	**B**: 45 to 180 days (average 60 to 90 days) **C**: Two weeks to six months **D**: Two to eight weeks	**B**: all persons who are HBsAg positive are infectious; **C**: indefinite **D**: indefinite		Refer to Canadian Immunization Guide (current edition). Available at: www.canada.ca/en/public-health/services/canadian-immunization-guide.html Contact OH or a delegate if HCW has percutaneous, non-intact skin or mucous membrane exposure. Refer to CDC dialysis recommendations www.cdc.gov/dialysis/index.html Hepatitis B-Reportable Disease. See *Communicable Disease Management Protocol*. Available at: www.manitoba.ca/health/publichealth/cdc/protocol/hepb.pdf *Sexual and perinatal transmission can occur, but is uncommon for Hepatitis C. Hepatitis C-Reportable Disease. See *Communicable Disease Management Protocol*. Available at: www.manitoba.ca/health/publichealth/cdc/protocol/hepc.pdf

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Herpes simplex virus	Encephalitis	**ADULT: RP** **PEDS: Contact**						
	Neonatal	**Contact**	Skin or mucosal lesions; possibly all body secretions and excretions	Direct contact	Birth to six weeks of age		Duration of symptoms	Contact Precautions are also indicated for infants delivered vaginally (or by C-section if membranes have been ruptured more than four to six hours) to women with active genital HSV infections, until neonatal HSV infection has been ruled out.
	Mucocutaneous: disseminated or primary and extensive (gingivos-tomatitis, eczema herpeticum)	**Contact**	Skin or mucosal lesions Sexual transmission Mother to child at birth	Direct contact	Two days to two weeks	While lesions present	Until lesions are dry and crusted	
	Recurrent	**RP**						
Herpes zoster See varicella zoster								
Histoplasmosis (*Histoplasma capsulatum*)	Pneumonia, lymphadenopathy and fever	**RP**			Three to 17 days			No person-to-person transmission. Acquired from spores in soil.
Hookworm (*Necator americanus, Ancyclostoma duodenale)*	Usually asymptomatic	**RP**		Percutaneous Fecal-oral	Few weeks to many months			No person-to-person transmission. Larvae must hatch in soil to become infectious.
Human herpesvirus 6 (HHV-6) See Roseola								

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Human immunodeficiency virus (HIV)	Asymptomatic; multiple clinical presentations	**RP**	Blood, genital secretions, breast milk and certain other body fluids	Mucosal or percutaneous exposure to infective body fluids Sexual transmission, Vertical mother to child	Weeks to years	From onset of infection	Continuous	Immediately contact OH or a delegate if HCW has percutaneous, non-intact skin or mucous membrane exposure. Diagnosis of HIV/AIDS is a Reportable Disease. *Refer to Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/hiv.pdf
Human metapneumovirus	Respiratory tract infection	**Droplet and Contact**	Respiratory secretions	Large droplets Direct and indirect contact	Three to five days		*Duration of symptoms	May cohort if infected with same virus. Patient should not share room with high-risk roommates. *Discontinue precautions based on resolution of respiratory symptoms (non-ventilated patients) or clinical improvement (ventilated patients) for 48 hours, and not based on duration of treatment or negative laboratory results. Chronic respiratory symptoms or post viral cough do not require maintenance of precautions.
Human T-cell leukemia virus, human T-lymphotrophic virus (HTLV-I, HTLV-II)	Usually asymptomatic, tropical spastic, paraparesis, lymphoma	**RP**	Breast milk, blood and certain other body fluids	Vertical mother to child; mucosal or percutaneous exposure to infective body fluids	Weeks to years	Indefinite		
Infectious mononucleosis – See Epstein Barr								

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Influenza Seasonal	Respiratory tract infection	**Droplet and Contact**	Respiratory secretions	Large droplets, direct and indirect contact	One to four days	Probably one day before to three to five days from clinical symptom onset in adults; up to seven to 10 days in young children	*Duration of symptoms	If a private room is unavailable, consider cohorting patients during outbreaks. Patient should not share a room with high-risk roommates. *Discontinue precautions based on resolution of respiratory symptoms (non-ventilated patients) and/or clinical improvement (ventilated patients) for 48 hours, and not based on duration of treatment or negative laboratory results. Chronic respiratory symptoms or post viral cough do not require maintenance of precautions. Consider antiviral prophylaxis for exposed roommates Reportable Disease. *See Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/influenza1.pdf

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Pandemic Novel influenza viruses	Respiratory tract infection	*** Pandemic Influenza Precautions**	As for seasonal influenza	As for seasonal influenza	Unknown; possibly one to seven days	Unknown, possibly up to seven days	*Duration of symptoms	*See Canadian Pandemic Plan Prevention and Control of Influenza during a Pandemic for all Healthcare Settings.* Available at: www.canada.ca/en/public-health/services/flu-influenza/canadian-pandemic-influenza-preparedness-planning-guidance-health-sector.html Refer to PHAC website for specific guidance documents. *Discontinue precautions based on resolution of respiratory symptoms (non-ventilated patients) and/or clinical improvement (ventilated patients) for 48 hours, and not based on duration of treatment or negative laboratory results. Chronic respiratory symptoms or post viral cough do not require maintenance of precautions. Reportable Disease See *Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/sari.pdf

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Avian	Respiratory tract infection, and conjunctivitis	**Droplet and Contact**	Excreta of sick birds, possibly human respiratory tract secretions					For current information on Avian influenza: *Human Health Issues Related to Domestic Avian Influenza in Canada.* Available at: www.phac-aspc.gc.ca/publicat/daio-enia/9-eng.php Reportable Disease See *Communicable Disease Management Protocol* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/sari.pdf
Lassa fever **See Viral hemorrhagic fever**								
Legionellosis (*Legionella spp*) Legionnaires' disease	Pneumonia, Legionnaires' disease and Pontiac fever	**RP**			Two to 10 days			No person-to-person transmission. Acquired from contaminated water sources (inhalation not ingestion).
Leprosy (Hansen's disease) (*Mycobacterium leprae*)	Chronic disease of skin, nerves, and nasopharyngeal mucosa	**RP**	Nasal secretions, skin lesions	Direct contact	Nine months to 20 years			Transmitted between persons only with very prolonged extensive close personal contact. Household contacts should be assessed and may be given prophylaxis. Reportable Disease. See *Communicable Disease Management Protocol* at: www.manitoba.ca/health/publichealth/cdc/protocol/leprosy.pdf
Leptospirosis (*Leptospira spp.)*	Fever, jaundice and aseptic meningitis	**RP**			Two to 30 days			Direct person-to-person transmission is rare. Acquired from contact with animals and animal excretion.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Lice (pediculosis) Head Body Pubic (crab) (*Pediculus capitis, pediculus corporis, Pediculus humanus, Phthirus pubis*)	Scalp or body itch, itchy rash	**RP plus gloves for direct patient contact only**	Louse	Head and body lice: Direct and indirect contact Pubic lice: Usually sexual contact	Seven to 12 days	Until effective treatment to kill lice and ova	Until 24 hours after application of appropriate pediculicide; applied as directed.	Apply pediculicides as directed on label. If live lice found after therapy, repeat. Head lice: Wash headgear, combs, pillowcases and towels with hot water and dry with hot air for 15 minutes, or seal in a watertight plastic bag for two weeks or dry clean or freeze for several days. Body lice: As above, for all exposed clothing and bedding. *Refer to Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/pediculosis.pdf
Listeriosis (*Listeria monocytogenes*)	Fever, meningitis Congenital or neonatal infection	**RP**	*Listeria* grows well at low temperatures and is able to multiply in refrigerated foods that are contaminated. Pregnant women and immuno-compromised persons should avoid cheese made with unpasteurized milk, cold cuts and uncooked meat products including hot dogs.	Foodborne Vertical mother to child in utero or at birth	Mean 21 days; three to 70 days following a single exposure to an implicated food product			Nosocomial outbreaks reported in newborn nurseries due to contaminated equipment or materials. Reportable Disease. *See Communicable Disease Management Protocol.* *Available at:* www.manitoba.ca/health/publichealth/cdc/protocol/listeriosis.pdf

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Lyme disease (*Borrelia burgdorferi*)	Fever, arthritis, rash and meningitis	**RP**		Tick-borne	To initial rash: three to 30 days			No person-to-person transmission. Reportable Disease. *See Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/lyme.pdf
Lymphocytic choriomeningitis virus	Aseptic meningitis	**RP**	Urine of rodents		Six to 21 days			No person-to-person transmission. Acquired fromcontact with rodents.
Lympho-granuloma venereum (C. *trachomatis* serovars L1,L2,L3)	Genital ulcers and inguinal adenopathy	**RP**		Sexually transmitted	Range of three to 30 days for a primary lesion	Weeks to years in presence of active lesions		
Malaria (*Plasmodium spp.)*	Fever	**RP**	Blood	Mosquito-borne; rarely transplacental from mother to fetus; blood transfusion	*Variable *P. falciparum*: nine to 14 days *P. vivax and P. ovale:* 12 to 18days *P. malariae*: 18 to 40 days *P. knowlesi*: 10 to 13 days			Not normally person-to-person transmitted. Can be transmitted via blood transfusion. *Can be prolonged in people who have taken prophylactic antimalarial medications.
Marburg virus See Viral hemorrhagic fever								

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Measles (Rubeola)	Fever, cough, coryza, conjunctivitis and maculopapular skin rash	**Airborne**	Respiratory secretions	Airborne	Seven to 18 days to onset of fever; rarely as long as 21 days	Four days before onset of rash (one to two days before onset of initial symptoms) until four days after onset of rash (longer in immuno-compromised patients)	Four days after start of rash; duration of symptoms in immuno-compromised patients	It is recommended that only immune HCWs, caretakers and visitors enter the room. N95 respirators required for unknown immune or non-immune persons who must enter patient room. Precautions should be taken with neonates born to mothers with measles infection at delivery. Immunoprophylaxis is indicated for susceptible contacts. Refer to Canadian Immunization Guide (current edition). Available at: www.canada.ca/en/public-health/services/canadian-immunization-guide.html Reportable Disease. *See Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/measles.pdf
Measles (Rubeola)	Susceptible contact	**Airborne**	Respiratory secretions	Airborne		Potentially communicable during last two days of incubation period	From five days after first exposure through 21 days after last exposure, regardless of post-exposure prophylaxis	
Melioidosis (*Pseudomonas pseudomallei*)	Pneumonia, fever	**RP**	Contaminated soil		Variable			Organism in soil in South-East Asia. Person-to-person has not been proven.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Meningococcus (*Neisserria meningitidis*)	Rash (petechial/ purpuric) with fever Meningococcemia meningitis and pneumonia	**Droplet**	Respiratory secretions	Large droplet, direct contact	Usually two to 10 days	Seven days before onset of symptoms until 24 hours after effective antimicrobial therapy	Until 24 hours of effective antimicrobial therapy has been received	Close contacts may require chemoprophylaxis, as per the Canadian Immunization Guide (current edition). Available at: www.canada.ca/en/public-health/services/canadian-immunization-guide.html Reportable Disease if invasive. See *Communicable Disease Management Protocol*. Available at: www.manitoba.ca/health/publichealth/cdc/protocol/mid.pdf
Methicillin-resistant S. aureus (MRSA)	Infection or colonization (e.g., asymptomatic) of any body site	***Contact**	Infected or colonized secretions and excretions	Direct and indirect	Variable	Variable	Variable	*When asymptomatic, precautions are not required in long term care, prehospital and home care. *See Guidelines for the Prevention and Control of Antimicrobial-Resistant Organisms.* Available at: www.manitoba.ca/health/publichealth/cdc/docs/ipc/aro.pdf See Appendix I, ARO
Middle East Respiratory Syndrome (MERS-CoV)	Malaise, myalgia, headache, fever, respiratory symptoms (cough, increasing shortness of breath), pneumonia and ARDS	**Droplet and Contact** ***AGMP**	Respiratory secretions and stool	Droplet, direct and indirect contact Aerosols during AGMP	Three to 10 days	Net yet determined; suggested to be less than 21 days	10 days following resolution of fever if respiratory symptoms have also resolved	*If AGMP: see strategies to reduce aerosol generation, *see PART B, Section IV, sub-section (iii), 1(b).* Single room; may cohort if infected with same virus. Reportable Disease. *See Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/sari.pdf

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Molluscum contagiosum	Umbilicated papules	**RP**	Contents of papules	Direct contact	Two weeks to six months	Unknown		Requires close direct personal contact for transmission.
Monkeypox	Resembles smallpox; lymphadenopathy is a more predominant feature	***Contact, Droplet and Airborne**	Lesions and respiratory secretions	Contact with infected animals; possible airborne transmission from animals to humans			*Contact: Until all lesions crusted	Transmission in hospital settings is unlikely. See: www.cdc.gov/ncidod/monkeypox.
Mucormycosis (phycomycosis; zygomycosis) (Mucor, Zygomycetes)	Skin wound, rhinocerebral, pulmonary, gastrointestinal, disseminated infection *	**RP**	Fungal spores in dust and soil	Inhalation or ingestion of fungal spores	Unknown		Unknown	No person-to-person transmission. Acquired from spores in dust and soil. *Infections in immunocompromised patients.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Mumps	Swelling of salivary glands, orchitis or meningitis	**Droplet**	Saliva	Large droplets, direct contact	Usually 16 to 18 days; range 12 to 25 days	Viral excretion highest seven days before to five days after onset or parotitis	Until five days after onset of parotitis	Droplet Precautions for exposed susceptible patients and health care workers should begin 10 days after first contact and continue through 26 days after last exposure. It is recommended that only immune HCWs, caretakers and visitors enter the room. For outbreaks see also, www.phac-aspc.gc.ca/publicat/ccdr-rmtc/10pdf/36s1-eng.pdf Refer to the Canadian Immunization Guide (current edition), available at: www.canada.ca/en/public-health/services/canadian-immunization-guide.html Reportable Disease. *See Communicable Disease Management Protocol,* available at: www.manitoba.ca/health/publichealth/cdc/protocol/mumps.pdf
Mycobacterium non-tuberculosis (atypical)	Lymphadenitis; pneumonia; disseminated disease in immuno-compromised host	**RP**			Unknown			No person-to-person transmission. Acquired from soil, water, animals and reservoirs.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Mycobacterium tuberculosis (also *Mycobacterium aftricanum, Mycobacterium bovis*)	Confirmed or suspected respiratory (including pleural, laryngeal)	**Airborne***	Respiratory secretions	Airborne	Weeks to years	While organisms are viable in sputum	Until deemed no longer infectious. If confirmed TB, until patient has received two weeks of effective therapy, and is improving clinically and has three consecutive sputum smears negative for acid fast bacilli, with at least one early morning specimen If multi-drug resistant tuberculosis, for the duration of their hospital stay or until three consecutive sputum cultures are negative after six weeks of incubation	Tuberculosis in young children is rarely transmissible, due to usual absence of cavitary disease and weak cough. Assess visiting family members for cough. Also see: Canadian Tuberculosis Standards (current edition), available at: www.canada.ca/en/public-health/services/infectious-diseases/canadian-tuberculosis-standards-7th-edition.html *If AGMP: see strategies to reduce aerosol generation PART B, Section IV, sub-section iii (1 b). Reportable Disease. See *Communicable Disease Management Protocol,* *available at:* www.manitoba.ca/health/publichealth/cdc/protocol/tb.html

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
	Nonpulmonary: meningitis, bone or joint infection peritonitis, pericardial with no drainage Nonpulmonary: skin or soft tissue draining lesions	**RP** **RP** ***Airborne**	Aerosolized wound drainage	While viable microorgan-isms are in drainage			Maintain precautions until drainage has ceased or there are three consecutive negative acid fast bacilli smears of drainage. If multidrug resistant tuberculosis, for the duration of their hospital stay or until three consecutive cultures are negative after six weeks of incubation	Most patients with nonpulmonary disease alone are noncontagious. It is important to assess for concurrent pulmonary tuberculosis. * Airborne Precautions are necessary, if procedures which may aerosolize drainage are being performed.
	PPD skin test positive with no evidence of current pulmonary disease	**RP**		Non communicable				
Mycoplasma pneumoniae	Pneumonia	**Droplet**	Respiratory secretions	Large droplets	One to four weeks	Unknown	Duration of symptoms	
Neisseria gonorrhoeae	Urethritis, cervicitis, pelvic inflammatory disease, arthritis, ophthalmia neonatorum and conjunctivitis	**RP**		Sexual transmission Mother to child at birth Rarely: direct/ indirect contact	Two to seven days	May extend for months if untreated		Reportable Disease. See *Communicable Disease Management Protocol*. available at: www.manitoba.ca/health/publichealth/cdc/protocol/gonorrhea.pdf
Neisseria meningitidis See Meningococcus								

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Nocardiosis (*Nocardia spp.*)	Fever, pulmonary or CNS infection or disseminated disease	**RP**			Unknown			No person-to-person transmission. Acquired from organisms in dust and soil.
Noroviruses (Norwalk-like agents, Caliciviruses)	Nausea, vomiting and diarrhea	**Contact**	Feces	Direct and indirect contact (fecal/oral)	Usually 24 to 48 hours; range of 10 to 50 hours	When symptoms appear: duration of viral shedding; usually 72 hrs. after diarrhea resolves	72 hours after resolution of symptoms	Special attention should be made to cleaning. Usually outbreak associated.
Orf Virus (poxvirus)	Skin lesions	**RP**			Generally three to six days			No person-to-person transmission. Acquired from infected animals.
Parainfluenza virus	Respiratory tract infection	**Droplet and Contact**	Respiratory secretions	Large droplets, direct and indirect contact	Two to six days	One to three weeks	*Duration of symptoms	May cohort if infected with same virus. Patient should not share room with high-risk roommates. *Discontinue precautions based on resolution of respiratory symptoms (non-ventilated patients) or clinical improvement (ventilated patients) for 48 hours and not based on duration of treatment or negative laboratory results. Chronic respiratory symptoms or post viral cough do not require maintenance of precautions.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Parvovirus B-19 Human parvovirus	*Erythema infectiosum* (fifth disease), aplastic or erythrocytic crisis	**RP: Fifth disease:** **Droplet:** **Aplastic crisis or chronic infection in immuno-compromised patient**	Respiratory secretions	Large droplets, direct contact Vertical mother to fetus	Four to 21 days to onset of rash	Fifth disease: no longer infectious by the time the rash appears. Aplastic crisis: Up to one week after onset of crisis. Immuno-compromised with chronic infection: months to years	Aplastic or erythrocytic crisis: seven days Chronic infection in immuno-compromised patient: duration of hospitalization	
Pediculosis See lice								
Pertussis (*Bordetella pertussis and B. parapertussis*)	Whooping cough, non specific respiratory tract infection in infants, adolescents and adults	**Droplet**	Respiratory secretions	Large droplets	Average seven to 10 days; range six to 20 days	To three weeks after onset of paroxysms if not treated	To three weeks after onset of paroxysms if not treated; or until five days of appropriate antimicrobial therapy received	Close contacts (household and HCWs) may need chemoprophylaxis or immunization. If HCWs immunization not up to date, refer to OH or delegate. Refer to *Canadian Immunization (current edition),* available at: www.canada.ca/en/public-health/services/canadian-immunization-guide.html Reportable Disease. See *Communicable Disease Management Protocol.* *Available at:* www.manitoba.ca/health/publichealth/cdc/protocol/pertussis.pdf
Pinworms See *Enterobius*								

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Plague (*Yersinia pestis*)	Bubonic (lymphadenitis)	**RP**	*Fleas		One to seven days			*Transmission can occur from infected domestic animals (cats and dogs) through contaminated saliva. Person-to-person transmission is rare. Reportable Disease. See *Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/plague.pdf
	Pneumonic (cough, fever and hemoptysis)	**Droplet**	Respiratory secretions	Large droplets	One to seven days	Until 48 hours of appropriate antimicrobial therapy received	Until 48 hours of appropriate antimicrobial therapy received	Close contacts and exposed HCWs may require prophylaxis. Reportable Disease See *Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/plague.pdf
Pneumocystis jirovecii (carinii)	Pneumonia in immuno-compromised host	**RP**		Unknown	Unknown			Ensure roommates are not immunocompromised.
Poliomyelitis Infantile paralysis	Fever, aseptic meningitis, flaccid paralysis	**Contact**	Feces and respiratory secretions	Direct and indirect contact	Three to 35 days	Virus in the throat for approximately two weeks and in feces for three to six weeks	Until six weeks from onset of symptoms or until feces viral culture negative	Most infectious during the days before and after onset of symptoms. Close contacts who are not immune should receive immunoprophylaxis. *Reportable Disease.* *See Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/poliovirus.pdf

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Prion disease See CJD								
Psittacosis See *Chlamydia psittaci*								
Q Fever (*Coxiella burnetii*)	Pneumonia and fever	**RP**	Infected animals unpasteurized milk	Direct contact with infected animals and raw milk. Airborne from aerosolized contaminated dust	Nine to 30 days. May be prolonged when infectious dose is small			Acquired from contact with infected animals or from ingestion of raw milk. Person-to-person transmission is possible, but rarely reported. *Reportable Disease.* *See Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/qfever.pdf
Rabies	Acute encephalomyelitis	**RP**	Saliva	Mucosal or percutaneous exposure to saliva; corneal, tissue and organ transplan-tation	20 to 60 days Varies from few days to years			Acquired from contact with infected animals. Person-to-person transmission is theoretically possible, but not well documented. Post-exposure prophylaxis is recommended for percutaneous or mucosal exposure to saliva of rabid animal or patient. Reportable Disease. *See Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/rabies_protocol.pdf

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Rat bite fever *Actinobacillus* (formerly *Streptobacillus) moniliformis; Spirillum minus*	Fever and arthralgia	**RP**	Saliva of infected rodents; contaminated milk	Rodent bite, ingestion of contaminated milk	*A. monili-formis* three to 10 days, rarely longer; *S. minus* one to three weeks			No person-to-person transmission. *A.moniliformis*: rats and other animals, and contaminated milk. *S. minus*: rats, mice only.
Relapsing fever (*Borellia recurrentis*, other *Borellia* species)	Recurrent fevers	**RP**		Vector-borne				No person-to-person transmission. Spread by ticks or lice.
Respiratory syncytial virus (RSV)	Respiratory tract infection	**Droplet and Contact**	Respiratory secretions	Large droplets, direct and indirect contact	Two to eight days	Shortly before and for the duration of active disease	*Duration of symptoms	May cohort if infected with same virus. Patient should not share room with high-risk roommates. *Discontinue precautions based on resolution of respiratory symptoms (non-ventilated patients) or clinical improvement (ventilated patients) for 48 hours and not based on duration of treatment or negative laboratory results. Chronic respiratory symptoms or post viral cough do not require maintenance of precautions.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Rhinovirus	Respiratory tract infection and common cold	**Droplet and Contact**	Respiratory secretions	Direct and indirect contact, possibly large droplets	Two to three days	Until symptoms cease	*Duration of symptoms	May cohort if infected with same virus. Patient should not share room with high-risk roommates. *Discontinue precautions based on resolution of respiratory symptoms (non-ventilated patients) and/or clinical improvement (ventilated patients) for 48 hours and not based on duration of treatment or negative laboratory results. Chronic respiratory symptoms or post viral cough do not require maintenance of precautions.
Rickettsialpox *Rickettsia akari*	Fever and rash	**RP**		Mite-borne	Nine to 14 days			No person-to-person transmission. Transmitted by mouse mites.
Ringworm See *Tinea*								
Rocky Mountain Spotted Fever *Rickettsia rickettsii*	Fever, petechial rash and encephalitis	**RP**		Tick-borne	Three to 14 days			Not transmitted from person-to-person except rarely through transfusion.
Roseola infantum (HHV-6)	Rash, fever	**RP**	Saliva	Direct contact	10 days	Unknown		Transmission requires close direct personnel contact.
Rotavirus	Diarrhea	**Contact***	Feces	Direct and indirect contact (fecal-oral)	One to three days	Duration of viral shedding	Duration of symptoms	*Consider Contact Precautions for incontinent adults if stool cannot be contained, or for adults with poor hygiene who contaminate their environment.
Roundworm See Ascariasis								

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Rubella Acquired	Fever and maculopapular rash	**Droplet**	Respiratory secretions	Large droplets, direct contact	14 to 23 days	For about one week, before and after onset of rash	Until seven days after onset of rash	It is recommended that only immune HCWs, caretakers and visitors enter the room. Pregnant HCWs should not care for rubella patients, regardless of their immune status. Facial protection required for unknown immune or non-immune persons who must enter the room. Droplet Precautions should be maintained for exposed susceptible patients for seven days after first contact, through to 23 days after last contact. Administer vaccine to exposed susceptible non-pregnant persons within three days of exposure. Refer to *Canadian Immunization Guide (current edition).* *Available at:* www.canada.ca/en/public-health/services/canadian-immunization-guide.html Exclude susceptible HCWs from duty from day seven after first exposure, to day 23 after last exposure, regardless of post-exposure vaccination. Reportable Disease. See *Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/rubella.pdf

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Rubella Congenital	Congenital rubella syndrome	**Droplet and Contact**	Respiratory secretions, urine	Large droplets: Direct and indirect contact		Prolonged shedding in respiratory tract and urine; can be up to one year	Until one year of age, unless nasopha-ryngeal and urine cultures done after three months of age are negative	
Rubeola See Measles								
Salmonella (including *Salmonella typhi*)	Diarrhea, enteric fever, typhoid fever and food poisoning	**ADULT:** **RP*** **PEDIATRIC:** **Contact**	Feces	Direct and indirect contact (fecal/ oral) Food borne	Six to 72 hours *Salmonella typhi*:3-60 days	Variable	Duration of symptoms	*Consider Contact Precautions for incontinent adults if stool cannot be contained or for adults with poor hygiene who contaminate their environment. Reportable Disease. See *Communicable Disease Management Protocol*. Available at: www.manitoba.ca/health/publichealth/cdc/protocol/typhoid.pdf
Scabies (*Sarcoptes scabiei*)	Itchy skin rash	**Contact**	Mite	Direct and indirect contact	Without previous exposure, two to six weeks; one to four days after re-exposure.	Until mites and eggs are destroyed by treatment, usually after one or occasionally two courses of treatment, a week apart.	Until 24 hours after initiation of appropriate therapy	Apply scabicide as directed on label. Wash clothes and bedding in hot water, dry clean or seal in a plastic bag, and store for one week. Household contacts and exposed HCWs should be treated.
Scarlet fever See *Streptococcus*, Group A								

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Schistosomiasis (bilharziasis) *(Schistosoma spp.)*	Diarrhea, fever, itchy rash Hepatospleno-megaly and hematuria	**RP**						No person-to-person transmission. Contact with larvae in contaminated water.
Shigella spp. (bacillary dysentery)	Diarrhea	**ADULT: RP*** **PEDIATRIC: Contact**	Feces	Direct and indirect contact (fecal/ oral)	One to seven days	As long as organism present in feces. Usually ceases within one week of onset of illness.	Duration of symptoms	*Consider Contact Precautions for incontinent adults if stool cannot be contained or for adults with poor hygiene who contaminate their environment. Treatment with effective antimicrobial shortens period of infectivity. Reportable Disease. See *Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/shigellosis.pdf
Severe acute respiratory infection (SARI)								Reportable Disease. See *Communicable Disease Management Protocol.* available at: www.manitoba.ca/health/publichealth/cdc/protocol/sari.pdf
Severe acute respiratory syndrome (SARS Coronavirus) See Middle East Respiratory Syndrome (MERS- CoV)	Malaise, myalgia, headache, fever, respiratory symptoms (cough, increasing shortness of breath), pneumonia and ARDS	**Droplet and Contact** ***AGMP**	Respiratory secretions, stool	Droplet, direct and indirect contact Aerosols during AGMP	Three to 10 days	Net yet determined; suggested to be less than 21 days	10 days following resolution of fever if respiratory symptoms have also resolved	*If AGMP: see strategies to reduce aerosol generation, *see PART B, Section IV, sub-section (iii), 1(b).* Single room; may cohort if infected with same virus. Reportable Disease. See *Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/sari.pdf

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Shingles See Herpes zoster								
Smallpox (Variola virus) Generalized vaccinia, eczema vaccinatum See Vaccinia for management of vaccinated persons)	Fever, vesicular/ pustular in appropriate epidemiologic context	*Droplet, Contact and Airborne	Skin lesions and oropharyngeal secretions	Airborne, direct and Indirect contact	Seven to 10 days	Onset of mucosal lesions, until all skin lesions have crusted	Until all scabs have crusted and separated (Three to four weeks).	Immunization of HCWs was stopped in 1977. Refer to *Canadian Immunization (current edition).* Available at: www.canada.ca/en/public-health/services/canadian-immunization-guide.html for information regarding vaccine. Smallpox has been eradicated, but some stocks have been kept by some countries. Thus, re-introduction is possible. Care preferably should be provided by immune HCWs. Non-vaccinated HCWs should not provide care if immune HCWs are available. *N95 respirator for all regardless of vaccination status.
Sporotrichosis *Sporothrix schenckii*	Skin lesions, disseminated	**RP**			Variable			Rare person-to-person transmission. Acquired from spores in soil, on vegetation.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Staphylococcus aureus (If methicillin-resistant, also see MRSA)	Skin (furuncles, impetigo) wound or burn infection; abscess; scalded skin syndrome and osteomyelitis	**MINOR: RP** **MAJOR: Contact***	Drainage, pus	Direct and indirect contact	Variable	As long as organism is in the exudates or drainage	Until drainage resolved or contained by dressings	*MAJOR: drainage not contained by dressings.
	Endometritis	**RP**						
	Food poisoning	**RP**		Foodborne				
	Pneumonia	**ADULT: RP** **PEDIATRIC: Droplet**	Respiratory secretions	Large droplets, direct contact	Variable		Until 24 hours of appropriate antimicrobial therapy received	
	Toxic shock syndrome	**RP**						
Streptobacillus moniliformis disease See Rat-bite fever								
Streptococcus pneumoniae	Pneumonia, meningitis and other	**RP**	Respiratory secretions	Large droplets	Variable			Normal flora.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Streptococcus, Group A (GAS) (*Streptococcus pyogenes*)	Skin (e.g., erysipelas, impetigo), wound or burn infection	**MINOR: RP** **MAJOR: Contact***	Drainage, pus	Direct and indirect contact	One to three days, rarely longer	As long as organism is in drainage	Until 24 hours of appropriate antimicrobial therapy received	*MAJOR = drainage not contained by dressings.
	Scarlet fever, pharyngitis, in children under five years	**ADULT: RP** **PEDIATRIC: Droplet and Contact**	Respiratory secretions	Large droplets	Two to five days	10 to 21 days if not treated	Until 24 hours of appropriate antimicrobial therapy received	
	GAS-Endometritis (puerperal fever)	**RP**						
	GAS-Toxic shock, invasive disease (including necrotizing fasciitis, myositis, meningitis, and pneumonia)	**Droplet and Contact**	Respiratory secretions, wound drainage	Large droplets, direct or indirect contact	Unknown Has been as short as 14 hours	Seven days before onset of symptoms until 24 hours after appropriate antimicrobial therapy	Until 24 hours of appropriate antimicrobial therapy received	Reportable Disease. See *Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/igas.pdf
Streptococcus Group B (GBS) (*Streptococcus agalactiae)*	**GBS** Newborn sepsis, pneumonia and meningitis	**RP**		Mother to child at birth	Early onset one to seven days of age; late onset seven days to three months of age			Normal flora. Reportable Disease. See *Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/groupb.pdf
Strongyloides (*Strongyloides stercoralis*)	Usually asymptomatic May cause disseminated disease presenting as gram negative bacteremia, meningitis in immuno-compromised patient.	**RP**	Larvae in feces		Unknown			Rarely transmitted person-to-person. Infective larvae in soil.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Syphilis (*Treponema pallidum*)	Genital, skin or mucosal lesions, disseminated disease, neurological or cardiac disease and latent infection	**RP Gloves for direct contact with skin lesions** ***Neonate: Contact if lesions present and/ or after bath**	Genital secretions lesion exudates	Direct contact with infectious exudates or lesions Sexual transmission, Intrauterine or intrapartum from mother to child	Three days to three months; usually three weeks	When moist mucocutaneous lesions of primary, secondary and latent syphilis are present	*Neonate: Until 24 hours of appropriate antibiotics	Reportable Disease. See *Communicable Disease Management Protocol*. *Available at:* www.manitoba.ca/health/publichealth/cdc/protocol/syphilis.pdf
Tapeworm *Taenia saginata* *Taenia solium* *Diphyllobothrium latum*	Usually asymptomatic	**RP**	Larvae in food	Foodborne	Variable			No person-to-person transmission. Consumption of larvae in raw or undercooked beef or pork or raw fish; larvae develop into adult tapeworms in gastrointestinal tract. Individuals with *T. solium* adult tapeworms may transmit cysticercosis to others.
Hymenolepsis nana	Usually asymptomatic	**RP**	Ova in rodent or human feces	Direct contact (fecal/oral)	Two to four weeks	While ova in feces		
Tetanus *Clostridium tetani*	Tetanus	**RP**		Acquired from spores in soil which germinate in wounds, devitalized tissue	One day to several months			No person-to-person transmission. Reportable Disease. See *Communicable Disease Management Protocol*. Available at: www.manitoba.ca/health/publichealth/cdc/protocol/tetanus.pdf
Tinea (Dermato-phytosis) *Trichophyton sp, Microsporom sp Malassezia furur*	Ringworm (skin, beard, scalp, groin, perineal region); athletes foot and pityriasis versicolor	**RP**	Organism in skin or hair	Direct skin-to-skin contact	Variable four to 14 days	While lesion present		May be acquired from animals, shared combs, brushes, clothing, hats, sheets and shower stalls.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Toxic shock syndrome See *Staphylococcus aureus*, Group A *Streptococcus*								
Toxocariasis (*Toxocara canis, Toxocara cati*)	Fever, wheeze, rash and eosinophilia	**RP**	Ova in dog and cat feces		Unknown			No person-to-person transmission. Acquired from contact with dogs, cats.
Toxoplasmosis (*Toxoplasma gondii*)	Asymptomatic, fever, lympha-denopathy; retinitis, encephalitis in immuno-compromised host; congenital infection	**RP**	Ingestion of contaminated food or water; cat feces.	Intrauterine transmission from mother to foetus; transplanta-tion of stem cells or organs	Five to 23 days			Acquired with contact with infected felines or soil contaminated by felines, consumption of raw meat, contaminated raw vegetables or contaminated water.
Trachoma See *Chlamydia trachomatis*								
Transmissible spongiform encephalopathy See Creutzfeld-Jacob disease								
Trench fever (*Bartonella quintana*)	Relapsing fevers and rash	**RP**	Feces of human body lice	Louse-borne	Seven to 30 days			No person-to-person transmission in the absence of lice.
Trichinosis (*Trichinella spiralis*)	Fever, rash and diarrhea	**RP**	Infected meat	Food-borne	Five to 45 days			No person-to-person transmission. Acquired from consumption of infected meat.
Trichomoniasis (*Trichomonas vaginalis)*	Vaginitis	**RP**		Sexually transmitted	Four to 20 days	Duration of infection		

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Trichuriasis (whipworm) (*Trichuris trichiura*)	Abdominal pain and diarrhea	**RP**			Unknown			No person-to-person transmission. Ova must hatch in soil to be infective.
Tuberculosis See *Mycobacterium tuberculosis*								
Tularemia (*Francisella tularensis*)	Fever and lymphadenopathy pneumonia	**RP**		Arthropod bites Direct contact with infected animals Foodborne Inhalation with infected aerosols	One to 21 days			No person-to-person transmission. Acquired from contact with infected animals. *F. tularensis* is hazardous to laboratory workers. Notify laboratory if diagnosis is suspected. Reportable Disease. *See Communicable Disease Management Protocol.* Available at: www.manitoba.ca/health/publichealth/cdc/protocol/tularemia.pdf
Typhoid/ paratyphoid fever See *Salmonella*								
Typhus fever (*Rickettsia typhi*) Endemic flea-borne typhus (*Rickettsia prowazekii*) Epidemic Louse-Borne Fever	Fever, rash	**RP**	Rat fleas	Flea-borne	From one to two weeks, commonly 12 days			No person-to-person transmission.
	Fever, rash	**RP**	Human body louse	Louse-borne	One to two weeks			Person-to-person through close personal contact, not transmitted in absence of louse

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Vaccinia	Range of adverse reactions to the smallpox vaccine (e.g., eczema vaccination, generalized or progressive vaccinia, other)	**Airborne and Contact**	Skin exudates	Direct and indirect contact	Three to five days	Until all skin lesions resolved and scabs separated	Until all skin lesions resolved and scabs separated	Vaccinia may be spread by touching a vaccination site before it has healed or by touching bandages or clothing that may have been contaminated with live virus from the smallpox vaccination site. Immunization of health care workers was stopped in 1977. Refer to *Canadian Immunization Guide (current edition),* available at: www.canada.ca/en/public-health/services/canadian-immunization-guide.html for information regarding vaccine.
Vancomycin-resistant enterococci (VRE)	Infection or colonization of any body site	**Routine Practices**	Infected or colonized secretions, excretions	Direct and indirect contact	Variable	Duration of colonization		See *Prevention and Control of Antimicrobial-Resistant Organisms.* Available at: www.manitoba.ca/health/publichealth/cdc/docs/ipc/aro.pdf See Appendix I, ARO
Vancomycin intermediate-resistant Staphylococcus aureus (VISA)	Infection or colonization of any body site	**Contact**	Infected or colonized secretions, excretions	Direct and indirect contact	Variable	Duration of colonization	As directed by ICP	Laboratory reporting to Public Health. See *Prevention and Control of Antimicrobial-Resistant Organisms.* Available at: www.manitoba.ca/health/publichealth/cdc/docs/ipc/aro.pdf See Appendix I. ARO.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Vancomycin-resistant Staphylococcus aureus (VRSA) *Theoretical, to date not reported in Canada.*	Infection or colonization of any body site	**Contact**	Infected or colonized secretions, excretions	Direct and indirect contact	Variable	Duration of colonization	As directed by ICP	Laboratory reporting to Public Health. See *Prevention and Control of Antimicrobial-Resistant Organisms.* Available at: www.manitoba.ca/health/publichealth/cdc/docs/ipc/aro.pdf See Appendix I. ARO.
Varicella-zoster virus **Varicella (chickenpox)**	Fever with vesicular rash	**Airborne and Contact**	Skin lesion drainage, respiratory secretions	Airborne, direct and indirect contact	10 to 21 days	One to two days before rash and until skin lesions have crusted May be prolonged in immuno-compromised patients	Until all lesions have crusted and dried	HCWs, roommates and caregivers should be immune to chickenpox. N95 respirator required for unknown or non-immune persons who must enter the room. Susceptible high-risk contacts should receive varicella zoster immunoglobulin as soon as possible, latest within 96 hours of exposure. Varicella zoster immunoglobulin may extend the incubation period to 28 days. Newborns: Airborne Precautions should be taken with neonates born to mothers with varicella onset less than 5 days before delivery. Prevent exposure of susceptible persons and immunosuppressed patients. Refer *to Canadian Immunization Guide (current edition),* available at: www.canada.ca/en/public-health/services/canadian-immunization-guide.html for specific information.

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Herpes zoster (shingles), Localized- (covered) Normal host	Vesicular skin lesions in dermatomal distribution	**RP**	Vesicle fluid	Direct and indirect contact	Not applicable	Not applicable	Not applicable	HCWs, roommates and caregivers should be immune to chickenpox. Exercise care when handling dressing, clothing and other materials that may be contaminated with vesicular fluid.
Herpes zoster (shingles) Localized (not covered)* Normal host	Vesicular skin lesions in dermatomal distribution	**Contact**	Vesicle fluid	Direct and indirect contact		Until all lesions have crusted and dried	Until all lesions have crusted and dried	*Would only occur in rare circumstances. HCWs, roommates and caregivers should be immune to chickenpox. Exercise care when handling dressing, clothing and other materials that may be contaminated with vesicular fluid.
Herpes zoster (shingles) Localized – Immuno-compromised host	Vesicular skin lesions in dermatomal distribution	**Airborne and Contact**	Vesicle fluid	Airborne, direct and indirect contact		Until all lesions have crusted and dried and disseminated infection is ruled out	Until 24 hours after antiviral therapy started; then Routine Practices	Localized zoster may disseminate in immunocompromised host if not treated. Refer to CDC Shingles (Herpes Zoster) for definition of dissemination (affects three or more dermatomes). Available at: www.cdc.gov/shingles/hcp/clinical-overview.html HCWs, roommates and caregivers should be immune to chickenpox. N95 respirator required for unknown immune or non-immune persons who must enter the room. Susceptible high-risk contacts should receive varicella zoster immunoglobulin as soon as possible, latest within 96 hours of exposure. Varicella zoster immunoglobulin may extend the incubation period to 28 days.
Herpes zoster (shingles) Disseminated	Vesicular skin lesions in dermatomal distribution	**Airborne and Contact**	Vesicle fluid	Airborne, direct and indirect contact		Until all lesions have crusted and dried	Until all lesions have crusted and dried	

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Varicella or herpes zoster Susceptible contact	Susceptible contact: No history of varicella illness or immunization with VZV vaccine or IgG antibodies and exposed to a person with chickenpox or disseminated zoster.	**Airborne**	Respiratory secretions	Airborne	10 to 21 days	Potentially communicable during last two days of incubation period May be prolonged in immuno-compromised patients	Eight days after first contact until 21 days after last contact with rash regardless of post-exposure vaccination (28 days if given varicella zoster immuno-globulin)	Airborne Precautions should be taken with neonates born to mothers with varicella onset less than five days before delivery. Prevent exposure of susceptible persons and immunosuppressed patients. HCWs, roommates and caregivers should be immune to chickenpox. N95 respirator required for unknown immune or non-immune persons who must enter the room. Susceptible high-risk contacts should receive varicella zoster immunoglobulin as soon as possible, latest within 96 hours of exposure. Varicella zoster immunoglobulin may extend the incubation period to 28 days.
Variola See smallpox								
Vibrio parahaemo-lyticus enteritis	Diarrhea and food poisoning	**RP**	Contaminated food, especially seafood	Foodborne	Between 12 and 24 hours; range from four to 30 hours			
Vincent's angina (trench mouth)		**RP**						

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Viral hemorrhagic fevers (Lassa, Ebola, Marburg, Crimean-Congo viruses)	Hemorrhagic fever	**Droplet and Contact** ***AGMP**	Blood and other body fluids; respiratory secretions;skin if ebola	Direct and Indirect contact Possibly Airborne if pneumonia Ebola, Lassa: Sexual contact	Lassa one to three weeks Ebola two to 21 days	As long as blood and body fluids contains virus (includes post mortum) Lassa virus may be excreted in urine for three to nine weeks after onset	Until symptoms resolve	Local public health authorities should be notified immediately. *AGMP necessary: refer to strategies to reduce aerosol generation, PART A, Section II, C, 2(c) for discussion on AGMPs and PART B., Section IV, sub-section (iii) 1(b), for strategies to reduce the risk of aerosol generation. Reportable Disease. See *Communicable Disease Management Protocol*. Available at: www.manitoba.ca/health/publichealth/cdc/protocol/ebola.pdf
West Nile (Neurological Syndrome, Non-neurological syndrome, asymptomatic)	Meningitis, encephalitis, paralysis and tremors	**RP**		Vectorborne	Two to 21 days	No person-to-person transmission		No person-to-person transmission except by blood transfusion or tissue/organ donation. Demonstrated in utero and can be transmitted by breastfeeding. Reportable Disease. See *Communicable Disease Management Protocol*. Available at: www.manitoba.ca/health/publichealth/cdc/protocol/wnvhumancaseprotocol2006.pdf
Whipworm See Trichuriasis								
Whooping cough See Pertussis								

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Yersinia enterocolitica; Y. pseudo-tuberculosis	Diarrhea and mesenteric adenitis	**ADULT: RP*** **PEDIATRIC Contact**	Feces	Direct and indirect contact (fecal/oral foodborne)	Four to six days, range one to 14 days	Duration of excretion in stool Usually two to three weeks	Duration of symptoms	*Consider Contact Precautions for incontinent adults if stool cannot be contained or for adults with poor hygiene who contaminate their environment. Pediatric precautions apply to children who are incontinent or unable to comply with hygiene. See *Communicable Disease Management Protocol*. Available at: www.manitoba.ca/health/publichealth/cdc/protocol/versiniosis.pdf
Zika *Aedes aegypti* *Aedes albopictus*	Fever, rash, headache, conjunctivitis and joint pain	**RP**	Semen, vaginal fluids, blood, cells, tissue and organs of infected individuals	Mosquito-borne, transplacental from mother to fetus, blood/blood product transfusion, donated tissue, organs, and semen of infected individuals	Three to 14 days	Three to 21 days after onset of symptoms		Transmitted primarily through the bite of infected mosquitos. Mother to child transmission, transmission by transfusion of infected blood and sexual transmission has occurred. Pregnant women are advised to avoid travel to areas with current Zika virus outbreaks or areas of risk of outbreaks. Infants born to infected mothers can have Congenital Zika Syndrome. Donors with a history of travel outside of Canada, the continental United States and Europe will be required to wait 21 days following their return before donating blood or blood products.
Zoster See Varicella (herpes zoster)								

Microorganism	Clinical Presentation	Precautions	Infective Material	Route of Transmission	Incubation Period	Period of Communicability	Duration of Precautions	Comments
Zygomycosis (Phycomycosis) See Mucormycosis								

Appendix I - Epidemiologically Significant Organisms

Requiring Additional Precautions

Note: See recommendations for Contact Precautions for control measures (PART B., Section IV., sub-section (i).

1. Clostridioides difficile (formerly called Clostridium difficile)

Please see MHSAL *Clostridioides difficile* Infection Communicable Disease Management Protocol.

Available at:

www.manitoba.ca/health/publichealth/cdc/protocol/cdifficile.pdf

Please see PHAC *Clostridium (Clostridioides) difficile* Infection Prevention and Control Guidance for Management in Acute Care Settings. Available at:

www.canada.ca/en/public-health/services/infectious-diseases/nosocomial-occupational-infections/clostridium-difficile-infection-prevention-control-guidance-management-acute-care-settings.html

Please see PHAC *Clostridium (Clostridioides) difficile* Infection Prevention and Control Guidance for Management in Long-Term Care Settings. Available at:

www.canada.ca/en/public-health/services/infectious-diseases/nosocomial-occupational-infections/clostridium-difficile-infection-prevention-control-guidance-management-long-term-care-facilities.html

Please see Clinical Practice Guidelines for *Clostridium difficile* Infection in Adults and Children: 2017 Update by the Infectious Diseases Society of America (IDSA) and Society for Healthcare Epidemiology of America (SHEA).

Available at:

https://www.idsociety.org/globalassets/idsa/practice-guidelines/clinical-practice-guidelines-for-clostridium-difficile.pdf

2. Antimicrobial Resistant Organisms

Please see MHSAL Guidelines for the Prevention and Control of Antimicrobial Resistant Organisms. Available at:

www.manitoba.ca/health/publichealth/cdc/docs/ipc/aro.pdf

3. Viral Gastroenteritis

Noroviruses (previously called Norwalk-like viruses) are a common cause of gastroenteritis. These viruses are part of a family called caliciviruses.

Many strains of noroviruses have been implicated in outbreaks of gastroenteritis in various settings, including hospitals, LTC facilities and rehabilitation centers. Noroviruses are found in the stool or emesis of infected individuals when they are symptomatic, and up to at least three or four days after recovery. The virus is able to survive relatively high levels of chlorine and varying temperatures and can survive on hard surfaces for hours or days. The efficacy of alcohol-based handrubs against noroviruses varies with type and concentration of alcohol in the formulation, with a minimum 60 per cent (v/v) concentration of ethanol required for good activity. WHO experts recommend the use of alcohol-based handrubs during outbreaks of noroviral gastroenteritis.[4] Transmission during facility outbreaks has been documented to result from person-to-person contact affecting patients as well as HCWs. Environmental contamination may be a factor in outbreaks in health care.

The identification of outbreaks is based on clinical and epidemiological factors as there is a short incubation period with rapid onset of symptoms. In addition, diagnostic testing is technically difficult and not always readily available, except in a reference laboratory.

Please refer to the MHSAL Norovirus Public Health Fact Sheet. Available at:

www.manitoba.ca/health/publichealth/factsheets/norovirus.pdf

Rotavirus is the most common cause of nosocomial gastroenteritis in pediatric settings. Rotavirus can be a causative microbial agent of nosocomial infection not only in children but also in immunocompromised persons and the elderly.

The virus is present in extremely high concentration in the stool, thus minimal environmental contamination may lead to transmission.

4. Emerging Respiratory Infections

Acute respiratory infections of significant public health importance include infections caused by either emergence of new variants of known respiratory pathogens (e.g., novel influenza viruses, SARS, MERS-CoV, SARI) or emerging pathogens for which transmission characteristics are not yet known.

For more information, or in situations of emerging respiratory infections, refer to:

- MHSAL Communicable Disease Management Protocol-Severe Acute Respiratory Infection (SARI) and Emerging Respiratory Pathogens.

  Available at: www.manitoba.ca/health/publichealth/cdc/protocol/sari.pdf

- PHAC website for specific guidance documents.

  Available at:www.phac-aspc.gc.ca/eri-ire/index-eng.php

Appendix II - Terminal Cleaning

1. Terminal cleaning refers to the process for cleaning and disinfection of patient accommodation, which is undertaken upon discharge of any patient or on discontinuation of Contact Precautions. The patient room, cubicle or bedspace, bed, bedside equipment and environmental surfaces and sinks and bathroom should be thoroughly cleaned before another patient is allowed to occupy the space. The bed linens should be removed before cleaning begins.

2. In general, no extra cleaning techniques are required for rooms that have housed patients for whom other Additional Precautions were in place. Specific recommendations related to Additional Precautions are outlined in items 4 and 9 below.

3. Terminal cleaning should primarily be directed toward those items that have been in direct contact with the patient or in contact with the patient's excretions, secretions, blood or body fluids.

4. Housekeeping personnel should use the same precautions to protect themselves during terminal cleaning that they would use for routine cleaning. Respirators are not needed unless the room was occupied by a patient for whom there were Airborne Precautions and insufficient time has elapsed to allow clearing of the air of potential airborne microorganisms (See Appendix III).

5. All disposable items in the patient's room should be discarded.

6. Reusable items in the room should be reprocessed as appropriate to the item. Refer to the most current publication for environmental infection control.

7. Bedside tables, bedrails, commodes, mattress covers and all horizontal surfaces in the room should be cleaned with a detergent or disinfectant.

8. Carpets that are visibly soiled with patient's excretions, blood or body fluids should be cleaned promptly.

   a. Routine washing of walls, blinds and window curtains is not indicated. These should be cleaned if visibly soiled.

   b. Privacy and shower curtains should be changed.

   c. Disinfectant fogging is not a satisfactory method of decontaminating air and surfaces and should not be used.

9. Additional terminal cleaning may be required in outbreak situations where continued transmission of specific infectious agents is noted (e.g., *C. difficile,* norovirus or rotavirus). The efficacy of disinfectants being used should be assessed and if indicated, a more effective disinfectant should be selected (e.g., sporicidal). Attention should be paid to frequently touched surfaces such as doorknobs, call bell pulls, faucet handles and wall surfaces that have been frequently touched by the patient. In outbreak situations or when there is continued transmission, rooms of *C. difficile* infection patients should be decontaminated with specific cleaning agents. Refer to recommendations in the following guidelines:

   a. PHAC *Clostridium (Clostridioides) difficile* Infection Prevention and Control Guidance for Management in Acute Care Settings. Available at:

      www.canada.ca/en/public-health/services/infectious-diseases/nosocomial-occupational-infections/clostridium-difficile-infection-prevention-control-guidance-management-acute-care-settings.html

   b. PHAC *Clostridium (Clostridioides) difficile* Infection Prevention and Control Guidance for Management in Long-Term Care Settings. Available at :

      www.canada.ca/en/public-health/services/infectious-diseases/nosocomial-occupational-infections/clostridium-difficile-infection-prevention-control-guidance-management-long-term-care-facilities.html

Appendix III – Time Needed (by number of air changes per hour) to Remove Airborne Microorganisms after Generation of Infectious Droplet Nuclei has Ceased

Air Changes Per Hour (ACH) and Time in Minutes Required for Removal Efficiencies of 99 per cent or 99.9 per cent of Airborne Contaminants*

Minutes required for a removal efficiency:+

Air Changes Per Hour	99%	99.9%
2	138	207
4	69	104
6	46	69
8	35	52
12	23	35
15	18	28
20	14	21
50	6	8
400	<1	1

* This table can be used to estimate the time necessary to clear the air of airborne *Mycobacterium tuberculosis* after the source patient leaves the area or when aerosol-producing procedures are complete.

+Time in minutes to reduce the airborne concentration by 99 per cent or 99.9 per cent.

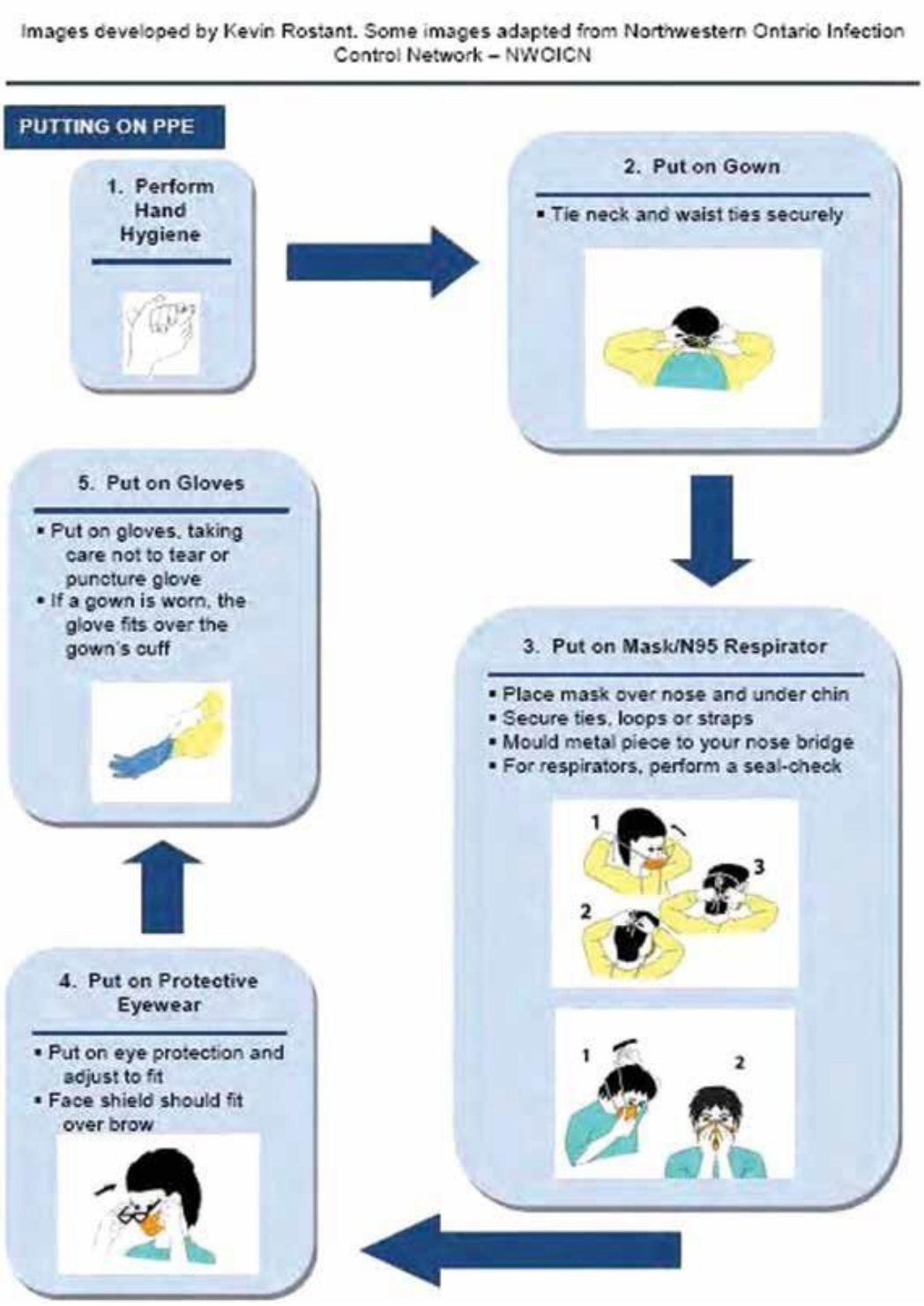
Source:

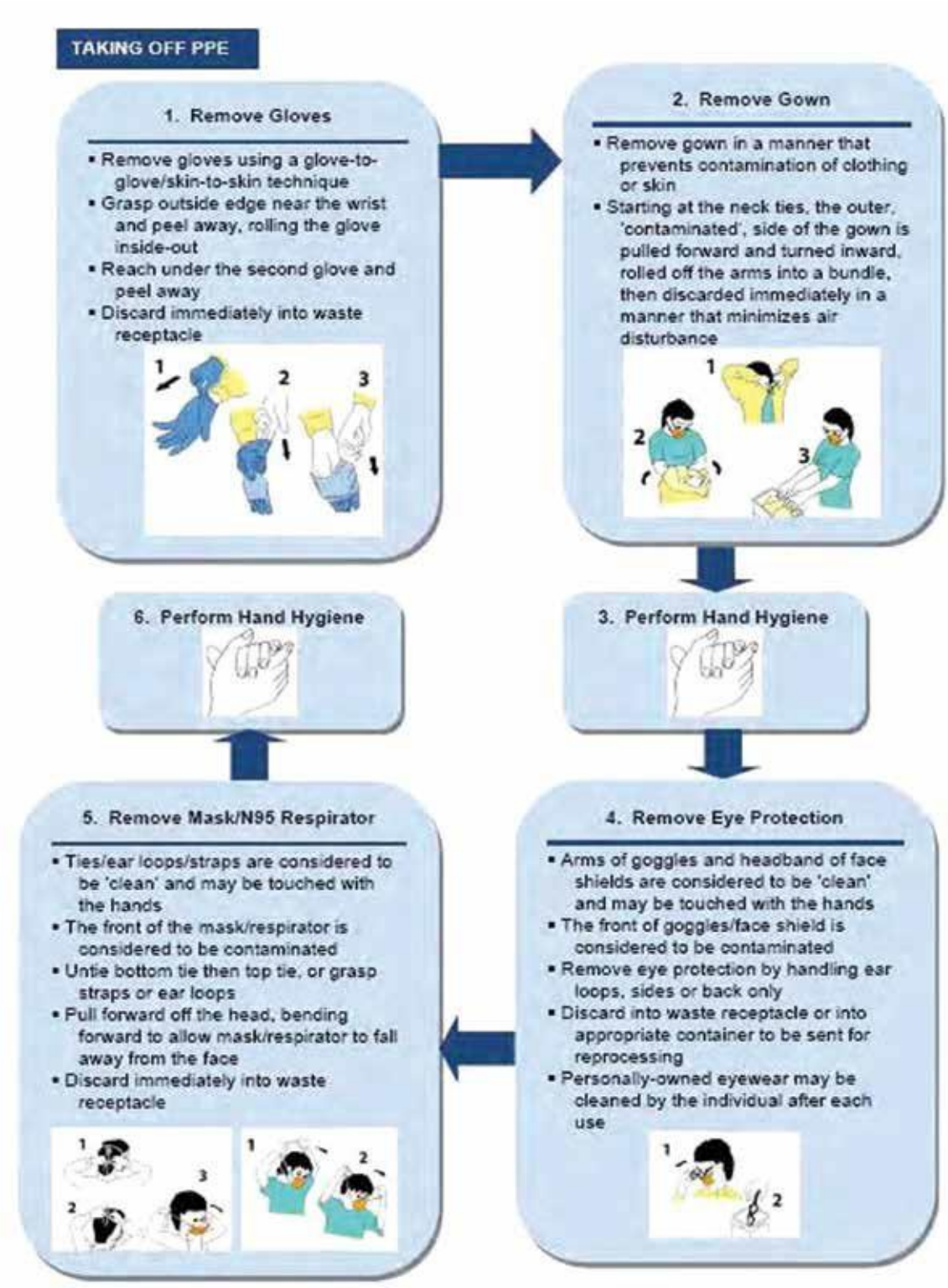
Adapted from *Canadian Tuberculosis Standards*, 7th Edition. Public Health Agency of Canada. February 2014.

Adapted from *Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health care Settings.* Centers for Disease Control and Prevention. *MMWR* 2005;54(No. RR-17):1-144.

Appendix IV – Technique for Putting On and Taking off PPE

Images used with permission from the Ontario Ministry of Health and Long Term Care





Additional optional opportunities for hand hygiene include:

*between steps 1 and 2

*between steps 4 and 5, and before leaving the care area

Appendix V – Elements that Comprise Contact Precautions

In addition to Routine Practices, the following are elements that comprise Contact Precautions

<table>
<tr><th>Element</th><th>Acute Care</th><th>Long Term Care</th><th>Ambulatory/
Clinic Setting</th><th>Home Health Care</th></tr>
<tr><td colspan="5">CONTACT PRECAUTIONS</td></tr>
<tr><td rowspan="4">Accommodation</td><td colspan="3">Door may be open</td><td rowspan="4">No restrictions on accommodations</td></tr>
<tr><td>Single room with designated toilet and sink for patient</td><td colspan="2">Placement is on a case-by-case basis</td></tr>
<tr><td>Remain in room unless required for diagnostic, therapeutic or ambulation purposes</td><td>Not required to remain in room unless symptomatic</td><td>Identify patients who require precautions</td></tr>
<tr><td>May go or be taken outside the facility, but cannot visit other patient rooms</td><td></td><td>Encourage patient to perform hand hygiene on entering the setting</td></tr>
<tr><td>Signage</td><td colspan="3">Yes</td><td>Not applicable</td></tr>
<tr><td>Gloves</td><td>For all activities in the room or bed space</td><td colspan="3">For direct hands-on care
If direct contact with frequently touched environmental surfaces is anticipated</td></tr>
<tr><td>Gown</td><td>For all activities where skin or clothing will come in contact with the patient or the patient's environment</td><td colspan="3">For direct hands-on care</td></tr>
<tr><td rowspan="2">Equipment and items in the environment</td><td colspan="3">Dedicate if possible</td><td>Routine Practices</td></tr>
<tr><td colspan="2">Chart (paper or mobile electronic) should not be taken into the room
Clean and disinfect shared items between use</td><td>Cover examination tables with a clean sheet prior to use</td><td></td></tr>
<tr><td rowspan="3">Environmental cleaning</td><td colspan="3">C. difficile and ARO rooms require additional cleaning</td><td rowspan="3">Routine household cleaning</td></tr>
<tr><td colspan="3">Routine cleaning for all other rooms</td></tr>
<tr><td colspan="3">Remove and launder all curtains (privacy, window, shower) when visibly soiled and on terminal cleaning</td></tr>
<tr><td>Transport</td><td colspan="3">Health care workers wear gloves and gown for direct contact with the patient during transport
Clean and disinfect equipment used for transport after use</td><td>Not applicable</td></tr>
<tr><td>Communication</td><td colspan="4">Effective communication regarding precautions must be given to patient, families, other departments, other facilities and transport services prior to transfer</td></tr>
</table>

Source: Adapted from Ontario Ministry of Health and Long Term Care; PIDAC, adapted from *Routine Practices and Additional Precautions in all Health Care Settings,* November 2012

Appendix VI – Elements that Comprise Droplet Precautions

In addition to Routine Practices, the following are elements that comprise Droplet Precautions

<table>
<tr><th>Element</th><th>Acute Care</th><th>Long Term Care</th><th>Ambulatory/ Clinic Setting</th><th>Home Health Care</th></tr>
<tr><td colspan="5">DROPLET PRECAUTIONS</td></tr>
<tr><td rowspan="2">Accommodation</td><td colspan="3">Door may be open
Patient to remain in room or bedspace</td><td>Discuss feasibility of spatial separation with patient (e.g., how to separate the patient from the others when the patient will be sleeping).</td></tr>
<tr><td>Single room designated toilet and sink for patient preferred.
Remain in room unless required for diagnostic, therapeutic or ambulation purpose.
If not available perform risk assessment to determine placement. Cohorting of those who are confirmed to have the same infectious agent may be acceptable.
Ensure that patients have two metres spatial separation and draw privacy curtain.
Ensure Droplet Precautions can be applied in nursery settings.</td><td>Perform point of care risk assessment to determine placement.
If a two metre separation is not possible, manage the patient in their bed space with privacy curtain drawn.</td><td>Triage the patient away from waiting area to a single room as soon as possible or maintain a two metre spatial separation.
The patient is to wear a mask for the duration of the visit and perform hand hygiene.</td><td></td></tr>
<tr><td>Signage</td><td colspan="3">Yes</td><td>Not applicable</td></tr>
<tr><td>Facial Protection
Mumps
Rubella</td><td colspan="4">Yes, within two metres of patient
Immune health care workers should provide direct care to patients. Facial protection is not required if immune. Facial protection required for unknown immune or non-immune HCWs who must enter the room.</td></tr>
<tr><td rowspan="2">Equipment and items in the environment</td><td colspan="2">Dedicate if possible</td><td colspan="2">Routine Practices</td></tr>
<tr><td colspan="3">Chart (paper or mobile electronic) should not be taken into the room. Clean and disinfect shared items (e.g., wheelchair, commode).</td><td>Routine household cleaning practices</td></tr>
<tr><td>Environmental Cleaning</td><td colspan="4">Routine cleaning</td></tr>
<tr><td rowspan="2">Transport</td><td colspan="4">Patient to wear a mask during transport</td></tr>
<tr><td>Limit transport unless required for diagnostic or therapeutic procedures transport</td><td></td><td></td><td>Not applicable</td></tr>
<tr><td>Communication</td><td colspan="4">Effective communication regarding precautions must be given to patient families, other departments, other facilities and transport services prior to transfer.</td></tr>
</table>

Source: Adapted from the Ontario Ministry of Health and Long Term Care, PIDAC, *Routine Practices and Additional Precautions in All Health Care Settings*, November 2012

Appendix VII – Elements That Comprise Airborne Precautions

In addition to Routine Practices, the following are elements that comprise Airborne Precautions

<table>
<tr><th>Element</th><th>Acute Care</th><th>Long Term Care</th><th>Ambulatory/ Clinic Setting</th><th>Home Health Care</th></tr>
<tr><td colspan="5">AIRBORNE PRECAUTIONS</td></tr>
<tr><td>Accommodation</td><td colspan="2">Airborne infection isolation room or transfer as soon as possible when AIIR becomes available.
If unavailable, place patient in a single room with door closed pending availability of an AIIR. Patient to wear a mask if feasible.</td><td>Airborne infection isolation room if available or alternate arrangements if necessary</td><td>Not applicable</td></tr>
<tr><td>Signage</td><td colspan="3">Yes</td><td>Not applicable</td></tr>
<tr><td rowspan="2">N95 Respirator
TB
Measles
Varicella</td><td colspan="2">Required for entry to room</td><td>For duration of visit</td><td>Required for entry to patient’s home</td></tr>
<tr><td colspan="4">Only immune health care workers should enter room. N95 respirator not required if immune. N95 respirator required for unknown immune or non-immune HCWs who must enter the room.</td></tr>
<tr><td>Equipment and Items in the environment</td><td colspan="4">As per Routine Practices</td></tr>
<tr><td>Environmental Cleaning</td><td colspan="3">Routine cleaning</td><td>Routine household cleaning</td></tr>
<tr><td rowspan="2">Transport</td><td colspan="3">Patient to wear a mask during transport
Transport staff to wear an N95 respirator during transport</td><td rowspan="2">Not applicable</td></tr>
<tr><td>Limit transport unless required for diagnostic or therapeutic procedure</td><td colspan="2"></td></tr>
<tr><td>Communication</td><td colspan="4">Effective communication regarding precautions must be given to patient families, other departments, other facilities and transport services prior to transfer.</td></tr>
</table>

Source: Adapted from the Ontario Ministry of Health and Long Term Care, PIDAC, *Routine Practices and Additional Precautions in All Health Care Settings,* November 2012

Appendix VIII – Elements That Comprise Droplet and Contact Precautions

In addition to Routine Practices, the following are elements that comprise Droplet and Contact Precautions

<table>
<tr><th>Element</th><th>Acute Care</th><th>Long Term Care</th><th>Ambulatory/ Clinic Setting</th><th>Home Health Care</th></tr>
<tr><td colspan="5">DROPLET AND CONTACT PRECAUTIONS</td></tr>
<tr><td rowspan="2">Accommodation</td><td colspan="3">Door may be open
Patient to remain in room or bedspace</td><td>Discuss feasibility of spatial separation with patient (e.g.,how to separate the patient from others when the patient will be sleeping)</td></tr>
<tr><td>Single room, designated toilet and sink for patient
Remain in room unless required for diagnostic, therapeutic or ambulation purposes
If not available, perform risk assessment to determine placement
Cohorting of those who are confirmed to have the same infectious agent may be acceptable
Ensure that patients have two metres spatial separation and draw privacy curtain
Ensure Droplet Precautions can be applied in nursery settings</td><td>Perform point of care risk assessment to determine placement
Not required to remain in room unless symptomatic
If a two metre separation is not possible, manage the patient in their bed space with privacy curtain drawn</td><td>Identify patients who require precautions
Triage patient away from waiting area to a single room as soon as possible or maintain a two metre spatial separation
Patient to wear a mask for duration of visit and perform hand hygiene</td><td></td></tr>
<tr><td>Signage</td><td colspan="3">Yes</td><td>Not applicable</td></tr>
<tr><td>Facial Protection</td><td colspan="4">Yes, within two metres of patient</td></tr>
<tr><td>Gloves</td><td>For all activities in the room/bed spaces</td><td colspan="3">For direct hands-on care If direct contact with frequently touched environmental surfaces is anticipated</td></tr>
<tr><td>Gowns</td><td colspan="2">For all activities where skin or clothing will come in contact with the patient or the patient's environment</td><td colspan="2">For direct hands-on care</td></tr>
<tr><td rowspan="2">Equipment and items in the environment</td><td colspan="3">Dedicate if possible</td><td rowspan="2">Routine Practices</td></tr>
<tr><td colspan="2">Chart (paper or mobile electronic) should not be taken into the room. Clean and disinfect shared equipment after use.</td><td>Cover examination table with a clean sheet prior to use.</td></tr>
<tr><td>Environmental Cleaning</td><td colspan="3">Routine cleaning
Remove and launder all curtains (privacy, window and shower) when visibly soiled and on terminal cleaning</td><td>Routine household cleaning</td></tr>
<tr><td rowspan="4">Transport</td><td colspan="4">Patient to wear a mask during transport</td></tr>
<tr><td colspan="3">Limit Transport unless required for diagnostic or therapeutic procedures</td><td>Not applicable</td></tr>
<tr><td colspan="3">Health care workers wear gloves and gown for direct contact with the patient during transport</td><td>Not applicable.</td></tr>
<tr><td colspan="3">Clean and disinfect equipment used for transport after use.</td><td></td></tr>
<tr><td>Communication</td><td colspan="4">Effective communication regarding precautions must be given to patient families, other departments and transport services prior to transfer.</td></tr>
</table>

Source: Adapted from the Ontario Ministry of Health and Long Term Care, PIDAC, *Routine Practices and Additional Precautions in All Health Care Settings*, November 2012

Appendix IX – Elements that Comprise Airborne and Contact Precautions

In addition to Routine Practices, the following are elements that comprise Airborne and Contact Precautions

<table>
<tr><th>Element</th><th>Acute Care</th><th>Long Term Care</th><th>Ambulatory/
Clinic Setting</th><th>Home Health Care</th></tr>
<tr><td colspan="5">AIRBORNE AND CONTACT PRECAUTIONS</td></tr>
<tr><td>Accommodation</td><td colspan="3">Airborne infection isolation room or transfer as soon as possible when AIIR becomes available.
If unavailable, place patient in a single room with door closed pending availability of an AIIR. Patient to wear a mask if feasible.</td><td>Not applicable</td></tr>
<tr><td>Signage</td><td colspan="3">Yes</td><td>Not applicable</td></tr>
<tr><td rowspan="2">N95 Respirator

Varicella</td><td colspan="2">Required for entry to room</td><td>For duration of visit</td><td>Required for entry to patient’s home</td></tr>
<tr><td colspan="4">Only immune health care workers should enter room
N95 respirator not required if immune
N95 respirator required for unknown immune or non-immune HCWs who must enter the room</td></tr>
<tr><td>Gloves</td><td>For all activities in the room/bed space</td><td colspan="3">For direct hands-on care
If direct contact with frequently touched environmental surfaces is anticipated</td></tr>
<tr><td>Gown</td><td>For all activities where skin or clothing will come in contact with the patient or the patient’s environment</td><td colspan="3">For direct hands-on care</td></tr>
<tr><td rowspan="2">Equipment and items in the environment</td><td colspan="3">Dedicate if possible</td><td rowspan="2">Routine Practices</td></tr>
<tr><td colspan="2">Chart (paper or mobile electronic) should not be taken into the room
Clean and disinfect shared items between use</td><td>Cover examination tables with a clean sheet prior to use</td></tr>
<tr><td rowspan="2">Environmental Cleaning</td><td colspan="3">Routine cleaning for rooms</td><td rowspan="2">Routine household cleaning</td></tr>
<tr><td colspan="3">Remove and launder all curtains (privacy, window, shower) when visibly soiled and on terminal cleaning</td></tr>
<tr><td rowspan="3">Transport</td><td colspan="3">Patient to wear a mask during transport
Transport staff to wear a N95 respirator during transport</td><td rowspan="3">Not applicable</td></tr>
<tr><td>Limit transport unless required for diagnostic or therapeutic use</td><td colspan="2"></td></tr>
<tr><td colspan="3">Health care workers wear gloves and gown for direct contact with the patient during transport
Clean and disinfect equipment used for transport after use</td></tr>
<tr><td>Communication</td><td colspan="4">Effective communication regarding precautions must be given to patient, families, other departments, other facilities and transport services prior to transfer</td></tr>
</table>

Source: Adapted from Ontario Ministry of Health and Long Term Care; PIDAC, adapted from *Routine Practices and Additional Precautions in all Health Care Settings*, November 2012.

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