

INFECTION PREVENTION AND CONTROL GUIDELINES FOR AUDIOLOGY

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INTERORGANIZATIONAL GROUP FOR SPEECH-LANGUAGE PATHOLOGY AND AUDIOLOGY

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Update and Review

It is recommended that the contents of this document be reviewed and updated every three years, or as required based on substantial changes in accepted infection prevention and control practice.

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INTRODUCTION

Infection prevention and control (IPC) in audiology practice refers to “*the conscious management of the clinical environment for purposes of minimizing or eliminating the potential spread of disease.*”¹ IPC strategies are designed to protect clients,^{*} health care providers and the community. Research has shown that health care associated infections cause significant morbidity and mortality, and at least 30% of health care related infections can be prevented by following IPC strategies.²

Audiologists are responsible for ensuring the safety of the patients they serve. The practice of audiology necessitates a high degree of patient contact, and both the patient and the clinician are exposed to multiple environments that have been exposed to numerous patients indirectly or directly (e.g., headphones, immittance tips, electrodes, probe tubes, etc.), therefore, increasing the risk of exposure to infectious microorganisms.³

Further, hearing health care services that are provided by an audiologist are sought by a diverse population of patients differing across numerous factors such as age, socioeconomic position, pre-existing disease, history of pharmaceutical interventions, and other aspects that can influence the integrity of one’s immune system and their ability to fend off potentially infectious microorganisms, subsequently resulting in a heightened susceptibility for contracting an infection.⁽³⁾ Furthermore, although cerumen is not considered infectious unless contaminated with blood or mucous it should always be treated as an infectious substance.¹

Consequently, all audiologists and patients are possible carriers of infection, or at risk of becoming infected. Each audiologist must be accountable and responsible for ensuring IPC practices are used to maintain a safe and healthy hearing health care setting. Audiologists play a critical role in the development and maintenance of IPC programs whether they work on their own or as part of a multidisciplinary team.⁴

PURPOSE AND SCOPE

The purpose of these guidelines is to provide audiologists with succinct and practical IPC information that is applicable across clinical practice settings. These may include but are not limited to ambulatory and community clinics (including private practice settings); childcare and school settings; long term care facilities (i.e., nursing homes, homes for the aged, retirement homes, group homes); private homes; and hospital settings (i.e., nursing units and intensive care units).

This document reviews **standard**[†] or **routine precautions** and **additional precautions** of relevance to the profession. Health Canada⁵ uses the term **routine practices** to

^{*} Client/Patient: refers to an individual receiving audiological care and will be used interchangeably throughout this document.

[†] All glossary terms are identified in green bolding.

describe the system of IPC practices recommended in Canada to prevent and control transmission of **microorganisms**. According to the World Health Organization (WHO),⁴ standard or routine precautions are to be applied to all clients at all times, regardless of diagnosis or infectious status. Additional precautions, including **airborne, droplet**, and **contact precautions**, may be necessary for certain situations when routine practices alone are not sufficient to prevent transmission of disease.

This document is intended to guide clinical practice and decision-making on IPC issues. Audiologists are encouraged to reflect on their individual practice and their typical assessment and intervention procedures as they review the contents of these guidelines. In some instances the documented recommendations will already be an integral component of an audiologist's IPC practice, where in other instances, a change or shift in clinical practice may be required in order to integrate use of the IPC guidelines. Audiologists should also be aware of and comply with employer and/or agency policies, occupational health and safety legislation, and any additional provincial standards related to IPC, where they exist.

GUIDING PRINCIPLES

1. IPC strategies are designed to protect clients, audiologists, other service providers, and the community.⁶
2. **Health care associated infections** can be prevented and/or minimized by following IPC strategies.⁶
3. Audiologists follow IPC practices at all times and use critical thinking and problem solving in managing clinical situations.⁶
4. A systematic approach to IPC requires each audiologist to play a vital role in protecting everyone who utilizes the healthcare or education systems in all their many forms.
5. Audiologists have an understanding of the following IPC core competencies required to protect their patients and themselves in their work setting:⁷
 - Understands basic microbiology and how infections can be transmitted in health care settings
 - Understands transmission based precautions
 - Understands the activities of routine practices/standard precautions
 - Understands the importance of hand hygiene/hand washing
 - Knows, selects and demonstrates appropriate Personal Protective Equipment for their jobs
 - Appreciates the difference between clean, disinfected and sterile items
 - Recognizes that reusable equipment that has been in direct contact with a patient should be cleaned and reprocessed before use in the care of another patient
 - Demonstrates critical assessment skills related to exposure to infectious agents, awareness to local outbreaks and use of infectious disease protocols
 - Understands the role of vaccines in preventing certain infections

- Knows the infectious conditions that require absence from work or work restrictions

THE SCIENCE OF INFECTION CONTROL

The Immune System

The immune system, the body's defense system, is a complex network of specialized cells, tissues and organs that has evolved to defend the body against attacks by "foreign" invaders. When functioning properly the body fights off invasions from microbes such as **bacteria, viruses, fungi** and **parasites**.⁸ Resistance to pathogenic microorganisms can vary greatly from one individual to another. Some individuals may be immune to infection or may be able to resist **colonization** by an infectious agent. Other individuals exposed to the same microorganism may become asymptomatic carriers. Still others will develop disease. Factors including, for example, age; underlying diseases; and breaks in the "first line of defense" (e.g., factors such as surgical operations, anesthesia, or invasive procedures) may make individuals more susceptible to infection. Self care practices such as good hand hygiene, and respiratory etiquette can all reduce the risk of infection.

Patients with compromised immune systems may lack the ability to fend off infections from the aforementioned microbes that rarely cause disease or infection in healthy individuals. Harmless microbes existing throughout the environment and under the right conditions can cause serious, life-threatening illnesses in individuals with some level of immunocompromise.¹ Infections that take advantage of weakness in the immune defenses are called "opportunistic infections". From an IPC standpoint, it is crucial that audiologists understand the concept of opportunistic infection, as many of the patients the audiologist sees may be immunocompromised in some way.

Process of Infection

For infection to occur, the microbe has to have a mode of transmission and a route of transmission into a susceptible host. Mode of transmission of disease refers to the means by which a potentially infectious agent is made accessible to a susceptible host.¹ Natural orifices including the nose, eyes, and mouth are common entry points and referred to as routes of transmission. Any break in the skin such as cuts, nicks, scrapes, cracked hands are common routes for microbes to gain access to the susceptible host. Once in the body, the microbe must be able to reproduce and resist the immune system to produce disease.

Knowing the methods in which a disease is transmitted is important for implementing proper infection control measures. Each disease has transmission characteristics based on the nature of the microbe that causes it (see Table 1). The types of transmission are not mutually exclusive. Some diseases can be transmitted in more than one way.

Adapted from Infection Control in the Audiology Clinic by Bankaitis and Kemp (2005). Reprinted with permission from Auban Inc.

Table 1: Overview of infectious diseases and common microbes, microbial category of the causative or microbial agent, and associated complications relative to the hearing aid dispensing environment

Disease	Microbial Category	Complications
AIDS	virus (HIV)	wide range of opportunistic infections causing malaise, hearing disorders, systemic infection, death
<i>Aspergillus</i>	fungus	cutaneous infection
<i>Candida</i>	fungus	candidiasis, cutaneous disease of the skin and nails, mucousal infection of the oral, esophageal, bronchial, and/or vaginal surfaces, systemic infection, meningitis, endocarditis, pulmonary infection
Chicken pox	virus	conjunctivitis, shingles, encephalitis
Coag neg <i>staphylococcus</i>	bacterium	folliculitis, furuncles, boils, carbuncles, bacteremia, endocarditis, pneumonia, osteomyelitis
Common cold	virus	cough, occasional low-grade fever, malaise
Cytomegalovirus	virus	mild flu-like symptoms, moderate to severe generalized infection, liver or spleen damage, sensorineural hearing loss, visual impairment, cognitive dysfunction
Hepatitis B (HBV)	virus	flu-like symptoms, jaundice, fever, liver damage, death
Herpes simplex	virus	herpetic conjunctivitis, pain, discomfort, suppurative inflammation of digits
Herpes zoster	virus	painful vesicular eruptions, discomfort
Influenza	virus	respiratory infection, fever, chills, headache, myalgia, cough, sore throat
Otitis externa	bacterium, fungus	itchy, dry ear canal skin, redness, edema, pain
<i>Pseudomonas aeruginosa</i>	bacterium	bacteremia, endocarditis, chronic otitis externa, malignant otitis, otitis externa, pulmonary infections, eye infections
SARS	Prion (virus)	fever, headache, body aches, discomfort, dry cough, respiratory distress, death
<i>Staphylococcus aureus</i>	bacterium	folliculitis, furuncles, boils, carbuncles, bacteremia, endocarditis, pneumonia, osteomyelitis
Streptococcal infection	bacterium	pneumonia, suppurative inflammation, endocarditis, kidney problems
Tuberculosis	bacterium	persistent, dry cough, chronic lung infection, malaise, weakness, loss of appetite, weight loss, fever, chills, night sweats

The list in Table 1 is not exhaustive. As new infectious agents, such as the H1N1 influenza virus are identified health care practitioners must remain current with these agents, their symptoms and the recommended infection control practices (Public Health Agency of Canada, 2009).

There are four main modes of disease transmission: contact, vehicle, airborne, and vector borne transmission.¹

1. **Contact Transmission:** is the most frequent mode of disease transmission in the healthcare setting. It involves the spreading of disease by way of touching or

coming in contact with potentially infectious objects. Contact transmission may be direct, indirect or droplet.

- a. *Direct Contact Transmission*: type of contact transmission which requires close physical contact between an infected person and a susceptible person, and the physical transfer of microorganisms. Direct contact includes touching an infected individual, kissing, sexual contact, contact with oral secretions, or contact with body lesions. Diseases spread exclusively by direct contact are unable to survive for significant periods of time away from a host.⁹
 - b. *Indirect Contact Transmission*: refers to situations where a susceptible person is infected from contact with a contaminated surface. Some organisms are capable of surviving on a surface for an extended period of time. The microbe has already been transferred from its original resting place to a secondary surface. Frequent touch surfaces include door knobs, handrails, tables, chairs, washroom surfaces, computers, office supplies and toys.⁹ Any touch surface that cannot be easily cleaned and disinfected should be discouraged.
 - c. *Droplet Contact Transmission*: diseases can be transferred by infected droplets contacting surfaces of the eye, nose, or mouth directly or indirectly. Droplets containing microbes can be generated when an infected person coughs, sneezes, or talks. Droplets are too large to be airborne for long periods of time, and quickly settle out of the air.⁹ They are generally larger than 5 microns and propelled short distances, less than one meter.¹⁰ Measles and SARS are examples of diseases capable of droplet contact transmission.⁹ Respiratory etiquette is an important consideration in order to prevent the spread of droplet secretions.
2. **Vehicle Transmission**: occurs when disease is spread through ingestion of or exposure to contaminated substances, via food, water, blood or body substances. The ingestion of food contaminated with Salmonella, resulting in food poisoning is one example of vehicle transmission. Another example is when supplies of blood and blood products for transfusion services in many nations were contaminated by HIV (human immunodeficiency virus) and hepatitis viruses.⁹
 3. **Airborne Transmission**: refers to situations where residue from evaporated droplets or dust particles containing microbes can remain suspended in the air.⁹ This residue can remain suspended in the air for long periods of time and are spread by air currents within a room or over a long distance. These organisms must be capable of surviving long periods of time outside the body and must be resistant to drying.⁹ Airborne transmission allows organisms to enter the upper and lower respiratory tracts. Diseases that are capable of airborne transmission include influenza, whooping cough, pneumonia, tuberculosis, measles and chickenpox.⁹ While environmental controls (e.g., appropriate ventilation systems and air handling) are especially important with regard to airborne transmission, a

hierarchy of controls is recommended. This hierarchy includes the use of **personal protective equipment**.

4. **Vectorborne Transmission:** vectors are animals or insects that carry disease and are capable of transmitting disease by interacting with a susceptible host. Examples of vectors are flies, mites, fleas, and dogs.⁹ The most common vector for disease is the mosquito for malaria, West Nile virus, and yellow fever and through infected ticks for Lyme Disease.^{9, 11} Vectors are mobile and therefore increase the transmission range of a disease.

PRECAUTIONS

Standard Precautions or Routine Practices

As mentioned previously, standard or routine precautions are to be applied to all clients at all times, regardless of diagnosis or infectious status.⁴ They are the minimum practice standard or activity that is expected.⁷

The elements classified as standard precautions/routine practices include:

- Hand hygiene
- Risk assessment related to client symptoms, care and service delivery, including screening for infectious diseases, fever, respiratory symptoms, rash, diarrhea, excretions and secretions
- Risk reduction strategies such as promoting use of respiratory etiquette, client accommodation, and use of personal protective equipment, etc.
- Environmental cleaning, disinfection, and sterilization of multiple and single use equipment and high touch surfaces
- Laundry and waste management
- Sharps injury prevention and post exposure management
- Healthy workplace practices including the education of audiologists, clients, their families, and other staff regarding recommended immunizations and when to stay home from work

The Canadian Committee on Antibiotic Resistance (CCAR)² (<http://www.ccar-ccra.com/english/pdfs/IPC-BestPractices-June2007.pdf>) offers fact sheets outlining many of the standard or routine precautions listed above. These are available for public use and may be reprinted without special permission (unless otherwise noted).

Standard or routine precautions are asterisked (*) to indicate the availability of a fact sheet at the attached hyperlink. Appendix B of this document, *Sample Audit Tool for Implementation of IPC Practices* (adapted from CCAR documents), also provides a checklist of routine practices to be implemented by audiologists in their clinical environments.

Additional Precautions

Additional precautions may be necessary for certain situations when routine practices are not sufficient to prevent transmission, such as patients with highly infectious diseases or who are colonized with antibiotic resistant organisms (e.g., tuberculosis, measles, MRSA). Additional precautions must be instituted as soon as indicated by triggering mechanisms such as case history, diagnosis, symptoms of infection, and laboratory information. There are three categories of additional precautions based on mode of transmission: airborne, contact and droplet. It is recommended that health care providers consult with an infection control practitioner within their health organization, or their nearest Centre for Disease Control to determine when additional precautions are required and how these should be implemented.

STANDARD PRECAUTIONS OR ROUTINE PRACTICES

Hand Hygiene

Hand hygiene* is the single most important way to prevent infection. Refer to the World Health Organization (2009) document entitled WHO Guidelines on Hand Hygiene in Health Care¹² (http://whqlibdoc.who.int/publications/2009/9789241597906_eng.pdf) for a comprehensive review of this area.

Audiologists should perform hand hygiene:

- Before and after direct client care
- Between “dirty” and “clean” activities with the same client (e.g., immediately after cerumen removal and before audiometry)
- Immediately after touching body fluids or any contaminated items in the immediate environment
- Immediately after removing personal protective equipment such as gloves (e.g., after performing cerumen management)
- Prior to and after eating or smoking
- Prior to and after the application of cosmetics, lip balm or adjustments to contact lenses
- After handling money or other items that may be contaminated
- After personal body functions, such as using the toilet or blowing one’s nose
- Immediately if skin is contaminated and/or injury occurs
- At the end of a workday

Audiologists should encourage clients to perform hand hygiene at the beginning of their appointment, prior to handling any assessment and/or rehabilitation materials, or when transitioning between “dirty” and “clean” activities.

Alcohol-based hand rubs are recommended to decontaminate hands in clinical situations when ***hands are not visibly soiled***. It is recommended that they contain a minimum of 60% ethanol (ethyl alcohol).

Hand Rub Technique:

- Remove hand and arm jewellery
- Apply between 1 to 2 full pumps of product, or a loonie-sized amount onto one palm.
- Spread product over all surfaces of hands, concentrating on finger tips, between fingers, back of hands, and base of thumbs
- **Rub hands until product is dry. This will take 15-20 seconds if an adequate amount of product has been used. The entire hand rub technique process should take approximately 20-30 seconds in total.**

Hand washing must be performed when *hands are visibly soiled*. A disposable pump dispenser is recommended in all settings except for individual client/resident personal use, where bar soap is also considered acceptable. Antibacterial soaps may be used in critical care areas such as Intensive Care Units (ICU) or in areas where invasive procedures are performed.

Hand Washing Technique:

- Remove hand and arm jewellery
- Wet hands with warm water (hot water will lead to dryness)
- Apply soap
- Vigorously rub all aspects of your hands **for a minimum of 15 seconds**, paying particular attention to finger tips, between fingers, backs of hands and base of thumbs
- Rinse and dry hands thoroughly by blotting gently so as not to damage the skin
- Turn off taps with paper towel, if available

Soaps, antimicrobial agents, and extra hand washing can be hard on the hands. To maintain skin integrity it is important to use hand lotion.

Risk Assessment

Risk assessment* is the process of systematically evaluating risks to safety and health.¹³ A risk assessment procedure includes the following:

Step one: Identifying hazards and those at risk:

- From a specific interaction (e.g., face-to-face interaction with a client, transport of a client, etc.)
- With a specific client (e.g., infants, clients with respiratory illness, etc.)
- In a specific environment (e.g., classroom, private home, therapy room, etc.)

Step two: Evaluating and prioritizing risks:

- Estimate the risks regarding severity and probability of causing harm

Step three: Deciding on preventive action to eliminate or control the risks

Step four: Taking action to put preventive and protective measures in place

Step five: Monitoring and reviewing

The same process would apply to decision-making regardless of the practice setting.

Audiologists should be prepared to ask a few simple questions in the clinic setting to confirm whether or not assessment and/or aural rehabilitation should proceed, and/or whether standard and/or additional precautions are required. Questions regarding communicable diseases (such as coughs, fevers, rashes, diarrhea, and eye infections) should be included as part of the screening. Questions regarding recent exposures to infectious disease such as chickenpox or tuberculosis and recent travel, depending on what is prevalent in the community, should also be asked.

Remember all body fluids are considered as possibly infectious. Body fluids include blood, drainage from scrapes and cuts, feces, urine, vomit, nasal discharge, and saliva. Cerumen is not considered infectious unless contaminated with blood or mucous. The colour and viscosity of cerumen, however, makes it difficult to detect the presence of such bodily fluids, particularly if the material is clear like mucous or dark-coloured like dried blood. Due to the potential for contamination, cerumen should always be treated as an infectious substance.¹

Information regarding when to stay at home or cancel an appointment should be provided to prospective clients at the time of initial booking. A script could include the following:

If you/your child have symptoms of fever and cough, diarrhea, rash, or untreated eye infections within 24 hours of your appointment, please let this office know before the scheduled appointment. Visits can be re-scheduled due to illness.

A sample screening poster and screening questionnaire for febrile respiratory illness are available on pages 29-30 of The Canadian Committee on Antibiotic Resistance (CCAR) (2007) document (<http://www.ccar-ccra.com/english/pdfs/IPC-BestPractices-June2007.pdf>).

Audiologists should also be aware of health and travel alerts regarding exposure to infectious diseases including pandemics. They would be advised to follow the guidelines put forth by the Ministry(ies) of Health related to specific situations.

Risk Reduction Strategies

Risk reduction strategies must be implemented once the risk assessment has been completed. Strategies such as hand hygiene, respiratory etiquette, accommodation, use of personal protective equipment (PPE), cleaning and disinfection or sterilization of equipment are all considered risk reduction strategies as their implementation will reduce the risk of infection transmission.

Respiratory Etiquette

Respiratory etiquette* involves measures to contain respiratory secretions for all individuals with signs and symptoms of a respiratory infection. They include the following:

- Cover nose/mouth when coughing or sneezing – cough into elbow or sleeve. Never use your hand!
- Use tissues to contain respiratory secretions and dispose of them in nearest waste receptacle after use.
- Perform hand hygiene (e.g., hand washing or use alcohol-based hand rub) after having contact with respiratory secretions and contaminated objects.

Patients should be prompted to self-assess when booking appointments and should be educated about respiratory etiquette.

A sample respiratory etiquette poster is available on page 31 of the The Canadian Committee on Antibiotic Resistance (CCAR) (2007) document² (<http://www.ccar-ccra.com/english/pdfs/IPC-BestPractices-June2007.pdf>).

Client Accommodation

In acute and residential care settings, patients should be assigned to single rooms if they are likely to contaminate the environment and transmit infection. In outpatient settings, patients may be seated in a separate waiting room while they await their appointment or rescheduled if they are likely to contaminate the environment and transmit infection.

Maintaining a 1 to 2 metre distance from a client is recommended until an initial screening can be completed. Sitting beside the client rather than across from them is preferred.

Personal Protective Equipment

Barriers or personal protective equipment PPE* are required whenever there is a risk of coming in contact with non-intact skin, mucous membranes or body fluids. PPE may serve to protect the audiologist and/or may serve to protect the client when the audiologist presents with non-intact skin, or a respiratory virus or infection.

For audiologists, common situations that may require the use of PPE would include:

- if ear drainage, blood, sores or lesions (on the scalp) are evident
- when the audiologist's skin or client's skin is broken
- handling of earmolds or hearing aids directly from patients
- the removal or handling of earmold impressions
- performance of cerumen management
- cleaning or disinfecting instruments contaminated with cerumen
- any audiological services provided in environments where additional precautions have been identified (i.e., a client with C-difficile in a hospital setting, additional airborne or droplet precautions in a long term care facility, etc.)
- handling dirty laundry or waste materials

- cleaning up spills of body fluids or when disinfecting a contaminated area
- when dealing with immunocompromised clients

Gloves are the most commonly worn PPE. They do not replace good hand hygiene; however, they should be worn when there is a risk of coming in contact with non-intact skin, mucous membranes, or body fluids. Gloves are not required for routine care activities in which contact is limited to intact skin. Gloves are available in a variety of sizes and should fit tightly to one's skin to prevent any interference when performing audiological procedures. Glove material should be chosen based on the risks for which they are being worn (e.g., vinyl for personal care, latex for sterile invasive procedures, nitrile for exposure to chemicals). Single use disposable gloves must not be reused or washed. Gloves should be located in the labs, sound suite, hearing aid fitting rooms and available in different sizes.

Remove or change gloves and perform hand hygiene when:

- moving between dirty and clean procedures, even on the same client (e.g., following cerumen management and moving on with audiometry)
- after contact with contaminated items

Gloves should be removed immediately after completion of the procedure at point of use and before touching clean environmental surfaces.

Proper procedure for removal of gloves is as follows:

- With both hands gloved, grasp the outside of one glove at the top of your wrist.
- Peel off this first glove, peeling away from your body and from wrist to fingertips, turning the glove inside out.
- Hold the glove you just removed in your gloved hand.
- With your ungloved hand, peel off the second glove by inserting your fingers inside the glove at the top of your wrist.
- Turn the second glove inside out while tilting it away from your body, leaving the first glove inside the second.
- Dispose of the entire bundle promptly in a waterproof garbage bag. **Do not reuse!**
- Wash your hands thoroughly as soon as possible after removing gloves and before touching any objects and surfaces.

Adapted from: Occupational *Health & Safety Agency for Healthcare in BC (OHSAH)* (2008) Home and Community Care Risk Assessment Tool: Resource Guide¹⁴ (<http://www.ohsah.bc.ca/552/3415/>)

Masks, eye protectors, and face shields are used to protect the audiologist's nose, mouth, and eyes from splashes and/or sprays of potentially infectious materials, or when the audiologist or client is at risk of airborne contamination.¹² Likewise, they can be used to protect a client. The use of this protective apparel would be considered droplet precautions, as the microbe carrying droplets can land on mucous membranes of the mouth and nose or contaminate the conjunctiva of the eyes, all of which are

portals for infection. Splashes and sprays can occur when a client is coughing or sneezing or during procedures such as using a buffing or grinding wheel.

Fit-tested masks (e.g., N95 masks) are used when airborne precautions are indicated. The audiologist must be 'fit tested' in order to ensure that the mask fits tightly to the face and filters airborne organisms. A fit-tested mask is worn when:

- the client has a known or suspected airborne infection (e.g., tuberculosis, chickenpox, measles, hantavirus)
- performing aerosolizing procedures with a client with droplet infection (e.g., open suctioning)
- there is a health alert that requires use of a fit-tested mask

Masks and eye protection should be worn within 1 to 2 metres of the coughing or sneezing client in order to prevent the transmission of microorganisms. Eyes should be covered from all directions.

Gowns are recommended to be worn anytime the chance of contamination to clothing exists. Gowns should be discarded immediately after completion of the procedure at the point of use. One example of when an audiologist should don a gown would be during vestibular assessments to protect the audiologist in case the patient becomes ill.

The proper sequence for donning PPE is as follows:

1. gown
2. mask
3. eye protection
4. gloves

The proper sequence for removal of PPE is as follows:

1. gloves
2. gown
3. wash hands prior to removing the mask
4. mask

Refer to page 37 of The Canadian Committee on Antibiotic Resistance (CCAR) (2007)² document fact sheet entitled *The use of gowns, aprons, and lab coats* for further information (<http://www.ccar-ccra.com/english/pdfs/IPC-BestPractices-June2007.pdf>).

Table 1 from the CASLPO (2006) *Infection control for regulated professionals*¹⁵ document (<http://www.caslpo.com/Portals/0/positionstatements/InfectionControlCASLPOEDITION.pdf>) is re-produced, with adaptations, below. It provides a comprehensive summary of risk assessment and risk reduction strategies for different situations.

Table 2: Assessing the Risk**

Situation	Infection Control Strategy (escalating from least to most invasive)
Routine Client Care No physical contact Communication with client >1 metre away	<i>Routine Precautions</i> ➤ Hand washing ➤ Respiratory etiquette (cover mouth nose when coughing or sneezing, followed by proper hand washing)
Physical Contact with client intact skin	<i>Contact Precautions</i> ➤ Hand washing
Physical contact with client, <u>you or client</u> has infected or open wound, non-intact skin, no respiratory concerns	<i>Contact Precautions</i> ➤ Hand washing ➤ Gloves ➤ Proper removal and disposal of gloves followed by hand washing
Contact with client, procedure may involve body fluids, splashing (droplets)	<i>Droplet Precautions</i> ➤ Hand washing ➤ Use professional judgment: Gloves Surgical Mask Eye protectors Gowns ➤ Proper removal and disposal of PPE followed by hand washing
Close contact with client, respiratory symptoms	<i>Droplet Precautions</i> ➤ Hand washing ➤ Respiratory etiquette ➤ Use professional judgment: Gloves Surgical mask for you and/or your client Eye protectors
Close contact with client, fever and respiratory symptoms	<i>Droplet Precautions</i> ➤ Hand washing ➤ Respiratory etiquette ➤ Use professional judgment: Gloves Surgical mask for you and/or your client Eye protectors ➤ Follow health alerts if applicable
Contact with client with known airborne infection e.g., active TB	<i>Airborne Precautions</i> ➤ Droplet Precautions with fit-tested mask ➤ Proper ventilation
Health Alert in effect	Follow Ministry of Health Directives

**In audiology, the practice environment may dictate the infection control strategy used in a given situation. For example, close contact with a client who has fever and/or respiratory symptoms in an acute care setting may necessitate the use of PPE. In a school or community clinic environment, PPE may be less accessible. Standard practice in these types of environments would involve re-scheduling of a client appointment until such a time as symptoms have disappeared.

Cleaning, Disinfection, and Sterilization

1. Clinical Equipment

Equipment that is reused must be reprocessed by **cleaning, disinfection** and/or **sterilization** after each patient to prevent transmission of disease and to maintain the integrity of the equipment. It is beyond the scope of this document to describe all the components of a full equipment reprocessing protocol that meets best practice standards. PIDAC (2006) Best Practices for Cleaning, Disinfection and Sterilization in All Health Care Settings¹⁶ is a comprehensive and current guide related to the areas of cleaning, disinfection and sterilization. Clinicians who are responsible for the development of reprocessing protocols are strongly encouraged to consult this document for further information.

1.1 Levels of Reprocessing:

Cleaning: 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 with water, detergents and mechanical action. Thorough and meticulous cleaning is required before any equipment/device may be decontaminated, disinfected and/or sterilized.

Disinfection: refers to the inactivation of disease-producing microorganisms¹⁷ and reduction in the number of viable microorganisms.¹⁸ The level of disinfection depends on the extent to which microbes are eliminated.¹⁹ Disinfection does not destroy all bacterial spores.¹⁷ Disinfectants are used on inanimate objects in contrast to antiseptics, which are used on living tissue.

High Level Disinfection (HLD): The level of disinfection required when processing semicritical medical equipment/devices. High level disinfection processes destroy vegetative bacteria, mycobacteria, fungi and enveloped (lipid) and non-enveloped (non-lipid) viruses, but not necessarily bacterial spores. Medical equipment/devices must be thoroughly cleaned prior to high level disinfection.

Low Level Disinfection (LLD): Level of disinfection required when processing noncritical medical equipment/devices or some environmental surfaces. Low level disinfectants kill most vegetative bacteria and some fungi as well as enveloped (lipid) viruses. Low level disinfectants do not kill mycobacteria or bacterial spores. Medical equipment/devices must be thoroughly cleaned prior to low level disinfection.

Sterilization: The level of reprocessing required when processing critical medical equipment/devices. Sterilization results in the destruction of all forms of microbial life including bacteria, viruses, spores and fungi. Equipment/devices must be cleaned thoroughly before effective sterilization can take place.

The **Spaulding Classification** is used to determine the proper level of reprocessing for clinical equipment. The Spaulding Classification defines three categories of equipment:

critical, semi-critical and **non-critical** and specifies the corresponding levels of reprocessing required for each.

Table 3: The Spaulding Classification

Category	Level of Processing/Reprocessing	Examples
Critical ➤ Items that enter sterile tissue, including the vascular system.	Cleaning followed by Sterilization	➤ Generally not applicable to audiology practice.
Semi Critical ➤ Items that come in contact with non-intact skin or mucous membranes but do not penetrate them. ➤ Items that contact cerumen are considered semi-critical due to potential contamination with blood and body fluids.	Sterilization or Disposable/Single Use is preferred. Cleaning followed by High Level Disinfection (HLD) as a minimum.	Any item entering the ear canal: Insert earphone, impedance probe tips, cures and other cerumen equipment, otoscope tips, probe tubes.
Non-critical ➤ Items that contact only intact skin or do not directly touch the client.	Cleaning followed by Low Level Disinfection (LLD)	Insert earphones (exclusive of foam tip), Bone conduction oscillator, Patient response button, Listening Stethoscope

1.3 Semi-critical Equipment

All reusable audiological equipment that is classified as semi-critical must be reprocessed by thorough pre-cleaning followed by either sterilization or high-level disinfection as a minimum. The preferred sterilization technique is heat under pressure in an autoclave. Unfortunately, most implements used by audiologists would melt under these conditions.¹⁹ Chemical solutions containing hydrogen peroxide or glutaraldehyde, often referred to as cold sterilants, are also available to achieve either sterilization or high-level disinfection. Effective sterilization and/or high level disinfection using these chemical solutions is dependent on many factors including:¹⁸

- The use of solutions classified for sterilization and/or high-level disinfection only. Products classified as intermediate or low-level disinfectants are not adequate.
- The physical properties of items being sterilized. Items must be relatively smooth, impervious to moisture, and be of a shape that permits all surfaces to be exposed to the solution.
- Adequate exposure to all surfaces, both interior and exterior. Tubing must be completely filled and the items must be clean and arranged in the solution to assure total immersion. The items must be completely submersed in the solution for the prescribed period of time.
- Use of efficient solutions. The solution must be clean and fresh. Most products come in solutions consisting of two parts that when added together form what is referred to as an "activated" solution. The shelf life of activated solutions is indicated in the instructions for commercial products. Generally, this is from one to four weeks.
- Rinsing. Instruments, implants, and tubing (both inside and out) should be rinsed with sterile saline or sterile water prior to use to avoid tissue damage.

- Integrity of reprocessing. Items must be packaged, transported and stored after reprocessing in such a way to maintain integrity until point of use.

It is strongly recommended that sterilization and/or high level disinfection be performed in a centralized area that complies with all necessary physical and human resource requirements. It is unlikely that either sterilization or high-level disinfection can be adequately achieved in a typical clinical setting. Furthermore, due to potential toxicity of cold sterilants, these solutions must be handled carefully by properly trained staff in a well-ventilated setting using appropriate personal protective equipment. **Single-usage** semi-critical equipment is therefore recommended as an alternative to reusable equipment whenever possible and especially in cases where a centralized reprocessing service is not available.

Audiological supplies should be labelled by the manufacturer or supplier as single use or re-usable. Those items labelled as single-usage should not be reprocessed. Single use items are for use with a single client only and may only be reused on that same client within a short duration of time (e.g., during the same appointment). Single use items should not be reused with the same client if there is visible discharge on them.

Available single use items include:

- Probe microphone tubes
- Plastic otoscope specula
- Plastic earmold impression syringe tips
- Insert earphone foam tips
- Single-use OAE probe tips
- Disposable ABR electrodes
- Otoblocks

The decision whether to reprocess semi-critical equipment or to use only single-use items involves risk management and cost considerations that may vary across practice settings. Therefore clinicians must carefully consider these factors when developing their site-specific reprocessing standards for semi-critical equipment.

1.4 Non-Critical Equipment

Any items or surfaces that contact only intact skin or do not directly touch patient skin are considered non-critical and can be reprocessed through cleaning followed by low-level disinfection. Low level disinfectants include quaternary ammonium compounds, 3% hydrogen peroxide, and diluted bleach (1:100). BC CDC Laboratory Services: A Guide to Selection and Use of Disinfectants, 2003

(http://www.bccdc.ca/NR/rdonlyres/EAA94ACF-02A9-4CF0-BE47-3F5817A25669/0/InfectionControl_GF_DisinfectntSelectnGuidelines_nov0503.pdf) provides further information about chemical solutions that can be used to achieve low level disinfection.

Non-critical audiological equipment that is used in direct patient care should be cleaned and disinfected between clients. This includes items such as otoscopes (excluding disposable tips), supra-aural earphone cuffs and headbands, bone conduction

oscillators and patient response buttons. Note that some low level disinfectants must remain wet for a period of three to five minutes for full action so this time must elapse before the next patient use.

2. Clinical Environment

A regular cleaning and disinfection schedule should be developed for general environmental surfaces such as countertops, floors, telephones and computer keyboards. A cleaning and disinfection checklist for audiologists, adapted from CASLPO (2006), is outlined below.¹⁵

Table 4: Cleaning and Disinfection Check List for Environmental Surfaces/General Housekeeping

Practice Considerations	What to Use	Recommendations
<ul style="list-style-type: none"> ▪ Floors ▪ Sinks ▪ Desks or countertops ▪ Storage shelves and bins ▪ Telephones, computers, credit card reader ▪ Washrooms (public and staff) ▪ Fitting/repair rooms ▪ Sound suites ▪ Toys used for assessment 	<p>*Cleaning usually involves soap and water, detergents or enzymatic agents to physically remove soil, dust or foreign material.</p> <p>*Low Level Disinfection: Quaternary Ammonium Compounds, or Iodophores, or 3% Hydrogen Peroxide, or Diluted Bleach (5mls bleach/500 mls water).</p> <p>Plush toys and reading materials (e.g. magazines, books) which are handled and cannot be laundered, should be discarded.</p>	<ul style="list-style-type: none"> ▪ Daily and when visibly soiled ▪ Clean high traffic areas more frequently (e.g., reception counter, chair in sound suite) ▪ Keep shelves and bins tidy and clean, dust free ▪ Following use or prior to use if suspected contamination ▪ Care must be taken to ensure residues from the cleaning process itself (e.g., detergents, solvents, etc.) are also removed from equipment. ▪ Consider laminating paper material used by patient/clients repeatedly during intervention so that it can be wiped with disinfectant.)

Laundry

The risk of actual disease transmission from soiled linen is negligible provided that hygienic handling, storage and processing of clean and soiled linen occurs.²

Collection and handling of linen should be completed with a minimum of agitation and shaking. Soiled linen should be placed in a laundry basket or waterproof bag (not on the floor). In home and office settings, any laundry* soiled with blood or body fluids should be handled while wearing gloves. Touching soiled linen to one's clothes or skin should be avoided. Heavily soiled linen should be rolled or folded to contain the heaviest soil in the centre of the bundle.

Laundry carts or hampers do not need to be covered from an infection prevention perspective however they should be cleaned after each use. If a cloth laundry bag is used to store or transport soiled linen, it can be washed in the same cycle as the linen contained within it.

It is impossible to *clean* laundry when organic material is present. Solid soil, feces or blood clots should be removed from linen with a gloved hand. Linens may then be

laundered together using detergent and dried in a hot air dryer to ensure killing of microorganisms. Cold water wash may be used if cold water detergent is available. Complete wash and rinse cycles should be used. In a home setting, machine drying or hanging clothing and linens on a clothes line are both suitable methods for drying.

Clean laundry must be *stored* separately from soiled linens.

If clothing containing blood or body fluids is sent to a community dry cleaner, it should be appropriately labelled.

Waste Handling

Waste handling is divided into three categories: general, biomedical, and pathological. Legislation requires that biomedical waste, including sharps such as needles and blades, be handled and disposed of in a manner that prevents transmission of potential infections. Local, regional, provincial and federal regulations on waste segregation must be followed.

Waste that is contaminated with blood, ear drainage or cerumen containing blood or ear drainage, can be placed in the regular waste receptacles. However, it should be separated from the rest of the trash to avoid casual contact. Place this waste in small plastic bags or wrap in paper before disposing in trash.

General office waste, used gloves or non-sharp medical equipment may be disposed of in regular waste receptacles. It is recommended that waste be packaged in a leak-proof container that can be disposed of (e.g., plastic bag) or cleaned after emptying (e.g., plastic waste bin or trash can). Waste should be emptied frequently and stored in a manner that protects it prior to pick up/disposal.

Special consideration must be given to spills of blood and body substances. Routine precautions must be implemented (gloves, masks, eye protection). The spill area must initially be cleaned using disposable towels. The clean area then requires disinfection with a low level disinfectant. Rinse and dry the area using disposable towels. All waste must be disposed of in a plastic lined container. Once waste is disposed of, perform hand hygiene immediately.¹¹

Any **sharps** in the practice setting should be disposed of immediately in a clearly labelled, puncture resistant container. The container should have a tightly fitting lid that seals and prevents leakage.

Healthy Workplace Practices

Adapted from The Canadian Committee on Antibiotic Resistance (CCAR) (2007)² (<http://www.ccar-ccra.com/english/pdfs/IPC-BestPractices-June2007.pdf>)

Healthy workplace practices involve several factors:

Immunizations: Audiologists are at risk for exposure to and transmission of a variety of vaccine preventable diseases, because of their contact with patients. Use of immunizing agents protects both the audiologist and patients from being infected. Any practice setting that provides direct patient care should ensure that all audiologists providing patient care have the opportunity to access appropriate vaccinations. Considerations related to immunization for audiologists should include an awareness of one's own history of childhood communicable diseases. Another consideration, as per employer policies, is that any new staff should have a tuberculin skin test at the beginning of their employment, unless they have documentation of a negative skin test in the past 12 months.

Recommended immunizations for all healthcare workers, including audiologists, are:

- Annual influenza immunization
- Measles, mumps and rubella (MMR), two doses
- Diphtheria, polio and tetanus (DPT)
- Hepatitis B
- Varicella vaccine (chickenpox) – recommended for anyone who may be susceptible (history for disease is negative, IgG negative)
- Meningococcal (If working directly with patients with disease)

Staying home from work: Knowing when to stay home from work is another important consideration in IPC. In the event of a health alert, audiologists should follow Ministry of Health Guidelines or other relevant guidelines.

Audiologists are encouraged to stay home from work under the following conditions:

- Febrile respiratory illness
- Dermatitis on their hands (consult your physician about your risk)
- Cold sores or shingles that cannot be covered
- During the initial days of a respiratory illness
- Diarrhea
- Eye infections until treated

Most employers will have policies that should be adhered to in this regard. The same recommendations would also apply to clients, who should be encouraged to re-schedule their visit under any of the above conditions (refer to *Risk Assessment* section of this document).

Education: Audiologists should demonstrate knowledge and work practices that reduce the risk of infection. Healthy workplace practices involve providing leadership and acting as a role model to other service providers, clients, and families related to IPC. Appendix A provides an outline of the *Core Competencies in Infection Prevention and Control for All Health Care Providers*. These competencies cluster around the following areas: critical assessment skills, understanding the basic rationale for routine practices, personal safety, use of routine practices, cleaning, disinfection, sterilization, waste management, and additional precautions.

Employees and staff audiologists as part of their new-hire orientation should receive infection control training. It is imperative that all employees be made aware of the organization's infection control practices, including location of IPC manual, materials and methods/safety practices of disinfecting/sterilizing equipment. Further, yearly updates on the area of infectious disease and infection control are required to ensure that practice standards reflect changes in the workplace.

Post Exposure Management. Audiologists should ensure they are familiar with employer procedures related to punctures or mucous membrane exposures to blood borne pathogens or other potentially infectious agents. Employer guidelines should be consulted following an exposure to any potentially infectious agent but should guidelines not be available in a given work setting, the following are designed to outline appropriate steps to minimize the seriousness of exposure. While the following are the most common infectious agents encountered in an audiological practice, others might be causes of potential harm (for example, avian flu) with further information available on the Health Canada website at www.hc-sc.gc.ca.

1. **Hepatitis B [HBV]/Hepatitis C [HBC]/Human Immunodeficiency Virus [HIV]:**
While the risk of exposure to blood borne pathogens via body fluids is minimal in the field of audiology, risk is possible during procedures such as the taking of ear mold impressions and the removing of cerumen. In spite of using precautions such as the use of gloves, it is possible that the audiologist might come in contact with blood products. In order to address post exposure management methods, it is important to differentiate between whether the exposure occurred superficially (on intact skin) and whether the contact penetrated the skin via an injury or non-intact skin exposure. If the contact occurred only superficially, no action is required; however, if the contact occurred with non-intact skin, the following is recommended:
 - a. HBV: If the audiologist is not already immunized against HBV, it is recommended that they receive a hepatitis B vaccination series as soon as possible, preferably within 24 hours after the incident and no more than 7 days following the incident.
 - b. HCV: Consider testing as a baseline within 7-14 days of the incident and again as a follow-up 4-6 months following the incident.
 - c. HIV: Unless the patient with whom the incident occurred is known to be infected or is considered high risk, generally no action is required.

Should the exposure be deemed invasive rather than either superficial exposure or non-intact skin, it is recommended that the audiologist consult the Public Health Agency of Canada, their occupational health department or their physician IMMEDIATELY for the most current post management options.

2. **Tuberculosis [TB]:** Following treatment in close proximity to a patient with known TB, compliance to hospital or provincial guidelines should be following which will typically include a tuberculin skin test with treatment should the audiologist test positive for mycobacterium tuberculosis (TB).

3. **Influenza:** While annual vaccinations against influenza are recommended for all audiologists working directly with patients, it is possible (and highly likely) that atypical influenza outbreaks will require additional management strategies. Audiologists should consult with their provincial Centre for Disease Control for specific instructions during atypical outbreaks.
4. **Meningococcal Disease:** Should intensive, unprotected contact (i.e., without wearing a mask) occur, the audiologist should receive antimicrobial prophylaxis following exposure.

CONCLUSION

The purpose and scope of these guidelines is to provide audiologists with succinct, practical IPC information that is applicable across a variety of practice settings. Audiologists are encouraged to familiarize themselves with the *Core Competencies for Infection Prevention and Control for Health Care Providers* (Appendix A), to reflect on their own IPC knowledge in relation to these competencies, and to consider their own individual practice as they review the contents of these guidelines. A sample audit form for Implementation of IPC Practices (Appendix B) has been made available to assist with the practical implementation of these recommendations. It is our intent that the implementation of these guidelines while developing audiology specific work practice controls will ensure safe practice environments related to IPC for both audiologists and the clients whom we serve.

APPENDIX A

Core Competencies for Infection Prevention and Control for Health Care Providers **Source: Community and Hospital Infection Control Association (2006)**

Target Audience: Individuals who are accountable for the quality of health care delivered in Canada.

AREA OF COMPETENCY	DETAILED CORE COMPETENCY
Critical Assessment Skills <i>These skills are the under-pinning for the other five core competencies</i>	<ul style="list-style-type: none"> • Critical assessment skills related to exposure to infectious agents, awareness to local outbreaks and use of infectious disease specific protocols
Basic Rationale for Routine Practices	<ul style="list-style-type: none"> • Understands basic microbiology and how infections can be transmitted in health care settings
Personal Safety	<ul style="list-style-type: none"> • Knows how to appropriately manage sharps, blood and body fluids and recognizes the appropriate first aid activities for exposures to blood and body fluids • Understands the role of vaccines in preventing certain infections, including annual influenza immunizations for health care workers
Routine Practices	<ul style="list-style-type: none"> • Understands the importance of hand hygiene/hand washing • Understands the activities of Routine Practices/Standard Precautions • Respiratory Etiquette • Knows and selects appropriate Personal Protective Equipment (PPE) for their job(s) • Demonstrates appropriate use of PPE
Cleaning, Disinfection, Sterilization, Waste Management	<ul style="list-style-type: none"> • Maintains safe clean environment • Understands importance of using PPE when sorting laundry • Recognizes that re-usable equipment that has been in direct contact with a client should be cleaned and reprocessed before use in the care of another client • Appreciates the differences between clean, disinfected (low, medium, and high-level) and sterile items • Knows the difference between regular and biohazard wastes
Additional Precautions	<ul style="list-style-type: none"> • Understands Transmission Based Precautions (Additional Precautions): Why and when they are used

APPENDIX B

(Adapted from Appendix III – Audit Tool, Canadian Committee on Antibiotic Resistance (CCAR) Infection Prevention and Control Best Practices for Long Term Care and Community Care Including Health Care Offices and Ambulatory Clinics)

Checklist or Audit Tool for Implementation of IPC Practices (i.e., applicable to public and private audiology practice settings)

Date Checklist / Audit completed:

By:

Items	Fully Implemented	Partially Implemented	Not Implemented	N/A	Comments
WAITING AREA					
Infection control signs at entry					
Infection control signs at reception desk					
Alcohol-based hand cleaner and signage					
Tissue boxes available					
Garbage cans available					
Clean toy and soiled toy bins available (or if no toys or magazines available, a sign indicating rationale)					
RECEPTION					
Personal Protective Equipment (PPE) available (masks, gloves)					
Reception staff can maintain 1 metre distance from patients					
Telephone screening protocol has been developed and implemented					
TREATMENT ROOMS					
Alcohol-based hand cleaner available in all rooms OR					

Items	Fully Implemented	Partially Implemented	Not Implemented	N/A	Comments
Hand washing sinks with soap available in all rooms					
Rooms only have essential supplies					
Written policies exist for decontaminating treatment rooms between patients and at the end of the day					
CLEANING PROCEDURES					
Written procedures for cleaning the office setting have been provided by (or to) the cleaning staff					
Approved and appropriate disinfectant products are available for patient surfaces					
Approved and appropriate disinfectant procedures are available for equipment and instruments					
PROTOCOL DEVELOPMENT AND STAFF TRAINING					
Annual staff training or updating completed on infection prevention					
Annual staff training on proper PPE use					
DISINFECTION / STERILIZATION OF MEDICAL DEVICES					
Manufacturer's instructions are followed					
Process for cleaning semi-critical and critical devices including written protocols for: disassembly sorting and soaking physical removal of organic material rinsing drying physical inspection wrapping					

GLOSSARY

Additional precautions: Interventions implemented for certain pathogens or clinical presentations in addition to routine infection control practices, to reduce the risk of transmission of microorganisms from patient to patient, patient to health care worker, and health care worker to patient.¹⁶ <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/02pdf/28s1e.pdf>

Airborne precautions: These are additional to standard precautions and are designed to reduce the transmission of diseases spread by the airborne route.¹⁵

Airborne transmission: A manner of spreading diseases through microbial exposure suspended in the air as droplet residue or dust particles.¹

Bacteria: Life-form consisting of a single DNA molecule suspended in cytoplasm and encased within a thin cell wall that is capable of independently executing all the functions and processes necessary for survival and potentially capable of causing disease.¹

Cleaning: 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 with water, detergents and mechanical action. Thorough and meticulous cleaning is required before any equipment/device may be decontaminated, disinfected and/or sterilized.¹⁶

Clinical Practice Setting: These may include but are not limited to ambulatory and community clinics (including private practice settings); childcare and school settings; long term care facilities (i.e., nursing homes, homes for the aged, retirement homes, group homes); private homes; and hospital settings (i.e., patient care units or services).

Colonization: The presence of microorganisms in or on a host with growth and multiplication but without tissue invasion or cellular injury.¹²

Contact precautions: These are additional to standard precautions and are designed to reduce the risk of transmission of microorganisms by direct or indirect contact.¹⁵

Contact transmission: A manner of spreading disease through microorganisms that are transmitted by touching or coming in contact with potentially infectious objects. The spread of disease may occur either via direct, indirect, or droplet contact.¹

Critical equipment: A medical device that enters sterile tissues, including the vascular system. Critical medical devices present a high risk of infection if the device is contaminated with any microorganisms, including bacterial spores. Examples of critical medical devices include but are not limited to needles, syringes, scalpels and invasive/surgical instruments, all implantable devices, biopsy forceps and all instruments used for foot care.¹⁶

Disinfection: A process involving killing a percentage of germs.¹

Droplet precautions: These are additional to standard precautions and are designed to reduce the transmission of infectious spread by the droplet route. The precautions consist of a water resistant surgical or procedure mask and eye protection or face shield for the health care worker.^{5, 15}

Fit-tested mask: Is a mask that was fit via a process of selecting the correct size and type of respirator (mask) and ensuring that the wearer knows how to use it correctly (e.g., N95 mask).²

Fungus: Diverse group of organisms that thrive or grow in wet or damp areas and can cause disease.¹

Hand hygiene: A process for the removal of soil and transient microorganisms from the hands. Hand hygiene may be accomplished using soap and running water or the use of alcohol-based hand rubs. Optimal strength of alcohol-based hand rubs should be 60% to 90% alcohol. Refer to the World Health Organization (2009) document entitled WHO Guidelines on Hand Health Hygiene in Health Care.¹²

Health care associated infection: Also known as nosocomial infection and hospital-associated infection. An infection acquired in hospital by a patient who was admitted for a reason other than that infection. An infection occurring in a patient in a health care facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infection among staff of the facility.⁶

Hierarchy of control measures: A framework that includes three levels of control: engineering controls, administrative controls and personal protective measures.

1. *Engineering controls* are built into the design (private bathrooms, private rooms, HVAC systems) of a health care facility. Infection prevention and control professionals should be involved in the design and planning of new facilities. An infection control risk assessment should be done to evaluate and mitigate potential risks for microorganism transmission by means of air, water and environmental sources.
2. *Administrative controls* include protocols for hand hygiene, immunization of residents and caregivers, protocols for managing caregivers and clients during an outbreak and protocols for caring for clients with communicable diseases.
3. *Personal protective equipment* is the least desirable way to control hazards as it does not eliminate them, it merely contains the hazard and is dependent on its appropriate use by educated, knowledgeable staff.²

(Adapted from BC Centre for Disease Control Document on Respiratory Outbreaks)

High level disinfection (HLD): The level of disinfection required when processing semi-critical medical equipment/devices. High level disinfection processes destroy

vegetative bacteria, mycobacteria, fungi and enveloped (lipid) and non-enveloped (non-lipid) viruses, but not necessarily bacterial spores. Medical equipment/devices must be thoroughly cleaned prior to high level disinfection.^{6, 12}

Infection prevention and control (IPC): Evidence-based practices and procedures that, when applied consistently in health care facilities and settings, can prevent or reduce the risk of transmission of microorganisms to health care personnel, clients and visitors.^{1, 16}

Low level disinfection (LLD): The level of disinfection required when cleaning and disinfecting non-critical equipment and environmental surfaces. Low level disinfection does not kill mycobacteria, or bacterial spores, but will kill most vegetative bacteria and some fungi.^{15, 16}

Microorganism: Any organisms (animal or plant) of microscopic size.¹

Non-critical equipment: Medical device that touches only intact skin (but not mucous membranes) or does not directly touch the client. Intact skin acts an effective barrier against most microorganisms; therefore, the sterility of items coming in contact with skin is “non-critical”.¹⁶

Parasite: Organisms that grow, feed, and are sheltered on or in a different organism while contributing nothing to the survival of the host.²

Personal protective equipment (PPE): Specialized equipment or clothing used by health care workers to protect themselves from direct exposure to clients’ blood, tissue or body fluids. Personal protective equipment may include gloves, gowns, fluid-resistant aprons, head and foot coverings, face shields or masks, eye protection, and ventilation devices (e.g., mouthpieces, pocket masks). It is the responsibility of the health care worker to put on the appropriate personal protective equipment in any situation that is likely to lead to exposure of blood, body fluids, excretions and secretions.^{15,16}

Routine practices: Is the term used by Health Canada/Public Health Agency of Canada to describe the system of infection prevention and control practices recommended in Canada to prevent and control transmission of microorganisms in health care settings. Consistent use of routine practices with all clients/residents/patients is critical to preventing transmission of microorganisms from client to client and client to staff. The full description of routine practices to prevent and control transmission of nosocomial pathogens can be found on the Public Health Agency of Canada website: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/99vol25/25s4/index.html>.^{5,16} PIDAC’s Routine Practices fact sheet is available at: http://www.health.gov.on.ca/english/providers/program/infectious/pidac/fact_sheet/fs_routine_010107.pdf.¹⁶

Semi-critical equipment: A medical device that comes in contact with mucous membranes or non-intact skin, but does not penetrate them, including but not limited to insert earphones, impedance probe tips, otoscope tips.¹⁵

Sharps: Objects capable of causing punctures or cuts (e.g., needles, syringes, blades, glass).^{15,16}

Single-usage: Refers to an item that may be used and reused on a single client, but may not be reused on other clients.¹

Spaulding classification: A strategy for reprocessing contaminated medical devices. The system classifies medical devices as critical, semi-critical, or non-critical based upon the risk from contamination on a device to client safety. The system also establishes three levels of germicidal activity (sterilization, high-level disinfection, and low-level disinfection) for strategies with the three classes of medical devices (critical, semi-critical and non-critical).¹⁵

Standard precautions: Is the term used by the World Health Organization to describe the system of infection prevention and control practices recommended to be applied to all patients at all times regardless of their known or presumed infectious status. These include: hand hygiene; risk assessment; risk reduction strategies; environmental cleaning, disinfection, and sterilization; waste and laundry management; and healthy workplace practices.⁴

Sterilization: The level of reprocessing required when processing critical medical equipment/devices. The sterilization process results in the destruction of all forms of microbial life including bacteria, viruses, spores and fungi.¹⁷

Vectorborne transmission: A manner of spreading disease whereby insects or animals carrying a pathogenic agent transfer disease by interacting with a susceptible host.¹

Vehicle transmission: When disease is transmitted through ingestion of or exposure to contaminated substances, via food, water, blood or bodily substances.⁹

Virus: Any of a large group of submicroscopic agents that act as parasites and consist of a segment of DNA or RNA surrounded by a coat of protein. Because viruses are unable to replicate without a host cell, they are not considered living organisms in conventional taxonomic systems. Nonetheless, they are described as “live” when they are capable of replicating and causing disease.⁸

Waste handling: All the activities, administrative and operational, involved in the production, handling, treatment, conditioning, storage, transportation and disposal of waste generated by health-care establishments. Waste is divided into three categories; general (e.g., used gloves, tongue depressors), biomedical (e.g., sharps) and pathological (body tissue or fluids).¹¹

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