Ongoing Infection Prevention and Control

Introduction

This tip sheet offers guidance on incorporating infection prevention and control (IPC) principles into your occupational health and safety plan.

The COVID-19 pandemic has shown that diseases can have dramatic impacts on businesses and organizations in Canada. Employers should consider adding infection prevention and control principles to their safety or business continuity plans to reduce the impact of these diseases.

Infection prevention and control is a set of principles, practices and procedures designed to prevent people from becoming infected with diseases, and control disease spread if an infection occurs. IPC was developed with the goal of preventing healthcare associated infections. IPC programs have been implemented successfully in health care, long-term care, and livestock sectors.

This page briefly explains IPC principles and highlights how they can be implemented in all workplaces.

Chain of Transmission

The chain of transmission is the cycle by which a disease spreads through a population. It is described as having six links, each connecting to the next:

- **Infectious Agent** – The cause of disease such as bacteria, fungi, or viruses
- **Source** – Where infectious agents are found such as hosts (e.g., humans and animals), water, food, surfaces, or soil
- **Portals of Exit** – How infectious agents leave a source such as non-intact skin, eyes, nose, mouth, or genitals
- **Modes of Transmission** – Ways that the infectious agent transfers to a susceptible person
  - Direct transfer such as close contact (e.g., skin-to-skin contact or kissing), transfer of respiratory droplets, or direct exposure to soil or vegetation harboring infections agents.
  - Indirect transfer such as airborne particles that carry infectious agent, through vehicles (e.g., water, food, blood, or inanimate objects), or vectors (e.g., insects).
- **Portals of Entry** – How infectious agents enter a susceptible person
- **Susceptible People (or Animals)** –Those at risk of infection (e.g., workers). Susceptibility depends on factors such as their health, genetics, or vaccination status.

Disease transmission occurs when an **agent** leaves a **source** through a **portal of exit** and travels by a **mode of transmission** until it finds a **portal of entry** into a **susceptible person**.

It is important to understand and to assess how infectious diseases can be transmitted in the workplace. The chain of transmission can be broken by implementing multiple layers of control measures that incorporate IPC, including routine practices.

Routine Practices

Routine practices are the foundation of effective infection prevention and control. They consist of rules and practices that prevent or control disease transmission.

Elements of routine practices include:

- Assessing infection risk
- Hand hygiene and respiratory etiquette
- Control of the environment
- Health measures
- Personal protective equipment

Assessing infection risk

The first element is the act of identifying and assessing the risk of infection in a setting. Once identified, proper controls can be applied to minimize the risk. Trained and experienced workers are better able to identify and assess high risk work activities. Assessments should involve the health and safety committee or representative, workers and supervisors. Workers can also continually assess work processes and procedures by asking themselves:

- Is this a high-touch surface or a potential source of an infectious agent?

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- Is this job task high risk (e.g., cleaning up blood or spit, assisting a co-worker or client who is ill)?
- Is there a potential for exposure to hazardous products or chemicals (e.g., bleach)? Or infectious agents? (e.g., handshaking, caring for a sick person, tattooing)?
- Are people around me showing signs of illness?
- Are the proper control measures in place to perform the task safely?

Risk of infection is often based on the tasks workers are performing and local community disease outbreak conditions. Job task risks can be categorized as:

- Low risk
  - Working alone or in a physically distanced cohort
  - Little or no interaction with others
  - Well-ventilated workspace
  - Setting has many layered occupational health and safety controls and public health measures in place
  - High vaccination uptake for common diseases in the community and workplace
- High risk
  - Interaction with people who are ill or infected (e.g., COVID-19, flu, or hepatitis)
  - Frequent contact with many people
  - Poorly ventilated workspace
  - Crowded workspaces and working closely to others
  - Setting has no layered occupational health and safety controls and public health measures in place
  - Low vaccination uptake for common diseases in the community

A COVID-19-specific assessment tool is available from the Public Health Agency of Canada.

Good hand hygiene and respiratory etiquette

Good hand hygiene is considered by public health experts to be the most important and effective IPC measure to prevent the spread of diseases. Many diseases are spread by hand contact with contaminated surfaces followed by the touching of eyes, mouth, or nose with unwashed hands. Common contaminated surfaces include:

- Handles (e.g., doorknobs, handrails, tools, or equipment)
- Controls (e.g., buttons, levers, or switches)
- Other people (e.g., handshakes, caring for others, performing personal services)

The risk of disease transmission is lowered when all people in a setting, including workers and visitors, perform effective hand hygiene.

Effective hand hygiene includes following the proper procedures at the correct times, such as:

- Following personal hygiene activities (e.g., after using the bathroom, after coughing or sneezing into your hand)
- After handling waste (e.g., used tissues, waste collection and removal)
- Before and after smoking, taking oral medication, eating, and drinking
- Before putting on and after removing gloves
- After contact with blood or other body fluids, mucous membranes, or non-intact skin
- Before and after using high-touch or contaminated equipment, instruments, or surfaces
- Before and after touching your mask

Two methods for hand hygiene:

- Water and soap (preferably liquid or foam soap)
  - Provides very thorough cleaning
  - Effective at removing germs and dirt if performed for at least 20 seconds

    - Preferred method if hands are contaminated or visibly soiled
- Alcohol-based hand rub (ABHR)
    - Must have at least 60% alcohol content
    - Convenient
    - Portable
    - Dispensers can be installed wherever needed
    - Preferred for certain settings

Many infectious diseases spread from person-to-person by respiratory droplets and airborne particles. When diseases are prevalent in a community, workplaces should emphasize good respiratory etiquette. When people in a setting have good respiratory etiquette, the risk of disease spread is lowered. Respiratory etiquette involves:

- Covering up sneezes and coughs with tissue or elbow to avoid releasing germs into the air.
- Properly disposing of tissues after each use, preferably in a no-touch plastic lined waste container.
- Providing masks to individuals who are coughing or sneezing.

Control of the environment

Control of the environment includes the physical or mechanical measures that are built into a setting such as barriers or ventilation. Ensuring optimal ventilation can help reduce the concentration of potentially infectious droplets or aerosols in the air. This can be achieved by natural ventilation (opening windows or doors) or through mechanical ventilation (e.g., Heating, Ventilation, and Air Conditioning systems).

Cleaning and disinfecting of environmental surfaces or specific tools and equipment is another form of control. Some germs can survive on surfaces for minutes to days, allowing them to spread from person-to-person. To prevent the spread of disease, clean and disinfect all high-touch surfaces (e.g., handles, switches, and controls) on a routine schedule, when visibly soiled or obviously contaminated. Perform additional cleaning and disinfection, when required. The number of times a surface should be cleaned depends on how often it is touched as well as by how many different people touch it.

It is also important to make sure that work activities are conducted in environments appropriate for the task. For example, a home-based hairdresser should not provide services in a room that is also used for cooking or eating.

Health measures

When IPC practices are properly implemented and followed, a workplace can prevent or dramatically reduce the spread of diseases.

Workplace policies where IPC practices apply:

- Worker immunization
- Workplace wellness
- Workplace cleaning and disinfection
- Worker and visitor screening
- Worker and visitor illness
- Worker hygiene
- Other applicable occupational health and safety policies

For infection prevention and control practices to be effective, workers should be trained on:

- Good hand hygiene and respiratory etiquette
- The proper use and care of equipment (e.g., personal protective equipment, air purifiers)
- What to do if they or someone in the setting shows symptoms of illness
- Workplace orientation for new workers and refresher for existing workers

Other important factors necessary to maintain effective IPC:

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- Review and adjust the IPC practices as needed and in response to local disease conditions.
- Review worker adherence to IPC policies, practices, and procedures. Retrain workers if necessary.
- Isolate people who are ill from healthy people.
- Implement systems to maintain adequate supplies of hand sanitizer, soap, and personal protective equipment.
- Post IPC educational materials prominently for workers and visitors.
- Make sure supervisors are trained and competent on IPC.

Infection prevention and control practices work best in settings where employers have a high degree of control (e.g., indoor facility, office, retail). These principles are more challenging to implement for employers of mobile workforces (e.g., police or service technicians) who have little control over the work settings. Consider focusing worker training on personal preventative practices and communication techniques to make sure clients understand company health measure.

Use of personal protective equipment (PPE)

Employers should assess the risk that diseases pose to their workers before implementing personal protective equipment (PPE) requirements. All PPE must be worn, handled, and disposed of properly to avoid self-contamination. PPE should only be used where appropriate and by workers who are properly trained and fit tested as required. The most common PPE used in IPC programs are:

- **Eye protection (safety glasses, goggles, or face shields):** physical barrier that prevents germs from entering the body through the moist membranes of the eyes, nose, and mouth.
- **Medical masks:** barrier to help prevent the spread of large respiratory droplets and spit.
- **Respirators (e.g., N95):** filter most germs from the air while breathing. Wearers should be medically able to use respirators and fit tested to make sure the respirator has a good seal.
- **Gloves:** made of materials that germs cannot penetrate. Best used for high risk activities and must be used in conjunction with hand hygiene.
- **Gowns:** made of materials that germs cannot penetrate. Often used when contact with infectious material is expected.

Additional Practices

If a setting experiences many concurrent worker illnesses or if a community is experiencing a disease outbreak, additional practices should be implemented, consisting of one or more of these measures:

- More stringent worker and visitor screening criteria
- Requiring workers, visitors, and participants to wear appropriate masks
- Improving ventilation and air filtration
- Requiring physical distancing
- Installing additional temporary barriers

During severe disease outbreaks or global pandemics, these may be considered important base measures of infection prevention and control, and consultation with local public health agencies may be recommended.

Integrating IPC into a Business Continuity Plan

Integrating IPC into business continuity plans will help organizations continue to function during an infectious disease outbreak, such as a pandemic.

- Incorporate appropriate and compatible routine practices into workplace policies and training programs (e.g., create documents, forms, and tools).
- Educate the workforce. Provide workers with regular refresher training on common diseases and how to avoid exposure using personal hygiene practices. Include instructions on:
  - Following good hand hygiene practices.
  - Sneezing and coughing according to good respiratory etiquette.
  - Treating minor cuts quickly.
  - Avoiding sharing personal items (e.g., combs, brushes, towels, or razors).
  - Assessment of infection risks.
- Provide information on vaccination against common diseases to workers. Some professions are more likely to be exposed to diseases (e.g., tattoo artist, correctional officer, veterinarian, or housekeeper).
- Assign IPC program responsibilities to health and safety personnel and managers.
- Purchase and maintain adequate PPE stock.

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- Consider having the work environment and tasks evaluated for infection risks by a professional, and create an exposure control plan (ECP) for all identified hazards.
- Evaluate current cleaning and disinfection practices. Focus efforts on high-touch surfaces and objects.
- Consider running an annual flu vaccine clinic for workers or providing paid time off for workers to get the vaccine.
- Refer to available reputable resources (e.g., PHAC, local public health) when implementing IPC principles in the workplace.
- Monitor IPC implementation effectiveness and make adjustment if necessary.
- Develop a plan for monitoring guidance and requirements from local public health authorities.
- Consider plans to quickly respond to outbreaks:
  - Rapid pivot to work-from-home.
  - Switching to curbside pickup, online/virtual services, etc.
  - Revising sick leave policies to encourage employees to stay home when they are sick.

Designing a setting with IPC in mind

When renovating or designing new workspaces consider the following design elements to minimize the spread of disease:

- Floor and furniture surfaces that are easy to clean and do not degrade when frequently exposed to cleaning products.
- Choosing antibacterial surface materials for high-touch surfaces (e.g., zinc or copper alloys).
- Installing hand sanitizer dispensers in key locations such as building entrances, reception, food consumption areas, outside elevators.
- Reducing the number of high-touch points (e.g., washroom entrances without doors, motion activated faucets).
- Installing ventilation equipment with high air exchange rate and optimizing air flow patterns (i.e., not directing airflow from person-to-person).
- Installing in-ventilation or upper-room Ultraviolet Germicidal Irradiation (UVGI) units.

Benefits of integrating IPC principles into business continuity or safety plans

- Prevents or minimizes the spread and outbreak of diseases
- Preserves the health of workers, visitors, participants, and their families
- Reduces the risk of business slowdown or closure due to absenteeism or public health order
- Boosts company reputation
- Saves labour costs

Challenges of integrating infection prevention and control into business continuity or safety plans

- Requires organization leaders to monitor their workforce and community disease rates closely.
- May create tension with workforce, visitors, or participants who do not want to follow the routine practices.
- May increase operating costs for training, supplies and equipment.

Stay informed, be prepared and follow public health advice

In the event of an infectious disease outbreak, follow the advice of your local public health authority and occupational health and safety regulator, and adjust your workplace plans and procedures accordingly.

Resources

Guide to Prevention and Control of Infectious Diseases in the Workplace – BC Public Service Agency & BC Government and Service Employees' Union

Infection Prevention and Control – Public Health Ontario

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Infection Control – British Columbia Centre for Disease Control

Infection Prevention and Control – World Health Organization

Infection Prevention and Control – Government of Alberta

Hand Washing: Reducing the Risk of Common Infections – Canadian Centre for Occupational Health and Safety

Lesson 1: Introduction to Epidemiology – Centers for Disease Control and Prevention

If you or someone you know is in crisis, please contact your local hospital, call 911 immediately, or contact a Crisis Centre in your area.

It is important that mental health resources and support are provided to all workers, including access to an employee assistance program, if available.

For further information on COVID-19, refer to the Public Health Agency of Canada.

Note that this guidance is just some of the adjustments organizations can make during a pandemic. Adapt this list by adding your own good practices and policies to meet your organization's specific needs.

Disclaimer: As public and occupational health and safety information is changing rapidly, local public health authorities should be consulted for specific, regional guidance. This information is not intended to replace medical advice or legislated health and safety obligations. Although every effort is made to ensure the accuracy, currency and completeness of the information, CCOHS does not guarantee, warrant, represent or undertake that the information provided is correct, accurate or current. CCOHS is not liable for any loss, claim, or demand arising directly or indirectly from any use or reliance upon the information.