

PART 5: CHEMICAL AND BIOLOGICAL SUBSTANCES

| | | | |
|--|------------|---|---|
| Definitions | 5.1 | In this Part: “adverse health effect” “biological agent” | means an acute or chronic injury, acute or chronic disease, or death; means an agent which, by reason of its properties, is hazardous to the health or safety of a person who is exposed to it, and includes (a) an infectious agent and infectious material as defined in section 6.33, and (b) a toxin of biological origin; |
| General information requirement | 5.2 | If a worker is or may be exposed to a chemical or biological substance chemical substance or biological agent which could cause an adverse health effect, the employer must ensure that | (a) the identity of the substance chemical substance or biological agent, its possible effects on worker health and safety and any precautions required to protect for the health and safety of the worker are clearly indicated by labels, MSDSs, placards, signs, tags or other similar means, (b) the content and meaning of the information required by paragraph (a) is clearly communicated to the worker, (c) effective written procedures are prepared and implemented to prevent a risk of exposure to a chemical substance or biological agent by any route that could cause an adverse health effect, and to address emergency and cleanup procedures in the event of a spill or release of a the substance chemical substance or biological agent, and (d) the supervisor and the worker are trained in and follow the established procedures in Parts 5 and 6 of this Regulation for safely handling, using, storing and disposing of the substance chemical substance or biological agent, including emergency and spill cleanup procedures. |

EXPLANATORY NOTE

The proposed new definition for “biological agent” in section 5.1 has been added in order to accommodate the amendments proposed to Part 6 covering infectious agents and materials, and to emphasize linkage between the *Workers Compensation Act* and the *Occupational Health and Safety Regulation*. “Biological agent”, is a subset of “hazardous substance” in section 106 of the *Workers Compensation Act*.

More specific requirements are contained in Parts 4, 5, and 6.

The biological agents covered by section 6.33 are those capable of inducing infection, whereas those covered by section 5.2 also include other substances – specifically biochemical toxins, some of which can cause toxic effects, allergic reactions or death. Examples include insect toxins, bacterial endotoxins, grain flour allergens, photodermatitis agents (e.g., furanocoumarins), venom, etc.

Based on feedback from stakeholders, a definition has been added for “adverse health effect” to emphasize that the biological agent, including an infection agent or material and toxin of biological origin is within scope only when they are capable of causing an adverse health effect. This would exclude, for example, the common cold, seasonal flu or a pollen-induced asthma-like condition commonly experienced by the general public during the growing season.

Section 5.2 is a general information requirement to ensure the employer is aware of the following:

- hazardous chemical substances and biological agents to which workers may be exposed during work,
- the identity of the substance or agent,
- the risk of exposure,
- necessary health and safety precautions,
- written procedures, and
- the need to educate workers as to the hazards, safe handling, use, storage and disposal of chemical substances or biological agents, where practicable.

DRAFT

PART 6: SUBSTANCE SPECIFIC REQUIREMENTS

~~BIOHAZARDOUS MATERIALS-INFECTIOUS AGENTS AND INFECTIOUS MATERIALS~~

| | | |
|--|------|---|
| Definitions | 6.33 | In sections 6.33 to 6.41-6.40 : |
| "infectious agent" | | means a prion, virus, bacterium, fungus or other biological agent that is determined by the World Health Organization or Health Canada to have the potential of an adverse health effect as defined in section 5.1; |
| "biohazardous material" | | means a pathogenic organism, including a bloodborne pathogen, which due to its known or reasonably believed ability to cause disease in humans, would be classified as Risk Group II, III or IV as defined by the Medical Research Council of Canada, or any material contaminated with such an organism; |
| "infectious material" | | means a liquid or solid material that is contaminated with an infectious agent; |
| "occupational exposure" | | means reasonably anticipated, harmful contact with blood or other potentially biohazardous material that may result from the performance of a worker's duties; |
| | | means reasonably anticipated contact with an infectious agent or infectious material resulting from the performance of a worker's duties; |
| "route of transmission" | | means any route by which an infectious agent may be transmitted including contact, droplet or airborne transmission; |
| "standard or routine infection control precautions" | | means safe work practices as defined by the <i>Practical Guidelines for Infection Control in Health Care Facilities</i> issued by the World Health Organization, as amended from time to time, and the <i>Infectious Diseases, Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care</i> guidelines issued by Health Canada, as amended from time to time; |
| "transmission-based precautions" | | means safe work practices based on the route of transmission as defined by the <i>Practical Guidelines for Infection Control in Health Care Facilities</i> issued by the World Health Organization, as amended from time to time, and the <i>Infectious Diseases, Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care</i> guidelines issued by Health Canada, as amended from time to time. |
| Exposure control plan | 6.34 | The employer must develop and implement an exposure control plan meeting the requirements of section 5.54, if a worker has or may have occupational exposure to a bloodborne pathogen, or to other biohazardous material as specified by the Board. (1) If a worker has or may have occupational exposure, the employer must develop and implement an exposure control plan that meets the requirements of section 5.54 and that includes the following: (a) a risk assessment conducted by a qualified person to determine if there is a potential for occupational exposure by any route of transmission; (b) a list of all work activities for which there is a potential for occupational exposure; |

- (c) engineering controls and administrative controls to eliminate or minimize the potential for occupational exposure;
- (d) standard or routine infection control precautions and transmission-based precautions for all work activities that have been identified as having a potential for occupational exposure including
 - (i) housekeeping practices designed to keep the workplace clean and free from spills, splashes or other accidental contamination,
 - (ii) work procedures to ensure that contaminated laundry is isolated, bagged and handled as little as possible, and
 - (iii) work procedures to ensure that laboratory or other samples containing an infectious agent or infectious material are handled in accordance with the *Laboratory Biosafety Manual* issued by the World Health Organization, as amended from time to time, and the *Laboratory Biosafety Guidelines* issued by Health Canada, as amended from time to time;
- (e) a description of personal protective equipment designed to eliminate or minimize occupational exposure;
- (f) a program to inform workers about the contents of the exposure control plan and to provide them with adequate education, training and supervision to work safely with, and in proximity to, an infectious agent or infectious material;
- (g) a record of all training and education provided to workers in the program described in paragraph (f);
- (h) a record of all workers who have been exposed to an infectious agent or infectious material while performing work activities.

**Risk
identification**

6.35 The employer must maintain a list of all job classifications and must identify all tasks and procedures in which there is a potential for occupational exposure to a bloodborne pathogen, or to other biohazardous material specified by the Board.

Controls

- 6.36**
- (1) Engineering controls and work practice controls must be established to eliminate or minimize the potential for occupational exposure to a bloodborne pathogen or other biohazardous material:
 - (1.1) On and after January 1, 2008, when a hollow-bore needle is used in a workplace to access a vein or artery for the purpose of collecting blood or caring for or treating a person, the employer must ensure that
 - (a) if it is clinically appropriate, a safety-engineered needle that provides the highest level of protection from a needlestick injury is used, or a needleless device is used in place of a hollow-bore needle, and
 - (b) safe work procedures and practices relating to the use of those safety-engineered needles or needleless devices are implemented.
 - (2) Personal protective equipment must be worn to shield workers from biohazardous material.
 - (3) Housekeeping practices must be designed to keep the workplace clean and free from spills of biohazardous material.
 - (4) Work procedures must ensure that laundry contaminated with biohazardous material is isolated and bagged, and handled as little as possible.
 - (5) Repealed. [B.C. Reg. 312/2003.]

- Labels and identification** **6.37** (6) ~~For bloodborne pathogens, the employer must implement a system of universal precautions for all tasks and procedures identified as having a potential for occupational exposure under section 6.35.~~
- (1) ~~Except as provided in subsections (2) to (4), a container of known or suspected biohazardous material must have a label affixed which discloses the product identifier, the name of the organism known or suspected to be present, information on the safe handling of the material, or a biohazard symbol, and a reference to an MSDS for the material if one has been prepared.~~
- A container holding a known or suspected infectious agent or infectious material must be clearly identified by the biohazard symbol as described in the *Controlled Products Regulations (Canada)* or by other means indicating the presence of an infectious agent.**
- (2) ~~A label on a diagnostic specimen of human body fluid or tissue that is known or suspected to contain a biohazardous organism is exempt from subsection (1) if~~
- ~~(a) the label discloses a sample identifier, and the risk group number of any risk group II, III, or IV organism, as defined by the Medical Research Council of Canada, known or suspected to be present,~~
- ~~(b) the specimen is identified as biohazardous by use of a biohazard symbol or equivalent means, and~~
- ~~(c) sufficient information is provided to enable immediate contact with the medical professional providing the sample in the event of an emergency.~~
- A laboratory sample of a known or suspected infectious agent or infectious material must only be transported in accordance with the *Transportation of Dangerous Goods Act*.**
- (3) ~~If a container of known or suspected biohazardous material is too small to be labelled, the employer is exempt from the requirements of subsections (1) and (2) if an equivalent system of hazard communication is developed and implemented.~~
- (4) ~~Laundry or waste material that is contaminated with a known or suspected bloodborne pathogen is exempt from subsections (1) and (2) if~~
- ~~(a) all such material is handled using universal precautions, and~~
- ~~(b) an alternate and equally effective system of hazard identification, such as distinctive coloured bagging, is used.~~
- (5) ~~Known or suspected biohazardous material that is not in a container must be identified, by~~
- ~~(a) posting a conspicuous and clearly legible placard that discloses the information required in subsection (1), or~~
- ~~(b) an equivalent means of hazard communication.~~
- Education and training** **6.38** ~~The employer must inform workers about the contents of the exposure control plan and provide them with adequate education and training to work safely with and in proximity to potentially biohazardous material.~~
- Vaccination** **6.39** ~~Vaccination against hepatitis B virus must be made available at no cost to the worker, upon request, for all workers who have, or who may have, occupational exposure to hepatitis B virus.~~

| | | |
|---------------------------|-------------|--|
| | | <p>(1) An employer must offer vaccination against hepatitis B virus to all workers at risk of occupational exposure to that virus.</p> <p>(2) If the <i>Communicable Disease Control Immunization Program Manual</i> issued by the BC Centre for Disease Control, as amended from time to time, lists a vaccine that protects against infection by an infectious agent, the employer must offer the vaccination to all workers at risk of occupational exposure to that infectious agent.</p> <p>(3) Vaccinations offered under subsections (1) and (2) must be provided without cost to workers.</p> |
| Health protection | 6.40 | <p>(1) A worker potentially exposed, to hepatitis B virus or another bloodborne pathogen in an exposure incident must be advised to seek a medical evaluation at the time of the incident.</p> <p>(2) The medical evaluation must be based on an assessment of the risks associated with the incident, and subsequent post-exposure health management, must be provided as necessary.</p> |
| Medical evaluation | | <p>If a worker may have been exposed to the human immunodeficiency virus (HIV), hepatitis B virus or any other infectious agent, the employer must advise the worker to seek immediate medical evaluation.</p> |
| Records | 6.41 | <p>A record must be kept of all workers who are exposed to biohazardous or potentially biohazardous material while on the job, and of worker education and training sessions on biohazardous materials.</p> |

EXPLANATORY NOTE

Sections 6.33 to 6.41 relating to biohazardous materials are proposed to be amended to emphasize that the scope is not limited to blood-borne or body fluid-borne pathogens. The proposed amendments clarify that Part 6 also covers infectious agents capable of causing high morbidity and death among workers during the course of employment, such as the agents responsible for SARS, tuberculosis, Legionnaires Disease and an influenza pandemic such as the 1918 “Spanish Flu”. Part 6 would not apply to common diseases such as seasonal influenza, the common cold and similar diseases that are relatively benign and affect the general population on a periodic basis.

Infectious agent and infectious material definitions

It is proposed that “biohazardous materials” be redefined as “infectious agent” and “infectious material” in section 6.33, and that the definition for an “infectious agent” be linked to a classification system. The proposed system is based on the biosafety containment classification system developed by the Communicable Diseases Branch of the World Health Organization (WHO), the Office of Laboratory Security of the Public Health Agency of Canada (OLS-PHAC), and the US Dept. of Health and Human Services, Centers for Disease Control and Prevention (DHHS-CDC).

The purpose of the proposed amendments is with specific reference to infectious agents in Risk Groups 2, 3 and 4 as set forth by the WHO and Health Canada. For the purposes and application of Part 6 covering infectious agents and materials, the following groups apply:

- Risk Group 2 agent
 - can cause human disease,
 - is unlikely to spread to the community,
 - may be a hazard to workers, and
 - usually has an effective prophylaxis or treatment available,

- examples include the Hepatitis B and Hepatitis C viruses, *Legionella* spp, and *Staphylococcus aureus*.
- Risk Group 3 agent
 - can cause severe human disease,
 - may spread to the community,
 - may be a serious hazard to workers,
 - usually has an effective prophylaxis or treatment available;
 - examples include the human immunodeficiency virus (“HIV”), the Severe Acute Respiratory Disease (“SARS”) coronavirus, hanta virus, *Yersinia pestis*, and *Mycobacterium tuberculosis*.
- Risk Group 4 agent
 - causes severe human disease,
 - likely to spread to the community,
 - is a serious hazard to workers, and
 - usually has no effective prophylaxis or treatment available;
 - examples include the hemorrhagic fever viruses such as Ebola, Marburg and Lassa.

To clarify questions that arose during public consultation, it is emphasized that Part 6 does not include Risk Group 1 agents that are common to the general community and of low morbidity (e.g., the common cold or seasonal influenza). These low hazard agents are unlikely to cause occupational disease, posing little or no risk to a worker.

The proposed amendments are linked by key phrases (underlined) as defined in sections 5.1 and 6.33, in accordance with a paradigm based on the following three criteria:

1. Biological agent

- A hazardous substance as defined by section 107 of the *Workers Compensation Act*
- An infectious agent or infectious material as defined in section 6.33
- A Risk Group 2, 3 and 4 infectious agent
- Can cause an adverse health effect in workers

2. Adverse health effect

- An acute or chronic injury
- An acute or chronic disease, or
- Death

3. Occupational exposure

- A reasonably anticipated contact with an infectious agent or infectious material
- Results from the performance of a worker’s duty.

An infectious agent must meet all three criteria in order to fall within the scope of Part 6. For example, the seasonal influenza virus would not meet all three criteria. Although it is classified in Risk Group 2, it does not cause an adverse health effect, as defined in section 5.1. However, its potentially highly pathogenic counterpart, a pandemic influenza virus, would require an exposure control plan. Similarly most coronaviruses would not fall under Part 6; however, a highly pathogenic form – such as the coronavirus responsible for SARS – would require an exposure control plan.

In accordance with section 6.34, there are several ways in which a worker might be exposed to an infectious agent at work:

- a) exposure as a result of working with a biological agent; e.g., in a microbiology laboratory;
- b) exposure as a result of working with, or in close proximity to, an infected individual; e.g., in a hospital or other medical setting;

- c) exposure as the result of coming into close contact with an infected individual in a non-medical setting; e.g., serving customers;
- d) exposure which does not result from the work itself but is incidental to it, mainly because infectious agents are present as contaminants; e.g., farming (infected livestock or poultry, hanta virus), pet stores (infected animals) forestry (tick-borne diseases), archaeology (contaminated material), garbage collection, sewage treatment.

To summarize, revisions to Parts 5 and 6, as proposed, cover worker exposure to infectious agents capable of causing high morbidity or death.

Route of transmission definition

A new definition for “route of transmission” is proposed in order to clarify that the risk assessment must consider all potential routes of transmission for the infectious agent, including contact, droplet and airborne transmission. Certain infectious agents may utilize one, two, or all three routes of transmission.

In response to a number of requests by stakeholders, what is meant by the proposed new definition for “routes of transmission” is described in more detail as follows. This information will be included in an accompanying guideline.

1. Contact transmission

Contact transmission is divided into two subgroups, direct-contact and indirect-contact transmission.

- *Direct-contact transmission*
 - Involves a direct body surface-to-body surface contact and physical transfer of agents between a susceptible host and an infected or colonized person or animal, with one serving as the source of the infectious agent and the other as a susceptible host. An example is when a healthcare worker provides care, and is close contact, with an infected patient or when a farm worker is handling infected livestock.
- *Indirect-contact transmission*
 - Involves contact of a susceptible host with contaminated intermediate objects, usually inanimate, such as door handles and other common items, infected animal tissues, contaminated equipment such as sewage pumps, or contaminated hands that are not washed. In the medical setting it would include gloves that are not changed between patients, contact with contaminated clinical instruments, or other contaminated surfaces such as counters. Also known as fomite transmission.

Indirect contact transmission also includes introduction of an infectious agent into a person’s body via a biological “vector”. An example of such a vector is a tick harboring the bacterium responsible for Lyme disease.

2. Droplet transmission

A person can be exposed to infectious agents contained in droplets present in the air when droplets land on the mucous tissues of the eyes, mouth or outer nasal passages.

For example a large diameter droplet (50 micrometre [μm] or larger) generated through a cough or sneeze by an infected person can land on the mucous tissues of the eyes, mouth or outer nasal passages.

3. Airborne transmission

Scientific evidence indicates that particles and droplets as large as 100 µm can be inhaled into the respiratory tract and distributed as follows:

- “*inhalable fraction*”: droplets and particles 50 - 100 µm in size deposit in the upper tract above the larynx including the inner nasal passages (“nasopharyngeal region”);
- “*thoracic fraction*”: droplets and particles in the 10 - 30 µm diameter range deposit below the larynx as far as the terminal bronchi (“tracheobronchial region”);
- “*respirable fraction*”: droplets and particles in the 0.1 or less up to 10 µm diameter range deposit in the alveoli (“pulmonary or alveolar region”).

Hence, infectious agents may be deposited throughout the respiratory tract depending on the droplet or particle size when attached to, or contained in, droplets up to 100 µm in diameter.

Droplets aerosolized as the result of coughing, sneezing or clinical procedures decrease in size within seconds in air due to evaporation particularly at typical indoor temperature and relative humidity levels. Some of these droplets (e.g., those less than 5 µm in diameter) may take more than 60 minutes to fall to the floor. As a result, infectious agents carried by small droplets (about 10 µm or less in diameter) can be dispersed widely by air currents and may become inhaled into the lungs of a susceptible host within the same room or over a longer distance from the source or point of generation, depending on biological, environmental and other factors.

Therefore, for the purposes of Part 6,

- Droplet transmission means deposition of droplets or particles onto the mucous tissues of the eyes, mouth or outer nasal passages, and
- Airborne transmission means the deposition of droplets into the respiratory tract.

Standard or routine infection control precautions definition

In response to feedback from stakeholders, the proposed definition for “standard infection control precautions” has been revised to include the term “routine” as it is commonly used in healthcare throughout BC. This amendment helps to clarify the application of section 6.34 (1) (d). It replaces “universal precautions”, a term no longer used by the infection control community.

Transmission-based precautions

A definition for “transmission-based precautions” is being proposed to complement the definition for “route of transmission” since the type of infection control measures that are put in place are specific to the route of transmission. As an example, if an agent is suspected or known to be transmitted through the air (such as the tuberculosis bacillus), airborne precautions require the worker to wear a respirator as protection for that agent. If an agent is known to be transmitted solely by droplet means, respiratory protection would not be required. A surgical mask would suffice for droplet protection. However, where the route of transmission has not been clearly established, for example the transmission patterns for the influenza virus, and it is unclear whether transmission involves the droplet or airborne route or both, it is expected that the higher level of precautionary measures are implemented during an influenza pandemic.

Exposure control plan

To ensure consistency with the requirements for an “exposure control plan” as outlined in section 5.54, it is proposed that sections 6.35, 6.36, 6.38, and 6.41 be repealed and included as

subsections to section 6.34. Risk identification, controls, education and training, records, among others, are all components of an exposure control plan. Hence,

- existing section 6.35 is proposed to be amended and renumbered as section 6.34 (1) (b),
- existing section 6.36 (1) is proposed to be amended and renumbered as section 6.34 (1) (c),
- existing section 6.36 (2) is proposed to be amended and renumbered as section 6.34 (1) (e),
- existing section 6.36 (3) is proposed to be amended and renumbered as section 6.34 (1) (d) (i),
- existing section 6.36 (4) is proposed to be amended and renumbered as section 6.34 (1) (d) (ii),
- existing section 6.36 (6) is proposed to be amended and renumbered as section 6.34 (1) (d),
- existing section 6.38 is proposed to be amended and renumbered as section 6.34 (1) (g), and
- existing section 6.41 is proposed to be amended and renumbered as sections 6.34 (1) (g) and 6.34 (1) (h).

Proposed new section 6.34 (1) (a), which complements the proposed changes to section 6.34, sets out the requirement for conducting a risk assessment for potential exposure to an infectious agent or material by any route of transmission, and that the risk assessment be carried out by a qualified person.

Based on feedback from stakeholders, there was a request to provide a definition for a “qualified person”. “Qualified” is defined in section 1.1 as “being knowledgeable of the work, the hazards involved and the means to control the hazards, by reason of education, training, experience or a combination thereof”. In terms of Part 6 – Infectious agents and infectious materials” it means the person has knowledge of microorganisms, infectious agents (microbiology), means of transmission, infection control principles and experience in conducting hazard evaluations and risk assessments.

Labels and identification

Following feedback from stakeholders, the proposed amendments to section 6.37, “Labels and identification”, have undergone further revision in recognition of the current practice of labeling samples with a biohazard symbol common to WHMIS and the *Controlled Products Regulations*. This practice is common to all healthcare facilities in BC. Furthermore, this means all biohazardous samples are treated similarly using standard or routine infection control precautionary measures.

Vaccination

Further to feedback received during public consultation, the proposed amendment to section 6.39, “Vaccination”, was revised. This revision clarifies the responsibility of the employer to provide vaccinations for the Hepatitis B virus and any other infectious agents for which vaccinations become available, provided that the worker is at risk of occupational exposure to the agent. The key defining terms for this section are “occupational exposure” and “infectious agent” in determining the application of this section. Suitable vaccines for occupationally exposed workers are prescribed by the Immunization Program manual issued by the BC Centre for Disease Control and is referenced in a revised subsection (2). This would apply for newly available vaccines.

Medical evaluation

Based on consultation with stakeholders, the proposed amendment to section 6.40 (1), “Health protection” has been revised in order to clarify its application. Accordingly, the call-out has been renamed “Medical evaluation”. It is clarified that the responsibility of the employer is limited to advising the worker who may have been exposed to the human immunodeficiency virus (HIV), hepatitis B virus or any other infectious agent to seek immediate medical attention and

evaluation. Current section 6.40 (2) is in error and has been deleted. The responsibility for evaluating the risk of exposure and any subsequent preventative or prophylactic treatment lies with medical practitioner, not the employer.

DRAFT

G6.34-2 Exposure control plan - Pandemic influenza NEW

Preliminary Issue February 8, 2007

Background: For some time, health authorities have advised of the possibility of an influenza pandemic arising from a mutated strain of a virus currently found primarily in birds (technically referred to as the H5N1 virus). WorkSafeBC has issued this guideline to assist with workplace planning in the event of an influenza pandemic. The guideline addresses the expectations for exposure control plans to protect workers from possible exposure to such a virus in BC workplaces.

The guideline is intended to be consistent with the direction of the recent documents adopted by agencies such as the US Center for Disease Control and the World Health Organization. It is also intended to be consistent with primary themes of the SARS Commission Report by Justice A. Campbell, such as the precautionary principle when evaluating scientific evidence related to control measures, including respiratory protection.

This guideline has been developed by an interdepartmental committee at WorkSafeBC, in consultation with workplace stakeholders and following a period of consultation with other parties. As is the case with other guidelines, it may be revised from time to time based on evolving evidence on the nature of the virus and appropriate means of control.

Regulatory excerpt

Section 6.34 (Exposure control plan) of the *OHS Regulation* ("Regulation") states:

The employer must develop and implement an exposure control plan meeting the requirements of section 5.54, if a worker has or may have occupational exposure to a bloodborne pathogen, or to other biohazardous material as specified by the Board.

Section 5.54 states:

- (1) An exposure control plan must be implemented when
 - (a) exposure monitoring under section 5.53(3) indicates that a worker is or may be exposed to an air contaminant in excess of 50% of its exposure limit,
 - (b) measurement is not possible at 50% of the applicable exposure limit, or
 - (c) otherwise required by this Regulation.
- (2) The exposure control plan must incorporate the following elements:
 - (a) a statement of purpose and responsibilities;
 - (b) risk identification, assessment and control;
 - (c) education and training;
 - (d) written work procedures, when required;
 - (e) hygiene facilities and decontamination procedures, when required;
 - (f) health monitoring, when required;
 - (g) documentation, when required.
- (3) The plan must be reviewed at least annually and updated as necessary by the employer, in consultation with the joint committee or the worker health and safety representative, as applicable.

Purpose of guideline

This guideline discusses the application of the *Regulation* to the protection of workers in the event of an influenza pandemic. It provides background information on regulatory context, the

nature of pandemic influenza, routes of transmission, and adverse health effects. It also provides information on exposure control plans in the workplace, and guidance on specific types of controls, including engineering measures, work procedures, and personal protective equipment.

The guideline does not specifically address issues related to the health of the public and any medical procedures used for the treatment of patients, which are within the purview of public health and medical authorities. Internet locations for accessing further information on pandemic planning, whether for the workplace or the community, are provided at the end of this guideline.

Regulatory context

Sections 6.34 and 5.54 of the *Regulation* are basic requirements that apply in the circumstances of a pandemic influenza, when the pandemic virus is specified as "biohazardous material" by WorkSafeBC. However, they operate in the context of other requirements.

For example, [Part 3](#) of the *Workers Compensation Act* ("Act") and [Part 3](#) of the *Regulation* address issues such as employer and worker responsibilities, programs, correction of unsafe conditions, undue risk, and the procedures related to any work refusals. The general requirements for chemical and biological safety in [Part 5](#) of the *Regulation*, as well as provisions on biohazardous materials in [Part 6](#) on control procedures, education and training, and records help round out the framework.

What is pandemic influenza?

Pandemics are worldwide outbreaks of disease such as influenza. Three outbreaks of pandemic influenza (as opposed to seasonal influenza) occurred in the 20th century: 1918 (Spanish influenza), 1957 (Asian influenza), and 1968 (Hong Kong influenza).

The World Health Organization (WHO), Health Canada and in British Columbia, the BC Centre for Disease Control (BC CDC), have recommended that all jurisdictions and workplaces prepare influenza pandemic preparedness plans to diminish the potential adverse effects of an influenza pandemic. The WHO has advised that there is a risk of pandemic influenza that could cause widespread illness and even death, in humans.

Seasonal, pandemic, and avian influenzas can be differentiated as follows:

- Seasonal influenza - An infection caused by influenza viruses carried and spread among humans, typically on a seasonal basis.
- Pandemic influenza - A new strain (or subtype) of influenza virus that quickly spreads among humans worldwide because humans have little or no pre-existing immunity against it.
- Avian (Bird) influenza - A disease caused by influenza viruses carried and spread among birds. There are some cases where the virus has been transmitted from birds to humans.

There are a number of phases that a pandemic is likely to go through, as shown in the following Table.

Table 1: Pandemic influenza phases (adapted from the *WHO global influenza preparedness plan 2005*)

| Phase | Characteristics |
|--------------------------|--|
| Phase 1 - Pre-Pandemic | No new influenza viruses detected in humans. The risk of human infection or disease is low. |
| Phase 2 - Pre-Pandemic | No new influenza viruses detected in humans. However, a circulating animal influenza poses a risk of disease to humans. |
| Phase 3 - Pandemic Alert | Humans have been infected with a new type of influenza originating from animals but there has been no significant human-to-human spread (except in rare instances of close contact). |

| | |
|-----------------------------|---|
| Phase 4 - Pandemic Alert | Small clusters of limited human-to-human transmission but the disease is not widespread (still localized). |
| Phase 5 - Pandemic Alert | Larger clusters of human-to-human transmission but the disease is still not widespread. Evidence suggests that the virus is becoming increasingly better adapted to humans. |
| Phase 6 - Pandemic | Increased and sustained transmission in the general population. |

When there is confirmed human-to-human transmission and a pandemic influenza virus has been characterized by health authorities, WorkSafeBC would specify it as a "biohazardous material" under section 6.34 of the *Regulation*. In so doing, there becomes a legal obligation for employers to have a pandemic influenza exposure control plan in place where workers have, or may have, occupational exposure to the pandemic influenza virus. As with all aspects of emergency preparation, it is important to have the plan in place before a pandemic occurs.

What are the symptoms of pandemic influenza?

The effects of pandemic influenza are expected to be much more severe than for seasonal influenza, due to a lack of immunity to the virus. Seasonal influenza affects people to varying degrees, with symptoms including headache, fever, fatigue, sore throat, and runny nose. In some cases secondary infections such as pneumonia may develop. Symptoms of pandemic influenza are likely to include high fever (higher than 38 degrees Celsius), chest pain, and difficulty breathing.

In its materials on pandemic influenza, the BC CDC advises influenza is communicable for 24 hours before onset of symptoms, and 3 - 5 days afterwards (but may be longer in some children and some adults).

How can pandemic influenza be spread?

Pandemic influenza would be spread in the same way that seasonal influenza is spread, typically by contact with ill persons or with surfaces that an infected person has handled or touched.

Exposure to a pandemic influenza virus may occur in a variety of ways such as

- Shaking hands with an infected person or touching a surface contaminated with the virus followed by touching one's eyes, nose, or mouth
- Infectious droplets (from a coughing or sneezing person) landing in the eye or onto the mucosa (moist inner surface) of the nose or mouth
- Breathing airborne droplets or particles containing influenza viruses (generated, for example, from coughing, sneezing, and aerosol-generating medical procedures in infected patients)
- Sharing food items or utensils with an infected person

Is there a vaccine or a treatment for pandemic influenza?

At present, there is no vaccine for the prevention of pandemic influenza. It is only possible to develop a vaccine after the actual pandemic influenza virus has been identified. In addition, it typically requires 4 to 6 months to produce a new influenza vaccine.

Antiviral drugs (that slow down or kill the virus) have been shown to be beneficial against seasonal influenza. However, their effectiveness against a pandemic influenza virus is not known. There is evidence that some of these products can reduce or stop influenza viruses from spreading throughout the body and improve the prospects of survival.

What is "occupational exposure" to pandemic influenza?

"Occupational exposure," as defined by the *Regulation* means "reasonably anticipated, harmful contact with blood or other potentially biohazardous material that may result from the

performance of a worker's duties." The term "occupational exposure" refers to exposure at work and not to exposures in other settings such as at home or during social activities.

The possibility of harmful contact varies depending on the specific organism and its route of transmission. For a virus causing pandemic influenza, "harmful contact" resulting from the performance of a worker's duties may occur, for example, when caring for, or having other close contact with a person who has pandemic influenza. Examples of workplaces where harmful contact may occur include hospitals, community care facilities, group homes, private homes, and ambulances.

Exposure control plan (ECP)

An ECP is a plan for preventing harmful exposure of workers to a pandemic influenza virus in the workplace.

As required by section 6.34 of the *Regulation*, an employer must implement an exposure control plan where it can be reasonably anticipated that workers will have occupational exposure to a pandemic influenza virus during the course of their work activities. It is expected that ECPs would be required for most workplaces.

In many workplaces of lower risk, the ECP may involve relatively few measures to help ensure safety, such as provision and use of hand washing facilities (see [Table 2](#)) and use of cough/sneeze etiquette. More extensive measures will be required for protection of workers in higher risk circumstances, for example, health care personnel involved in direct patient care, emergency response personnel, and first aid attendants.

The majority of workplaces in British Columbia will require an ECP. A risk assessment will determine how extensive the plan will have to be in order to reduce the risk of worker exposure to the pandemic influenza virus.

An ECP will need to incorporate the following elements, as specified in section 5.54 of the *Regulation*:

- A statement of purpose and responsibilities
- Risk identification, assessment, and control
- Education and training
- Written work procedures, when required
- Hygiene facilities and decontamination procedures, when required
- Health monitoring, when required
- Documentation, when required

Section 5.54(3) requires that the ECP be reviewed at least annually and updated as necessary by the employer, in consultation with the joint OHS committee or worker health and safety representative, as applicable. To assist with communication and understanding, it is recommended the employer consult with workplace parties in the initial development of the ECP.

The elements of the ECP are discussed below.

1. **Statement of purpose and responsibilities:** While individual workplaces may state the purpose of the ECP in different ways, an underlying purpose of the ECP is to prevent harmful exposure of workers to a pandemic influenza virus in the workplace. Assignment of responsibilities for implementation of the ECP in a small workplace is likely to be

straightforward, typically involving one person. In a larger workplace, there may be some division of responsibilities for implementing aspects of the ECP.

2. **Risk identification and assessment:** A key step in assembling the exposure control plan is the proper identification and assessment of risk. It begins with an understanding of the nature of the pandemic influenza virus and how it can be transmitted.

Risk identification and assessment for exposure to the pandemic influenza virus should be based on factors such as

a. Routes of transmission by which the virus can infect a worker: In the case of pandemic influenza it is anticipated there will be three primary routes of transmission, all of which need to be controlled. The routes are

- **Contact transmission, both direct and indirect:** Direct contact involves direct skin-to-skin contact, such as when a worker performs any patient care or emergency response activity that requires direct personal contact (such as turning or bathing a patient). Indirect contact transmission involves a worker's contact with a contaminated intermediate object such as a table, door knob, telephone, or computer keyboard and then touching the eyes, nose, or mouth. Contact transmission is important to consider because influenza viruses can persist for minutes on hands and hours on surfaces.
- **Droplet transmission:** Large droplets may be generated by an infected person through coughing or sneezing, and also through certain medical procedures (such as cough induction). Droplets travel a short distance through the air and can be deposited on inanimate surfaces, or in the eyes, nose, or mouth.
- **Airborne transmission:** Airborne (inhalable) particles can be generated from some medical procedures such as endotracheal intubation, bronchoscopy, nebulizer treatment, or airway suctioning. They can also be generated from coughs and sneezes.

Both coughs and sneezes produce large droplets and smaller airborne particles. The smaller particles remain suspended in air for longer periods, and can be inhaled. In addition, large droplets can evaporate quickly to form inhalable particles. As the distance from the person coughing or sneezing increases, the risk of infection from airborne exposure is reduced, but can still be a concern in smaller, enclosed areas, especially where there is limited ventilation. As the number of infected people in a room increases, all things equal, the risk of infection can increase.

b. Work methods or procedures that may result in exposure: The potential for workplace exposure will vary from sector to sector, and will also depend on work activities in a sector. For example, in the health care sector, direct patient care involves a higher potential for exposure to the virus than activities which involve work at a distance, such as delivery of supplies, or maintenance in areas where patients are not present. In the former case, all routes of transmission are possible; in the latter, the routes are more likely to be restricted to avenues such as indirect contact.

c. Identification of the workers at risk of exposure: Appropriate protective measures will vary according to the kinds of activities the workers perform and the relationship of those activities to routes of transmission and proximity to sources of infection.

3. **Risk control:** The required controls may range from simple hand washing and cough/sneeze etiquette, to more extensive measures requiring administrative and engineering controls as well as personal protective equipment (PPE). Control measures need to address all possible routes of transmission involved.

Exposure controls must meet the requirements of section [6.36 \(Control procedures\)](#) of the *Regulation*. The first two provisions of this section address expectations for engineering/work practice controls, and personal protective equipment as follows:

- (1) Engineering and work practice controls must be established to minimize or eliminate the potential for exposure to biohazardous material.
- (2) Personal protective equipment must be worn to shield workers from biohazardous material.

An example of an engineering control in a hospital could include a well-ventilated isolation room with a directed airflow that ensures the safety of workers. An example of an employer's work practice control is a policy of encouraging sick workers to remain at home. Work practices would also include the procedures established in the workplace to eliminate or minimize the potential for exposure. Such work practices may be substantial in higher risk workplaces (see [Table 2](#)).

The plan may also require the use of PPE, such as respirators, gloves, gowns, goggles, surgical masks, and face shields. The proper donning, fit checking, doffing, and disposal of the PPE and training in these practices must also be considered. [Table 2](#) at the end of this guideline provides information on basic measures related to personal hygiene and PPE for several types of work circumstances.

4. **Education and training:** Under section [6.38 \(Education and training\)](#) of the *Regulation*, the employer must ensure that workers are informed about the contents of the ECP and provided with education and training to work safely with and in proximity to potentially biohazardous material. Information provided to the workforce should ensure an understanding of the means of transmission of the virus and applicable control measures. Information on the use of PPE should include instruction on the means of donning and doffing of the equipment.
5. **Written procedures, hygiene/decontamination facilities, health monitoring, and documentation:** Section [5.54](#) requires these elements of the ECP where necessary to protect workers. In the event of a pandemic influenza, the expectations are as follows:

Written procedures would be required if the complexity of the procedure and risks involved, or the size of the workplace merit instructions being written. For example, written procedures might be required for a hospital isolation ward, but not in a small workplace of low risk as long as worker education and training addresses basic issues of worker protection.

Hygiene facilities to permit proper hand washing whenever needed are a basic expectation under all ECPs. **Decontamination procedures** will be needed in some higher risk workplaces, for example, when cleaning re-usable personal protective equipment such as gowns, aprons, face shields, and goggles.

In all workplaces workers should be monitored for possible symptoms of pandemic influenza. If a worker develops symptoms, appropriate measures should be taken to minimize exposure of other workers, and the worker should be referred to the appropriate medical authority.

Section [6.41 \(Records\)](#) of the *Regulation* establishes requirements for **documentation** of worker exposure and training. It is expected that documentation of the exposure associated with job positions and which workers are in those positions will meet the intent of this requirement as it applies to worker exposure.

Where to get more information

Both WorkSafeBC and various public health authorities have web sites with further information on infectious diseases, pandemic planning, and protection from exposure.

- WorkSafeBC - www.worksafebc.com
- The BC Centre for Disease Control - www.bccdc.org
- The Public Health Agency of Canada - www.phac-aspc.gc.ca
- The World Health Organization - www.who.int
- The US Center for Disease Control - www.pandemicflu.gov

Table 2: Personal protective measures for pandemic influenza

This Table provides basic information for personal protection of workers in some but not all types of work situations.¹ A risk analysis will need to be done in all cases, including those covered by this Table, to ensure that control measures properly protect workers. The Table focuses on PPE and personal hygiene, but does not address work procedures or engineering controls, which also need to be considered as part of the exposure control plan.

| | Low risk: Workers who typically have no contact with pandemic influenza-infected persons ² | Moderate risk: Workers who may be exposed to infected persons from time to time in relatively large, well ventilated workspaces ³ | High risk: Workers who may have contact with infected patients, or with infected persons in small, poorly ventilated workspaces ⁴ |
|---|--|--|--|
| Hand hygiene | Yes (washing with plain or antimicrobial soap and water; or use of hand wipes that contain effective disinfectant) | Yes (washing with plain or antimicrobial soap and water; or use of hand wipes that contain effective disinfectant) | Yes (washing with plain or antimicrobial soap and water; or use of hand wipes that contain effective disinfectant) |
| Disposable gloves | Not required | Not required (unless handling contaminated objects on a regular basis) | Yes in some cases- e.g. when working directly with pandemic influenza patients |
| Apron, Gown, or similar body protection | Not required | Not required | Yes in some cases- e.g. when working directly with pandemic influenza patients |
| Eye protection - Goggles or Face shield | Not required | Not required | Yes in some cases- e.g. when working directly with pandemic influenza patients |
| Airway Protection - respirators | Not required | Not required (unless likely to be exposed to coughing and sneezing) | Yes (minimum N95 respirator or equivalent) |

1. For example, lab work is an activity not covered by the Table. Lab workers will require appropriate hand, body, and eye protection when handling specimens that are or may be contaminated with the pandemic influenza virus. Also, approved respiratory protection would be required where there may be exposure to contaminated aerosols.
2. This category would typically apply to workers who do not have contact with the public, for example, in locations such as production facilities or administrative clerical areas.
3. This category would typically include workers who routinely deal with the public, some of whom may be infected with the pandemic virus, in circumstances where typically the contact is of a short duration, and the workspace is relatively large and well ventilated. Examples include cashiers, tellers, receptionists, and sales persons. Protective measures may be required if workers handle, on a regular basis, objects that may be contaminated (e.g. money, paperwork, or ticket stubs), or are exposed to coughing or sneezing.
4. High risk activities typically involve workers (e.g. health care, first aid, and emergency response) who treat patients with pandemic influenza, or who do other work in isolation wards, rooms, or home settings where such patients are present. They may also include other circumstances where there is extensive contact with the public in small enclosed areas where ventilation is poor.