

# BIOLOGICAL HAZARDS

## TABLE OF CONTENTS

### Basic Informations

Teacher's Notes	
A. Hazard Identification and Control Review . . . . .	2
B. Biological Hazards Overview. . . . .	3
C. Types of Biological Hazards . . . . .	4
D. How Do Biological Hazards Enter the Body? . . . . .	6
E. How Biological Hazards are Spread . . . . .	8
F. Controlling Exposure to Biological Hazards . . . . .	11
• Engineering Controls . . . . .	11
• Administrative Controls . . . . .	12
• Personal Protective Equipment. . . . .	13
• Standard Precautions . . . . .	14
• WHMIS . . . . .	16
G. Pandemics. . . . .	17
Handout . . . . .	21
Presentations . . . . .	23

### Supplemental Information

Teacher's Notes	
A. Agriculture and Landscaping . . . . .	35
Presentation. . . . .	37

## TEACHER'S NOTES

### A. Hazard Identification and Control Review

Detailed information on the legislated requirements for hazard assessment is included in the chapter on legislation. Detailed information on the process for identifying and controlling hazards and sample hazard assessment forms are included in the chapter on health and safety management systems. A brief overview is provided here to reinforce the importance of the basic principles of hazard identification, assessment and control.

#### What is a Hazard?

A **hazard** is any situation, condition or thing that may be dangerous to the safety or health of workers.

(OHS Code Part 1)



Where's the hazard?

#### Identifying Hazards

The first step in preventing incidents, injuries or illness in the workplace is identification of all the hazards within the workplace that could cause injury or illness. In Alberta, the employer is responsible for conducting an overall hazard assessment in the workplace (OHS Code, Part 2); however, all workers should be able to recognize and identify hazards in the workplace on an ongoing basis. As work conditions change, so may the hazards. It is essential that workers be alert and aware of their surroundings at all times.

#### Controlling Hazards

The hierarchy of controls applies to all types of hazards and is outlined below.

Whenever possible, hazards should be **eliminated**. If this is not possible, hazards must be controlled. **Control** means reducing the hazard to levels that do not present a risk to worker health. Controls, in order of preference, include:

- Engineering Controls
- Administrative Controls
- Personal Protective Equipment (Used only when other levels of control are not possible or if additional protection is required to ensure the health and safety of workers.)



Hazard Control

## B. Biological Hazards Overview

Biological hazards are organisms or products of organisms that present a health hazard to humans. Biological hazards can be encountered anywhere in the environment, including home, school or work. Exposure to biological hazards in the workplace may result in a significant amount of occupationally associated disease, although the biological hazards are not always recognized in the work setting.



Pathogen Memory  
Card Match

Out of date

C-Types.ppt  
Slide 1

Ten Minute Epidemic

## C. Types of Biological Hazards

Biological hazards can be put into different categories. The most common biological hazards include:

- *Bacteria* – microscopic organisms that live in soil, water, organic matter or the bodies of plants and animals and are characterized by lack of a distinct nucleus and the inability to photosynthesize.
- *Viruses* – a group of pathogens that consist mostly of nucleic acids and that lack cellular structure. Viruses are totally dependent on their hosts for replication.
- *Fungi* – any of a major group of lower plants that lack chlorophyll and live on dead or other living organisms.

Examples of different types of biological hazards:

- bacteria – Escherichia coli (E. coli), Mycobacterium tuberculosis (TB), tetanus
- viruses – common cold, influenza, measles, SARS, Hantavirus, rabies
- fungi – athlete's foot, mould, rusts, mildew, smut, yeast, mushrooms

Other concerns from the environment may include:

- insect stings/bites
- allergic reactions; e.g., peanuts, pollen, bee stings
- poisonous plants/animals; e.g., poison ivy, cobras, belladonna

**Note:** Students should be able to identify occupations where people can potentially be exposed to infectious diseases. Students could suggest the occupations, source or potential disease, as shown.

Occupation	Contact Source	Disease
Dentists, nurses, volunteers in hospital or health care	Patient's blood, body fluids	Hepatitis, colds, flu
Child care worker, babysitter	Children's body fluids, such as runny nose, dirty diapers, cuts	Colds, flu, eye infections, head lice, meningitis
Animal control officer	Animal bite	TB, tetanus, rabies
Food service industry	Undercooked food	Salmonella, e coli
Caretaking/cleaning/waste disposal personnel	Used needles, broken glass	Hepatitis B, C, HIV
Pet shop	Bird droppings	Psittacosis
Greenhouse worker	Plants, insects	Skin rashes, pollen allergies, contact allergies
Hairdresser	Insect	Head lice
Farm worker	Hay mould, animals, grain dust, animals	Hay fever, ring worm
Water/Wastewater operator	Sewage	tetanus, flu, diphtheria, HIV



D-HowEnter.ppt  
Slides 1-4

## D. How Do Biological Hazards Enter the Body?

Factors that determine if a person will contract a disease and how bad it will be include the dose, type of organism and the resistance (or susceptibility) of the individual. Some organisms can live outside a host for hours or even days, while others require a host to survive. Some organisms are very small and lightweight, remaining in the air for long periods. Others quickly settle out onto surfaces, and are a contact concern. All of these issues affect potential exposure.

Biological hazards can enter the body by different routes. When determining appropriate protective measures, a clear understanding of how biological hazards enter the body is an important first step.

### Routes of Entry

Biological hazards enter the body through:

- inhalation; i.e., breathing
- absorption; i.e., direct contact through breaks in the skin, even chapped skin, or through mucous membranes/contact with eyes, nose, mouth
- ingestion; i.e., swallowing
- injection; i.e., through a puncture

The most common routes of entry for biological hazards are inhalation and absorption from direct contact.

### Inhalation

Inhalation is a common way for biohazards to get into the body. The effect on the body depends on the biohazard and the amount that is breathed in.

Although our immune system and lungs have mechanisms to fight germs, many biohazards are very strong and can overcome our defenses.

Unlike chemical inhalation, we often don't know that we have inhaled a bacteria, virus or mould because there is no taste or smell and there are no irritating effects. It is only when we get symptoms of the infection that we realize we were exposed.

## Absorption

A biohazard can enter the bloodstream through broken skin, such as a cut, chapped skin, hangnail or any other break in the skin. Cover broken skin with a bandage or gloves to seal the wound and wear appropriate protection to keep the wound area safe from biohazardous penetration. Splashes of blood/body fluids to the eyes is another way biohazards can be absorbed.

## Ingestion

Swallowing biohazards can sometimes occur without us knowing it, often simply from not washing our hands. Poor hand washing is one of the most common ways that biological hazards can be transmitted. Workers should always wash their hands before eating so that any hazardous material on the hands is not ingested.

In labs or any areas where specimens and other materials that are toxic by ingestion are commonly used, there must be no drinking or eating. No food should ever be stored in refrigerators where hazardous biological materials are stored.

## Injection

When something sharp punctures the skin, a biohazard can enter the body through the skin. At home, if you drop a glass on the floor, what do you do? Sweep up the pieces with a broom? Pick them up with your bare hands? In a lab, if that glass contained a biohazard, picking the pieces up with your bare hands could enable the biological agent to enter your body through the cut or puncture.



D-HowEnter.ppt  
Slide 5



E-HowSpread.ppt  
Slide 1

## E. How Biological Hazards Are Spread

The transmission of biological hazards can be reduced by using certain precautions.

Biohazard	Disease	Spread	Precaution/Control
Bacteria	Pink eye (conjunctivitis)	Human to human contact	Do not share eye makeup; wash hands
Virus	Hepatitis A	Human to human contact	Do not ingest contaminated water or food; avoid direct contact with infected person
Virus	Hepatitis B	Human to human contact	Immunization; avoid intimate contact with infected person; avoid tattooing and body piercing; follow standard precautions; do not recap needles; dispose of sharps in sharps disposal container
Virus	Hepatitis C	Human to human contact	Avoid intimate contact with infected person; avoid tattooing and body piercing; follow standard precautions
Virus	Measles	Human to human contact; spread by cough and nasal droplets	Immunization; avoid direct contact with infected person
Virus	Hantavirus	Mouse droppings and urine	Do not sweep up droppings; wear respiratory protection
Bacteria	Lyme disease	Tick to human	Wear long sleeved shirts and long pants and shoes; ensure socks are worn outside of pant legs
Virus	West Nile	Mosquito to human, through a bite	Eliminate standing water; wear light- coloured clothing, long sleeved shirts, long pants and mesh head covering; use insect repellent
Virus	Common cold	Human to human contact	Cover mouth when coughing; dispose of used tissue; wash hands; sanitize sports equipment
Fungus	Athlete's foot	Human to human contact, through shared locker rooms, footwear	Do not share footwear; disinfect showers/locker rooms; ensure feet are dry following showering



### Optional Exercise to Reinforce Learning

Many students will be able to identify illnesses they know about. The teacher can provide the source and have students provide the types of illnesses or disorders transmitted through the source. Here is a list, organized by different sources:

Source	Illness or Disorder
People	Colds, flus, pink eye, cold sores, hair lice, HIV, hepatitis, meningitis
Animals (pets or wildlife)	Flea bites, rabies, hantavirus (from mouse droppings), pinworms
Insects	West Nile virus (from mosquitos), allergies (from bee stings), Lyme disease (from deer ticks)
Plants	Food or pollen allergies, poisonous plants, berries or seeds
Unclean water, uncooked food	Giardiasis, infections from e coli or salmonella bacteria

Many infectious diseases can spread from contact between people. For example:

- *Athlete's foot* – can be spread by sharing footwear and walking barefoot in public showers/change rooms. (Note: Hair lice and minor rashes can also be caused by close contact or by sharing personal items or clothing.)
- *Eye infections* – can spread through sharing of makeup applicators, brushes and wipes or by hand-to-eye contact; e.g., rubbing eyes.
- *Colds or flu* – can spread through close personal contact; e.g., hand-to-hand, then the hand is placed near mouth, nose or eye.
- *Mononucleosis* – can spread through mucus and saliva by kissing or sharing drinks/water bottles/cigarettes.
- *HIV* – can spread by exposure to blood and body fluids.
- *Hepatitis* – two strains of hepatitis (B and C) can be spread by exposure to blood or body fluids.

HIV and hepatitis B and C are very serious diseases that can lead to death.



Source Sort



E-HowSpread.ppt  
Slide 2



The Germ Spreaders

E-HowSpread.ppt  
Slide 3

### Optional Suggested Activity

Provide students with a list of human activities and ask which are likely to help spread germs. Examples may include:

**CAN**

sneezing  
sharing personal items  
touching contaminated surfaces  
kissing

**CANNOT**

running  
talking on the phone  
watching tv  
walking in the rain

If you spend time outdoors, you may be frequently exposed to outdoor biological hazards.

Out of date

## F. Controlling Exposure to Biological Hazards

There are three approaches to control hazards. The first consideration for controlling biological hazards, as with all other types of hazards, is to look at engineering controls. If a hazard cannot be eliminated or physically controlled through engineering methods, the second approach to controlling hazards is administrative controls. Finally, if exposure to a hazard cannot be prevented with either engineering or administrative controls, then personal protective equipment is necessary.

Where reasonably practicable, the employer must use engineering controls.



If the hazard cannot be eliminated or controlled by the use of engineering controls,

The employer must use administrative controls that control exposure to the hazard to a level as low as reasonably achievable.



If the hazard cannot be eliminated or controlled by the use of engineering or administrative controls,

The employer must ensure that appropriate personal protective equipment is used.



If the hazard cannot be eliminated or controlled by the use singly of engineering controls, administrative controls or personal protective equipment,

The employer may use a combination of engineering controls, administrative controls or personal protective equipment.

### Engineering Controls

Engineering controls are the preferred defense and include built-in protection in buildings, work areas, equipment or supplies. Hazard protection is built in and, therefore, control is at the design stage. Examples of controlling biological hazards, using engineering controls in a building, are:

- ventilation systems and construction seals to create negative-pressure rooms
- bio-safety hoods, with specific ventilation systems



F-Controlling.ppt  
Slides 1-2



Cast Iron Chef  
Bio Hazard

This type of control enables a worker to minimize potential exposure when used properly.

Other engineering controls include:

- Sharps disposal containers for needles and other sharps – eliminates the potential of getting cut or injected with potentially infected body fluids. These containers allow sharps to be disposed in a manner that minimizes the risk of puncture. In addition, the container itself is puncture-proof and is usually appropriately labelled during the manufacturing process.
- Self-sheathing needles and lancets as well as needleless systems – engineered to eliminate and prevent puncture wounds.
- Automatic flush toilets and automatic taps, soap dispensers and towel dispensers – eliminate hand contact in public washrooms.

### Administrative Controls

Administrative controls are steps in work procedures or work processes that minimize the risk of exposure to a hazard. This type of control does not eliminate a hazard but can significantly reduce the risk of injury. Administrative controls are set up by management and workers and are used if a hazard cannot be eliminated or reduced through engineering controls. Examples of administrative controls include:

- worker training
- policies, such as rules that require regular hand washing
- procedures, such as disinfection and wet-mopping for hazards such as hantavirus clean-up
- specific work schedules to rotate duties so that exposure times are limited

While management generally must make the rules, workers are responsible for following them. Administrative controls require constant diligence to be effective.

Vaccination is a type of administrative control; however, vaccines do not exist for all biological hazards. For example, hepatitis B vaccine is widely available and influenza vaccine is also common. Other biohazards, such as hepatitis C, hantavirus and many others, do not yet have vaccines.



F-Controlling.ppt  
Slides 3-5

## Personal Protective Equipment

When a hazard poses a threat, even after engineering and administrative controls have been implemented, then personal protective equipment (PPE) is necessary.

The most common items of personal protective equipment to protect from biological hazards include:

- latex gloves
- a proper mask for biohazards
- eye protection

It is important to note that simple dust masks do not prevent the spread of viruses and bacteria. Careful consideration is necessary when choosing the most appropriate mask or respirator for biological hazards. For example, to protect against the SARS virus, health care workers need to wear a mask rated N95. When dissecting animals for bio labs or performing first aid, latex gloves are paramount. Glasses should be worn if splashes to the face are possible but respirators are likely not required. Respirators are used in jobs, such as cleaning out buildings that have been infected with mice, cleaning ducts that could harbour moulds or cleaning cages and pens that have housed birds infected with psittacosis.



F-Controlling.ppt  
Slide 6

### Summary Chart: Routes of Entry and PPE for Biohazards

Route of Entry	Personal Protective Equipment
Inhalation – breathing in biohazards	respirators
Absorption – through the eyes, mucous	impervious clothing, eye protection, gloves
Ingestion – contaminated hands, food, cigarettes	gloves, protective clothing
Injection – puncture through the skin	gloves, protective clothing



F-Controlling.ppt  
Slides 7-8

#### Make sure PPE Is Effective:

- Use the **appropriate** PPE for the hazards.
- Ensure the PPE **fits** properly.
- Make sure different pieces of PPE don't interfere with each other and all remain **effective**.
- **Check**, before each use, to make sure PPE is operational and in good condition.
- **Clean** your PPE regularly.

If there is a chance that body fluids can enter through either direct contact or by being splashed, then a face shield or safety goggles are necessary. Work in environments, such as hospitals, labs, veterinary clinics or meat packing facilities, may require special safety clothing or full body protection against any biological hazards. Depending on the work, workers may also be exposed to chemical hazards (e.g., cleaning agents) and, therefore, the personal protective equipment would need to protect against both types of hazards.

To be effective, PPE must be worn, therefore it must be comfortable and fitted for each person. Workers must be trained properly so that it is worn when needed, inspected and either discarded, if it is disposable, or properly cleaned, if not disposable.

#### Standard Precautions

Standard precautions (also known as universal precautions) are a type of administrative control that is well known in workplaces or occupations where biological hazards are common. Standard precautions are based on the premise that all body fluids are considered infectious and are treated as such.

#### Standard Precautions:

- Consider all body fluids infectious.
- Wash hands.
- Disinfect surfaces and equipment with 10% bleach solution.
- Wear gloves and other PPE appropriate to the situation.

### Protect Yourself at School, at Work, at Play and at Home

Get into the habit of protecting yourself, your co-workers, your family and your friends from biological hazards:

**Food or beverages** – use your own utensils, glasses or straws when sharing food or drinks.

**Clothing or shoes** – infections and diseases can be spread through clothing or shoes. Wash any personal items like swimsuits, gym shorts or running shoes if you share these items.

**Makeup** – if you share personal makeup, use disposable applicators rather than sharing the same makeup applicator. Discard mascara after three months.

**Hairbrushes** – use your own hairbrush, since it is very easy to spread hair lice, eggs or larvae.

**Drama or dance costumes** – dry clean or wash costumes that are shared.

**Musical (wind) instruments** – mouthpieces that are shared can be a source of contamination. A procedure for sanitizing musical instruments must be available and explained to students/band members. Whenever possible, students should supply their own mouthpieces rather than sharing.

**Diapers** – always wash your hands thoroughly after changing diapers or soiled underwear.

**Sports equipment** – every school and sports team must have procedures for sanitizing small equipment, such as balls, racquets and mitts, and apparatus, such as rings, parallel bars and climbing gear.



F-Controlling.ppt  
Slide 9

### Optional Suggested Activity

Note: Students can probably identify a number of biological hazards they may encounter during a barbeque or picnic. Students can suggest ways to prevent exposure:

Activity/Source	Hazard	Prevention Ideas
mosquitoes	West Nile virus	netting around tables, insect repellent
cold food gets too warm/hot food cools off	salmonella	bring coolers with ice, put food away after serving, keep food cold
undercooked meat	E coli thermometers	cook food thoroughly, use meat
dirty water sources	Giardiasis	bring own drinking water, bottle water, boil water

## WHMIS

Suppliers of products that are biological hazards must label them with a WHMIS label (including the biohazard symbol) to make workers aware of the hazard. For the purposes of WHMIS, only those suppliers who supply organisms **because** they are a biological hazard are required to label their organisms with a WHMIS supplier label and provide MSDS. Typically, this would be research facilities associated with medicine or agriculture; e.g., a university. Other workplaces must take all reasonable precautions to protect workers but WHMIS labels and MSDS will not likely be available.

Workers in various occupations may be exposed to biological hazards, for example:

- animal handlers
- agricultural workers
- medical workers
- child care workers
- laundry workers
- laboratory workers
- waste water and sewage workers
- any job where you come in contact with people



## G. Pandemics

An influenza (flu) pandemic is a widespread outbreak of disease that occurs when a new influenza virus appears that people have not been exposed to before. Pandemics are different from seasonal outbreaks of influenza. Pandemic influenza can cause serious illness because people do not have immunity to the new virus. Effective vaccines would not be immediately available and impacts on society would be significant.

**Seasonal Influenza** is a respiratory illness, caused by the influenza virus that affects many Canadians each year. Influenza viruses are easily passed from person- to-person. Although most people will recover completely, 2000–8000 Canadians die every year from influenza and its complications. Seasonal influenza outbreaks are caused by viruses that people have already been exposed to; flu shots are available to prevent widespread illness and impacts on society are less severe.

**Avian Influenza** is a group of influenza viruses that cause sickness and death in birds. Sometimes, these bird viruses infect other species, such as pigs and humans. Avian influenza is mainly spread by direct contact between infected birds and healthy birds. It can also be transmitted when birds come in contact with equipment or materials (including water and feed) that have been contaminated with feces or secretions from the nose or mouth of infected birds.

People can also spread the disease indirectly from farm to farm by their carrying the virus on their clothing, boots or vehicle wheels.

**Pandemic Influenza** would be this new strain that people would have no immunity against and the illness is usually more severe. The disease spreads easily from person-to-person affecting a large percentage of the population. An effective vaccine would not be immediately available.



Ten Minute Epidemic

	Seasonal Influenza (Flu)	Pandemic Influenza
Occurrences	Occurs every year, during the winter months	Occurs 3 to 4 times a century; can take place in any season
Infection Rate	Affects 5–15% of the Canadian population	Experts predict an infection rate of 15–35% of the population.
Fatality Rate	Kills 2000–8000 people each year in Canada.	The worst pandemic of the last century, the Spanish Flu of 1918, killed 30 000–50 000 in Canada and 20–40 million people worldwide
Recovery	Most people recover within a week or two.	Usually associated with a higher severity of illness and higher risk of death.
Groups at Risk	Some people at risk for serious complications of influenza include: <ul style="list-style-type: none"> <li>• the very young (less than 24 months)</li> <li>• adults or children with chronic conditions</li> <li>• people over 65 years</li> </ul>	All age groups may be at risk for infection. For example, adults between the ages of 20–40 were disproportionately affected during the 1918 pandemic.
Prevention	Annual influenza immunization is effective because the virus strain in circulation each winter can be fairly reliably predicted.	A vaccine against pandemic influenza will not be available at the start of a pandemic; new strains of viruses must be accurately identified. Producing an effective vaccine could take at least six months.
Treatment	Anti-viral drugs are available for those most at risk of becoming seriously ill.	Anti-viral drugs may be in limited supply.

Imagine that up to one third of the workforce cannot work because workers are sick or caring for an ill family member. Workers could be unavailable to work for varying periods of time over six to eight weeks. Imagine that material suppliers are facing the same absentee rates and that goods and services from other countries are not available.

## What Should Employers Do?

- Plan for the impact of a pandemic on your business. Check that existing contingency plans are applicable to a pandemic. In particular, check to see that core business activities can be sustained over several weeks.
- Identify other critical inputs (e.g., raw materials, suppliers, subcontractors), services, products and logistics required to maintain business operations by location and function during a pandemic.
- Determine which outside activities are critical to maintaining operations and develop alternatives in case they cannot function normally. For example, what transportation systems are needed to provide essential materials? Does the business operate on just in time inventory or is there typically some reserve?
- Plan for possible short interruptions of essential services like sanitation, water, power and disruptions to the food supply.
- Identify your company's essential functions and the individuals who perform them. Build in the training redundancy necessary to ensure that their work can be done in the event of an absentee rate of 15–35%.
- Maintain a healthy work environment by encouraging healthy behaviours at all times and posting tips on how to stop the spread of germs at work. Ensure that waterless antiseptic hand agents are available for use.
- Establish or expand policies and tools that enable employees to work from home with appropriate security and network access to applications, if possible.
- Expand online and self-service options for customers and business partners, if possible.
- Communicate with and educate your workers. Tell the workforce about the threat of pandemic influenza and the steps the company is taking to prepare for it.
- Update sick leave as well as family and medical leave policies and communicate the importance of staying away from the workplace if workers become ill. Concern about lost wages is the largest deterrent to not coming to work when ill.

For more information, go to:

[www.health.alberta.ca/health-info/pandemic-influenza.html](http://www.health.alberta.ca/health-info/pandemic-influenza.html)

Out of date

## Student Research

Sometimes, workers may not have all the information they need about biological hazards. This exercise shows students there are resources available on the Web to help them find out more about working safely.

Assign students the task of going to any or all of the following websites to find biological hazard resources:

- [www.worksafe.alberta.ca](http://www.worksafe.alberta.ca)
- [www.cdc.gov](http://www.cdc.gov)
- [www.health.alberta.ca](http://www.health.alberta.ca)
- [www.phac-aspc.gc.ca](http://www.phac-aspc.gc.ca)
- [www.hc-sc.gc.ca](http://www.hc-sc.gc.ca)
- [www.ccohs.ca](http://www.ccohs.ca)

Out of date

Out of date


BIOLOGICAL HAZARDS	
<b>Biohazards include:</b>	
bacteria	
• e.g., e coli, tuberculosis, tetanus	
viruses	
• e.g., influenza, measles, mumps, rabies, avian flu	
fungi	
• e.g., athlete's foot, mould, yeast, mushrooms	
other natural hazards include:	
• poisonous plants; e.g., stinging nettles, reptiles	
• venomous insects; e.g., black widow spider	
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C-Types.ppt Slide 1

**BIOLOGICAL HAZARDS**

**Routes of Entry**  
**Inhalation**

- airborne droplets from a sneeze
- disturbing contaminated materials; e.g., stirring up grain dust



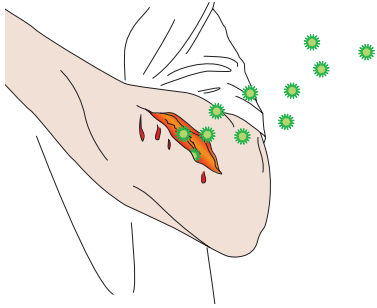
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**BIOLOGICAL HAZARDS**

**Routes of Entry**  
**Absorption**

- contact with open sores/wounds
- splashes to mucous membranes



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D-HowEnter.ppt Slide 2



**BIOLOGICAL HAZARDS**

### Routes of Entry Ingestion

- handling food with contaminated hands
- touching mouth with contaminated hands or utensils



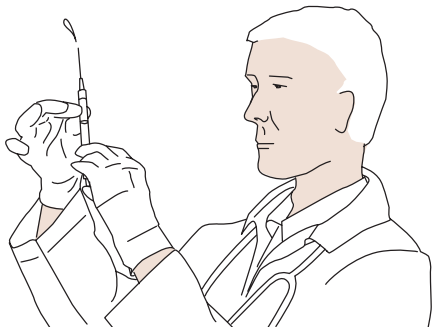
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**BIOLOGICAL HAZARDS**

### Routes of Entry Injection

- needlestick injuries
- other puncture wounds that involve contaminated materials



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**BIOLOGICAL HAZARDS**

**If you get a needlestick or cut from an object that may be contaminated with blood or body fluids:**

1. Squeeze the puncture wound to make it bleed.
2. Wash the area.
3. Report it to your teacher/parent/employer.
4. Record it.
5. Go to the nearest hospital emergency department.

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D-HowEnter.ppt Slide 5

BIOLOGICAL HAZARDS	
<b>Carriers of Biohazards</b>	
Carrier	Examples
people	hepatitis A, B, C
pets and wildlife	hantavirus, avian flu
insects	west nile virus
dirty food and water	giardiasis (beaver fever)
dirty needles	hepatitis B
other carriers	e.g., grain dust – contaminated with endotoxins
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BIOLOGICAL HAZARDS	
<b>How Infections are Spread</b>	
Activity	Infections
sharing equipment, clothing, supplies	athlete's foot, pink eye, mononucleosis
hand contact from contaminated surfaces to others or to self	colds, flu
blood and body fluids	HIV, hepatitis B, C
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E-HowSpread.ppt Slide 2

BIOLOGICAL HAZARDS	
When Working Outdoors or on Farms	
Hazard	Illness or Injury
Bee stings	Irritation or allergic reaction
Deer ticks	Lyme disease
Plants	Hay fever
Bats	Rabies
Mouse droppings	Hantavirus
Mosquito bite	West Nile virus

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E-HowSpread.ppt Slide 3

## BIOLOGICAL HAZARDS

### Hierarchy of Controls

Where reasonably practicable, the employer must use engineering controls to eliminate or physically control the biohazard.

↓ If not enough:

The employer must use administrative controls that control exposure to the hazard to a level as low as reasonably achievable.

↓ If necessary:

The employer must ensure that appropriate personal protective equipment is used.

↓ Finally:

The employer might need to use a combination of engineering controls, administrative controls and/or personal protective equipment to manage exposure.

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F-Controlling.ppt Slide 1

## BIOLOGICAL HAZARDS

### Engineering Controls

- ventilation
  - general; e.g., negative pressure of a dirty room to ensure contaminated air does not escape
  - local exhaust; e.g., bio-safety hoods
- self-sheathing needles/needleless systems
- automatic flush toilets, automatic taps and towel dispensers

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F-Controlling.ppt Slide 2

**BIOLOGICAL HAZARDS**

### Administrative Controls

- procedures
  - frequent hand washing
  - no eating/drinking in work area
  - washing/decontaminating surfaces; e.g., in veterinary hospital  
Note: Surfaces should be nonporous and easy to clean; e.g., stainless steel.
  - wet mopping rather than dry sweeping
- medical monitoring
- vaccinations

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F-Controlling.ppt Slide 3

**BIOLOGICAL HAZARDS**

### Hand Washing

**Wash hands before and after:**

- using the washroom
- visiting/caring for people who are sick
- being outdoors
- handling or petting animals
- changing diapers
- eating
- preparing or handling food
- sneezing or blowing your nose

**Wash your hands regularly and often, especially when sick.**

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**BIOLOGICAL HAZARDS**

### Hand Washing Tips

**30 seconds! or sing "Happy Birthday"**

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**BIOLOGICAL HAZARDS**

### Personal Protective Equipment (PPE)

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**BIOLOGICAL HAZARDS**


## Make Sure PPE is Effective

- Use PPE that is **appropriate** for the hazards.
- Ensure PPE **fits** properly.
- Make sure the different pieces of equipment do not interfere with each other and they all remain **effective**.
- **Check** before using PPE to make sure it is in good working condition.
- **Clean** your PPE regularly.

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**BIOLOGICAL HAZARDS**



## Standard Precautions

### Help Reduce Infections or Illness

- Assume body fluids are infectious.
- Cover cuts.
- Wear gloves.
- Wash hands frequently.
- Clean surfaces with a bleach solution.
- Report injuries to your supervisor.

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**BIOLOGICAL HAZARDS**

**Do not share...**

- food or beverages
- clothing or shoes
- makeup
- hairbrushes
- drama or dance costumes
- musical (wind) instruments
- sports equipment

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Out of date

## TEACHER'S NOTES

**A. Agriculture and Landscaping**

Jobs in agriculture, such as farming and landscaping, including cutting trees and mowing lawns, expose workers to a wide variety of biological hazards. Biological hazards include saliva, blood, milk, animal bedding, fungi, grain, food, hair/skin and wastes. Diseases passed from animals to humans are generally called zoonoses. This means that animals can be infected with a biological hazard and pass it along to humans. Many types of diseases in animals are not spread to humans. Of those that can be spread from animal to humans, most do not subsequently spread from human to human.

Psittacosis: Workers in pet stores, veterinary clinics, zoos and laboratories are at risk. This disease results in fever and headache and can affect the lungs. Infection can occur from inhaling dried bird droppings and secretions or touching birds that are infected. Birds can be household birds, such as parrots, or wild birds like pigeons. Controls include use of wet clean-up methods to reduce dust generation and use of a respirator and rubber gloves.

**Avian Influenza**

Birds and other animals, including pigs, also contract and transmit influenza. Wild birds, in particular, are natural carriers of influenza A viruses. They have carried animal influenza viruses, with no apparent harm, for centuries. Migratory waterfowl (ducks, geese) are known to carry viruses of the H5 and H7 strains or subtypes. These viruses are usually in the low pathogenic form – in other words, that aren't as deadly to birds as highly pathogenic strains.

Currently, avian influenza H5N1 is circulating Asia, Europe, and Africa, infecting many poultry populations and some humans. There is no evidence this virus is transmitted from person to person.



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### What Do You Need to Do as a Worker?

- Minimize exposures at the workplace.
- Recognize the biological hazards and talk to your employer about any hazards you need to be aware of.
- Participate in training provided by your employer.
- Wear personal protective equipment and follow instructions for proper use.
- Wash your hands and face with soap and water before eating and smoking and after finishing work. Wash your hands after using the bathroom.
- Remove work clothes before eating and before leaving work.
- Keep work clothes away from other laundry and wash them separately.
- Keep a list of all the jobs and industries in which you have worked.

Out of date

**BIOLOGICAL HAZARDS****Do not share...**

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