Bloodborne Pathogens Safety Awareness Presentation

Environmental Health and Safety

McGill

Bloodborne Pathogens

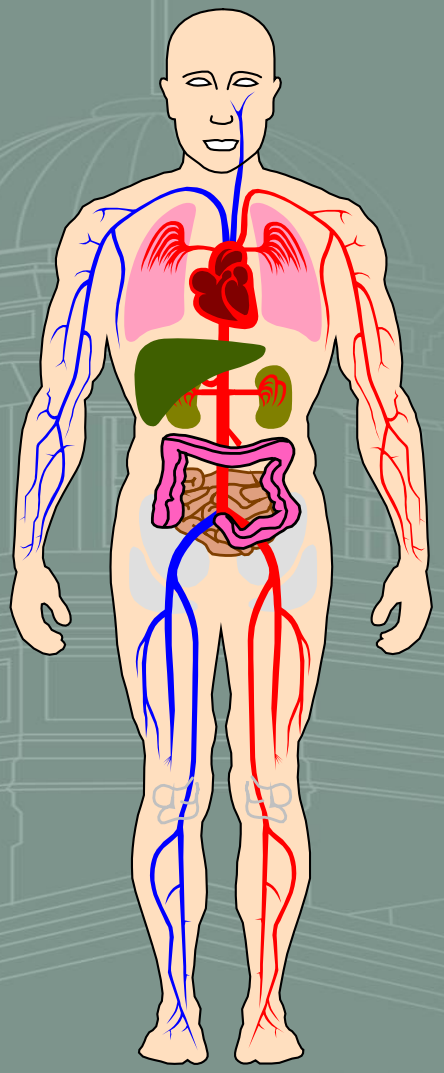
Bloodborne Pathogen (BBP)

- Microorganisms in blood, body fluids, and/or tissue that can cause disease in humans

Blood includes human blood and blood components, products made from human blood, and also medications derived from blood (e.g., immune globulins, albumin, etc.)

Other Potentially infectious Materials

- Body fluids such as semen, vaginal secretion
- Body fluids contaminated by blood
- Any unfixed tissue or organ



Transmission of BBPs

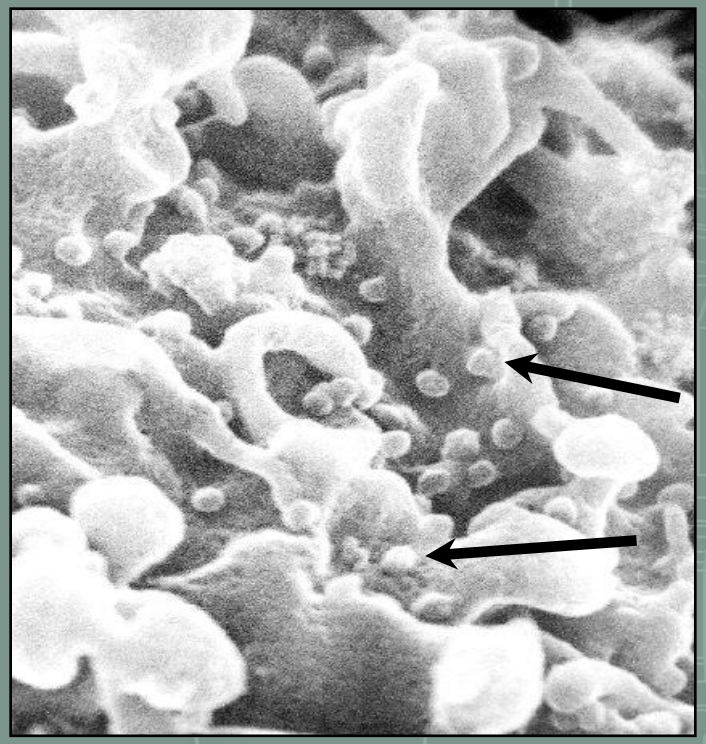
BBP can enter your body through:

- A break in the skin (cut, burn, lesion, etc.)
- Percutaneous – through the skin by cut or puncture (e.g. needlestick)
- Via mucous membranes (eyes, nose, mouth)

Transmission of BBPs

Risk of infection depends on several factors:

- The pathogen involved
- The type/route of exposure
- The amount of virus in the infected blood at the time of exposure
- The amount of infected blood involved in the exposure
- Whether post-exposure treatment was taken
- Specific immune response of the infected individual



HIV - seen as small spheres on the surface of white blood cells

What to do in case of exposure?

- Wash, wash, wash!!
- Remove contaminated clothing or personal protective equipment immediately.
- Notify your supervisor and complete the Post-Exposure BBP Risk Identification Checklist.
- Your supervisor will contact the Occupational Health Program Administrator (M-F 8h00-16h00) or the Occupational Health Physician (outside of regular hours) who will provide directions on how to proceed. If you are unable to contact anyone, proceed to St.-Luc Hospital.
- Within 24 hours complete the McGill Accident and Incident Report Form and return to EHS.

Treatment

- You may be offered Post-Exposure Prophylaxis (PEP) medications.
- PEPs must be started as soon as possible.
- EHS will work with you and your department to see how to prevent the incident from reoccurring.

Exposure Determination

EXAMPLES OF JOB CLASSIFICATIONS IN WHICH SOME OF THE EMPLOYEES MAY HAVE OCCUPATIONAL EXPOSURE	
Cleaning Crews	Cleans laboratory facilities where blood may be present.
Maintenance Technicians	Maintain items or areas that may be contaminated.
Laboratory Personnel	Handle human sera and blood samples; draw blood. Process blood and tissue samples.

Personal Protective Equipment (PPE) must be in good condition and worn at all times

Routine Practices

"Routine practices are a set of infection control strategies and standards designed to protect workers from exposure to potential sources of infectious diseases. Routine practices are based on the premise that all blood, body fluids, secretions, excretions, mucous membranes, non-intact skin or soiled items are potentially infectious."

Canadian Centre for Occupational Health and Safety: http://www.ccohs.ca/oshanswers/prevention/universa.html

Bloodborne Pathogens Standard

The major provisions of the standard include:

- Exposure Control Plan
- Universal and/or Standard Precautions
- Engineering Controls
- Personal Protective Equipment
- Record Keeping
- Work Practices
- Hepatitis B Vaccination Program
- Post-Exposure Follow-up

Responsibilities

Individual

- Handle all human bloods, bodily fluids and unfixed tissues/cells as if they were potentially contaminated with bloodborne pathogens.

- Complete the required training and understand the risks of working with bloodborne pathogens.

- Consider seriously the offer of hepatitis B vaccination. If the individual refuses, a form stating the risk of doing so must be signed.

- Follow the appropriate practices and procedures established for the work environment to limit or prevent exposures, and adopt the principle of "Routine Practices"

- Report any exposures to supervisory personnel, fill out Accident and Incident Report Form and undertake any necessary medical review or treatment.

Responsibilities

Supervisor/Principal Investigator

- Determine those at risk of exposure and forward the names of staff and students to the Occupational Health Program Administrator for registration in the program.

- Ensure that those who may risk exposure complete the required training and vaccination.

- Ensure that individuals are thoroughly informed of the risks associated with their work.

- Ensure that those with potential exposure have available and use the appropriate personal protective equipment and that "Routine Practices" are followed.

Responsibilities

Student Health Services

- Provide the administration of hepatitis B vaccine for students working with bloodborne pathogens.
- Transmit appropriate patient information to the Occupational Health Program Administrator to be kept in the patient's Occupational Health file.

Occupational Health Program

- Provide and update training for all those at risk of exposure.
- Investigate exposure incidents, as necessary.
- Audit Occupational Health Program periodically.
- Maintain and ensure that medical records remain confidential.

Written Program

The Bloodborne Pathogens Exposure Control Plan is McGill's detailed plan to eliminate or minimize employee and student exposure to bloodborne pathogens and other infectious agents.

The fundamental principles of this plan are based on both federal and provincial recommendations in an effort to reduce the risk of exposure to bloodborne pathogens.

A copy of the Bloodborne Pathogens Exposure Control Plan may be found:

- ✓ On the EHS website
- ✓ By contacting the Occupational Health Program Administrator directly

Greatest Risks

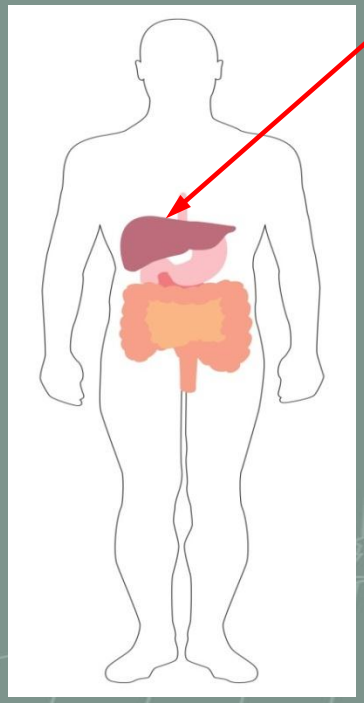
The three BBP's that pose the greatest risk are:

- Hepatitis B (HBV)
- Hepatitis C (HCV)
- HIV

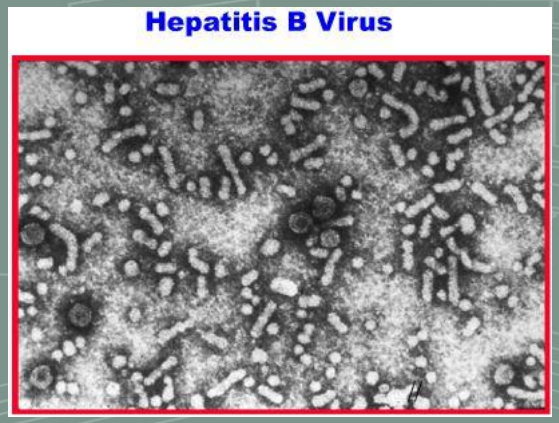
Hepatitis B

Hepatitis means “inflammation of the liver.” It can lead to severe illness, liver damage, and sometimes death

- Virus attacks liver resulting in inflammation, enlargement, and tenderness
- Acute and chronic infections
- Possible liver damage ranging from mild to fatal



The liver is a large, dark red gland located in the upper right abdomen behind the lower ribs. It functions in removing toxins (poisons) from the blood, in the digestion of fats, and in other body processes.



Courtesy of Schering Corporation

Transmission

How is the HBV infection spread?

- Unprotected sex with multiple partners
- Sharing needles during injecting drug use
- From infected mother to child during birth
- Sharps/needle sticks

HBV is found in the following body fluids:

- Blood
- Semen
- Saliva

Because HBV is so infectious (100 times more infectious than HIV) contact with even small amounts of infected blood can lead to transmission of the virus.

Risk Factors / Symptoms / Effects

What are the risk factors for Hepatitis B?

- Working with human blood

Symptoms :

- Loss of appetite
- Fatigue
- Stomach cramps
- Vomiting
- Jaundice (yellowing of skin and eyes)

Effect of HBV infection

- About 90% of adults recover from HBV

Hepatitis B Vaccine

Is there a vaccine to prevent Hepatitis B?

- Yes, in healthy people the HBV vaccine provides over 90% protection from chronic HBV infection.

Where can I get the HBV vaccine?

- Contact the Occupational Health Program Administrator for information

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Who should have their HBV antibody titer checked?

The only people who need to have their HBV titer check are those who:

- Have been exposed
- Have a frequent high risk of exposure, such as those working with “active Hepatitis B”

Are routine HBV vaccine boosters recommended?

- No

Hepatitis C

What is the Hepatitis C Virus?

- HCV is a virus that attacks the liver.

How is HCV infection spread?

- HCV is primarily spread by contact with the blood of an infected person, but it can also be spread sexually and perinatally (mother to child).

Is there a vaccine to protect against HCV infection?

- NO!

Healthy human liver

Hepatitis C liver

A healthy human liver contrasted with a liver from an individual who died from hepatitis C. Note the extensive damage and scarring from chronic liver disease.

Hepatitis C

What are the symptoms of HCV infection?

- Incubation period of 6-7 weeks
- The majority of those infected with HCV have no symptoms
- If symptoms do occur, they include:
  - ✓ Flu-like symptoms
  - ✓ Loss of appetite
  - ✓ Fatigue
  - ✓ Stomach cramps
  - ✓ Vomiting
  - ✓ Muscle and joint pain
  - ✓ Jaundice (yellowing of skin)

Hepatitis C

Do people recover from HCV infection?

- 30% - 50% of infected individuals clear the infection without recurrence

- 50% - 70% develop chronic HCV infection.
Treatment with antiviral medications is effective in 15 – 30%

- It is recommended that **those working in health-care and R&D** only be tested **if they have an exposure**.

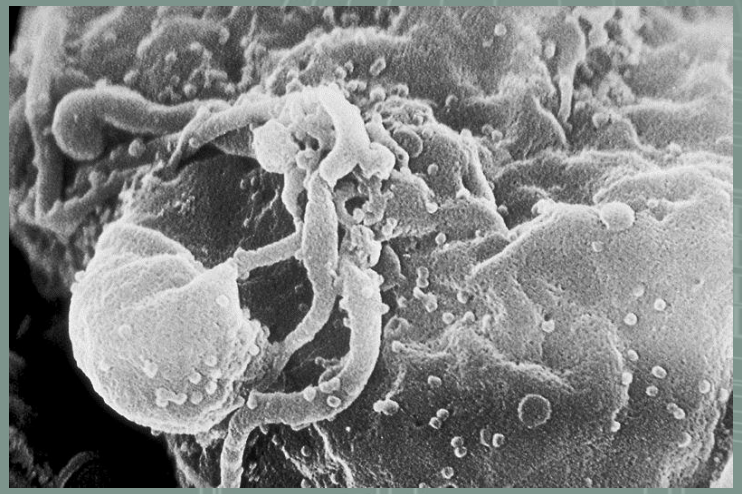
Human Immunodeficiency Virus (HIV)

What is HIV?

- HIV is the virus that can lead to AIDS

What is AIDS?

- **A**cquired **I**mmuno**d**eficiency **S**yndrome or AIDS is a disease which suppresses the immune system. By doing so, those infected are more susceptible to infections and/or forms of cancer.



Scanning electron micrograph of HIV-1 budding from a cultured lymphocyte.

Human Immunodeficiency Virus

Can HIV be transmitted?

- YES!

How?

- Blood
- Semen
- Vaginal fluids
- Breast milk
- By other bodily fluids

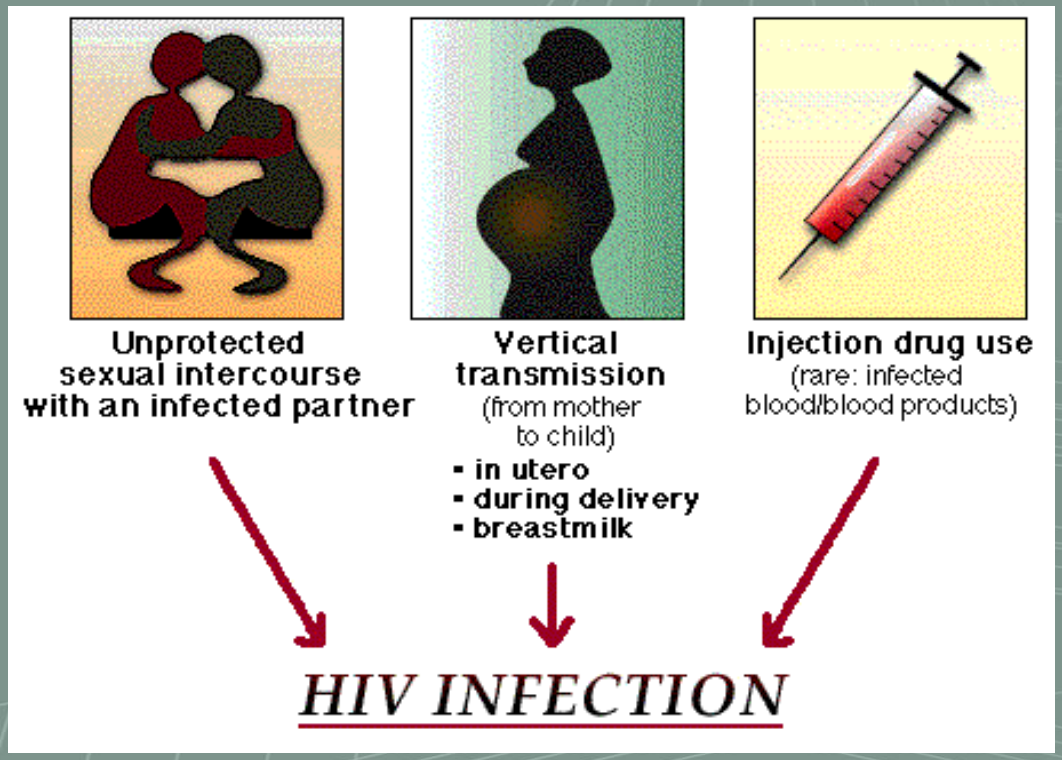


Image from http://www.hiv1tat-vaccines.info/routes_of_infection.htm

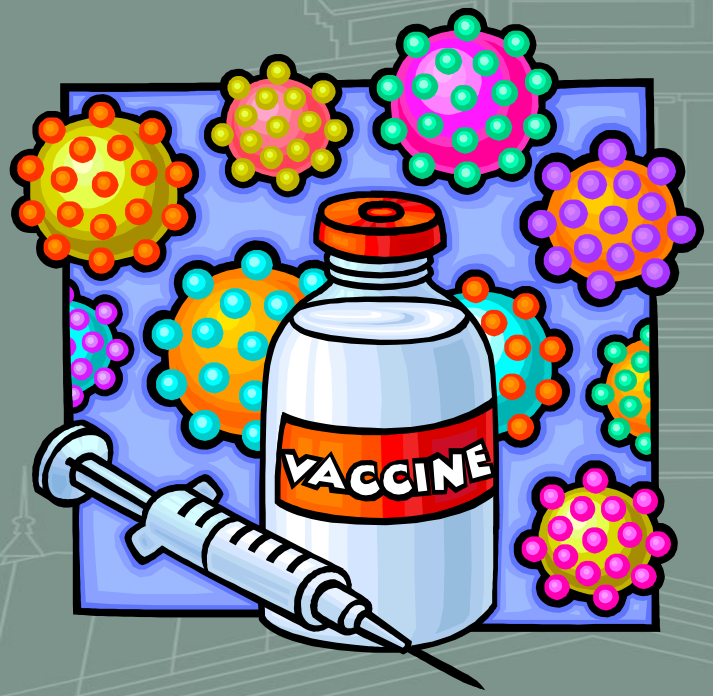
Human Immunodeficiency Virus

What are the symptoms of HIV infection?

- Fever
- Diarrhea
- Nausea
- Fatigue
- Weight loss
- Enlarged lymph glands
- Opportunist infections

Is there a vaccine?

- NO!



Human Immunodeficiency Virus

HIV Seroconversion

- Detectable antibodies within 3 months

Post-Exposure Prophylaxis (PEP)

- Demonstrated a 79% reduction in the rate of HIV conversion

High Risk Exposures Are

- When source is known to be HIV+
- When HIV status of source is unknown

For more information

For more information on the Bloodborne Pathogens Program at McGill, visit:

https://www.mcgill.ca/ehs/laboratory/ohs/bloodborne-pathogens

For an appointment in the Occupational Health Clinic, contact the Occupational Health Administrator here.

Also, anyone working with Bloodborne Pathogens must take the Introduction to Biosafety Course.