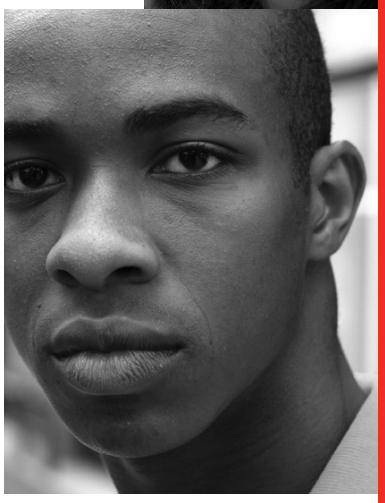
KNOWLEDGE IS OUR BEST DEFENCE:

AN HIV/AIDS EDUCATION RESOURCE FOR CANADIAN SCHOOLS

TEACHER RESOURCES



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CANADIAN AIDS SOCIETY
SOCIÉTÉ CANADIENNE DU SIDA

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This document is also available in French, titled: La connaissance est notre meilleure défense : une ressource éducative sur le VIH/sida pour les écoles du Canada – Ressources pédagogique

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HIV 101: The Basics

This brief 8-page overview will provide you with general information about HIV/AIDS. It is designed to be a quick reference resource for educators finding it difficult to locate accessible and informative materials. It is focused on the medical and scientific facts and gives short descriptions of transmission, prevention, treatment and testing. Longer modules with more detailed information on HIV and the immune system, HIV transmission, prevention, testing and treatment will follow. For some modules, examples of possible lesson plans and a list of helpful resources have been included with the topic.

Knowledge about HIV/AIDS is changing rapidly, so it is important to update your knowledge frequently. Many of the resources provided at the end of this document are for websites of HIV/AIDS organizations, which are frequently updated. Other valuable sources of information include your local public health unit (PHU) or Centre local de soins communautaires (CLSC), your local AIDS Service Organisation (ASO), or your local youth service organisation (YSO).

What does HIV stand for?

Human – The virus can only infect humans.

Immunodeficiency – The virus weakens the body's immune system and causes it to fail to work properly.

Virus – The infectious organism is a virus.

HIV infection is the condition of being infected with HIV. The immune system is still moderately strong.

What does AIDS stand for?

Acquired – HIV is not a condition passed on genetically; a person becomes infected with the virus.

Immune – The virus damages the immune system's ability to fight off viruses and bacteria.

Deficiency – The immune system fails to work properly; it becomes deficient, unable to protect the body from other infections.

Syndrome – There is a group of diseases and infections an HIV-infected person may experience.

How does HIV infection affect the immune system and cause disease?

The HIV (Human Immunodeficiency Virus) impairs the body's immune system (the body's internal defence against diseases). It primarily targets certain white blood cells (called T-lymphocytes, Helper T-cells or CD4 cells) that are a specific part of the immune system. If left untreated, HIV continues to weaken the immune system over many months or years. Infections occur and AIDS – the fatal stage of the disease – develops. (See the section that follows.) Illnesses that occur during AIDS may affect every organ system and impair the central nervous system.

The Life-Cycle of HIV: Signs and Symptoms

Acute Phase (Primary HIV Infection)

This is the period of time between exposure to the virus, its resulting infection and the development of antibodies. Some people experience flu-like symptoms.

Asymptomatic Phase

This is the period of time during which the infected person does not experience symptoms. The immune system is still moderately effective. Some people may experience symptoms such as fatigue, swollen glands, night sweats and other signs that accompany most infections. The length of this phase can vary, but it can last for more than a decade. An HIV positive person can still transmit the virus at this stage.

Symptomatic Phase

This is the period of time in which the infected person experiences increased vulnerability to infections like colds and may have additional symptoms, such as weight loss and diarrhea. Some people will experience their first hospitalization related to their infected state during this phase.

AIDS

During this advanced phase, the person experiences the direct effects of HIV infection, including adverse bodily conditions or health problems. The immune system no longer protects the infected person.

AIDS is ***not*** itself a disease. It is a syndrome defined by a series of clinical criteria that includes a diagnosed HIV infection and the presence of one or more opportunistic infections and clinical conditions. A T-cell/CD4 cell count below 200 per cubic millimetres of blood is considered the threshold for defining the devolution of HIV to AIDS. This stage is fatal.

Individuals will vary in how quickly they will advance through these phases. Treatment can slow the progress of the disease significantly.

The introduction of Highly Active Antiretroviral Therapy (HAART) in the mid-1990s dramatically decreased the death rate and has slowed the progression of HIV infection to AIDS.

Complications

The immune system of people with AIDS becomes so damaged that they become vulnerable to specific diseases that rarely affect healthy adults. These diseases include, but are not limited to:

- Infections such as pneumocystis pneumonia (PCP); cytomegalovirus (CMV); and severe yeast infections (candidiasis) – esophageal, lung, bronchial, and vaginal.
- Mycobacterium avium complex (MAC); mycobacterium tuberculosis (TB).
- Increased frequency or severity of herpes zoster outbreaks.
- Conditions affecting the brain, including toxoplasmosis.
- Certain cancers: anal, cervical, Kaposi's sarcoma and lymphoma.
- Chronic intestinal disturbances.

There are medications that can reduce, although not eliminate, the amount of HIV in an infected person's body. This allows a person with HIV-infection to live a relatively normal life for a long period of time. In developed countries, HIV-infection is now considered by some to be a chronic disease or a manageable long-term condition. This is not the situation worldwide, where HIV-infection frequently progresses rapidly to AIDS, primarily due to a serious lack of the resources necessary to manage and treat HIV-infection.

Transmission

HIV is not an easy virus to pass from one person to another. It is not an airborne virus. It does not live long outside the body. You cannot catch it like you can catch a cold or the flu. HIV cannot be transmitted by casual contact.

HIV is a blood-borne virus. To cause infection, HIV must be transmitted directly into the bloodstream or through a mucous membrane from an infected person to a non-infected person. HIV is found in the blood, semen, vaginal fluid or breast milk of an infected person. Therefore, HIV transmission can only occur when blood, semen (cum), pre-seminal fluid (pre-cum), vaginal fluid or breast milk from an infected person enters the body of an uninfected person.

The three major transmission routes are:

1. **Sexual intercourse: penile/vaginal, oral (mouth to penis or mouth to vagina) and penile/anal**

   - Sexual transmission of HIV occurs by absorption of infected semen, blood or vaginal fluid through mucous membranes and abrasions (tiny unfelt scratches or tears in delicate tissues occurring during sexual intercourse). Within the category of sexual transmission, there are differences in likelihood of transmission during any unprotected sexual act.
   - Anal intercourse is the highest risk sexual behaviour. It is the most likely mode of sexual transmission for HIV, whether anal intercourse occurs between a man and a woman or between a man and a man. The anal mucosa is fragile; tissue tearing and bleeding frequently

occur, although they may not always be noticed. Lymphatic tissue occurs all along the digestive tract, so near the anus there are concentrations of T-cells, HIV's favourite targets.

- Vaginal/penile intercourse poses risk to both men and women. However, women are more at risk than men. Physiologically, women have more delicate tissue in the vaginal area. Younger women, whose cervixes are not fully formed, and older postmenopausal women are especially vulnerable. During menopause, there is often thinning of the vaginal lining, which makes it more fragile and therefore more likely to develop abrasions during intercourse.

2. Exposure to infected blood

- HIV may be transmitted by an infected person to a non-infected person through the use of syringes or needles, or other equipment used by injectors (e.g., cotton, cookers, drug solution and water) for drug injection. When people inject drugs such as steroids or hormones intravenously, intramuscularly or under the skin, small amounts of blood can remain in the needles, syringes or other paraphernalia used in drug preparation. If these are then used by another person, HIV-infected blood can be injected into the next user's bloodstream. Though much less likely, transmission may also occur when infected blood comes in contact with open sores or cuts.
- Accidental exposure may occur when health care providers come in contact with HIV-infected blood through needle sticks or if blood comes in contact with broken skin or mucous membranes.

3. Perinatally, from an infected woman to her child(ren) during pregnancy, childbirth or breastfeeding

- Transmission of the virus from an HIV-positive woman to her child through pregnancy, childbirth or breastfeeding can be prevented. Pregnant women should receive counselling and testing for HIV. If a pregnant woman is HIV-positive, she can take specific medications during the pregnancy and/or during the birth process that will reduce the potential for transmission of HIV to her child. The infant should also receive medications after it is born.
- When feasible, the baby should be formula-fed instead of being breastfed, since there is a possibility of HIV transmission through breast milk. However, the viability of formula-feeding in areas where the safety of the water supply cannot be guaranteed must be taken into consideration. Breast-feeding by a non-infected woman may be a better option. If this is not possible, the breast milk of the infected mother may be the better option to prevent water-borne disease in a baby with a potentially compromised immune system.
- In countries where HIV infection is epidemic, the rate of mother-to-child transmission is very high. Medications to prevent vertical transmission are frequently unavailable, or if available, the cost is prohibitive. In these same countries, the limited availability of breast milk substitutes, their cost and the lack of accessibility to clean water supplies combine to make the possibility of vertical transmission highly probable when the mother is HIV infected.

- The prevention of mother to child HIV transmission is one of the success stories of HIV prevention in North America. Routine counselling and screening for HIV in pregnant women, combined with treatment of HIV-infected women during both pregnancy and the birthing process, as well as feeding with breast milk substitutes, have virtually eliminated mother to child transmission.

Prevention

Once the HIV enters the human body, there is no way to eliminate it. The virus remains in the body indefinitely, weakening the immune system and eventually resulting in death.

There is no cure for HIV infection. As a result, prevention remains critical. Major current prevention efforts and recommendations include:

Preventing Sexual Transmission

- Abstinence from behaviours that can transmit HIV provides the surest protection against transmission of HIV and other STIs.
- Consistent and correct use of a barrier method for each sexual act that can transmit HIV. Recommendations include the use of a male latex condom (polyurethane male condom, in the case of latex allergies) or a female condom as a barrier against exchange of body fluids. Lambskin condoms should not be used, as the lambskin contains tiny pores through which potentially HIV-infected fluid can pass.

Preventing Transmission Through Exposure to Blood

- Abstaining from drug use, especially from practices that can transmit HIV and other blood-borne infections.
- Seeking counselling or treatment for drug use in order to cease or minimize drug use.
- If continuing to inject drugs, using practices to reduce risk. These include:
    - Using a new, sterile syringe for every injection. (Many communities have needle and syringe exchange programs that provide these items free of charge, but very few communities have safe injection sites.)[1]
    - Sterilizing syringes before use if they must be re-used.
- Practising universal precautions during contact with blood or when cleaning blood or infectious materials in medical and household settings. This can include using latex gloves, disposable syringes and disinfectant, as well as practising other infection-control procedures such as wearing masks and sterilizing equipment.

[1] For example, see Insite – North America's first legal supervised injection site, http://www.vch.ca/sis/

Preventing Perinatal Transmission

While mother-to-child-transmission of HIV has decreased significantly in Canada due to universally available treatment options, worldwide many babies acquire HIV from their mothers. Preventing vertical transmission requires that:

- Prenatal care is available to all pregnant women.
- Healthcare providers offer HIV counselling and testing in a non-judgmental environment.
- Medications to treat the HIV-infected woman and prevent transmission of the virus to her child are accessible to all.
- Medications are available to treat the baby following its birth, as per current medical protocol.
- Support is available to all HIV-infected women who are abandoned by partners and family when they are identified as HIV-positive.

Prevention in all areas requires that individuals take responsibility not only for themselves, but also for their sexual partners and drug use contacts.

HIV Testing

The Human Immunodeficiency Virus (HIV) weakens our immune system by infecting and destroying specific white blood cells. Our immune system responds to HIV by producing antibodies. An HIV test looks for these antibodies.

There is a window period of up to three months between exposure to HIV and the time when the immune system develops antibodies. If testing is done before the window period is over, test results may get an inaccurate result (i.e., the test may be negative, but the person may actually be HIV-infected, and therefore transmit the virus to others).

The most commonly used test is the ELISA test, which requires a blood sample. It can take three to 10 days to obtain results from the ELISA test. If the test reveals the presence of HIV antibodies, a follow-up test, called a Western Blot, is done to confirm the results.

Also available are rapid tests that use blood from a finger prick, mucous obtained by swabbing the inside of the cheek or urine. A test result can be ready in twenty minutes. If the test is positive, it must be confirmed with a Western Blot test.

In Canada, there are three different testing options available, depending on the province or territory in which testing for HIV takes place:

1. **Anonymous HIV Testing**

   No identifying information is collected. A code is used to match the person wanting to be tested with his or her HIV test order and test results.

2. **Nominal/name-based HIV Testing**

   The HIV test is ordered using the person's indentifying information, and the test results are recorded in the person's health care record.

3. **Non-nominal/Non-identifying HIV Testing**

   The HIV test is ordered using a code or the person's initials. The test results are not recorded in the person's health care record.

A negative HIV result should be confirmed after a three-month period. However, if the person engages in further risky behaviours during the window period, testing should be delayed at least four weeks from the date of that activity in order to get an accurate test result.

Decisions related to whether, when and how to be tested, as well as with whom to disclose results, are complex. Pre- and post-test counselling is highly recommended. Youth should be encouraged to seek out a testing facility where the staff is experienced in serving adolescents.

People who are infected and are aware of their HIV status can work with their health care providers to determine a treatment plan most effective for them. Treatment early in the course of HIV infection can reduce the amount of the virus in an infected person's body. This can permit a person with HIV-infection to live a relatively normal life for a long period of time.

HIV infected individuals should seek guidance about how to notify sexual partners and drug use contacts. Recent publications have addressed this issue for specific populations.[2]

NOTE: In Canada, it is estimated that approximately 30% of people infected with HIV do not know they are infected and are at risk of transmitting the virus to others. Testing when risk factors are present can prevent further transmission of HIV.

HIV Treatment

There is no cure for HIV; the infection remains in the body indefinitely. Early treatment combined with access to quality support can enable people who are HIV-infected to live healthier and longer lives.

There are three main ways to treat people infected with HIV:

1. **Controlling the HIV**

   Antiretroviral medications, which have been available since 1995, work by reducing the ability of HIV to copy itself (replicate) within the infected person's body. The less HIV there is in the body, the stronger the person's immune system. The healthier the person's immune system, the better able it is to fight off opportunistic infections and AIDS-related illnesses.

[2] HALCO. (December 2008) HIV disclosure: A legal guide for gay men in Ontario/Dévoilement du VIH: Guide d'information sur le droit, pour les hommes gais en Ontario. Available in English and French. Please Note: the guide contains graphic language which may not be suitable for all audiences.

Different medications and different dosages are required for different populations, due to normal physiological changes that occur at different life stages: infancy, adolescence and advanced years. The choice of HIV-related medications may also be affected by the relative health of the immune system prior to infection. Antiretroviral medications have unpleasant and sometimes dangerous side effects. Regular follow-up care with a health care provider or clinic is essential to monitor the progression of the infection and the effectiveness of antiretroviral and other HIV-related medications.

2. Promoting the health of the infected person and his or her immune system

Some approaches include ensuring a nutritious diet, regular exercise, vitamin and mineral supplementation, the use of complementary therapies and psychological and spiritual counselling. Economic support may be required for individuals to meet these basic needs.

3. Preventing illnesses and HIV/AIDS-related infections

Regular health care is necessary, as are the following:

1. Screening for HIV/AIDS related conditions and diseases such as TB and cervical cancer.
2. Screening for medication-related side-effects and complication.
3. Immunizations or vaccinations to prevent diseases and illnesses to which people with HIV are more susceptible.

Antiretroviral therapy has extended the life expectancy of many people being treated for HIV infection. Given that HIV is a long-term disease affecting all areas of life, living with it is dramatically improved when a variety of supportive services are used to assure access to care, adherence to medications and overall quality of life. Specially funded programs and providers must work to ensure that access to HIV care and treatment is available to low-income, underinsured and uninsured people in Canada and throughout the rest of the world.

HIV and the Immune System

Introduction

Understanding HIV and the immune system is essential for understanding HIV/AIDS.

At each Grade level, from kindergarten through Grade 12, students need to increase their understanding of the body's immune system and how HIV infection impacts its functioning.

An understanding of the body's immune response to HIV will help students understand why prevention and transmission of HIV is important, provide a foundation for understanding HIV treatment and support understanding of how a vaccine against HIV will potentially work.

Students will learn:

- The basic elements of the immune system;
- How a healthy immune system responds to germs (bacteria, fungi, viruses, parasites and other micro-organisms);
- How HIV affects the immune system; and
- How to promote and maintain a healthy immune system.

The Immune System

The immune system is the body's natural defence system that it uses to fights off infections and diseases. It is composed of many interdependent cells and organs that protect the body from bacteria, parasites, fungi, viruses and tumour cells. The immune system acts like an army to protect the body from invaders, and each of the different cells of the immune system performs a highly specialized but interrelated function in fighting off these invaders.

When bacteria, viruses or other agents invade the body, they are recognized as foreign and the immune system is signalled to attack and destroy them. If the immune system does not response strongly enough to an invading agent, infection occurs.

The interrelationships between the cells in the immune system are complex and extremely intricate. As a result, damage to one type of cell in the system compromises the entire system's ability to protect the body from infections and cancers.

How HIV Affects the Immune System

The Human Immunodeficiency Virus (HIV) is a **retrovirus**, a type of virus that stores its genetic information on a single-stranded RNA molecule. After a retrovirus enters a cell, it creates a DNA version of its genes and its DNA becomes part of the infected cell's DNA.

HIV infects one particular type of immune system cell called **CD4 cells** or **T-cells**. T-cells coordinate immune regulation and secrete specialized factors that activate other white blood cells to fight off infection. In healthy individuals, the number of CD4 cells normally ranges from 450 to 1,200 cells per microlitre of blood. This measurement is known as the T-cell count.

When infected with HIV, a T-cell becomes an HIV-replicating cell. The virus binds with the cell, copies itself into the cell's DNA and causes the cell to begin producing new HIV viruses. This process eventually causes the cell to die. As the number of T-cells decreases, the infected person's immune system becomes increasingly compromised. (Remember, T-cells regulate and activate other immune system cells to fight infection.) When a person's T-cell count, or their number of CD4 cells, drops to below 200 cells per microlitre of blood, the person is considered to have AIDS.

An infected person's body tries to fight off HIV infection by aggressively manufacturing antibodies, which are tiny bits of protein designed to bond with HIV particles and neutralize them before they can infect more cells. Most HIV tests actually detect the presence of these antibodies, not HIV itself.

It is particularly difficult for the immune system to fight off HIV infection for the following reasons:

- HIV attacks the immune system itself, weakening its ability to fight back.
- HIV replicates in large quantities that are more than the compromised immune system can handle.
- HIV has the ability to mutate or change very quickly, making it more difficult for the body to fight the infection. (The more replications [copies] the virus makes, the increased likelihood of mistakes or mutations.)

If a person is infected with HIV, he or she is said to be HIV-positive. Someone who is HIV-positive may appear to be perfectly healthy. However, if the infection is left untreated, HIV continues to weaken the immune system over many months or years. Infections occur and AIDS develops – the fatal stage of the disease (see below). Illnesses that may occur during the final stage of HIV infection (AIDS) may affect every organ system and impair the central nervous system.

The Life-Cycle of HIV: Signs and Symptoms

Acute Phase (Primary HIV Infection)

This is the period of time between exposure to the virus and infection and the development of antibodies. Some people experience flu-like symptoms.

Asymptomatic Phase

This is the period of time during which the infected person does not experience symptoms. The immune system is still moderately effective. Some people may experience symptoms such as fatigue, swollen glands, night sweats and other signs that accompany most infections. This phase varies in length and can last more than a decade. Infected people, however, can still spread the virus in this phase.

Symptomatic Phase

During this period of time, the infected person experiences increased vulnerability to infections like colds and may have additional symptoms, such as weight loss and diarrhea. Some people will experience their first hospitalization due to their infected state.

AIDS – Acquired Immunodeficiency Syndrome

During this advanced phase, infected people experience the direct effects of HIV infection. Their immune system is no longer able to protect them, and they experience bodily conditions or health problems caused by HIV infection.

AIDS is not a disease itself. It is a syndrome defined by a series of clinical criteria that includes a diagnosed HIV infection and the presence of one or more opportunistic infections and clinical conditions, or a T-cell/CD4 cell count below 200 per cubic millimetres of blood. In Canada, the Public Health Agency of Canada considers the point at which HIV develops into AIDS to be the moment when "the body can no longer fight infection."

Individuals will vary in how quickly they will advance through these phases. Treatment can slow the progress of the disease significantly.

The introduction of Highly Active Antiretroviral Therapy (HAART) in the mid-1990s dramatically decreased the death rate and has slowed the progression of HIV infection to AIDS.

Complications

The immune system of people with AIDS has become so damaged that they become vulnerable to specific diseases that rarely affect healthy people. These include, but are not limited to:

- Infections: pneumocystis pneumonia (PCP); cytomegalovirus (CMV); severe yeast infections (candidiasis) – esophageal, lungs, bronchial, and vaginal; mycobacterium avium complex (MAC); mycobacterium tuberculosis (TB);
- Increased frequency or severity of herpes zoster outbreaks;
- Conditions affecting the brain, including toxoplasmosis;
- Certain cancers: anal, cervical, Kaposi's sarcoma and lymphoma; and
- Chronic intestinal disturbances.

There are medications that can reduce, but not completely eliminate, the amount of HIV in an infected person's body. These antiretroviral drugs prevent HIV from replicating itself and destroying the body's immune system. These drugs are highly toxic, unpleasant to take and may cause serious side effects. They are also very expensive.

If taken on schedule, these antiretroviral drugs may allow a person infected with HIV to live a relatively normal life for a long period of time. However, these treatments are relatively new. We do not yet know how long they will extend a person's life. We also do not know if they will lose their effectiveness and become unable to stop replication of the virus at some point in the future.

Due to this treatment option, in developed countries HIV infection is now considered by some to be a chronic but manageable long-term condition. This is not the situation worldwide, where HIV infection frequently progresses rapidly to AIDS, primarily due to a desperate lack of the resources necessary to identify, manage and treat HIV infection. (More about the worldwide epidemic will be found in the section of this document entitled Global Impact of HIV and AIDS.)

Educational Resources:

General Information

AVERT. (2009). History and science of HIV/AIDS. http://www.avert.org/history-science.htm.

- Provides a scientific explanation of what HIV/AIDS looks like, what RNA is and the life cycle of HIV. Includes images and a video for advanced students. While the science described on this site is too advanced for students, educators will find the information useful in explaining HIV and how it attacks the body.

K-3

New York City Department of Education. (2005). How do we catch the germs that make us sick?; How does the body fight disease?; and How does HIV affect the immune system? *HIV/AIDS curriculum: A supplement to a comprehensive health curriculum.* http://schools.nyc.gov/offices/teachlearn/documents/docs/hivaidsdocs/hivaidsbookgr3.pdf

- A lesson plan designed to teach children to recognise how the body fights infection and illness in general through a body-mapping exercise. A second lesson plan includes an explanation of the immune system and how it fights infections with age-appropriate language and specific reference to HIV/AIDS and how it affects the body's immune system.

Grades 4-5

New York City Department of Education. (2005). What causes disease? and How does the immune system protect the body from disease? *HIV/AIDS curriculum: A supplement to a comprehensive health curriculum.* http://schools.nyc.gov/offices/teachlearn/documents/docs/hivaidsdocs/hivaidsbookgr4.pdf

- Lesson plans about how the immune system protects the body against infection. Excellent vocabulary sheet for teachers interested in taking a science-based approach to teaching about HIV/AIDS at this level.

Grades 6-8

New York City Department of Education. (2005). Lesson 1: How does the immune system react when a virus enters the body? *HIV/AIDS curriculum: A supplement to a comprehensive health curriculum.* http://schools.nyc.gov/offices/teachlearn/documents/docs/hivaidsdocs/hivaidsbookgr6.pdf

- Lesson plan that first explains how HIV/AIDS is transmitted and how the body's immune system reacts to it and then outlines how students should be encouraged to develop a public service announcement to explain what they have just learned about HIV. This lesson could be incorporated into an art project in which students are encouraged to use digital cameras to make actual public service announcements for their schools.

New York City Department of Education. (2005). Lesson 1: How does HIV impair the immune system? *HIV/AIDS curriculum: A supplement to a comprehensive health curriculum.* http://schools.nyc.gov/offices/teachlearn/documents/docs/hivaidsdocs/hivaidsbookgr7.pdf

- This lesson builds on the previous one (also included) to describe how the immune system is broken down by HIV, including excellent explanations of pathogens, replication, opportunistic infections and other HIV related terminology. Also includes diagrams and a true and false quiz about transmission. This lesson would be excellent incorporated into science curriculum.

Grades 9-12

San Francisco AIDS Foundation. (2008). How HIV damages the immune system? http://www.sfaf.org/aids101/virology.html

- Short technical introduction to how HIV attacks the immune system that includes humorous diagrams and images. The images and graphics could be combined with a plain language explanation of how HIV damages the immune system in a lesson that addresses HIV in a scientific and biological framework.

An In-depth Look at HIV Prevention

Introduction

There is neither a vaccine nor a cure for HIV infection. Once the virus has entered the body, it cannot be completely eliminated and remains in the body indefinitely. It weakens the immune system, eventually resulting in death due to opportunistic infections or AIDS-related diseases.

This epidemic has affected every area of the world. More than 60 million people have been infected with HIV; of these, about 20 million people have died. At this point in the epidemic, the number of new infections per year is more than the number of AIDS-related deaths per year. And yet, according to a 2003 report from the Global HIV Prevention Working Group,[3] less than one person in five at risk for HIV has access to basic HIV prevention services globally.[4] There are still widespread misconceptions about HIV/AIDS. Many people still do not understand how HIV is transmitted and therefore do not know how to protect themselves. Of those who do, there is still a considerable gap between knowledge and practice: not all people practice what they have learned in theory. Therefore, prevention education remains essential.

Prevention activities include three levels of intervention:[5]

- **Primary HIV prevention**
    - General and targeted education/information campaigns.
    - School and community-based sexual health education.
    - School- and community-based substance use prevention education.
    - Harm reduction initiatives, including condom distribution and needle exchange programs.
    - Observation of universal precautions.
    - Prenatal HIV screening.
- **Secondary HIV prevention**
    - HIV testing – in particular, offering HIV testing to people who request testing for other STIs.
    - Providing HIV prevention information and support to people already infected with the virus.
    - Assisting people who test HIV-positive to contact their sexual and/or needle-sharing partners.

[3] Formed in 2002, The Global HIV Prevention Working Group is an international panel of leading public health experts, clinicians, biomedical and behavioural researchers, and people affected by HIV/AIDS. The working group seeks to inform global policy making, programme planning, donor decisions on HIV prevention and advocate for a comprehensive response to HIV/AIDS that integrates prevention and care. http://www.globalhivprevention.org/

[4] Global HIV Prevention Working Group (2003) Access to HIV prevention: Closing the gap. http://www.kff.org/hivaids/200305-index.cfm

[5] Adapted from - Manitoba Health. HIV transmission, testing, and prevention. Accessed on March 7, 2009 from: http://www.gov.mb.ca/health/aids/ttp.html (link was active at time of writing of this report, but is now dead)

- **Tertiary HIV prevention**
    - The development of legislation that protects the rights of persons living with HIV/AIDS.
    - Anti-discrimination education.
    - Ensuring access to treatment for all persons living with HIV.

Through the HIV/AIDS learning activities proposed in this document, students at each Grade level, from Kindergarten through Grade 12, will be presented with learning opportunities from within each level of HIV prevention described above. For example, the recommended curriculum and lesson plans will help students to:

- Develop an understanding of the principles of universal precautions (cross-referenced with Topic Area: HIV and the Immune System);
- Develop healthy relationship skills;
- Develop an understanding of the implications of substance use on themselves and others, with particular attention to the impact on decision-making and problem-solving skills (cross-referenced with Topic Area: Transmission);
- Develop an understanding of the principles of harm reduction initiatives, including condom distribution, needle exchange programs and safe injection sites (cross-referenced with Topic Area(s): Access to HIV/AIDS Services and Transmission);
- Develop an understanding of HIV testing procedures and related issues (cross-referenced with Topic Area: Access to HIV/AIDS Services); and
- Develop an understanding of the importance of prenatal HIV screening as a tool to prevent vertical transmission of HIV (cross-referenced with Topic Area(s): Transmission and Global Impact of HIV and AIDS).

Universal Precautions

Children and youth need to become familiar with and use universal precautions in their everyday life, whether at home, school or in the community.

The basic principles are easily taught and modeled in the classroom environment, from kindergarten onward. Some children will have been introduced to some of these concepts from daycare, nursery or preschool environments. **For others, it will be new material. It is recommended that this information be reviewed at the start of each academic year. A poster, such as those listed in the resources section below, should be posted prominently somewhere in the classroom to reinforce this information.**

Some Basic Concepts:

1. Germs that cause infectious diseases (bacteria, viruses, protozoans, fungi and parasites) are present on skin surfaces; in the mouth, nose, and eyes; on the scalp; and in body fluids.
2. Body fluids are particularly effective carriers of germs. Blood may carry infectious diseases such as HIV and hepatitis B and C. Direct contact with blood and other body fluids should be avoided.
3. Universal Precautions are a set of behaviours that may prevent the transmission of infectious diseases, including HIV and hepatitis B and C. Universal precautions should be used when handling the body fluids or blood of **all** individuals.
4. Barriers such as gloves can reduce the spread of infections. Non-latex gloves should be readily available in the classroom and in all other school settings.
5. Students should be taught to manage their own first aid needs. Minor cuts and scrapes may be covered with an article of clothing or a gauze pad and pressure applied to stop any bleeding. Even young students can be taught to wash minor injuries and apply dressings and bandages. Students should be taught to use non-latex gloves to administer first aid.
6. Students should be taught that intact skin is a good barrier against blood-borne infections. However, non-intact skin (cuts, rashes, eczema, psoriasis) provides an opening for blood-borne pathogens to enter the body. Gloves are a standard precaution whenever there is a bloody injury.
7. Students should know that when an accident results in an injury that bleeds during play, in the playground, in the gymnasium or at an athletic event all play should stop. Young children should be encouraged to get a teacher or other responsible adult to help with the first aid needs of the injured student.
8. The injured student should be assisted to clean and bandage the injury. Any soiled clothing should be removed and placed in a sealed plastic bag to be returned home with the student. Any blood spills should be cleaned up by the appropriate school personnel following school protocol.
9. Hand-washing is essential following the administration of first aid, whether or not non-latex gloves are used.
10. Hands should be regularly and diligently washed with soap and water. Hand-washing reminders should be posted near sinks and in all washrooms.
11. Any soiled gauze pads, dressings or bandages should be disposed of in specially marked biohazard disposal containers. All public settings should have a policy for the safe disposal of body waste litter.
12. Students should be taught how to dispose of sharps, such as used needles. All public settings should have a policy for the safe disposal of sharps in hard-sided bio-hazard disposal containers.
13. Local public or community health nurses may be available as guest speakers and may also be sources of further information.

Preventing Sexual Transmission

Prevention of transmission of HIV through sex requires the adoption of certain behaviours that eliminate or significantly reduce the risk. From a public health viewpoint, practising safer sex can be regarded as a harm reduction strategy.

What is safe sex?

The concept of safer sex practices entered common discourse in the 1980s, with the onset of the epidemic. In Canada and the US, the term safer sex is used to describe a continuum of risk related to sexual behaviours, rather than a dichotomy between no risk and high risk behaviours. The United Kingdom and Australia use the term safe sex. In international literature, both terms may be found.

These terms have come to have a variety of meanings in the sexual health education and HIV/AIDS prevention discourse. In abstinence-based HIV/AIDS education, the term safe sex may be defined as sexual intercourse within a mutually monogamous, trusting relationship between people who have both tested negative for HIV and other sexually transmitted infections, do not share needles or other injection drug equipment and have no other risk factors. Such relationships are founded on a high level of mutual respect and communication. Safe sex is a term often found in faith-based literature.

Safer sex is defined as a continuum of sexual behaviours that range from those that involve no potential exchange of body fluids that may transmit HIV, to those using barriers to prevent transmission of the virus. Bodily fluids that can transmit HIV include blood, vaginal fluid, pre-ejaculate, semen and breast milk.[6] Correct and consistent use of male or female condoms, dams and gloves, together with the use of contraceptives, will work to reduce the possibility of transmission of HIV and unintended pregnancy. Other precautions that will also reduce the risk of STI and HIV transmission include using water-based lubricant, both to increase enjoyment and also to reduce the risk of condom breakage, and avoiding oral sex after dental work and brushing and flossing, since micro-abrasions or minute tears in the gums may provide a point of entry for bacteria and viruses.

Students must be familiar with the continuum of risk related to sexual behaviours; that is, be aware that some sexual activities have little or no risk, while others may present a low, medium or high risk of transmission of the virus.[7]

Together with understanding which sexual behaviours present risk, and how they may mitigate that risk through the use of barriers, students need to develop communication skills that will facilitate their use of safer sex practices when they choose to be sexually active. They must be able to negotiate what sexual activities they are ready to participate in, with whom and under what circumstances. They require practice in assertiveness skills, negotiation skills and refusal

[6] Saliva may transmit Hepatitis B, and feces may transmit Shigella or Hepatitis A.

[7] The Canadian Federation for Sexual Health (CFSH) has an excellent chart that assesses the risk for the transmission of sexually transmitted infections, including HIV, when condoms or other barriers are not used. It is available in both English and French. This tool is suitable for young and older teens. http://www.cfsh.ca/Your_Sexual_Health/Contraception-and-Safer-Sex/Safer-Sex/STI-Risk-Chart.aspx

skills. Students also need to be able to assess risk, plan to mitigate that risk and be familiar with available community resources should their planning fail. This may include access to HIV and STI counselling and testing and possibly post-exposure prophylaxis.

Preventing Perinatal Transmission

HIV can be transmitted from a mother to her baby during pregnancy, during labour and birth, and through breastfeeding. This mode of transmission is commonly called mother-to-child transmission (MTCT). This name ignores the fact that the majority of women are infected by their male partners, reinforcing stigma and discrimination against women living with HIV, since the name suggests that the mother is solely to blame for infecting the child. The term parent-to-child transmission "better recognizes the roles and responsibilities of both parents in protecting themselves and their families against HIV infection."[8]

The first step towards reducing the number of babies infected in this way is to prevent HIV infection in women and to prevent unintended pregnancies. Women require easy access to quality sexual and reproductive health information and care. This requires a commitment to addressing the various biological, social, cultural and economic factors that increase women's vulnerability to HIV.

The second focus must be on identifying women who are HIV infected and providing them and their babies with needed care and treatment. Preventing parent-to-child transmission, which is also called vertical transmission, requires the following:

- **Prenatal care** is available to all pregnant women. Provision of prenatal care is essential for the health and well-being of women. Prenatal care brings women in contact with health promotion education, including HIV prevention education; HIV and other sexually transmitted infection counselling; testing and treatment; and referrals to social and economic or material support services.
- Healthcare providers offer **HIV counselling and testing** in a non-judgmental environment. HIV-related stigma and **discrimination must be eliminated** in the health care environment. Health care providers must be educated to provide compassionate, non-judgmental counselling, testing and care, as needed by women. Integration of HIV/AIDS care into sexual health and reproductive care would reduce the fear women have of being identified as HIV infected through their attendance at HIV treatment clinics;
- **Medications** to treat women living with HIV and to prevent transmission of the virus to the child are accessible to all. The lack of availability and the cost of antiretroviral medications combine to make treatment inaccessible to many women worldwide. Although the most effective treatment involves a combination of antiretroviral drugs taken throughout pregnancy and during labour, even a single dose of medications during labour can cut the transmission rate dramatically.

[8] UNAIDS and UNESCO. (2002) HIV/AIDS and education: A toolkit for ministries of education. Bangkok: UNESCO. Section 01: Basic facts about AIDS. http://www.unescobkk.org/ebooks/documents/aids/toolkit/

- A **trained birth attendant** who is able to administer medications to prevent HIV transmission to the child during the birthing process is accessible to all women. In many areas of the world, women do not have access to birth attendants who are able to administer medications, or these birth attendants do not have access to the necessary medications.
- **Medications** are available to treat the baby following its birth as per current medical protocol. The lack of availability and the cost of antiretroviral medications combine to make treatment inaccessible to many women and their babies worldwide. In some regions, the medications may be free, but all related expenses – i.e., transportation to specialised clinics, clinic fees, laboratory fees, blood tests, etc. – might be prohibitive. This needs to be addressed, as well.
- **Breast milk substitutes** and a **safe water supply** need to be available to women living with HIV so that they can prepare these formulas. The World Health Organization advises mothers with HIV not to breastfeed whenever the use of replacements is acceptable, feasible, affordable, sustainable and safe. However, if safe water is not available, then the risk of life-threatening conditions from replacement feeding may be greater than the risk of acquiring HIV from breastfeeding. An HIV-positive mother should be counselled on the risks and benefits of the different infant feeding options and should be helped to select the most suitable option for her situation. UNICEF recommends that women who are not known to be HIV positive and those who do not know their status should exclusively breastfeed for the first six months.
- **Economic and other practical support** should be available to all women with HIV, many of whom are abandoned by partners and family when they are identified as HIV positive. Economic support for women living with HIV is essential. Women who are economically vulnerable are more likely to participate in survival sex or sex for money. These activities place them at greater risk of becoming re-infected with other strains of the virus. In addition, their vulnerability potentially decreases their ability to negotiate condom use.

In addition, public education campaigns must work to reduce HIV-related stigma, another frequent obstacle to preventing mother-to-child transmission. Some women, including women in small, rural or isolated communities in Canada, are afraid to attend clinics that distribute antiretroviral drugs, visit specialist health care providers or feed their babies "formula," for fear that they reveal their HIV status by doing so.[9]

MTCT results in more than 1500 children per day becoming infected with HIV. Access to testing to determine status is vital to child survival. HIV test results in children less than 18 months do not give a clear result, since children born to HIV positive women have antibodies from their mother in their blood. Without antiretroviral therapy, between 60% and 75% of HIV positive children will die before the age of five years. If they are able to receive effective treatment, less than 20% of HIV positive children will die.

[9] While working in an isolated Northern Canadian community, the author spoke with several women who expressed fear of being identified as HIV-positive. They believed that if they attended the health clinic too frequently, the community would discover their status and they would be stigmatized. Innovative programs were put in place to facilitate access to care for some women who were HIV-positive in this community. Also, breast-feeding was normative in this community. One young woman chose to leave this community when she learned of her positive status so that she could both receive treatment, and later, formula-feed her baby without scrutiny.

Access to quality health care is key. HIV positive children are at greater risk of acquiring and succumbing to infectious diseases. These children require access to immunizations, as well as early treatment of all infections.

New HIV Prevention Strategies

Two prevention tools still under development are vaccines and microbicides.

Vaccine Development

There is currently no vaccine available for HIV or AIDS.

Vaccines have been used as tools to prevent infectious diseases for more than 100 years. Today there are vaccines to prevent more than 30 common infections. Many of these infections were fatal prior to the introduction of vaccines.

Vaccines work by teaching the body's immune system how to defend itself against the specific virus by creating an immune response, before it is exposed to a virus. Later, if the vaccinated person is exposed to the virus, their immune system responds quickly to neutralize and clear the virus.

Without treatment, HIV infection progresses to AIDS, a fatal stage of HIV infection. To date, more than 25 million people have died worldwide. The development of an effective HIV vaccine would prevent new infections and slow the epidemic. An effective HIV vaccine could act in one of two primary ways. A **preventative** vaccine could prevent individuals from becoming infected with the HIV. A **therapeutic** vaccine would be designed to be used in those persons already infected with HIV. It would act to prevent the infection from progressing as quickly to AIDS.

Several factors complicate the development of an effective HIV vaccine:

1. The HIV mutates, making it difficult for the immune system to target it effectively.
2. HIV inserts copies of its genetic material into the cells of the immune system and other parts of the body. These copies hide in the body for many years, eventually weakening the immune system so that the body eventually develops AIDS.

Researchers have not yet been able to develop a vaccine that is able to stimulate sufficient immune response to protect against HIV infection. Significant work is continuing to take place around the globe, including in Canada. For further information about vaccine development, check out the AIDS Vaccine Handbook at http://www.avac.org/ht/a/GetDocumentAction/i/2634.

Microbicides

Women make up 48% of all adults living with HIV globally; this percentage rises to 59% in sub-Saharan Africa. In the US and in Canada, women are overrepresented in the percentage of adults who are living with HIV. Gender inequality plays a significant role in new infections among women and girls. Women are frequently unable to insist upon fidelity in their sexual relationships and unable to negotiate safer sex practices. Correct and consistent condom use is often controlled by the man.

Microbicides are currently being developed to provide women with a prevention tool that they can control. Biological, social, cultural and economic factors, including sexual violence and survival sex, combine to make women and girls particularly vulnerable to HIV infection.

Microbicides are substances that a person could apply topically to the genitalia that would act to prevent transmission of HIV and other sexually transmitted infections. They may come in a variety of forms, including gels, creams, films or vaginal rings that would release the active substance slowly over a period of days or weeks.

There are seven mechanisms for prevention currently being researched with respect to microbicides:

1. Creating a physical barrier to HIV transmission.
2. Inactivating or neutralizing the virus before it passes through the epithelium, the layer of cells lining the vaginal or rectal cavity, and enters the body.
3. Strengthening the body's natural defences against HIV. This action is known as a vaginal defence enhancer.
4. Preventing transmission of other STI infections.

The three remaining methods involve adapting current antiretroviral treatments for HIV into microbicidal forms:

5. Using fusion inhibitors to prevent the HIV virus from fusing with a potential host cell.
6. Relying on reverse transcriptase inhibitors to prevent the virus from copying its RNA.
7. Employing uptake inhibitors to prevent the uptake of the HIV by cells after the virus has entered the body.

There are many microbicide candidates in development. However, it takes many years for an experimental drug to move through all stages of research. In 2007, there were 36 microbicide candidates in the pre-clinical phases of development and 11 in different phases of clinical trials where they were being tested for efficacy and side effects in humans (Action Now, 2007, p. 2).

Safe, effective microbicides have the potential to prevent millions of HIV infections around the world. Their availability could empower women and girls worldwide to take control of their sexual health without negotiation with their partners.

Educational Resources

K-3

CATIE (2008) *Universal precautions fact sheet*. Bilingual.
http://library.catie.ca/PDF/ATI-10000s/19661.pdf

- This bilingual poster provides a short guide for educators to teach younger students about universal precautions that will help them to protect themselves against infection from any communicable disease, not just HIV/AIDS.

Grades 6-8

Canadian Association for School Health. (2007). Selecting a contraceptive method. Adapted from *Beyond the basics: A sourcebook on sexuality and reproductive health education*. Ottawa: Author. ISBN 0-9688118-0-9 400 pp.
http://www.sexualityandu.ca/teachers/pdf/Selecting-a-Contraceptive-Method.pdf

- This lesson plan allows educators to use web research to promote discussion of various contraceptives, including abstinence and condoms. This lesson allows educators to open up the discussion to how abstinence and condoms also prevent the spread of HIV and STIS.

Campbell, S. et al. (2009) *Sex? A healthy sexuality resource*. ISBN: 0-88871-851-9 132pp.
http://www.gov.ns.ca/hpp/publications/11032_SexBook_Feb10_En.pdf

- This resource is aimed at youth and is written in language that would be easily accessible to them. The document could also be used by educators to plan prevention activities and lessons, including lessons on refusal skills and building self-confidence in students at this level.

Covell, K. & Howe, B.R. (2003) Children's rights curriculum resource. University College of Cape Breton.
http://discovery.uccb.ns.ca/psych/images/uploads/final_Grade_8_curriculum.pdf

- While this is a comprehensive resource meant to provide information and lessons for educators on all children's rights, it provides an excellent lesson plan for discussing condom use as a rights issue, rather than a sexuality issue (p. 108). Provides possible discussion questions.

New York City Department of Education. (2005). Lesson 5: How can we prevent HIV infection? *HIV/AIDS curriculum: A supplement to a comprehensive health curriculum.*
http://schools.nyc.gov/offices/teachlearn/documents/docs/hivaidsdocs/hivaidsbookgr6.pdf

- Lesson based on discussion that encourages students to list myths and facts about how to prevent HIV transmission. Correct answers on how to prevent HIV infection that are age-appropriate are included. Lesson notes suggest that to reinforce this knowledge, students should be encouraged to create a poster, poem or rap song about prevention. In an adapted lesson, students could be encouraged to post their posters in their schools, or play their songs and read their poems on school radio.

Grades 9-12

AVAC. (N.A). *Introduction to AIDS vaccines*. http://www.avac.org/vax_101/AVAC_pt1.html

- Flash presentation that gives an overview of what a vaccine is and how research is being conducted for an HIV/AIDS vaccine. Good for educators to familiarise themselves with the information or as a wider classroom lesson on the difficulties of developing an HIV/AIDS vaccine.

TARSC. (N.A). *Auntie Stella toolkit*. http://www.tarsc.org/auntstella/html/questions.htm

- This toolkit was developed in Zimbabwe to teach teenagers in that country about positive sexual health. Using a question and answer format like Dear Abby, fictitious youth write in and ask questions about their sexual health. Some of the questions concern STIs and could easily become the basis of a Dear Abby activity at this level. The kit provides a guide on how to approach the subject, how to lead discussion and how to encourage peers to help each other out with the material. This tool would be useful in a multicultural classroom.

A Student's Guide to HIV Testing

The Human Immunodeficiency Virus (HIV) weakens our immune system by infecting and destroying specific white blood cells. Our immune system responds to HIV by producing antibodies. An HIV test looks for these antibodies.

Who might want to get tested?

People who:

- Have had sex without a condom, but have never been tested;
- Have had sex without a condom since their last HIV test;
- Are pregnant or have a partner who is pregnant;
- Have injected drugs with needles and other equipment that may have been used by someone else first;
- Have had body piercings or tattoos done with a needle that may have been used by someone else first; and
- Have had sex without a condom with someone who might have engaged in any of the activities listed above.

Why should I get tested?

If you engage in high-risk behaviours, but test negative for HIV antibodies, you can:

- Learn how to avoid infection or reduce your chances of becoming infected.

If you are infected with HIV, you can:

- Seek early medical care and treatment, such as antiretroviral medications, as well as other services that can help you effectively manage your HIV infection so that you can live a long and healthy life;
- Inform sexual partners about any exposure to HIV and the need for protection; and
- Learn how to prevent transmitting HIV to others.

How does testing work?

A small sample of blood is tested for antibodies to HIV. The most commonly used test is an ELISA test. This test is highly accurate. Results from the ELISA test can take three to ten days.

If the test reveals the presence of antibodies to HIV, a follow-up test called a Western Blot is done to confirm the results.

Some places in Canada offer rapid testing. Rapid tests use blood from a finger prick, mucous from a swab taken inside of your cheek or urine. A test result can be ready in twenty minutes. If the test is positive, it must be confirmed with a Western Blot test.

There is a window period from the time of HIV infection to the time when tests can detect antibodies in your blood. This window period is usually four weeks to three months. The Public Health Agency of Canada does not set a specific timeline for this window period. As a result, if you think you were exposed to HIV, you should wait at least four weeks before getting tested. If you don't wait until after the "window period" is over, you may get an inaccurate result (i.e., you may be told that your test is negative, but actually be HIV-infected, and transmit the virus to others).

It is important to make careful and informed decisions about whether, when and how to be tested. Whether you test negative or positive for HIV-infection, you will also want to think carefully about those people to whom you wish to disclose your results. You should choose a testing facility that is experienced with adolescents. The testing facility should offer pre- and post-test counselling. Counsellors will help you make these decisions.

A negative HIV result should be confirmed after a three-month period.

Remember, if you participate in another risky activity during the window period, you will need to wait at least four weeks from engaging in that activity in order to get an accurate test result.

What testing options are available?

Depending on where you live in Canada, you may have three different testing options:

1. ***Anonymous HIV testing***

   You do NOT give your name or address or other identifying information. You might be asked for some statistical information like your age, gender, ethnicity and HIV-related risk factors, depending on where you live in Canada. This information is used to plan HIV-related services.

   You are given a number or code. The person who orders the HIV test and the laboratory conducting the test on the blood sample do not know to whom the code belongs. When you return to the test site to get your results, you give them your number or code. In this way, no one but you knows that you were tested.

   If your HIV test result is positive, you are responsible for telling your sexual partners and your drug use contacts. You can ask for help with this task.

   Your test results are not recorded in your health care record.

2. ***Nominal/name-based HIV testing***

- The HIV test is ordered using your name.
- Your indentifying information is collected. Statistical information is collected.
- Your test results are recorded in your health care record.
- If your test result is positive, in those provinces and territories where HIV infection is a notifiable disease, the person who ordered your test is legally required to notify public health officials of your name.
- The person who ordered your HIV test, or a public health official, is responsible for notifying your sexual partners and drug use contacts.
- When they notify your sexual partners or drug use contacts, they will not share your name.

3. ***Non-nominal/non-identifying HIV testing***

- Your HIV test is ordered using a code or your initials.
- If your test result is positive, a public health official will check with the person who ordered your test to verify whether your sexual partners and drug use contacts have been notified. If the public health official is satisfied that your partners have been notified of possible exposure to HIV, the official will not ask for your name.

Testing options may not be available at all test sites. Call ahead to check your options before you go.

Where can I go to get tested?

There are many places that provide HIV testing services or that will know where you can go to get tested. For example:

- Community health centres or clinics or CLSCs.
- Family planning clinics.
- Public health units.
- Sexual health clinics.
- Youth organizations.
- Drug treatment facilities.
- Your family doctor.

You can look in the yellow pages of your local phone book or use Canada411.ca to find local contact information.

Every province or territory in Canada has an AIDS service organization that can help you locate a youth-friendly place to get tested. Here is a link to a site that lists ASOs in Canada: http://www.catie.ca/eng/Links/Local.shtml#ab and another link that lists Canadian HIV/AIDS Hotlines: http://www.cdnaids.ca/hotlines

You might also ask a school guidance counsellor, nurse, your case worker, probation officer or another trusted adult.

Getting My Test Results

What if my test is negative?

If your test is negative, this is a good time to learn how to avoid HIV infection or reduce chances of becoming infected. Your test site most likely has information about HIV prevention, or you may be able to arrange to speak to an individual confidentially. They may offer educational workshops or other events where you can learn about HIV/AIDS with other youth.

What if my test is positive?

If your test is positive, you will want to talk with a health care provider about health care and treatment options, such as antiretroviral medications. Your HIV test site or your health care provider will help you locate services that can help you manage your HIV infection, and you can ask for help to talk with your sexual partners and/or drug use contacts. You can learn how to prevent transmitting HIV to others.

If you are pregnant, or your partner is pregnant, you will want information about preventing transmission of HIV to your baby.

If you test positive, you will want to get some advice and support about disclosure – that is, revealing you are HIV positive, both to your sexual partners and your community. You will need to learn why you should share this information with specific people, but why in some cases requesting this information may be an infringement of your rights to privacy. Canadian criminal law is ambiguous on the subject; however, HIV-infected individuals who have infected others have been convicted by our justice system of several serious offences. For more information, please check out the HIV/AIDS Legal network website, http://www.aidslaw.ca/EN/index.htm

Where can I go for more information or for help?

For general information about HIV and AIDS:

Your local AIDS service organization (ASO). A list of provincial and territorial ASOs can be found here: http://www.catie.ca/eng/Links/Local.shtml#ab

For specific information about testing resources, consult:

Anonymous HIV Testing Sites in Ontario
http://www.actoronto.org/home.nsf/pages/referrallists/$file/Anonymous%20HIV%20Testing%20Sites%20in%20Ontario.pdf

If you are HIV Positive:

Live Positive (by Positive Youth Outreach)
http://www.livepositive.ca/english/positive-life-treatment-so-1.asp

Youthco AIDS Society
http://www.youthco.org

Educational Resources

UPI. (2009). *HIV/AIDS: Telling teens their test results.*
http://www.youtube.com/watch?v=O_9RPCzr7To&feature=related

- Short two minute and forty second video about a case worker that reveals HIV/AIDS test results to teens. HIV positive herself, Anita Wilson describes her regular workday. The video could be used in a wider lesson on testing options and provide some visual understanding of the steps of taking an HIV test.

PROVINCIAL AND TERRITORIAL OFFICES FOR THE PREVENTION AND CONTROL OF SEXUALLY TRANSMITTED INFECTIONS

Alberta

STI Services
Alberta Health and Wellness
PO Box 1360, Stn. Main
Edmonton, AB T5J 9Z9
Tel: 780.427.2830
Fax: 780.422.5149
http://www.health.alberta.ca/health-info/STI-STD.html

British Columbia

STI/HIV Prevention and Control
BC Centre for Disease Control
655 West 12th Avenue
Vancouver, BC V5Z 4R4
Tel: 604.660.6161
Fax: 604.775.0808
http://www.stdresource.com/

Manitoba

Communicable Disease Control Branch
Public Health Division
Manitoba Health and Healthy Living
4th Floor, 300 Carlton Street
Winnipeg, MB R3B 3M9
Tel: 204.788.6737
Fax: 204.948.2040
http://www.gov.mb.ca/health/publichealth/cdc/sti/index.html

New Brunswick

Office of the Chief Medical Officer of Health
New Brunswick Department of Health
2nd Floor, 520 King Street, PO Box 5100
Fredericton, NB E3B 5G8
Tel: 506.453.2280
Fax: 506.453.8702
http://www.gnb.ca/0051/index-e.asp

Prince Edward Island

Office of the Chief Health Officer – PEI
Department of Health
P.O. Box 2000, 16 Garfield St.
Charlottetown, PEI C1A 7N8
Tel: 902.368.4996
Fax: 902.620.3354
http://www.gov.pe.ca/health/index.php3?number=1018470&lang=E

Quebec

Service de lutte contre les infections transmissibles sexuellement et par le sang
Direction générale de la santé publique
Ministère de la Santé et des Services sociaux
201, boul. Crémazie Est, RC-03
Montréal, QC H2M 1L2
Tel: 514.873.9890
Fax: 514.873.9997
http://www.msss.gouv.qc.ca/sujets/prob_sante/itss/index.php?home

Saskatchewan

Office of the Chief Medical Health Officer
Population Health Branch
Ministry of Health
3475 Albert Street
Regina, SK S4S 6X6
Tel: 306.787.3235
Fax: 306.787.9576
http://www.health.gov.sk.ca/population-health

Northwest Territories

Office of the Chief Medical Officer of Health
Department of Health and Social Services
Population Health, Health Protection Unit
Government of the Northwest Territories
Yellowknife, NT X1A 2L9
Tel: 867.920.8646
Fax: 867.873.0442
http://www.hlthss.gov.nt.ca/

Nova Scotia

Communicable Disease Prevention and Control Centre
Nova Scotia Department of Health Promotion and Protection
1601 Lower Water St., PO Box 487
Halifax, NS B3J 2R7
Tel: 902.424.8160
Fax: 902.424.0550
http://www.gov.ns.ca/hpp/cdpc/links.asp

Nunavut

Health Protection Office
Department of Health and Social Services
P.O. Box 1000, Station 1000
Iqaluit, NU X0A 0H0
Tel: 867.975.5700
Fax: 867.975.5755
http://www.gov.nu.ca/health/

Ontario

STI/AIDS/ Sexual Health/BBI Unit
Infectious Diseases Branch
Public Health Division
Ministry of Health and Long-Term Care
5700 Yonge Street, 8th Floor
Toronto, ON M2M 4K5
Tel: 416.327.7429
Fax: 416.327.7439
http://www.health.gov.on.ca/english/public/program/hivaids/aids_mn.html

Newfoundland and Labrador

Department of Health
Building 801, Pleasantville
St. John's, NF A1B 4J6
Tel: 709.729.3430
Fax: 709.729.5824
http://www.health.gov.nl.ca/health/

Yukon Territory

Health & Social Services
Yukon Territorial Government
4 Hospital Road
Whitehorse, YT Y1A 3H8
Tel: 867.667.8369
Fax: 867.667.8349
www.hss.gov.yk.ca

An In-depth Look at HIV and Its Transmission

Introduction

This topic is one of the core elements of HIV/AIDS education.

At each Grade level, from Kindergarten through Grade 12, students will increase their understanding of sexually transmitted infections, specifically the Human Immunodeficiency Virus (HIV) and how it is transmitted.

Having an understanding of how HIV is transmitted will help students understand how they may protect themselves from becoming infected, and if infected, how they may prevent transmission of the virus to others.

Students will learn:

- Which body fluids can transmit HIV;
- How the virus is transmitted;
- Routes of HIV transmission; and
- How to prevent transmission of HIV.

Some of this learning will be cross-referenced under the topic areas of prevention or the global impact of HIV and AIDS.

Which body fluids can transmit HIV?

HIV is a blood-borne virus. HIV must be transmitted directly into the bloodstream or through a mucous membrane from an infected person to a non-infected person. HIV is found in the blood, semen or vaginal fluid of an infected person. Therefore, HIV transmission can occur when blood, semen (cum), pre-seminal fluid (pre-cum), vaginal fluid or breast milk from an infected person enters the body of an uninfected person.

To become infected:

HIV Must Be Present – Infection may only occur if one of the people involved in an exposure situation is infected with HIV.

There Needs to Be Enough of the Virus – The concentration of HIV determines whether infection will occur. In blood, the virus is very concentrated. A small amount of infected blood is enough to infect someone.

HIV Must Get into the Bloodstream – HIV can enter through an open cut or sore, through contact with the mucous membranes or through the use of shared needles or other sharp instruments that have HIV-infected blood on them.

Mucous membranes are the delicate tissues that line openings into the human body – the vagina, the opening at the tip of the penis, the anus and rectum, and the mouth. Transmission risk is very high when HIV comes in contact with these porous mucous membranes. The virus enters the white blood cells that are near the surface of the mucous membrane and causes infection.

Note: It is not enough to be in contact with an infected fluid for HIV to be transmitted – there must be an opening in the skin or in the mucous membranes enabling the virus to enter the bloodstream.

Routes of HIV transmission

HIV may be transmitted by:

Sexual behaviours, including intercourse and oral sex: Penile/vaginal, oral (mouth to anus/penis/vagina) and penile/anal

Sexual transmission of HIV occurs by absorption of infected semen, blood or vaginal fluid through mucous membranes and abrasions (tiny unfelt scratches or tears in delicate tissues) during sexual activities. Within the category of sexual transmission, there are differences in likelihood of transmission during any unprotected sexual act.

Anal intercourse is the highest risk sexual behaviour. It is the most likely mode of sexual transmission, whether anal intercourse occurs between a man and a woman or between a man and a man. The anal mucosa is fragile, and tissue tearing and bleeding frequently occur, although they may not always be noticed. Lymphatic tissue occurs all along the digestive tract, thus there are concentrations of T-cells, one of HIV's favourite targets, near the anus.

Vaginal/penile intercourse poses risk to both men and women. However, women are more at risk than men. Physiologically women have more delicate tissue in the vaginal area, especially younger women, whose cervixes are not fully formed, and older postmenopausal women, who may have experienced some thinning of the vaginal lining, making it more fragile and therefore more likely to develop abrasions during intercourse.

Oral Sex is considered a low-risk activity for HIV infection. Pre-seminal fluid, semen and vaginal fluids all contain HIV. There is evidence that the longer a body fluid is in the mouth, the greater the possibility of infection; therefore, those who perform oral sex seem to be at slightly higher risk that those who receive oral sex.

Exposure to infected blood

HIV may be transmitted by an infected person to a non-infected person through the use of syringes or needles or other equipment used by injectors (cotton, cookers, drug solution and water) for drug injection. When people inject drugs, including steroids or hormones, intravenously, intramuscularly or under the skin, small amounts of blood can remain in the needles, syringes or other paraphernalia used in drug preparation. If these are then used by another person, HIV-infected blood can be injected into the next user's bloodstream.

Though much less likely, transmission may also occur through contact with open sores or cuts.

It is possible to become infected with HIV from tattooing and body piercing if the needles or instruments used are reused, shared or unsterile. Most communities have public health legislation governing the practices of both tattooing and body piercing.

Perinatally

HIV may be transmitted from an infected woman to her child(ren) during pregnancy, childbirth or breastfeeding. Transmission of the virus from an HIV-positive woman to her child through pregnancy, childbirth or breastfeeding can be prevented. Pregnant women should receive counselling and testing for HIV. If a pregnant woman is HIV-positive, she can take specific medications during the pregnancy and/or during the birth process that will reduce the potential for transmission of HIV to her child. The infant should receive medications after it is born.

Where feasible, the baby should be formula-fed instead of being breastfed, as there is a possibility of HIV transmission through breast milk. However, the viability of formula-feeding in areas where the safety of the water supply cannot be guaranteed must be taken into consideration. Breast-feeding by a non-infected woman may be a better option. If this is not possible, the breast milk of the infected mother may be the better option to prevent water-borne disease in a baby with a potentially compromised immune system.

In countries where HIV infection is epidemic, mother-to-child transmission is very high. Medications to prevent vertical transmission are frequently unavailable, or if available the cost is prohibitive. In these same countries, the limited availability of breast milk substitutes, their cost and the lack of accessibility to clean water supplies combine to make the possibility of vertical transmission via breast milk highly probable when the mother is HIV infected.

The prevention of mother to child transmission of the HIV from infected women to their children is one of the "success stories" of HIV prevention in the North America. Routine counselling and screening for HIV in pregnant women, combined with treatment of HIV-infected women during pregnancy and during the birthing process, together with feeding with breast milk substitutes have virtually eliminated MTCT.

Transfusions of infected blood or blood clotting factors (transmission is rare)

Since 1985, donated blood has been routinely screened for HIV antibodies and many other blood-borne antigens. Therefore, the risk of infection through transfusion of blood or blood products is extremely low. The Canadian blood supply is considered to be among the safest in the world.[10] In developing countries, blood transfusion is still a possible route of infection.

[10] "The World Health Organization has said that Canada's blood system is among the safest in the world." See Canadian Blood Services: "Frequently Asked Questions – Blood Safety & the Security of Canada's Blood System." http://www.bloodservices.ca/CentreApps/Internet/UW_V502_MainEngine.nsf/page/E_FAQSafety_Security?OpenDocument

Accidental exposure

Workers in health care settings may be at risk if stuck with needles containing HIV-infected blood or, less frequently, after blood gets into a worker's open cut or a mucous membrane, for example the eyes or inside of the nose. Most occupational settings, such as hospitals where accidental exposure to body fluids is a possibility, have a post-exposure prophylaxis protocol.[11]

HIV is NOT transmitted by day-to-day contact

HIV is not an easy virus to pass from one person to another. HIV is not an airborne virus. It does not live long outside the body. You cannot "catch it" like you can catch a cold or the flu. You cannot become infected from:

- Contact with body fluids like saliva, urine, tears, sweat, feces or vomit;
- Casual contact, such as sharing drinking glasses, cutlery or food with someone who is HIV-positive;
- Touching a toilet seat, a drinking fountain or a door knob; or
- Being bitten by Insects – mosquitoes, flies, ticks, fleas, bees or wasps, or other insects. (HIV can only live in human cells.)

Preventing HIV Transmission through Sexual Behaviours: Safer Sex

Transmission of HIV through sexual behaviours can be prevented. The risk of HIV transmission may be virtually eliminated by avoiding behaviours that are associated with the exchange of the body fluids – vaginal fluids, semen or blood – that potentially contain the virus. **Risk elimination** may be an appropriate choice for younger teens, or it may be chosen by older persons for personal reasons. Abstinence from all sexual behaviours outside of marriage is strongly supported by many religious and cultural groups. Abstinence from sexual activity that may include the exchange of body fluids, especially during early adolescence, is supported by many sexual health educators.

Risk reduction is an appropriate choice for persons who choose to engage in sexual behaviours that may include the exchange of body fluids – vaginal or anal intercourse and oral sex. Risk reduction is often called "safe sex" or "safer sex" in HIV/AIDS education discourse.

Barriers such as male condoms or female condoms for vaginal or anal intercourse and dental dams for oral sex, are used to prevent exposure to the other person's blood, semen or vaginal fluids. These barriers are effective ways to prevent the transmission of HIV if used consistently and correctly.

For people who choose to be sexually active, it is essential that they take care of their sexual and reproductive health. For women, this means good hygiene and regular breast and pelvic exams; for men, this means good hygiene and regular medical exams. For both women and

[11] See for example, BC Centre for Excellence in HIV/AIDS. (2007). Accidental exposure. http://www.cfenet.ubc.ca/sites/default/files/uploads/docs/Accidental_Exposure_Therapeutic_Guidelines.pdf or Centers for Disease Control and Prevention (CDC). (2007). Preventing occupational HIV transmission to healthcare personnel. http://www.cdc.gov/Hiv/resources/factsheets/hcwprev.htm

men, these exams should include regular tests for sexually transmitted infections, including HIV. Infection with another sexually transmitted infection increases the risk of becoming infected with HIV, since it often causes open sores or increases the fragility of the mucous membranes, making the possibility of exposure to infected blood higher.

Intravenous Drug Use: Preventing Exposure to Infected Blood

Shared intravenous drug equipment is a primary mode of transmission of HIV. Of the estimated 60,000 people living with HIV and AIDS in Canada, approximately 17% were infected through injection drug use where a transmission risk was identified.[12] It is not clear from available data how many additional HIV infections are attributable to transmission through sexual contact with an injection drug user. Nor is data available about the number of drug-associated mother-to-child-transmission (MTCT) cases.

However, when this data is combined, it becomes clear that the percentage of HIV infections in Canada, directly or indirectly attributable to injection drug use, is quite high.

Why is injection drug use a risk for HIV transmission?

At the start of every intravenous injection, blood is introduced into the needle and syringe. HIV is found in the blood of a person infected with the virus. Even a small amount of blood can contain enough of the virus to transmit it to another person. The reuse of a blood-contaminated needle or syringe by another drug injector, which is sometimes called "direct syringe sharing," carries a high risk of HIV transmission because infected blood can be injected directly into the bloodstream. Sharing drug equipment, or "works," is also a risk for spreading HIV. Infected blood can be introduced into drug solutions by:

- Using blood-contaminated syringes to prepare drugs;
- Reusing water;
- Reusing bottle caps, spoons or other containers ("spoons" and "cookers") used to dissolve drugs in water and to heat drug solutions; or
- Re-using small pieces of cotton or cigarette filters ("cottons") used to filter out particles that could block the needle.

Preventing HIV transmission through infected blood exposure must take a two-fold approach: preventing injection drug use and providing safer situations for those persons who use drugs. Preventing substance use is an important component of HIV and AIDS education, where the focus is on making healthy lifestyle choices, and should begin in the youngest Grade. As students mature, the focus should be on developing an understanding of the implications of substance use on oneself and others, with particular attention to impacting on decision-making and problem-solving skills. Students should also be supported and encouraged to develop

[12] Federal/Provincial/Territorial Advisory Committee on AIDS. 2006-2009 Strategic plan – Environmental scan: Context. Public Health Agency of Canada. Accessed on March 17, 2009 from http://www.phac-aspc.gc.ca/aids-sida/publication/stratplan0609/env-eng.php

refusal skills. In recognition that some people will use substances, older students should be introduced to harm reduction concepts, i.e., means of making injection drug use safer. Two options to reduce the potential harm of intravenous drug use exist in Canada: provision of safe equipment for drug use through needle exchange programs and provision of safe drug use settings or safe injection sites.

Needle Exchange Programs (NEPs)

Needle exchange programs provide new needles and syringes to intravenous drug users. In Europe, needle exchange programs (NEPs) first began providing services in 1983, in an attempt to reduce HIV and hepatitis B transmission. In Canada, the first needle exchange programs were introduced in 1989. Currently, there are more than 100 programs across Canada. NEPs may also provide referrals to drug treatment programs and methadone clinics, peer education and HIV prevention programs. Many provide male condoms, female condoms, alcohol pads and bleach for cleaning drug equipment. Many also offer on-site counselling and testing for HIV; hepatitis A, B and C; safer injection practice; vein care; STI prevention; testing and treatment; and abscess treatment. By providing education, counselling, testing and contact services, NEPs also play a significant role in preventing infection among the IDU's drug contacts, partners and children, in the case of HIV-infected pregnant women.

Unfortunately, despite the potential for considerable benefit, access to NEPs in Canada is limited. Many suburban, rural and isolated communities do not have access to NEPs. Many NEPs have limited hours. No programs exist in federal or provincial prisons. Furthermore, some NEPs limit the number of syringes or needles distributed to users at each visit.

Safe Injection Sites

Insite, the first legal supervised injection site in North America, is located in Vancouver's Downtown Eastside. There are similar safe injection sites located in Europe. Insite provides a clean, safe space for injection drug use, including access to clean injection equipment. It is staffed with health care providers able to offer first aid in the event of an overdose. When appropriate, staff can also connect clients with other onsite services, including primary care for the treatment of wounds, abscesses and other infections; addiction counselling; and support and referral to treatment services, including withdrawal management and opiate replacement therapy.[13]

Greater support for these programs is required for them to reach their potential in limiting HIV transmission through injection drug use. Exposing students to harm reduction concepts may help to increase community support for such programs. Students may also access these programs for themselves or others.

[13] Insite – North America's first legal supervised injection site. http://www.vch.ca/sis/

Educational Resources

General Information

Centers for Disease Control and Prevention (CDC). (1999) *HIV and its transmission.*
http://www.cdc.gov/hiv/topics/basic/index.htm#transmission

- Provides a plain language and reliable overview of how HIV is and is not transmitted. Could be adapted into a true/false quiz about how HIV can be contracted. Information is appropriate for all ages.

All Grade Levels

Canadian Association for School Health. (2007). Red light/green light. Adapted from *Beyond the basics: A sourcebook on sexuality and reproductive health education*. Ottawa: Author. ISBN 0-9688118-0-9 400 pp.
http://www.sexualityandu.ca/teachers/pdf/RedLightGreenLight.pdf

- This lesson plan encourages students to discuss, debate and then categorize sexual behaviours based on risk of transmission of STIS and HIV. Could be adapted to include injection drug use for older students, as well as be modified to address communicable disease transmission risks with young children. Available in French.

Sheth, Prameet and Brook Thorndycraft. (2009). HIV transmission: An overview. CATIE.
http://www.catie.ca/eng/PreventingHIV/fact-sheets/transmission-overview.shtml

- This overview is an essential resource for educators interested in covering the science behind HIV transmission and risk. This plain language document is easy to understand and provides good images of the areas of the body most vulnerable to transmission of the virus. In more mature classes, these images could be used as the basis for an identify and explain exercise in which students are encouraged to identify which areas of their bodies are most at risk for HIV transmission and why. The question and answer format in which some of the information is presented would be ideal for explaining sensitive subjects to older students. Related information sheets cover women's vulnerability to infection, how other STIs increase the risk of transmission and how HAART works to lower viral loads. Available in French.

K-3

New York City Department of Education. (2005). Lesson 4: How do people get sick? What is HIV? *What is AIDS? HIV/AIDS curriculum: A supplement to a comprehensive health curriculum.*
http://schools.nyc.gov/offices/teachlearn/documents/docs/hivaidsdocs/hivaidsbookk.pdf
http://schools.nyc.gov/offices/teachlearn/documents/docs/hivaidsdocs/hivaidsbookgr1.pdf

- A series of lesson plans for a basic introduction to disease and illness, including a lesson on HIV/AIDS. The lessons provide easy-to-understand and use explanations of terms and key words for educators. Possible activities and games to reinforce knowledge acquisition and retention are also included.

Grades 4-5

New York City Department of Education. (2005). Lesson 2: How is HIV transmitted? *HIV/AIDS curriculum: A supplement to a comprehensive health curriculum.*
http://schools.nyc.gov/offices/teachlearn/documents/docs/hivaidsdocs/hivaidsbookgr5.pdf

- An introductory lesson plan on the modes of transmission of HIV that emphasises IV drug use, perinatal transmission, blood transmission and sexual transmission. Singles out abstinence as the only 100% effective way in which to avoid infection through sexual intercourse. Encourages students to recognize that fear of HIV/AIDS stems from misinformation and encourages students to understand that HIV/AIDS infection occurs in some cases because of risky behaviour.

Grades 6-8

Social Program Evaluation Group. (1998) *Skills for healthy relationships: A program about sexuality, AIDS and other STDs*. Queen's University.
http://www.ece.gov.nt.ca/PDF1/Healthy%20Relationships.pdf

- A comprehensive sexual health program that includes information on transmission. Provides interactive lesson suggestions. It encourages the use of peer educators to facilitate small group work, lead discussions and use brainstorm activities and role-plays.

Grades 9-12

Canadian AIDS Society. (2004) *HIV transmission: Guidelines for assessing risk – A resource for educators, counsellors and health care providers.* Fifth Edition. 72 pp.
http://www.cdnaids.ca/web/repguide.nsf/pages/45A115EBBCBA2586852570210054FC3E/$file/HIV%20TRANSMISSION%20Guidelines%20for%20assessing%20risk.pdf

- A comprehensive, evidence-based guide outlining the risks for the acquisition and transmission of HIV and hepatitis C associated with various sexual activities. Graded from 1 (no-risk) to 4 (high-risk). Could form the basis for designing a lesson based on the game "High Risk, Low Risk, No Risk" where students are expected to classify different risky behaviours and explain why they classified them the way that they did.

Canadian AIDS Society. (2009). Positive you're not positive? http://www.rupositive.ca/.

- Developed by the Canadian AIDS Society, this site has an on-line risk assessment tool and lists transmission-related resources. Provides an interactive and confidential way for students to evaluate their personal risk for transmission. Available in French.

Canadian HIV/AIDS Legal Network. (2007) Injection drug use and HIV/AIDS/ L'injection de drogue et le VIH/sida
http://www.aidslaw.ca/publications/publicationsdocEN.php?ref=74

- This is a series of 13 information sheets on legal and ethical issues related to injection drug use and HIV/AIDS. These fact sheets could be used individually or as a series and could be incorporated as a reading/discussion assignment to encourage students to think critically about the potential risk of and harm reduction strategies for injection drug use.

AVERT. (2009). Transmission runaround http://www.avert.org/lesson2.htm

- Interactive lesson plan that is meant to encourage discussion about risky behaviour and HIV/AIDS transmission. Provides questions with answers that educators could use during the game. Could be adapted to include questions about intravenous drug use.

New York City Department of Education. (2005). Lesson 2: Facts about HIV Transmission. HIV/AIDS curriculum: A supplement to a comprehensive health curriculum. http://schools.nyc.gov/offices/teachlearn/documents/docs/hivaidsdocs/hivaidsbookgr10.pdf

- Activity sheet that describes the course of an HIV infection from the point of infection through the four phases ending in AIDS. Details the ways in which the virus can be transmitted, including detailed sexual acts that are risky, IV drug use, vertical transmission and blood transmission. This sheet is designed as a take home sheet for students to be able to consult when they need it. Subsequent lessons outline strategies for preventing transmission.

In-depth Look at HIV/AIDS Treatment

Introduction

There is no known cure for HIV infection. There is no medication that completely destroys or eliminates the virus from the body. There are drugs, therapies and treatments that slow the progress of HIV and lengthen the lives of people with HIV. Antiretroviral drugs must be taken continuously. Developing treatments for HIV infection has been challenging, as the virus itself changes quickly, mutating and creating new strains that present challenges in both detection and treatment.

In the early days of the epidemic, HIV infection quickly progressed to AIDS, the fatal stage of HIV. In 1987, AZT (zidovudine), a nucleoside analogue, was introduced as the first drug to treat HIV infection. In 1996, highly active antiretroviral therapy (HAART), a combination of three or more drugs, was introduced. This improvement in treatment has resulted in an increased number of people living with HIV in Canada.

Treatment is not a cure, and unfortunately, this is not well understood in Canada.

According to the *2003 Canadian Youth, Sexual Health and HIV/AIDS Survey*[14], two-thirds of Grade 7 students in Canada did not know there was no cure for HIV/AIDS, and students in high school were no better informed. Approximately half of Grade 9 students and 35% of Grade 11 students believed that a cure exists for AIDS. During the same year, close to 20% of adult Canadians also believed that HIV/AIDS could be cured if treated early.[15]

How does antiretroviral therapy work?

HIV infects white blood cells, forcing them to make many copies of the virus. The replication or copying process uses proteins called enzymes. Antiretroviral therapy prevents the virus from replicating inside the cells of the human immune system by reducing the activity of these enzymes. The body's immune cells live longer and are able to protect the body from infections and diseases, permitting the HIV-infected person to live healthier and longer.

What is antiretroviral therapy?

Antiretroviral therapy, also called highly active antiretroviral therapy (HAART), requires that the person living with HIV take three or more anti-HIV medications at the same time. AZT, a nucleoside analogue, interferes with the enzyme reverse transcriptase (RT), the enzyme used by HIV infected cells to make copies of the virus. AZT is used in combination with other anti-HIV drugs, such as protease inhibiters and non-nucleoside reverse transcriptase inhibitors.

[14] Council of Ministers of Education of Canada. (2003) Canadian youth, sexual health and HIV/AIDS . http://www.cmec.ca/Publications/Lists/Publications/Attachments/180/CYSHHAS_2002_EN.pdf

[15] Health Canada. (2003), Canada's report on HIV/AIDS. 65 pp. ISBN 0-662-67810-9. Accessed on Mar 21, 2009 at: http://www.phac-aspc.gc.ca/aids-sida/publication/reports/report03/pdf/report2003_e.pdf

The combination of medications makes it more difficult for the virus to adapt and become resistant. For antiretroviral therapy to be effective, the HIV-infected person must take the medications at the same time every day. People often have difficulty following their daily drug regimen. This is often due to the number of pills that must be taken. One area of HIV research is focused on combining the medications so that fewer pills need to be taken on a daily basis.

Antiretroviral therapy is also associated with side effects such as nausea and vomiting or headaches. Some side effects are quite unpleasant or even dangerous and require a change in the combination of medications.

What is the role of antiretroviral therapy in preventing mother-to-child-transmission?

A woman with HIV infection may pass the virus to her unborn baby during pregnancy or during labour and birth. After birth, she may pass the virus to her newborn through her breast milk. Vertical transmission is the most common way children become infected worldwide.

Universal testing during pregnancy has become a widely accepted public health policy. Women who test positive for the virus need to be assessed further to determine their need for antiretroviral treatment. To prevent vertical transmission, the most effective treatment involves taking a combination of antiretroviral drugs throughout pregnancy and during labour, followed by a six-week regimen of treatment for the newborn. Without treatment, the risk of vertical transmission is approximately 25%; with treatment, the risk reduces to approximately 8%. Treatment, in combination with caesarean section delivery and avoidance of breastfeeding, has reduced the risk of transmission to about 1% to 2% in high-resource countries. In low-resource countries, where access to antiretroviral medications may be limited, even a single dose of medication during labour can reduce the transmission rate dramatically.

Women who know that they are HIV-positive should plan their pregnancies in consultation with their health care providers. Quality health care combined with antiretroviral therapy will protect their health and prevent vertical transmission.

What is PEP – post-exposure prophylaxis?

Post-exposure prophylaxis (PEP) is a service that includes first aid, counselling to assess the risk of exposure, HIV testing and, depending on the outcome of the exposure assessment, a short course of antiretroviral treatment. It is most commonly offered following accidental exposure due to needle stick injury in the occupational setting. PEP has been extended to non-occupational situations, primarily after sexual assault. PEP may also include measures to prevent infection with other blood-borne infections, such as Hepatitis B and C. PEP should begin as soon as possible, and no later than 72 hours after exposure. PEP antiretroviral treatment requires compliance to the drug treatment regimen. It may have significant unpleasant side effects, including general malaise, fatigue, nausea, vomiting, diarrhea and headaches.

Testing for HIV should take place at 3 months and again at 6 months, post-exposure. PEP is not 100% effective; therefore, prevention measures must be reinforced.

Universal access to Antiretroviral Treatment

According to the World Health Organisation (WHO), approximately 33 million people are living with HIV, with 30 million of these people living in low and middle-resource countries. WHO estimates that 9.7 million of these people require antiretroviral therapy (ART). Despite widespread effort to increase access to ART, as of December 2007 only 3 million people had access to antiretroviral medications in low and middle resource countries.[16] The largest gains in access to treatment have been made in interventions to prevent mother-to-child-transmission and in paediatric ART programs.

Increased funding for antiretroviral medications is critical to universal access to treatment. However, many countries also require assistance to develop and support the healthcare system infrastructure, as well as to train healthcare providers.

[16] WHO. Antiretroviral therapy. Accessed on March 10, 2009 at http://www.who.int/hiv/topics/treatment/en/index.html

Educational Resources

General Information

UNAIDS. (2009). UNAIDS: Fast facts about treatment.
http://data.unaids.org/pub/FactSheet/2008/20080903_fastfacts_treatment_en.pdf

- Offers overview of treatment methods and medications, as well as the concept of first, second, third and fourth-line medications. Excellent plain language resource for educators who wish to explain treatment options to students.

WHO. (2009). Anti-retroviral therapy. http://www.who.int/hiv/topics/treatment/en/index.html

- Offers links to websites and publications with more detailed information about available treatment and their accessibility. A good resource, complete with statistics, for educators interested in presenting HIV/AIDS treatment as a social justice issue.

AVERT. (2009). Preventing mother to child transmission of HIV.
http://www.avert.org/motherchild.htm.

- Site that provides basic information on treatments that reduce the chance of mother to child transmission of HIV during the birth process and the risks of breast-feeding.

K-3

New York City Department of Education. (2005). When we are sick, What can we do to get better? *HIV/AIDS curriculum: A supplement to a comprehensive health curriculum*.
http://schools.nyc.gov/offices/teachlearn/documents/docs/hivaidsdocs/hivaidsbookgr1.pdf

- A lesson that teaches kids about medicines and how it is important that only medicines that are prescribed for them should be taken, and only when they are given by a parent, guardian or doctor. This lesson could be supplemented by a lesson on how medicines help our bodies fight infections.

Grades 9-12

PBS. (1999). HIV and the immune system. *Nova*.
http://www.teachersdomain.org/resource/tdc02.sci.life.gen.hivimmunity/

- This short video would be an excellent addition to a scientific discussion of HIV/AIDS in an advanced class. It explains how HIV bonds to human cells and how some people, because of a genetic mutation, are immune to HIV infection even when they engage in risky behaviours.

HIV Treatment Table

DRUG TYPE	DESCRIPTIONS	DRUG NAMES
Fusion Inhibitors	Fusion inhibitors prevent HIV from fusing with the outer membrane of the host cell	Enfuvirtide (Fuzeon) aka T20
Nonnucleoside – reverse transcriptase inhibitors (NNRTIs)	These drugs bind to and disable the reverse transcriptase enzyme in HIV that allows the virus to convert its RNA into DNA. Without being able to convert its genome into DNA, HIV cannot incorporate itself into the host cell's genome.	Delavirdine (Rescriptor) Efavirenz (Sustiva) Etravirine (Intelence) Nevirapine (Riramune)
Nucleoside – reverse transcriptase inhibitors (NRTIs)	NRTIs are faulty nucleotide analogues that, when incorporated by the conversion of HIV RNA into DNA, interrupt HIV reproduction by disabling DNA's ability to function properly.	Abacavir (Ziagen) Abacavir and Lamivudine (Kivexa) Atripla (Efavirenz, Emtricitabine, Tenofovir) Didanosine EC (Videx EC) Lamivudine (3TC) Stavudine (Zerit) Tenofovir (Viread) Tenofovire and emtricitabine (Truvada) Zidovudine (Retrovir) Zidovudine and Lamivudine (Combivir) Zidovudine and Lamivudine and Abacavir (Trizivir)
Protease Inhibitors	These drugs inhibit an enzyme necessary to cut up proteins produced in HIV replication.	Atazanavir (Reyataz) Atazanavir and Ritonavir (Rayataz and Norvir) Darunavir (Rezista) Fosamprenavir and Ritonavir (Telzir and Norvir) Indinavir and Ritonavir (Crixivan and Norvir) Lopinavir and Ritonavir (Kaletra) Nelfinavir (Viracept) Ritonavir (Norvir) Saquinavir (Invirase) Saquinavir and Ritonavir (Invirase and Norvir) Tipranavir
Integrase Inhibitors	Integrase inhibitors block the integration of HIV's genetic code into that of the host cell.	Raltegravir (Isentress – Merck)

Stigma and Discrimination

Introduction

HIV/AIDS diagnosis and disclosure can come with a high-level of stigma and discrimination. In Canada, infection is often misunderstood and thought to be just a problem for gay men or intravenous drug users. While the majority of infections in Canada are in these communities, that does not mean that the rest of the population should remain passive. In sub-Saharan Africa, for example, the means of transmission is largely through heterosexual sex. Regardless of a person's cause of infection, students need to learn that HIV/AIDS-infected people should not be targeted for stigma or discrimination.

The fear of the infected individual stems from the non-infected individual being afraid of infection. Oftentimes, a proper understanding of the ways that HIV can and cannot be transmitted will help to reduce stigma and discrimination. As a result, students need to have a solid understanding of the means of transmission of HIV and be assured that casual contact with someone who is infected cannot cause infection.

Educational Resources

General Information

PHAC. (2010). Questions and Answers: Gender Identity in Schools.
http://library.catie.ca/pdf/ATI-20000s/26289E.pdf

- This manual provides information for educators on how to address gender identity—more commonly known as trans identity. Using a question and answer format, it includes sections on proper terminology and the meaning of sexual identity, what to do if a student discloses a gender variant and how to create safe space for that student. The guide does not provide lesson plans, but the information could be adapted for any age group.

PHAC. (2010). Question and Answers: Sexual Orientation in Schools.
http://library.catie.ca/pdf/ATI-20000s/26288E.pdf

- This manual provides information for educators on how to address sexual orientation and sexual diversity in schools. Using a question and answer format, it includes sections on proper terminology, what to do if a student discloses a minority sexual orientation and the health and safety concerns for queer students. This guide does not provide lesson plans, but the information could be adapted for use in the classroom.

SIECCAN. (2010). Sexual Health Education in the Schools: Questions and Answers.
http://library.catie.ca/pdf/ATI-20000s/26276.pdf

- This manual delves into the hard questions around teaching sexual health in Canadian schools. It is not a pedagogical tool, but instead provides background for educators on why it is important to offer sexual health education in schools. Sections on models for delivering

sexual health education provide examples of how teachers might create sexual health lesson plans and highlight the importance of including lessons on issues of consent and sexual identity for older students.

PHAC. (2008). Canadian Guidelines for Sexual Health Education. http://library.catie.ca/PDF/ATI-20000s/26020.pdf

- These guidelines provide an outline of the objectives of sexual health education and provide insight for those designing sexual health curricula. While this guide does not provide teaching points or lesson plans, it is useful for educators attempting to design their own sexual health curricula for their classrooms.

AVERT. (2009). HIV & AIDS stigma and discrimination. http://www.avert.org/aidsstigma.htm

- This site provides a list of reasons HIV+ individuals suffer discrimination and the types of discrimination individuals might face. This resource could be included in a personal reflection assignment on stigma where students would be asked to discuss how they might feel if they were HIV+. Includes videos on the difference between safety and stigma that are most appropriate for Grades 9-12.

Centers for Disease Control and Prevention. (1999). HIV and its transmission. http://www.cdc.gov/hiv/resources/factsheets#Transmission

- This plain language discussion of how HIV can and cannot be transmitted is a good resource for educators, as it dismisses the myths that HIV/AIDS can be contracted through casual contact. This will provide a sound basis for a discussion of stigma for those who fear HIV+ people because they might be contagious.

K-3

New York City Department of Education. Lesson guide Grade 2. HIV/AIDS curriculum http://schools.nyc.gov/offices/teachlearn/documents/docs/hivaidsdocs/hivaidsbookgr2.pdf

- An activity based on the poem "Later Will I be Well?" that illustrates a child living with HIV. Provides possible questions that educators could ask and possible answers students may have to the questions. Provides a homework activity to reinforce the lesson on how children with HIV are like other children.

Stearn-Larosa, C. M. (2001). *Talking to your child about hatred and prejudice.* Anti-Defamation League. http://www.adl.org/issue_education/hateprejudice/prejudice7.asp

- An activity for young children about diversity in general, using lemons as a metaphor for human beings. A good introduction to combating discrimination in general, on which later Grades can expand to include discrimination against HIV-infected individuals.

Grades 4-5

Canadian HIV/AIDS Information Centre. *Learning about HIV: An active learning program for children in Grades 3-5.* http://library.catie.ca/PDF/P4/21159.pdf

- Consists of a child-centred activity booklet called *Learning About HIV* and supporting guide for teachers. Includes T/F quiz and crossword puzzle based around a story about a young girl doing a research report on HIV. Covers basic information, transmission and stigma. Available in French.

AVERT. (2009). Personal stories of young people living with HIV. http://www.avert.org/hiv-stories.htm

- This site publishes unedited stories from children and youth around the world who are living with HIV. These stories are written by children for children and could be used in a lesson on difference and discrimination. The stories are touching and cover subjects such as how these youth found out they were infected, how they were infected, how normal they feel despite their illness and what it's like for them to live with HIV. This would be a good resource for educators trying to encourage students to empathize with children who don't necessarily share similar backgrounds.

Grades 6-8

PKIDs. (2004). Stigma and infectious diseases: Instructional activities for adults. http://www.pkids.org/pdf/idw/adult4.pdf

- This workshop manual contains a copy of Ryan White's story (pp.20-23), a young boy infected with HIV through a blood transfusion in the 1980s. Ryan was 13 at the time of his infection and faced so much stigma from his community that he and his family were forced to move. This story and the discussion questions that follow could be adapted to teach 12-14 year olds about how stigma might feel if they were Ryan White.

Grades 9-12

AVERT. (2009) *Ten differences.* http://www.avert.org/lesson3.htm

- Lesson plan for a group activity about HIV prejudice, stereotyping and stigmatization. This lesson asks students to build a fictional character and then answer ten questions about how life would be different for this character if he or she were HIV+. Provides potential questions and student reactions.

Kidd, R, & Clay, S. (2003). *Understanding and changing HIV stigma: Toolkit for action.* CHANGE Project. http://www.globalhealthcommunication.org/tools/20

- This toolkit was developed for adults and children dealing with stigma and HIV/AIDS in Africa. It is, nevertheless, informative for students in Canada. On p. 144, there is an exercise that provides students with the tools necessary to combat stigma and discrimination when they see it in their communities. This exercise would be good for educators teaching HIV/AIDS as a social justice as well as a health issue.

While these are the latest facts available as of December 2009, educators are encouraged to consult the Public Health Agency of Canada website at http://www.phac-aspc.gc.ca/aids-sida/publication/index-eng.php#surveillance for updates.

HIV/AIDS in Canada: Fast Facts

The Epidemic to 2009

- The first case of AIDS was officially identified in 1982.
- Formal testing for HIV wasn't introduced until 1985.
- The total number of AIDS (not including HIV) diagnoses Canada-wide since 1979 is recorded as 21,300 – however, some provinces only started keeping records relatively recently.
- Newly reported cases of AIDS have been steadily decreasing since 1993. Prior to that, the number of cases increased steadily. This is as a result of better treatments which slow the progression of HIV to AIDS.
- The estimated total number of people diagnosed with HIV since 1979 is approximately 67,442.
- Females have climbed to represent 27.8% of the infected population (HIV and AIDS) in 2006 – while from 1979 to 1994 they had only represented 7.7% of the infected population.
- Based on population modeling done in 1999, it is estimated that between 9,400 and 13,300 of people living with HIV/AIDS are co-infected with Hepatitis C.
- From 1983 to 2008, 16,024 deaths have been recorded that have been linked to HIV and 13,458 that have been linked directly to AIDS.

As of 2008

- In 2008, 2,623 people were newly diagnosed with HIV across Canada.
- In 2008, the gender breakdown of all known AIDS cases in Canada was as follows:
    - 90.2% were male (18,947).
    - 9.8% were female (2,043).
- For new cases among males who tested positive for HIV in 2008:
    - 30.5% were attributed to MSM (men who have sex with men).
    - 10.3% were attributed to heterosexual contact
    - 8.2% were attributed to IV drug use.

- For new cases among females who tested positive for HIV in 2008:
    - 27.3% were attributed to heterosexual contact.
    - 14.8% were attributed to IV drug use.
- Approximately 75.6% of all new AIDS diagnoses in 2008 were among males and 24.4% were among females.
- In 2008, the age breakdown for new HIV diagnoses was as follows:
    - Under 15 years of age – 18
    - 15 – 19 years of age – 42
    - 20 – 29 years – 373
    - Between the ages of 30 and 49 – 1,155
    - Over the age of 49 – 337
- In 2008, the ethnic breakdown for new HIV diagnoses was as follows:
    - White: 66.1%
    - Aboriginal: 13.9%
    - Black: 12.2%
    - Other ethnicities: 7.8%
- The rate in Saskatchewan has risen dramatically between 2003 and 2008 with 40 reported positive test results in the province in 2003 and 174 in 2008.
- It is thought that almost 27% of those 65,000 infected are unaware of their diagnosis.
- Although rates of HIV diagnoses have remained stable since 1999, overall new AIDS diagnoses have declined across Canada, as more people have been able to obtain access to contemporary anti-retroviral treatments, which slows the progression of HIV to AIDS.

The Epidemic in Canada and its Affect on Children

- From 1984 to 2008, 2,851 children were exposed to HIV via perinatal transmission.
- Of these, 977 were born to mothers taking prophylactic treatments and 1,603 to mothers who were not.
- 541 children (under 15 years of age) are estimated to be living with HIV infections. (This is the number of children who have tested positive for HIV since 1985.)
- 96 HIV-related and 113 AIDS deaths have been recorded for those under the age of 15 from 1983 to 2008.

HIV/AIDS BY PROVINCE AND TERRITORY

NORTHWEST TERRITORIES, NUNAVUT AND YUKON

- The estimated total number of people who have been diagnosed with AIDS in the Northwest Territories, Yukon and Nunavut since 1979 is 27.
  - These territories rank 10th, 11th and 12th respectively in the total number of AIDS cases by province or territory.
- This number represents 0.002% of the total population of the Territories.
- In this region, from 1985 to 2008 there were 98 HIV diagnoses.

BRITISH COLUMBIA

- The estimated total number of people who have been diagnosed with AIDS in B.C. since 1979 is 4,282.
  - This is the third highest number of AIDS cases in any province.
- This number represents 0..09% of the total population of British Columbia.
- In British Columbia, from 1985 to 2008 there were 13,365 HIV diagnoses.
- About 46.9% of all HIV cases diagnosed in 2008 were attributed to MSM.
  - 18.7% were attributed to heterosexual contact.
  - 13.4% were attributed to IV drug use.

ALBERTA

- The estimated total number of people who have been diagnosed with AIDS in Alberta since 1979 is 1,410.
  - Alberta ranks 4th in the total number of AIDS cases by province.
- This number represents 0.04% of the total population of Alberta.
- In Alberta, from 1985 to 2008 there were 4,989 HIV diagnoses.
- About 31.4% of all cases of HIV diagnosed in 2008 were attributed to MSM.
  - 51.9% were attributed to heterosexual contact.
  - 13.8% were attribute to IV drug use.

SASKATCHEWAN

- The estimated total number of people who have been diagnosed with AIDS in Saskatchewan since 1979 is 253.
  - Saskatchewan ranks 7th in the total number of AIDS cases by province.
- This number represents 0.02% of the total population of Saskatchewan.
- In Saskatchewan, from 1985 to 2008 there were 997 HIV diagnoses.
- Of all cases of HIV diagnosed in 2008
  - About 2.4% were attributed to heterosexual contact.
  - 72.8% were attributed to IV drug use.

MANITOBA

- The estimated total number of people who have been diagnosed with AIDS in Manitoba since 1979 is 273.
  - Manitoba ranks 6th in the total number of AIDS cases by province.
- This number represents 0.02% of the total population of Manitoba.
- In Manitoba from 1985 to 2008 there were 1,561 HIV diagnoses.
- About 14.8% of all HIV cases diagnosed in 2008 were attributed to MSM.
  - 42.0% identified as heterosexual.
  - 6.8% identified as IV drug users.

ONTARIO

- The estimated total number of people who have been diagnosed with AIDS in Ontario since 1979 is 8,348.
  - This is the highest number of AIDS cases in any province.
- This number represents 0.06% of the total population of Ontario.
- In Ontario, from 1985 to 2008 there were 28,785 HIV diagnoses.
- About 27.6% of new HIV cases diagnosed in 2008 were attributed to MSM.
  - 13.0% were attributed to heterosexual contact.
  - 4.4% were attributed to IV drug use.

QUEBEC

- The estimated total number of people who have been diagnosed with AIDS in Quebec since 1979 is 6,098. (Records have only been kept since 2003.)
  - Quebec ranks 2nd in the total number of AIDS cases by province.
- This number represents 0.08% of the total population of Quebec.
- In Quebec, from 2003 to 2008 there were a 15,261 new HIV diagnoses;
  - It is important to note that in Quebec, the actual number of reports are an underestimate, since they only report those that they are certain are not duplicate reports
  - Exposure category information is not collected in Quebec.

NEWFOUNDLAND AND LABRADOR

- The estimated total number of people who have been diagnosed with AIDS in Newfoundland and Labrador since 1979 is 91.
  - Newfoundland and Labrador rank 9th in the total number of AIDS cases by province.
- This number represents 0.02% of the total population of Newfoundland and Labrador.
- In Newfoundland and Labrador, from 1985 to 2008 there were 250 HIV diagnoses.
- New HIV diagnoses are not required to identify the possible source of infection in the province.

NEW BRUNSWICK

- The estimated total number of people who have been diagnosed with AIDS in New Brunswick since 1979 is 174.
  - New Brunswick ranks 8th in the total number of cases per province.
- This number represents 0.02% of the total population of New Brunswick.
- In New Brunswick from 1985 to 2008 there were 380 HIV diagnoses.
- About 75% of all HIV cases diagnosed in 2008 were attributed to MSM.
  - 25% were attributed to heterosexual contact.
  - none were attributed to IV drug use.

NOVA SCOTIA AND P.E.I.

- The estimated total number of people who have been diagnosed with AIDS in Nova Scotia and P.E.I. since 1979 is 344.
  - These two provinces rank 5th in overall number of AIDS cases provincially.
- This number represents 0.03% of the total population of Nova Scotia and P.E.I.
- In these two provinces, from 1985 to 2008 there were 756 HIV diagnoses.
- About 36.3% of all new cases of HIV diagnosed in 2008 were attributed to MSM.
  - 54.5% were attributed to heterosexual contact.
  - 9.1% were attributed to IV drug use.

Sources Cited

Health Canada. Public Health Agency of Canada. Centre for Infectious Disease Prevention and Control. Surveillance and Risk Assessment Division. (2009). HIV and AIDS in Canada: Surveillance report to December 31, 2008. http://www.phac-aspc.gc.ca/aids-sida/publication/survreport/2008/dec/pdf/survrepdec08.pdf

Population numbers from Statistics Canada: http://www.statcan.gc.ca/daily-quotidien/100325/t100325a2-eng.htm

HIV/AIDS IN SUB-SAHARAN AFRICA

- The first case of AIDS is suspected to have occurred in humans in the 1930s via transmission from primate populations in Cameroon.
- The first epidemic is thought to have occurred in Kinshasa, Zaire, in the 1970s.
    - This was evidenced by a sudden increase in the incidence of opportunistic infections such as cytococcal meningitis, Kaposi's sarcoma, tuberculosis and pneumonia.
    - The spread of HIV and AIDS to the rest of sub-Saharan Africa started in the 1980s.
    - Formal testing was not available until 1985.
- By the mid-1980s, Guinea Bissau had the world's highest level of HIV-2.
    - 26% of blood donors, 9% of pregnant women and 37% of sex workers had tested positive.
- By 1998, sub-Saharan Africa was home to more than 70% of new HIV infections.
- In 2008, it is estimated that 1.4 million people died as a direct result of AIDS in sub-Saharan Africa.
- The estimated total number of persons living with HIV (PLWHIV/AIDS) is approximately 22.4 million.
- In 2008, 1.9 million people were diagnosed with HIV across this region, although overall infection rates have been declining since around 2000.
- Sub-Saharan Africa accounts for 67% of the total number of people diagnosed with HIV or AIDS globally.
- Women account for 60% of estimated HIV infections in sub-Saharan Africa
- Only 2.5% of all new infections are attributed to IV drug use. The majority of cases are linked to unsafe sexual practices
- It has been estimated that approximately 50% of PLWHIV/AIDS are co-infected with Hepatitis C.
    - Based on population modeling, approximately 10–11.5 million people in sub-Saharan Africa living with HIV are co-infected with Hepatitis C.
- Approximately 90% of all persons exposed to HIV perinatally in this region become infected due to the fact that prophylactic treatment is virtually inaccessible to pregnant and birthing women.
- In 2008, there were approximately 1.8 million children living with HIV or AIDS.
- In 2008, more than 14.1 million children were orphaned as a result of both parents dying of AIDS or AIDS-related infections.
- In 2008, approximately 390 000 children were infected with HIV in Sub-Saharan Africa

Sources Cited

UNAIDS/WHO. (2009, December). 2009 AIDS Epidemic Update. http://data.unaids.org/pub/Report/2009/JC1700_Epi_Update_2009_en.pdf

AVERT. (March 2007). Women, HIV and AIDS. http://www.avert.org/women.htm Date last modified: February 20, 2009.

U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. (2005). HIV/AIDS Surveillance Report, Volume 17, Revised Edition, June 2007. http://www.cdc.gov/hiv/topics/surveillance/resources/reports/2005report/default.htm

Educational Resources:

General Information

Barton-Knott, S. (2009, 16 Mar.) Fact sheet 11 - 07: Key facts by region – 2007 AIDS epidemic update. Joint United Nations Program on HIV/AIDS.
http://data.unaids.org/pub/EPISlides/2007/071118_epi_regional%20factsheet_en.pdf
http://data.unaids.org/pub/EPISlides/2007/2007_regional_fact_sheet_fr.pdf

- Fact sheet about the global pandemic produced by UNAIDS. This document could be used by educators to develop an understanding in their students of the scale of the pandemic around the world. A research activity on a single region/country could be developed using the basic information provided in these documents. Available in French.

Grades 6-8

AVERT. (2009). HIV and AIDS in Africa. http://www.avert.org/aids-hiv-africa.htm

- This website provides country reports for the hardest hit countries in Africa. The reports are comprehensive, including a history of the pandemic in that country, incidence rates and information on prevention and access to care. The language is accessible to students at this level and could be used as examples for students to create their own oral or written reports on the epidemic in different countries. This site also includes reports on Asia, the Americas and Europe for students to learn about the pandemic elsewhere.

UNAIDS. (2003). *HIV/AIDS and young people: Hope for tomorrow*. ISBN 92-9173-310-5 32 pp.
http://data.unaids.org/publications/IRC-pub06/jc785-youngpeople_en.pdf

- A more detailed report written by and for youth addressing the impact of HIV and AIDS on children and youth. The report highlights several challenges facing youth living with HIV/AIDS, including conflict and access to education and adequate health. While the report is too advanced for direct use in the classroom at this level, it could be used as a starting point for an activity based on creating empathetic relationships between Canadian students and youth around the world.

Grade 9-12

PBS. (2006). The age of AIDS. *Frontline.*
http://www.pbs.org/wgbh/pages/frontline/aids/view/?utm_campaign=searchpage&utm_medium=videosearch&utm_source=videosearch

- A 240 minute documentary conveniently divided in 10 minute parts by topic. The documentary covers all aspects of HIV/AIDS, but offers an excellent visual record of the African experience of the pandemic, from its early stages in Kinshasa, Zaire, in the 1980s to present day. The documentary could be used in lessons at this level on the history of the pandemic, US policy and HIV/AIDS, transmission and the science being used to find a treatment and a vaccine.

AVERT. (2009). AIDS, drug prices and generic drugs. http://www.avert.org/generic.htm

- In-depth discussion of the price of AIDS drugs and their generic equivalents. Would be a useful article for educators wishing to treat HIV/AIDS as a social justice issue. Students could be tasked with developing a public awareness campaign to lobby the Canadian government and the UN to support the mass production of generic drugs for use in countries that cannot currently afford branded drugs.

Journeyman Pictures. (2001). *The Cost of living – Thailand.*
http://www.youtube.com/watch?v=P6_GQK8i4Y4

- This short film (24 minutes) outlines Thailand's and South Africa's attempts to get generic and affordable anti-retroviral treatment for HIV/AIDS. This film could be combined with a social justice campaign project that would encourage students to develop posters and public awareness material to lobby the World Health Organization and the world's governments to include anti-retroviral therapy on essential drugs lists. To consult WHO's essential drugs list, please visit:
  http://www.who.int/selection_medicines/committees/expert/17/sixteenth_adult_list_en.pdf

APPENDIX 1.1

HIV/AIDS: The Enormity of the Epidemic

A Lesson Plan

Introduction

This lesson is designed to help students understand the enormity of the impact of AIDS on the population of sub-Saharan Africa by comparing its effects there with its effects on the population of the world in general, and especially on that of Canada. After locating Africa on a world map and individual sub-Saharan nations on a map of Africa, students will examine charts and graphs to find and compare data about HIV/AIDS in Africa, in the world and in Canada.

Grade Level: 6–8

Time Allotted: Two class sessions

Learning Objectives

Students will:

1. Develop an understanding of the enormity of the impact of HIV/AIDS in sub-Saharan Africa, the world and Canada;
2. Reinforce Internet research skills;
3. Locate information in graphs and tables; and
4. Make quantifiable distinctions between the impact of HIV/AIDS on the populations of sub-Saharan Africa and Canada.

Materials

Internet access or copies of data from all websites listed in this lesson plan

- UN AIDS. (2007, December). *Global report of the AIDS epidemic*. (Slide show). http://data.unaids.org/pub/GlobalReport/2008/20080715_globalreport_coreslides_en.ppt#284 (Slide 1)
- UN AIDS. (2007). *A global view of HIV infection*. (Wall map). http://data.unaids.org/pub/GlobalReport/2008/GR08_2007_HIVPrevWallMap_GR08_en.jpg

Handouts

- World Map – http://www.nationalgeographic.com/resources/ngo/education/xpeditions/atlas/
- Africa http://www.nationalgeographic.com/resources/ngo/education/xpeditions/atlas/index.html?Parent=africa&Mode=d&SubMode=w
- Canada http://www.nationalgeographic.com/resources/ngo/education/xpeditions/atlas/index.html?Parent=canada&Rootmap=&Mode=d&SubMode=w

Procedures

Class 1.

Note: This activity may be done as a large group activity, or students may be divided into small groups to complete the statistical research and report their findings back to the class.

1) Show the UN AIDS: *Global Report of the AIDS Epidemic*, December 2007, slide set.

2) Display the UN AIDS: *A Global View of HIV Infection*, 2007, wall map.

3) Give each student a copy of a blank outline map of the world, Africa and Canada, or provide access to large scale maps in the classroom. Have students locate Africa, sub-Saharan Africa and Canada.

4) Ask students to answer the following questions using the statistical resources from the UN AIDS website: http://www.unaids.org/en/KnowledgeCentre/HIVData/Epidemiology/epifactsheets.asp

    - How many people are living with HIV/AIDS in sub-Saharan Africa today? How many in the rest of the world? How many in Canada?
    - How many children under the age of 15 are living with HIV/AIDS in sub-Saharan Africa? How many children under 15 are living with HIV/AIDS worldwide? How many children under 15 are living with HIV/AIDS in Canada?
    - What percentage of people living with HIV/AIDS are under 15?
    - What percentage of all the children under 15 who have HIV/AIDS live in Africa?
    - What percentage of children under 15 who have HIV/AIDS live in Canada?

Homework

Ask students to choose any country and write a brief report containing the following information:

- Total population;
- Total number of people living with HIV/AIDS;
- Total number children under 15 living with HIV/AIDS; and
- Percentage of children living with HIV/AIDS in their chosen country compared to the whole of sub-Saharan Africa, the world and Canada.

Class 2.

1. Instruct students to consider the implications of the data they collected while they share it with their classmates. (For example: If the country they chose was their classroom, what would it look like and how many students would be affected? What if the country they chose was their school? How many students would be affected?)
2. Ask students to turn to a student sitting beside them and share their country report. (Pairs)
3. Ask each pair of students to turn to another pair of students and share their country reports. (Squares)
4. Ask students to re-convene and share any significant findings or insights with the class. (Share)

Assessment or Evaluation Suggestions

Use the following three-point rubric to evaluate how well students participated in the large group discussion, homework assignment and small group work components of this lesson.

Three points: Participated actively, with maturity and insight; demonstrated strong research skills; demonstrated a good understanding of the lesson concepts; demonstrated above-average communication skills. Written assignment – complete and accurate.

Two points: Participated with some maturity and insight; demonstrated grade-level appropriate research skills; showed average understanding of the lesson concepts; demonstrated average communication skills. Written assignment – incomplete and/or inaccurate.

One point: Participated minimally; demonstrated weak research skills; had difficulty discussing topics with maturity and insight; showed below-average understanding of lesson concepts; demonstrated poor communication skills or unable to assess (did not participate). Written assignment – did not complete.

Possible Extension Activities

1) Ask students to write a short paragraph reflecting on the global impact of HIV/AIDS.
2) View *A Generation of Orphans*, a half-hour documentary which gives voice to six orphans in sub-Saharan Africa. The DVD highlights their hardship, hope and courage as they struggle with the loss of their parents to AIDS. Available from the Stephen Lewis Foundation at http://216.95.229.16/films.htm for loan or purchase.
3) Invite a guest speaker to the next class who is able to address children and youth-related treatment issues in Canada and in sub-Saharan Africa. Depending on available community resources, this may be an HIV/AIDS health care provider, someone from an NGO active in the region or someone from a local ASO.

APPENDIX 1.2

Using "A Student's Guide to Testing" in the classroom

A Lesson Plan

Introduction

Although "A Student's Guide to Testing" was designed as an information sheet for individual students to use to guide them through the decision-making process and the process of getting tested for HIV antibodies, it may also be used in the classroom. In this two-part lesson, students will locate HIV and AIDS services in their communities.

Grade Level: 9–12

Time Allotted: Two in-class sessions

Learning Objectives

Students will be able to:

1. Define vocabulary related to the testing process.
2. Identify risk factors for HIV infection.
3. List reasons why someone would choose to get tested.
4. Describe the different kinds of HIV tests available.
5. Briefly describe testing options available in their communities.
6. Identify locations where testing for HIV takes place in their communities.
7. Identify where a youth who is HIV-positive could receive care and support in his or her community.

Materials

1. One copy of "A Student's Guide to Testing" for each student is included as part of this resource manual. Other guides are available online, including a comprehensive guide at http://www.aids.org/info/testing.html. (Educators are encouraged study a guide that is most appropriate for their needs and their classrooms.)
2. Computers with access to the web and/or access to a health or student resource room.
3. Two student volunteers, one female and one male, who will play the role of best friends who have decided to get tested.

Procedures

First Class Session

General Instructions to the Class:

a. During the next class, you are going to do a role-play. The class as a whole will role-play being counsellors at a health clinic. You will counsel two student volunteers through the HIV testing process.

b. You will use the handout "A Student's Guide to Testing" as a guide to preparing for the role-play.

c. You will gather the information needed to counsel the two students through each step of the testing process.

Divide students into six groups.

Assign each group one of the six sections of "A Student's Guide to Testing."

1. Who Might Want to Get Tested?
2. Why Should I Get Tested?
3. How Does Testing Work?
4. What Testing Options Are Available?
5. Where Can I Go to Get Tested?
6. Getting My Test Results

Give your students these instructions:

1. Choose a recorder for your group – someone who will write down all of your ideas and information.
2. Choose a presenter for your group – this person will present the information the group has gathered at the next class.
3. Even though there will be one presenter, all of the students are responsible for knowing the information gathered under their topics and will be asked to participate in the class discussion.
4. Choose a time-keeper for your group – this person will help keep track of the time allotted for the rest of the class activities.
5. The class will be organized into three sections:

    a. Brainstorm about the topic assigned to the group – 10 minutes
    (What do they know about the topic? What questions do they have? Where can they get answers to these questions?)

b. Research – 20 to 30 minutes
   Students may use print-based or web-based resources.

c. Preparation Time – 10 minutes
   Prepare presentations for the next class.

Remain available as a resource person to your students throughout the class.

Provide these instructions to the two student volunteers:

- You are best friends.
- You have decided that you want to get tested for HIV, but really don't know a lot about the testing process.
- You both have had sex.
- Cami, you have had the same partner for the last six months, since school started.
- Steve, you have had three partners since you started having sex. You think that one of your previous partners uses drugs.
- Think about questions you might have if you were going to get tested.

Second Class Session

Large Group Role-play

General Instructions to the Class:

During this class, we will perform a role-play based on the information you gathered in our previous class session. You will "counsel" or "advise" our two student volunteers through the HIV testing process.

1. Assign students to the same groups they were in during the previous class. (If the presenter is not available, students will need to choose an alternate.)
2. Ask the two volunteers to introduce their characters to the class. Remember to call the volunteers by the names of the roles they have taken on for the purpose of this role-play.
3. Guide the class through the steps of the testing process as described in "A Student's Guide to Testing."
    - Ask the presenter of each group to share the information the group prepared in response to questions by "Cami" and "Steve."
    - When the presenter has finished, check in with "Cami" and "Steve." Were all of their questions or concerns answered?
    - Ask the members of the class if there is anything they would like to add to the discussion.

Allow approximately 30 minutes for the role-play, plus an additional 10 to 15 minutes for discussion.

Following the role play, ask your students:

- Are there any questions you have about the HIV testing process that have not been answered?
- Ask "Cami" and "Steve" if they have any further questions.
- Remind students that they can use the "question box"[1] to leave anonymous questions.

Assessment or Evaluation Suggestions

1. Ask students to write a short journal entry reflecting on how they might support a friend who received a positive HIV test result.
2. In class, after completing the "Second Class Session" in this document, give your students a "pop quiz." Have them exchange their quizzes and mark them. Collect them, if you need them for grading purposes.

   Suggestions:

   - What does the HIV test look for? (antibodies)
   - Identify two reasons why you might want to get tested (sexual intercourse, intravenous drug use or pregnancy).
   - Name two testing options (anonymous, nominal or non-nominal).

3. Use the following three-point rubric to evaluate how well students participated in small group activities in the first class session, and again in the second class session role-play:

   Three points: Participated actively in small group session with maturity and insight; demonstrated strong research skills; demonstrated a good understanding of the lesson concepts; demonstrated above-average communication skills.

   Two points: Participated in small group session with some maturity and insight; demonstrated grade-level appropriate research skills; showed average understanding of the lesson concepts; demonstrated average communication skills.

   One point: Participated little in small group lesson; demonstrated weak research skills; had difficulty discussing topics with maturity and insight; showed below-average understanding of lesson concepts; demonstrated poor communication skills; unable to assess (did not participate).

[1] A question box is an ideal place for students to submit questions, personal concerns or comments throughout the year. Periodically, the teacher can use these submissions in a Q & A format group discussion or use them as a basis for future lesson planning.

Possible Extension Activities

1. Following this two-part lesson, an HIV-positive guest speaker could be invited to speak about his or her experience with the testing process and how he or she felt after receiving the test results.
2. Older high school students could adapt this role-play to teach younger students about the testing process.
3. Students could explore the legal rights of youth to seek health care and consent to treatment.

APPENDIX 2

WEBSITES

ORGANISATION	URL	CONTENT	NOTES
AIDS Vaccine Advocacy Coalition	www.avac.org	Provides accurate information about the latest developments of an AIDS vaccine, the latest research on biomedical prevention of HIV and advocacy issues related to the development of a vaccine.	Uses advanced scientific language in its explanations of the latest vaccine developments.
American Social Health Association	www.ashastd.org	Provides fact sheets and information on STIS and HIV.	
AVERT	www.avert.org	Resources include plain-language articles on prevention, treatment, testing, HIV and children, stigma, and the global pandemic. Provides games, activities and lessons for teaching HIV/AIDS awareness.	
Canadian Aboriginal AIDS Network	www.caan.ca	Provides links to resources focusing on Aboriginal issues and HIV, as well as links to other organizations. Fact sheets on HIV/AIDS and youth, women and aboriginals.	Bilingual
Canadian AIDS Society	www.cdnaids.ca	Provides access to resources and guides on issues to do with HIV/AIDS. Provides information on the AIDS Walk for Life.	Bilingual
Canadian AIDS Treatment Information Exchange	www.catie.ca	Online library of nationally-relevant resources on prevention, transmission, treatment and testing. Resources for youth and those living with HIV/AIDS. Option to order hard copies of resources.	National knowledge exchange broker for comprehensive HIV/AIDS information. Bilingual
Canadian Federation for Sexual Health	www.cfsh.ca	Resources and lesson plans for sexual health educators, including lessons on contraception, STIS and healthy relationships.	Part of the International Planned Parenthood Federation. Bilingual
Canadian Harm Reduction Network	www.canadianharmreduction.com	Provides links and articles on harm reduction for organizations committed to reducing effects of drugs and drug use on those who use drugs.	
Canadian HIV/AIDS Legal Network	www.aidslaw.ca	Provides information on the human rights and legal issues relating to HIV/AIDS. Easy to navigate list of publications and topics.	Bilingual

HIV/AIDS BY PROVINCE AND TERRITORY

ORGANISATION	URL	CONTENT	NOTES
Canadian Public Health Agency	www.phac-aspc.gc.ca	Provides information on communicable diseases and other illnesses that affect Canadians. Provides the latest statistical information on the HIV/AIDS epidemic in Canada.	CPHA is the official governmental organisation responsible for public health issues in Canada. Bilingual
Centers for Disease Control and Prevention	www.cdcnpin.org	Provides the latest statistical information about communicable diseases, including HIV/AIDS, in the USA. Provides links to education materials and fact sheets.	One of the leading organizations for monitoring diseases and illnesses in the world.
Insite	supervisedinjection.vch.ca	Provides information on Canada's first safe injection site.	
Ontario Harm Reduction Distribution Program	www.ohrdp.org	Provides FAQs on needle exchange programs and on harm reduction strategies. Lists needle exchange programs available in Ontario.	
UNAIDS	www.unaids.org	Provides information and reports on the global pandemic. Resources include policy reports, regional reports and fact sheets.	World body responsible for addressing the HIV/AIDS pandemic. Bilingual
YouthCo	www.youthco.org	Provides information about HIV/AIDS and harm reduction by youth for youth. Includes information on HIV and HEP C prevention, testing and transmission. Resources available for order.	Based in Vancouver, YouthCo provides workshops and a speakers bureau.


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