

# Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome: A Course for the Laboratorian ~ Biennium 2008-2010

This course meets the HIV/AIDS continuing education requirement for healthcare providers in the state of Florida.

## Objectives:

- Define the meaning HIV/AIDS.
  - Describe modes of transmission and current tests for HIV.
  - Explain the Infection Control Procedures.
  - Explain the clinical management of HIV/AIDS.
  - Name commonly used tests for HIV/AIDS.
  - Describe the various preventions of HIV.
  - Discuss the Florida Laws regarding HIV/AIDS.
  - Define Punishable Unlawful Acts.
- 

On July 1<sup>st</sup>, 1991, the Florida Legislature under F.S. 381.0034 mandated that the Department of Health require from each person licensed or certified as a Clinical Laboratory Personnel and other disciplines in healthcare a course on the modes of transmission, infection control procedures, clinical management, and prevention of human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS). As part of the requirement, all courses in the instruction of HIV/AIDS shall include information of the current laws governing AIDS in the State of Florida, the impact in testing, confidentiality of the test results and treatment of patients.

## What is the Human Immunodeficiency Virus (HIV)?

The human immunodeficiency virus (HIV) was discovered in 1985. It was confirmed that HIV (human immunodeficiency virus) was the causative agent for AIDS (acquired immunodeficiency syndrome). The concepts behind the infection with HIV was that once the virus entered the body it will damage the cells of the body's immune system and eventually inhibit the body from fighting any infections or various types of cancer. According to Lab Tests Online (2009), more than 980,000 cases of AIDS were diagnosed in the United States between 1981 and 2006. The CDC (Center for Disease Control & Prevention) estimates that more than one million people in America may be infected with HIV and that as many as 250,000 of these may not know that they are infected and can pass on the virus to others (Lab Tests Online, 2009, p1).

## What is the Acquired Immunodeficiency Syndrome (AIDS)?

AIDS is referred to the advancement of the HIV infection. This infection normally happens when the CD4 count falls below the 200/mL and there is appearance of an opportunistic infection. These opportunistic infections that will take advantage of the weak immune system of an infected patient include:

- Pneumocystis carinii pneumonia
- Toxoplasmosis
- Tuberculosis
- Extreme weight loss and wasting; exacerbated by diarrhea which can be experienced in up to 90% of HIV patients worldwide
- Meningitis and other brain infections
- Fungal infections
- Syphilis
- Malignancies such as lymphoma, cervical cancer, and

- Kaposi's Sarcoma

There are two human retroviruses that have been associated with AIDS, the HIV-1 and the HIV-2.

•  
**"HIV-1" Human Immune Deficiency Virus Type 1** – is the most common virus strain transmitted in the United States rooted in Central Africa.

**"HIV-2" Human Immune Deficiency Virus Type 2: Endemic in Western Africa** – first isolated strain from patients with AIDS in West Africa. Since 1982 a small number of cases with this strain of HIV have been reported in the United States. The cases observed with this strain of HIV have been traced to heterosexual transmission. At the present time there is not yet a cure or vaccine that will prevent HIV infection or AIDS. However, there are various medications that are used to slow down the process of the infection and help to reduce the seriousness of HIV consequences in many people.

Through the years we have learned that Acquired Immune Deficiency Syndrome (AIDS) is a disease and not a syndrome (Stop Aids Project, 2009). However, AIDS is still the name that most people use to refer to the immune deficiency caused by the human immunodeficiency virus (HIV). According to Stop Aids Project they have defined the acronyms of AIDS as: Acquired — because it is a condition that has to be contracted. It cannot be inherited or transmitted through the genes.

- Immune — because it affects the body's immune system, the part of the body that fights off diseases.
- Deficiency — because it makes the immune system stop working properly.
- Syndrome — because people with AIDS experience a number of different symptoms and opportunistic diseases.

## **Modes of Transmission:**

### **A. Infection of HIV**

Our body contains many types of cells that helps fight the various infections that we are exposed to. Within the types of cells that we have, there is a type of specialized cells known as the CD4+ T-lymphocytes. When HIV initiates its attack to the body, it goes after these specialized CD4 cells. They attack these cells and utilize them to make more copies of HIV; therefore weakening the immune system and making the body unable to protect itself from and infections or illnesses'. The HIV transmission will require HIV-infected cells to enter the body through "microabrasions of the mucous membranes or through penetration of the skin with a needle" (Stop Aids Project, 2009).

### **B. Transmission**

- The human immunodeficiency virus (HIV) can be found in several fluids and secretions of the body. The infection occurs via the sexual contact with an infected person, sharing needles and/or syringes with an infected person and in rare occasions by blood transfusion. According to the Center for Disease Control & Prevention (CDC) they state, that babies born to HIV-infected women may become infected before or during birth or through breast-feeding after birth (1999).

#### In the health care setting:

- The infection of HIV in healthcare workers has been contributed to being stuck by an infected needle, instruments, bites which breaks the skin, etc. HIV transmission has been reported to be about 3 in 1000 injuries with healthcare workers. The CDC has reported that there has been "only one instance of patients being infected by a health care worker in the United States; this involved HIV transmission from one infected dentist to six patients" (CDC, 1999).

Table: HIV Exposure and Infection between Healthcare workers. Table provided by AVERT, an international AIDS charity.

<b>Occupation</b>	<b>Documented occupational transmission</b>	<b>Possible occupational transmission</b>
Dental worker including dentist	0	6
Embalmer/morgue technician	1	2
Emergency medical technician/paramedic	0	12
Health aide/attendant	1	15
Housekeeper/maintenance worker	2	13
Laboratory worker, clinical	16	17
Laboratory technician, nonclinical	3	0
Nurse	24	35
Physician, nonsurgical	6	12
Physician, surgical	0	6
Respiratory therapist	1	2
Technician, dialysis	1	3
Technician, surgical	2	2
Technician/therapist, other than listed	0	9
Other health care occupations	0	6
<b>Total</b>	<b>57</b>	<b>140</b>

## **Infection Control Procedures:**

In order to protect their employees and prevent the spread of HIV, hospitals have enforced strict infection control guidelines to include universal precautions. All blood and body fluids are treated as potentially infectious. When the term universal precautions are used it tends to emphasize taking precaution with every encounter. As a healthcare worker we cannot assume about people's lifestyles and risk our lives with an infection. The World health Organization (WHO) advice healthcare workers to protect themselves from blood-borne infections including HIV by observing the following precautions:

- Hand washing after direct contact with patients.
- Use of protective barriers such as gloves, gowns aprons, masks, goggles for direct contact with blood and other body fluids.
- Safe collection and disposal of needles and sharps, with required puncture- and liquid- proof boxes in each patient care area. Syringes and needles are used once only and discarded in "sharps" containers.
- Preventing two-handed recapping of needles.
- Covering all cuts and abrasions with a waterproof dressing.
- Promptly and carefully cleaning up spills of blood and other body fluids.
- Using a safe system for health care waste management and disposal.
- Instruments are cleaned and sterilized after every use.
- Many items are disposed of after single use.
- Spilt blood and body fluids are cleaned up according to strict procedures.
- Laundry is cleaned according to strict infection control procedures.

### **What is the risk to hospital workers?**

The risks involving hospital workers can be if they accidentally prick themselves with a needle or other sharp instrument contaminated with HIV. A service and preventative treatment is available for workers who have accidentally pricked themselves with a needle or other sharp instrument contaminated with HIV. Preventive treatment may prevent the HIV getting into the bloodstream.

Even though hospital employees follow strict procedures when handling blood and body fluids, there is always a possibility of an accidental contamination. All blood and body fluids are considered and treated as potentially infectious. In the event that a hospital staff member has an accident involving contaminated blood, the hospital may ask permission from the patient to test their blood sample for HIV, hepatitis C or hepatitis B. These tests will alert the hospital whether a worker has been exposed to the viruses and could start immediate preventive treatment.

### **Post Exposure Prophylaxis (PEP)**

Through the various research conducted about HIV/AIDS treatment, they suggest that using antiretroviral drugs immediately after an injury may reduce the rate of transmission. This mode of treatment is known as Post Exposure Prophylaxis (PEP). According to AidsInfo (2010), PEP is the recommendation for health care workers if they have had a significant occupational exposure to blood or another high risk body fluid which is likely to be infected with HIV. All health care workers should be advised about the implications of taking PEP in case of an immediate decision is needed after an accidental injury.

## **Prevention of HIV**

The CDC has defined that the most common ways of HIV transmission is through anal or vaginal sex or sharing drug injection equipment with a person infected with HIV. In order to reduce the risks associated with these HIV transmission methods, it is recommended to follow these steps:

1. Know your HIV status. If you are between the ages of 13 and 64 you should be should be tested for HIV at least once. If you are at increased risk for HIV, you should be tested for HIV at least once a year.
2. If you have HIV, you can get medical care, treatment, and supportive services to help you stay healthy and reduce your ability to transmit the virus to others.
3. If you are pregnant and find that you have HIV, treatments are available to reduce the chance that your baby will have HIV.
4. Abstain from sexual activity or be in a long-term mutually monogamous relationship with an uninfected partner.
5. Limit your number of sex partners. The fewer partners you have, the less likely you are to encounter someone who is infected with HIV or another STD.
6. Correct and consistent condom use. Latex condoms are highly effective at preventing transmission of HIV and some other sexually transmitted diseases. "Natural" or lambskin condoms do not provide sufficient protection against HIV infection.
7. Get tested and treated for STDs and insist that your partners do too.
8. Male circumcision has also been shown to reduce the risk of HIV transmission from women to men during vaginal sex.
9. Do not inject drugs. If you inject drugs, you should get counseling and treatment to stop or reduce your drug use. If you cannot stop injecting drugs, use clean needles and works when injecting.
10. Obtain medical treatment immediately if you think you were exposed to HIV. Remember sometimes, HIV medications (PEP) can prevent infection if they are started quickly.
11. Participate in risk reduction programs. Programs exist to help people make healthy decisions, such as negotiating condom use or discussing HIV status. Your health department can refer you to programs in your area.

## **Florida HIV/AIDS Law:**

The Florida HIV/AIDS Law can be found in the Florida Statutes published yearly. In the recent 2009 Florida Statutes, all laws regarding HIV/AIDS can be found under Title XXIX-Public Health, Chapter 381.

### **2009 Florida Statutes**

#### **381.0034 Requirement for instruction on HIV and AIDS:**

Besides including the introduction portion of this course, the statute requires that each person licensed or certified under chapter 401, 467, part IV of chapter 468 or chapter 483 submit confirmation of having completed and HIV/AIDS course, on a form provided by the department, when submitting fees or application for each biennial renewal.

#### **381.004 HIV testing:**

(1) LEGISLATIVE INTENT.--The Legislature finds that the use of tests designed to reveal a condition indicative of human immunodeficiency virus infection can be a valuable tool in protecting the public health.

(2) DEFINITIONS.--As used in this section:

(a) "HIV test" means a test ordered after July 6, 1988, to determine the presence of the antibody or antigen to human immunodeficiency virus or the presence of human immunodeficiency virus infection.

(b) "HIV test result" means a laboratory report of a human immunodeficiency virus test result entered into a medical record on or after July 6, 1988, or any report or notation in a medical record of a laboratory report of a human immunodeficiency virus test. As used in this section, the term "HIV test result" does not include test results reported to a health care provider by a patient.

(c) "Significant exposure" means:

1. Exposure to blood or body fluids through needlestick, instruments, or sharps;
2. Exposure of mucous membranes to visible blood or body fluids, to which universal precautions apply according to the National Centers for Disease Control and Prevention, including, without limitations, the following body fluids:
  - a. Blood.
  - b. Semen.
  - c. Vaginal secretions.
  - d. Cerebro-spinal fluid (CSF).
  - e. Synovial fluid.
  - f. Pleural fluid.
  - g. Peritoneal fluid.
  - h. Pericardial fluid.
  - i. Amniotic fluid.
  - j. Laboratory specimens that contain HIV (e.g., suspensions of concentrated virus); or
3. Exposure of skin to visible blood or body fluids, especially when the exposed skin is chapped, abraded, or afflicted with dermatitis or the contact is prolonged or involving an extensive area.

(d) "Preliminary HIV test" means an antibody screening test, such as the enzyme-linked immunosorbent assays (ELISAs) or the Single-Use Diagnostic System (SUDS).

(e) "Test subject" or "subject of the test" means the person upon whom an HIV test is performed, or the person who has legal authority to make health care decisions for the test subject.

(3) HUMAN IMMUNODEFICIENCY VIRUS TESTING; INFORMED CONSENT; RESULTS; COUNSELING; CONFIDENTIALITY.—

#### **Human Immunodeficiency Virus Testing:**

There are several human immunodeficiency virus (HIV) tests used to detect antibodies to HIV or the genetic material (DNA or RNA) in blood and other types of samples.

- a) Enzyme-linked immunosorbent assay (ELISA)
- b) Western blot
- c) Polymerase chain reaction (PCR)
- d) Indirect fluorescent antibody (IFA)

#### **Informed Consent:**

- a) No one has the authority to order a test that has been deemed to identify the human immunodeficiency virus, or its antigen or antibody, without first obtaining the informed consent of the person upon whom the test is being performed, there are some exceptions of this informed consent.
- b) Prior to obtaining an informed consent the patient should receive an explanation of the right to confidential treatment of information identifying the subject of the test and the results of the test to the extent provided by law. Information shall also be provided on the fact that a positive HIV test result will be reported to the county health department with sufficient information to identify the test subject and on the availability and location of sites at which anonymous testing is performed.
- c) The consent does not need to be in writing as long as there is sufficient documentation in the medical record that the test has been explained and the consent has been obtained.
- d) Informed consent must be obtained from a legal guardian or other person authorized by law when the person:
  - i. Is not competent, is incapacitated, or is otherwise unable to make an informed judgment; or
  - ii. Has not reached the age of majority, except as provided in s. 384.30.

## **Informed Consent Not Required:**

Certain situations are exempted from requiring an informed consent, the exemptions included are:

- a) When testing required by state or federal law or by rule including the following situations:
  1. Testing persons convicted of prostitution or procuring another to commit prostitution
  2. Testing by a medical examiner
  3. Testing during a bona fide medical emergency when knowledge of results is necessary for providing appropriate emergency care or treatment and patient is unable to consent as documented in medical record
  4. When testing by blood, organ, semen, plasma, skin or other tissue banks
  5. When obtaining informed consent would be detrimental to patient as supported by documentation in the medical record and results are necessary to diagnosis and treatment (does not provide for routine testing without informed consent)
- b) When testing as part of an authorized autopsy
- c) When victim of sexual battery requests the defendant be tested
- d) When mandated by court order
- e) For anonymous epidemiological research
- f) When testing donated eyes or corneas
- g) Testing in the event of a significant exposure (consent must be sought, but if source refuses, can be done if blood was previously obtained for another purpose). Document all circumstances. If no blood available and source refuses, a court order may be obtained to direct the source to submit to testing.
- h) Test can be done in case of medical emergency where a significant exposure has occurred and the source expired or could not be resuscitated
- i) When testing hospitalized infant for appropriate diagnosis and treatment when parent cannot be contacted to give consent
- j) When testing to monitor progress of previously positive patient
- k) When repeat testing to monitor possible conversion after significant exposure.

## **Results:**

- a) Preliminary test results may be released to licensed physicians or the medical or nonmedical personnel involved in the care of the patient.
- b) Justification for use of preliminary results must be documented in the medical record by the provider who ordered the test
- c) Does not provide for routine identification of HIV-infected persons or when HIV testing is incidental to the preliminary diagnosis or care of a patient.
- d) Identity and results of test are confidential and may not be released except to:
  - i. Test subject and/or legally authorized representative
  - ii. Any person designated in a legally effective release (including 3<sup>rd</sup> party payors). General release not sufficient (must specify HIV results).
  - iii. To other persons subsequently authorized in a release issued by the test subject
  - iv. Agent, employee or provider participating in the care of the patient or who handles/processes body fluids or tissues (has a "need to know")
  - v. Health care providers consulting between themselves for purpose of providing diagnosis or treatment
  - vi. The department in accordance with rules for reporting and disease control
  - vii. Blood/Organ/Tissue/Semen banks
  - viii. Authorized medical or epidemiological researchers
  - ix. Person allowed access by court order
  - x. Employees of the department or of child-placing or child-caring agencies or foster families, adult custodian, adult relative or adoptive parents
  - xi. Employees of residential facilities or community-based care programs for developmentally disabled persons

- xii. Medical or non-medical personnel subject to a significant exposure during medical practice or in performance of professional duties
- xiii. Medical examiner shall disclose positive HIV results for the purpose of reporting and controlling the spread of disease
- xiv. Whenever disclosure is made pursuant to this section, it shall be accompanied by a statement in writing which includes the following: "This information has been disclosed to you from records whose confidentiality is protected by state law. State law prohibits you from making any further disclosure without the specific written consent of the person to whom such information pertains, or as otherwise permitted by state law. A general authorization for the release of medical or other information is NOT sufficient for this purpose."

**Counseling:**

Each county health department shall provide a program of counseling and testing for human immunodeficiency virus infection, on both an anonymous and confidential basis. Counseling provided to a patient tested on both an anonymous and confidential basis shall include:

- a) informing the patient of the availability of partner-notification services
- b) the benefits of such services
- c) and the confidentiality protections available as part of such services

**Confidentiality:**

Inappropriate disclosure of diagnosis of any STD including HIV/AIDS by any person who knew or should have known the nature of the information and maliciously, or for monetary gain makes this information known to any other person (except to a physician or nurse employed by the department or to a law enforcement agency) commits a felony of the third degree.

**384.24 Unlawful Acts**

It is unlawful and considered a 1<sup>st</sup> degree felony to have sexual intercourse with another person unless the other person has first been informed of the presence of a sexually transmitted disease and has consented to sex (where the source knows he/she is infected and has been informed that he/she may communicate the disease to others). This includes HIV, chancroid, gonorrhea, granuloma inguinale, lymphogranuloma venereum, genital herpes simplex, chlamydia, syphilis, PID/acute salpingitis, NGU.

## References:

AidsInfo. (2009, 11 8). *AidsInfo*. Retrieved 01 17, 2010, from Clinical Guidelines Portal:  
<http://www.aidsinfo.nih.gov>

*Center for Disease Control & Prevention*. (1999, July). Retrieved from HIV and it's Transmission.

*Health care workers and HIV Prevention*. (2010, February 16). Retrieved April 8, 2010, from Avert:  
<http://www.avert.org>

*Human Immunodeficiency Virus*. (2009, September 15). Retrieved from Lab Tests Online:  
<http://www.labtestsonline.org>

*Stop Aids Project*. (2009). Retrieved from HIV • AIDS • STD Definitions: <http://www.stopaids.org>

*The 2009 Florida Statutes*. (2009). Retrieved April 12, 2010, from Online Sunshine:  
<http://www.leg.state.fl.us/STATUTES/index.cfm?>

## TEST

- 1) All of the following are available tests for Human Immunodeficiency Virus Testing, except:
  - a) Enzyme-linked immunosorbent assay (ELISA)
  - b) Ligase Productivity
  - c) Polymerase chain reaction (PCR)
  - d) Indirect fluorescent antibody (IFA)
- 2) A consent is needed at all time in order to test for HIV:
  - a) True
  - b) False
- 3) The World health Organization (WHO) advice healthcare workers to:
  - a) to protect themselves from blood-borne infections
  - b) Preventing two-handed recapping of needles.
  - c) Promptly and carefully cleaning up spills of blood and other body fluids.
  - d) All of the above
- 4) HIV infection happens when the CD4 count falls below 200/mL:
  - a) True
  - b) False
- 5) The highest incidence of HIV exposure between healthcare are:
  - a) Technologists
  - b) Dialysis technicians
  - c) Nurses
  - d) Non-clinical laboratory technicians
- 6) The immediate treatment with antiretroviral drugs is known as:
  - a) Post Exposure Prophylaxis
  - b) HIV Genetic Treatment
  - c) HIV Exposure Surveillance
  - d) HIV Diagnostic System
- 7) Each county health department shall provide a program of counseling and testing for HIV infection:
  - a) True
  - b) False
- 8) Having sexual intercourse without notify the partner of the presence of a sexually transmitted disease is considered:
  - a) A crime
  - b) Punishable by law
  - c) 1<sup>st</sup> degree felony
  - d) All of the above
- 9) All licensed as a clinical laboratory personnel must have a course in the mode of transmission of HIV/AIDS:
  - a) True
  - b) False
- 10) The CDC estimates that more than \_\_\_\_\_ are infected with HIV:
  - a) One million people
  - b) Five million people
  - c)  $\frac{3}{4}$  of the population
  - d) None of the above

# Answer Sheet

Title: **Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome: A Course for the Laboratorian**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

E-mail Address: \_\_\_\_\_

FL Licensure #: (TC, TN, SU) \_\_\_\_\_

Note: Circle the correct answer.

- |     |   |   |   |   |
|-----|---|---|---|---|
| 1.  | A | B | C | D |
| 2.  | A | B | C | D |
| 3.  | A | B | C | D |
| 4.  | A | B | C | D |
| 5.  | A | B | C | D |
| 6.  | A | B | C | D |
| 7.  | A | B | C | D |
| 8.  | A | B | C | D |
| 9.  | A | B | C | D |
| 10. | A | B | C | D |

Mail to: Dreama Hall, FSH CEU Chairperson  
1155 Lake Ave S.E.  
Largo, FL 33771  
Wk. Phone: (727) 461-8296  
Fax: (727) 462-7596  
E-mail: fshceu@fshgroup.org