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Purpose & Goals
It is the goal of this course to provide the knowledge that will assist the healthcare provider in educating and caring for HIV/AIDS patients and their families.

Instructional Objectives
Upon completion of this course, the learner will be able to:
1. Explain the epidemiology, including incidence and prevalence of HIV/AIDS in the counseling and teaching environments.
2. Define AIDS and various signs and symptoms associated with AIDS.
3. List the various types of HIV tests and identify persons recommended by the Centers of Disease Control for HIV screening.
4. Outlining mechanisms by which susceptibility and infectiousness increase with coinfection of HIV and other sexually transmitted diseases.
5. List the recommended and specific ways to avoid transmission of HIV along with risk factors for infection.
6. State the correct procedure for handwashing with either alcohol based rubs or soap and water.
7. List OSHA and CDC requirements relating to HIV and bloodborne pathogens in light of standard, special and recommended precautions.
8. List the recommended strategies for the control of HIV in the environment.
9. Outline the steps to take if accidental occupational exposure to HIV should occur.
10. Define the complexity and multidimensional aspects of HIV Disease.
11. Identify lab testing necessary for the continuing care of the HIV/AIDS patient.
12. Name the various classes of pharmaceuticals used in the treatment of HIV/AIDS and relate the guidelines for initiation of retroviral therapy.
13. Identify various programs for the support of the HIV/AIDS patient.
15. Relate the legal rights of HIV patients under the Americans with Disabilities Act (ADA).
16. Define the laws relating to improper disclosure and confidentiality with regard to the HIV patient.

An Introduction to HIV
Knowledge is POWER. Accurate and timely information is a basic element of knowledge and is essential to those who are working to end the HIV/AIDS epidemic. This epidemic has created more published literature than any other disease in history, and advances in research and therapy have been extraordinary. Consequently, keeping up with the most current information can be extremely challenging. In an effort to combat the threat of AIDS, healthcare facilities have mounted an intensive education and training effort to ensure that all healthcare workers know and follow the recommended measures to prevent the transmission of HIV, and that they are given the tools to pass this vital information on to others. This course will aid the healthcare professional in understanding the core concepts of HIV.

What is HIV? What is AIDS?
Acquired Immune Deficiency Syndrome, better known by its acronym AIDS, results from, and is the late stage of infection with the blood-borne Human Immunodeficiency Virus (HIV). AIDS occurs when a person’s immune system is so damaged it cannot fight diseases and certain cancers. Since 1981, there have been approximately 600,000 AIDS-related deaths in the U.S. In 2009, more than 33 million people were living with HIV worldwide, and there were 8 million deaths attributed to HIV and AIDS. In 2009, there were over 1 million people living with HIV in the U.S. alone.

Two types of HIV have been identified, HIV-1 and HIV-2, and each is composed of numerous viral subtypes known as clades. Clades of HIV-1 cause similar disease. Interestingly, global distribution of clades varies with geographic location. For example, the B clade is found primarily in the more developed parts of the world, but is seldom found in the developing nations that are the most severely affected by HIV. In the U.S., HIV-1 is the virus responsible for most infections, and the term HIV refers primarily to HIV-1.

Both virus types target and destroy the subgroup of lymphocyte cells called CD4+ T-cells (also known as T helper cells), but each virus contains its own distinct genetic code and replication process. Both have the same modes of transmission and are associated with the same opportunistic infections and AIDS. Individuals infected with HIV-2 develop a milder infection at first and are less infectious early in the course of the disease. Infectiousness increases as the disease advances, and this seems to last a shorter time when compared to HIV-1.

Origins and spread of the HIV-1 and HIV-2 Viruses
Effects of the Human Immunodeficiency Virus were first seen in the United States in 1981 when separate groups of homosexual men living in New York and San Francisco became ill. The infection presented in the form of two diseases, Pneumocystis pneumonia (PCP) and Kaposi sarcoma (KS), that had previously been associated with persons having severe immune deficiency. The HIV virus itself was not identified until 1983.

In 1999, scientists from the University of Alabama at Birmingham published results in the prestigious journal Nature that showed a subspecies of chimpanzee native to the west...
equatorial region of Africa to be the original source of HIV-1. Chimpanzees infected with Simian Immunodeficiency Virus (SIV), which is shown to have a molecular analysis very closely related to HIV-1, were hunted by men in the bush-meat trade. Because of their viral similarity, scientists believe SIV mutated into HIV-1, and then entered the human population as humans came into contact with infected chimpanzee blood. The spread of HIV across Africa was later shown to have followed trucking routes used by men who worked in logging camps.

HIV-2 was first isolated from patients in West Africa in 1986, and the first case of infection in the U.S. was diagnosed in 1987. It has a molecular structure similar to viruses that infect the Old World sooty mangabey monkeys also native to West Africa. It is believed these monkeys harbored a virus that was the precursor of the HIV-2 virus.

Epidemiology and Trends

Prior to good testing techniques and the development of effective medications, the spread of HIV in the US occurred rapidly and silently. By 1995, statistics from the CDC showed that AIDS was the leading cause of death in adults aged 25 to 44 in the United States, far surpassing cancers and heart disease.

Fortunately, since 1996, there are now extremely effective therapies known as highly active antiretroviral therapy (HAART) that can affect whether or not HIV infection will progress to AIDS. HAART has significantly reduced the annual number of AIDS diagnoses and deaths since the mid-1990s, and this trend has continued to remain stable. HAART uses a combination of drugs that target different stages of viral replication to interrupt the viral life cycle and lower the amount of virus in the blood down to undetectable levels.

Because of HAART, HIV trends cannot be predicted as they once were since the progression between the time of HIV infection and the time of AIDS onset is no longer predictable. Other factors now come into play such as access to available drug therapy, adherence to recommended regimens, and individual response to HAART.

The year 2011 marked the official 30th anniversary of the presence of HIV and AIDS in the United States, a milestone in the course of this epidemic. In 2011, the Centers for Disease Control (CDC) released the 2008 HIV Surveillance Report which contained a vast amount of surveillance statistics for data recorded through the end of 2008. It is important to note that data from the CDC represents estimated cases, and not actual reports. Tracking HIV is extremely challenging for the CDC and depends on:

1. How often individuals are tested
2. When in the course of HIV disease individuals are tested. There is a long incubation period between when a person is actually infected and when symptoms appear, thus many people with HIV do not know their status. There is also much stigma about getting tested. Many people put off testing because they don’t know where to get tested or are afraid of learning their status. Therefore, HIV case reporting is of new diagnoses, not new infections.
3. Whether or not test results are reported to health departments
4. How case reports (with personal identifiers removed) are reported the CDC.

HIV Surveillance

HIV disease reporting in the United States is voluntary and depends on the part of state legislative and regulatory decisions. It is not federally mandated. Since April 2008, all 50 U.S. states, the District of Columbia, and 6 U.S. dependent territories have all used the same confidential name-based reporting system to collect HIV surveillance data. This system has been shown to be the most cost effective and accurate system of the various systems that were previously tried. Although HIV case reporting is becoming better and better, the overall process needs more time to grow and fully develop. The CDC retains all data in the HIV surveillance system under the highest security standards in order to maintain both confidentiality and data security.

The CDC defines HIV incidence as the number of new HIV infections in a specific population during a specific period of time. The tracking of HIV incidence is vital to the CDC so that the number of infections that occur each year can be decreased. Knowing HIV incidence helps determine the efficacy of prevention programs and care services, and regulates where funding and resources are needed.

It is important to note again that the number of new diagnoses of HIV does not necessarily reflect the trends in new HIV infections because some persons may be recently infected when they get tested, while others may have been infected for some time when they get tested. There is now a new solution available to estimate HIV incidence known as STARHS or Serological Testing Algorithm for Recent

HIV Seroconversion. STARHS can distinguish between “recent” (in approximately the last 5 months) and “long standing” infection at the population level. It is not used for individual test results. The ELISA or EIA standard assays for HIV testing will show reactive when there is the presence of anti-HIV antibodies. This result is then confirmed by a Western Blot test. These confirmed positive EIA results then undergo a “BED assay” which can determine whether infection is recent or long standing.

The CDC defines HIV prevalence as the number of people living with HIV infection in a given year (or at a given point in time). The greatest numbers of HIV infections continue among men who have sex with men (MSM). CDC recommends that sexually active MSM be tested for HIV at the very least on an annual basis. Because both prevalence and incidence are high among MSM, the CDC further suggests that MSM be tested every 3 to 6 months.

Table 1 gives a quick look at HIV statistics.

Infection of HIV

The HIV virus has a diameter of 1/10,000 of a millimeter. HIV-1 and HIV-2 belong to a class of viruses called retroviruses in the Retroviridae family, which have genes composed of single-stranded RNA molecules with a DNA intermediate. This is known as a viral genome, or provirus, that will remain within the host cell DNA. Retroviruses, like all viruses, can only replicate within a living host. Retroviruses use RNA as a template to make DNA. Unfortunately, HIV infection is still a poorly understood process despite the vast amount of research that has been done.

Replication is believed to begin when a dendritic cell binds HIV and transports it to a regional lymph node. These lymph nodes are thought to be the main sites for replication and spread of the virus. Cellular infection begins when the HIV virus encounters a macrophage or T cell with a surface receptor molecule known as CD4+. The virus particle...
Table 1: A Quick Look at HIV Statistics+

Number of people living with HIV infection worldwide..........................33.3 million
Number of people age 13 and older living with HIV/AIDS (HIV prevalence)....1.2 million
Percentage of people who have their HIV disease under control....................28%§
Number of people living with an AIDS diagnosis (AIDS prevalence) .............490,696
Number of women living with HIV/AIDS..................................................200,000
Number of new HIV infections as of 2009 (HIV incidence)........................48,100
Percentage of people who live with but don’t know they have HIV...(1 in 5) .......20%
Percentage of HIV infected adults who are linked to medical care after diagnosis...77%§
Percentage of diagnosed HIV infected adults who stay in medical care............51%§
Number of AIDS deaths in 2008.................................................................16,000
Degree in drop of the age-adjusted HIV death rate since 1995.........................77%§
Highest HIV incidence in the 1980s.........................................................130,000
Number of deaths since start of epidemic..................................................617,025
Number of minutes between each new infection........................................9.5 minutes
Top 10 Cities with the highest concentration of HIV (Alphabetical order)...........
Atlanta, Baltimore, Chicago, Ft. Lauderdale, Houston, Los Angeles, New York, Miami, Philadelphia, and San Francisco
Top 10 States with the highest concentration of HIV (Greatest to Least).........
New York, Florida, California, Texas, New Jersey, Georgia, Illinois, Maryland, North Carolina, and Pennsylvania

+Unless otherwise noted, all numbers are estimated numbers for the United States and dependent areas from most recent available data through 2011.
§Data from the Centers for Disease Control and Prevention MMWR 60(47):1618-1623.

uses complex proteins in its outer envelope to attach itself to the cell membrane and then enter the host cell. Within the cell, the virus particle releases its RNA, and the enzyme reverse transcriptase, converting the viral RNA to DNA. This new HIV DNA then moves into the cell’s nucleus, where with the help of enzymes, it inserts itself into the host cell’s DNA. Once inside the host cell’s DNA, the provirus can replicate and release new infectious viral particles. Figure 1 shows a scanning electron micrograph of hundreds of HIV particles in a culture with human lymphocytes.

Because the HIV virus lacks proofreading (error correcting) enzymes, there is a high percentage of errors that can occur when viral RNA is converted to DNA. The HIV virus also has a short life cycle. These two factors in combination are responsible for a high rate of viral mutations. Generally, the mutated forms do not afford any advantage to the virus, or are unable to replicate. However, mutations can occur that allow for drug resistance. For this reason, antiretroviral therapy must be a combination of drugs for success. It is imperative that antiretroviral drugs be taken exactly as recommended to prevent the selection of drug resistant strains of HIV.

Three Separate Phases of HIV Infection:

1. Acute Seroconversion. Between 4-11 days after the HIV virus has entered the infected person’s body, there is a period of rapid and widespread dispersion of the virus. Infected lymphocytes spread into deeper tissues such as the lymph nodes, the spleen, and the brain. At this time, a very stable proviral reservoir is established. Normally, the HIV virus enters the host through direct blood exposure of the virus from genital mucosa or by direct blood inoculation. When the virus enters through the GI tract, it gains an easy access to a large amount of lymphoid tissue known as GALT or gut-associated lymphoid tissue. This is an ideal location for viral replication, and GALT is a major area for establishing the proviral reservoir. Because the virus replicates unchecked before the host can begin mounting a significant immune response, viral load (a measure of the number of virus particles in the blood expressed as copies of RNA per milliliter of blood) is high during this period. Unfortunately, efforts to aggressively treat individuals during acute seroconversion do not yield any significant long-term benefit. The process of seroconversion may take anywhere from several weeks to several months to complete. Statistics show that about 50% of those infected with HIV will have flu-like symptoms, fever, rash, and lymphadenopathy during this time. Since acute seroconversion is the time that infected individuals are so highly infectious, it is advantageous to be able to detect infection as soon as possible. HIV infection has a window period that is defined as the time between initial infection and the point at which diagnostic tests can detect the presence of infection. The window period for HIV detection is between two to eight weeks, with an average of 25 days, but may be as long as six months when using tests that detect anti-HIV antibodies.

* The FDA approved the first test kit capable of...
Table 2: AIDS-Defining Conditions

- Bacterial infections, multiple or recurrent*
- Candidiasis of bronchi, trachea, or lungs
- Candidiasis of esophagus†
- Cervical cancer, invasive§
- Coccidioidomycosis, disseminated or extrapulmonary
- Cryptococcosis, extrapulmonary
- Cryptosporidiosis, chronic intestinal (>1 month’s duration)
- Cytomegalovirus disease (other than liver, spleen, or nodes), onset at age >1 month
- Cytomegalovirus retinitis (with loss of vision)†
- Encephalopathy, HIV related
- Herpes simplex: chronic ulcers (>1 month’s duration) or bronchitis, pneumonitis, or esophagitis (onset at age >1 month)
- Histoplasmosis, disseminated or extrapulmonary
- Isosporiasis, chronic intestinal (>1 month’s duration)
- Kaposi sarcoma†
- Lymphoid interstitial pneumonia or pulmonary lymphoid hyperplasia complex*††
- Lymphoma, Burkitt (or equivalent term)
- Lymphoma, immunoblastic (or equivalent term)
- Lymphoma, primary, of brain
- Mycobacterium avium complex or Mycobacterium kansasii, disseminated or extrapulmonary†
- Mycobacterium tuberculosis of any site, pulmonary,†§ disseminated,† or extrapulmonary†
- Mycobacterium, other species or unidentified species, disseminated† or extrapulmonary†
- Pneumocystis jirovecii pneumonia†
- Pneumonia, recurrent†§
- Progressive multifocal leukoencephalopathy
- Salmonella septicemia, recurrent
- Toxoplasmosis of brain, onset at age >1 month†
- Wasting syndrome attributed to HIV

* Only among children aged <13 years. (CDC. 1994 Revised classification system for human immunodeficiency virus infection in children less than 13 years of age. MMWR 1994;43[No. RR-12].)
† Condition that might be diagnosed presumptively.
§ Only among adults and adolescents aged >13 years. (CDC. 1993 Revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. MMWR 1992;41[No. RR-17].)

Centers for Disease Control and Prevention, MMWR, Recommendations and Reports. December 5, 2008 / 57 (RR10);9.

detecting the HIV virus itself as well as HIV antibodies. Manufactured by Abbott, the Architect HIV Ag/Ab Combo Test can reduce the window period by one week to as much as 20 days.

2. Asymptomatic Infection. During this phase, infected individuals may show no signs or symptoms of outward infection. Some persons may show a continuing generalized lymphadenopathy. Viral replication continues, and the individual’s immune system mounts a good defense. Viral load (please see the section entitled Lab Tests for assessment of HIV) may be stable, but CD4+ T-cell counts will steadily decline. This phase may last several years to over a decade.

3. AIDS. This phase occurs after the infected individual’s immune system becomes so damaged it cannot fight opportunistic infections and certain cancers. An HIV-positive person who has not had any serious illnesses also can receive an AIDS diagnosis on the basis of certain blood tests (CD4+ counts). Since January 1, 1993, AIDS cases have been defined by the CDC as adults/adolescents (>13 yrs. of age) who are HIV-infected with a CD4+ T-lymphocyte cell count of less than 200/µl or a CD4+ percentage of less than 14. This count is one-fifth the typical level of a healthy adult. A diagnosis of AIDS can also be made when a person who is positive for HIV shows the presence of opportunistic infections that are otherwise uncommon in an immunocompetent individual (Please see TABLE 2: AIDS-Defining Conditions). The time between acute seroconversion and a diagnosis of AIDS varies greatly from person to person and can depend on many factors such as when antiretroviral therapy is begun, individual response to therapy, compliance, etc.

AIDS Surveillance

For surveillance purposes only, the CDC has defined three stages of infection criteria for adults and adolescents ≥13 years. These stages are divided into Stage 1, Stage 2, Stage 3 (AIDS), and Stage 4 (unknown stage). More information on these stages of infection criteria can be found at the following CDC website: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5710a1.htm?ss_cid=rr5710a1_c#top.

HIV Coinfection

Persons infected with HIV may also be in-
fected with hepatitis B virus (HBV) or hepatitis C Virus (HCV). Injection drug users are especially at risk. Persons infected with HIV may be coinfected with tuberculosis (TB) as well. Coinfection of HIV with another disease complicates each individual disease process and can greatly affect treatment courses and outcomes.

HIV is the strongest known risk factor for progression from latent TB to active TB disease. Fortunately, persons with HIV and latent or active coinfection of TB can be effectively treated for TB. It is highly recommended that anyone infected with HIV be tested for TB coinfection.

In the United States, the CDC has identified chronic HBV infection in 6-15% of persons infected with HIV. HIV-HBV coinfection is associated with increased progression to liver fibrosis, increased cirrhosis, liver cancer, and liver failure. There is also a higher rate of hepatotoxicity with initiation of antiretroviral therapy than with HIV infection alone. Persons with HIV should also be tested for HBV.

Approximately one-fourth of HIV infected persons in the U.S. are also infected with HCV. HIV-HCV coinfection is associated with higher titers of HCV, more rapid progression to liver disease, and increased risk for cirrhosis of the liver. HCV is considered to be an opportunistic infection in HIV infected individuals, but it is not considered an AIDS-defining illness. At present, it is unclear what role HCV plays in HIV disease progression. It is recommended that anyone infected with HIV be tested for HCV coinfection.

Stigma of HIV Infection

A diagnosis of AIDS or the seroconversion of an individual to a positive HIV result has carried much stigma over the years. This is due in part because of the modes of transmission of the virus through sexual promiscuity and the homosexual-associated lifestyle, as well as the fear of infection with what was at one time a nearly fatal disease. Good patient education is vital to understanding that HIV is transmitted in the same manner as other blood-borne pathogens, requiring blood contact or sexual exposure, and cannot be transmitted with casual contact. Although there is no cure for HIV infection, patients must also be educated to know that, with proper treatment, infection no longer carries the death sentence that it previously did. People with HIV/AIDS can now live relatively normal lives.

Denial of HIV Infection

Despite the vast amounts of proven scientific and clinical literature, there still exists a small minority of people, including scientists and tenured professors in American universities, who continue to believe misinformation about the HIV virus. There are beliefs that the virus is harmless or does not exist, that testing is unreliable, that therapies don’t work well or are toxic, etc. There are also some individuals who are still convinced that AIDS and HIV are part of a conspiracy theory. Sadly, in South Africa alone, misinformation and denial by the government has in the past halted efforts to stop the spread of the epidemic and has resulted in the loss of hundreds of thousands of lives. As healthcare workers, we must ensure that patients have correct understanding and education of the HIV virus. AIDSTruth.org is a website dedicated to debunking misinformation regarding AIDS and HIV, and is regularly updated.

Signs and Symptoms of AIDS

Listed in Table 2, the CDC considers certain opportunistic infections and cancers to be AIDS-defining conditions. It is important to note that none of these diseases alone are specific to AIDS, but are known to manifest in AIDS patients because of the severe immunocompromised state characteristic of advanced HIV disease. One of the most prevalent of these infections is Pneumocystis jirovecii Pneumonia, caused by a yeast-like fungus. [Note: The former name for this disease was Pneumocystis carinii pneumonia (PCP) because it was erroneously classified as protozoan in origin; the acronym was kept as PCP since it was so widely used, and now stands for Pneumocystis jirovecii Pneumonia.] Other prevalent infections are Kaposi’s sarcoma (KS), a malignant tumor condition; Candidiasis, a fungal infection with a manifestation in AIDS patients primarily in the mouth and esophagus; Cryptococcosis, a fungal infection that can cause meningitis; Cytomegalovirus (CMV), a viral infection that can cause blindness, pneumonia, colitis, and death; and diarrhea caused by the protozoa Cryptosporidium.

The only way to know if someone is truly infected with the HIV virus is to be tested. Persons who are HIV positive have been known to be asymptomatic for ten or more years. The CDC has listed a number of physical signs that may be signs of advanced HIV infection, but are not specific to HIV:

- Recurring fever
- Profuse night sweats
- Profound and unexplained fatigue
- Swollen lymph glands in the armpits, groin, or neck
- Diarrhea lasting more than a week
- White spots or unusual blemishes on the tongue, in the mouth or throat
- Pneumonia
- Red, brown, pink, or purplish blotsches on or under the skin, or inside the mouth nose or eyelids
- Memory loss, depression, and other neurological disorders

HIV TESTING

Diagnostic testing is an important tool in the nation’s efforts to decrease the spread of HIV. Testing allows researchers to track the course of the epidemic, and provides information to help in developing prevention strategies and allocating resources for HIV-related services. Counseling, which should be provided before and after testing, provides a unique opportunity to educate individuals about HIV. Counseling should include risks, avoidance of infection, and when results are positive, treatment options, follow-up, and protection of others.

The CDC recommends HIV screening for:

1. All persons aged 13 to 64 in all healthcare settings, after the patient has been informed, unless the patient declines
2. Anyone beginning treatment for tuberculosis
3. Anyone with symptoms of, or seeking treatment for STDs
4. Anyone at high risk for HIV infection, with a recommended testing frequency, at the very least, on a yearly basis
5. Anyone beginning a new sexual relationship
6. Anyone whose blood or body fluids are the source of occupational exposure for a healthcare worker; they should be tested at the time of the exposure

There are three types of tests used to screen for the HIV virus:

1. Antibody tests, most commonly the enzyme-linked immunosorbent assay (ELISA), also known as the enzyme immunoassay (EIA).
2. Combination tests that test for both antibodies and a portion of the virus known as the p24 protein.

Known positive results are then confirmed by a Western Blot test that consists of an electrophoresis method that separates viral antigens and measures the serum antibody reaction to viral core and envelope proteins. In the U.S., all positive ELISA results are not reported unless confirmed by Western Blot.

The CDC provides a service website known as The National HIV and STD Testing Resources Web Site, available at www.hivtest.org, which allows users to enter a zip code, or city and state, and will find nearby testing centers. Users are shown approximate distance in miles to various testing centers, services available at each, and any free services offered.

Home Access Health Corporation sells as the “The Home Access HIV-1 Test System” or “The Home Access Express HIV-1 Test System.” This test allows blood samples to be taken at home and then sent in to a CLIA (Clinical Lab Improvement Act) and CAP (College of American Pathologists) certified lab for testing using the ELIZA system. Blood is collected with a simple finger prick and blood droplets are placed on special paper. The paper is then mailed to a laboratory with the subject’s personal and confidential identification number (PIN). The sample is analyzed and results are given through a toll-free telephone system using the subject’s PIN number. Results for the regular test are available 7 working days after the shipment date, or the next business day after shipping for the express test. Post-test counseling is provided by telephone after results are given. Professional counselors are available 24 hours a day, 7 days a week and anonymity is guaranteed. FDA approved studies have shown the kits to be able to correctly identify 99.5% of HIV negative blood samples. Kits are available through the company’s website (www.homeaccess.com), on the internet, and at local drug stores.

Various other rapid or point-of-care tests are also available that use blood, serum, plasma, mucosal transudate from cheek and gum tissue, and urine. Oral tests have a known incidence of false positives.

Transmission of HIV

Modes of Transmission

HIV is readily transmitted through sexual contact and exposure to blood and/or blood products and certain body fluids. Studies indicate the highest percentage of HIV transmissions occur during sex acts where body fluids are exchanged. Body fluids include blood, blood products, saliva, tears, urine, semen, vaginal secretions, breast milk, and perspiration. The use of contaminated needles by injecting drug users is the second most frequent route of transmission of HIV. HIV can be transmitted from pregnant women to their children during childbirth. HIV can also be transmitted through accidental needlesticks or contact with contaminated body fluids.

STDs and Transmission of HIV

There is much documented evidence to substantiate the fact that individuals infected with an STD are at minimum two to five times more likely to contract HIV if they are exposed to the virus through sexual contact (increased susceptibility). Also, individuals infected with HIV and another STD are more likely to transmit HIV through sexual contact (increased infectiousness). Herpes is an especially important example of an STD that makes individuals both more susceptible to HIV infection as well as more infectious to others when an individual has both herpes and HIV.

There are two mechanisms by which susceptibility to HIV infection increases:

1. Ulcers in the genital tract or skin from STDs (such as herpes, syphilis, or chancroid) cause breaks in these areas thus creating an entry portal for HIV. HIV can be isolated directly from the genital ulcers of both men and women. Syphilis can raise the transmission risk 7 fold, and genital herpes can raise the transmission risk as much as 25 fold when an infected person has an outbreak.

2. Inflammation from genital ulcers or non-ulcerative STDs (such as gonorrhea, chlamydia, and trichomoniasis) causes an increase in the concentration of HIV target cells in genital secretions, including CD4+ T cells. Chlamydia can cause a 3 fold increase in the transmission risk.

Infectiousness increases because HIV infected individuals who are also infected with STDs are likely to shed greater amounts of virus in genital secretions. The higher the concentration of virus in the genital secretions, the more likely it can be transmitted to a sex partner. When men are infected with both gonorrhea and HIV, the median concentration of HIV virus in semen can be as much as 10 times higher than men infected with HIV alone.

Individuals with a known STD infection should also be tested for HIV. Early detection and treatment of curable STDs must be a major focus of all programs aimed at reducing the HIV epidemic.

Ways HIV is NOT Transmitted

It should be noted that public concern regarding the transmission of HIV can be out of proportion to the transmission risk revealed by scientific study. Public education of the following facts is essential in HIV education:

1. HIV is not spread by shaking hands or touching someone who is HIV positive.
2. HIV is not spread by insect bites such as those inflicted by mosquitoes.
3. HIV is not spread by sharing eating utensils or drinking glasses with someone who is HIV positive.
4. HIV is not spread by sharing towels, linens, telephones, toilet seats, swimming pools, etc.
5. HIV is not spread by kissing, although some sources recommend against “deep kissing” of an infected person.

Preventing the Transmission of HIV

Prevention at National, Community, and Individual Levels

Statistics from the CDC have shown that prevention programs in the U.S. have averted over 350,000 HIV infections to date. In the 2010 fiscal year, the U.S. spent $26 billion dollars of federal funding to combat the HIV epidemic. In July 2010, the White House released the National HIV/AIDS Strategy (NHAS). This was the first comprehensive government plan to address this epidemic. The goals of this plan are: 1) to reduce the number of new HIV infections; 2) to increase access to care and improve health outcomes; and 3) to reduce HIV-related health disparities.

Proper patient education and counseling on the part of the healthcare worker is of utmost importance in preventing the spread of HIV. Infected persons should be counseled about the risks of infecting others, safe sex practices, and the importance of informing all previous sex partners of their positive HIV status. Individuals who are positive for HIV and do not tell their sex partners can now be successfully prosecuted.
Because of multiple HIV strains and different clades, it is possible for infected individuals to be co-infected with more than one strain of HIV. Infected persons should be counseled not to seek out other persons who are also HIV positive so they can feel “safe” about having sex with these individuals. A person who is being treated for their HIV infection may contract a co-infection that results in deterioration of a previously successful treatment course. There is also evidence of initial drug resistance in new infections.

Recommended Ways to Avoid Transmission of HIV

The CDC recommends three main ways to avoid infection with HIV:

1. Abstain from sexual intercourse (oral, vaginal, or anal sex)
2. Be in a long-term, mutually monogamous relationship with an uninfected partner
3. Abstain from sharing needles or syringes for nonprescription drugs

More specific ways include:

1. Avoid any behaviors that might result in contact with blood, semen, vaginal secretions, or other body fluids with visible blood.
2. Ask about the sexual history of any potential sex partner, and abstain from sex with any infected individual.
3. Reduce the number of sex partners to minimize risk.
4. Always use a condom from start to finish during any type of sex, oral vaginal or anal. Latex condoms should be used over other types because they offer greater protection against both HIV and STDs. If a person chooses to have sex with a partner whose status is unknown, a new condom should be used for each new act of insertive intercourse (oral, vaginal, or anal). Adequate lubrication should also be used during vaginal or anal sex with only water-based lubricants. These will protect the integrity of the condom and help prevent tears. Oil-based lubricants such as petroleum jelly, mineral oil, massage oils, body lotions, etc. should not be used because they can weaken the latex and cause breakage.
5. Avoid anal or rough vaginal intercourse, and avoid any behaviors that would tear the skin or lining of the genitals, anus or mouth and cause bleeding.
6. Avoid deep, wet, or “French kissing” with an infected person. Even though transmission has not been documented by this route, possible trauma to the mouth can occur, possibly resulting in the exchange of blood.
7. Avoid alcohol and illicit drugs which can impair the immune system and impair judgment.
8. Do not share needles, syringes or any other drug paraphernalia.
9. Do not share any personal items such as toothbrushes, razors, or devices used during sex because these items may be contaminated with blood, semen or vaginal fluids.
10. If you are infected with HIV or have engaged in sex in any behaviors that put you at risk for HIV infection, do not donate blood, plasma, sperm, body organs, or tissues.
11. All pregnant women should be tested for HIV so that any pregnant woman who is infected can begin antiretroviral therapy for her own health and to improve the chances that her infant will be born free of infection.

Risk Factors for HIV Infection:

- Having unprotected sex
- Having unprotected oral sex
- Having multiple sex partners
- Men who have sex with Men (MSM)
- Having a sex partner who has other multiple sex partners or is a MSM
- Having a sex partner who is an injection steroid or injection drug user
- Sharing needles or any equipment that is used to inject drugs (cokers, filtration cotton, etc.)
- Engaging in a business that exchanges sex for money or drugs
- Having a recent STD
- Being born to a mother who is infected with HIV

Prevention at the Healthcare Level

1. Handwashing

Handwashing is the single most effective method in preventing HIV and other diseases. For handwashing to be effective, hands must be washed with a sufficient amount of product, with the correct technique, and for a sufficient length of time in order to reduce the number of transient organisms.

Reports from the CDC show that alcohol-based sanitizer are more effective at killing pathogens and the least damaging to skin when compared to soap and water. They require less handwashing time and can easily be placed in areas where needed most. For these reasons, alcohol-based hand rubs are the preferred and recommended method for hand decontamination unless the hands are visibly soiled with blood, body fluids, or protein-based substances. The correct method of using an alcohol-based sanitizer is to apply a sufficient amount to wet all hand surfaces while focusing on fingernails and fingertips, rubbing until hands are dry. Drying time should take a minimum of 15-20 seconds; if it takes less than 15 seconds, an insufficient amount of sanitizer was used. When hands are visibly soiled, handwashing with soap and water should be done as follows: 3 ml of soap should be used to create a vigorous lather, scrubbing all hand surfaces for at least 20 to 30 seconds (the amount of time it takes to sing the “Happy Birthday” song two times, or the “ABCs” song). For more information on handwashing, please see the National Center of Continuing Education course on infection control entitled “Science of Infection Control Principals.”

2. Caregiver Concerns

If recommended precautions are taken and healthcare workers do not succumb to unrealistic fears, adequate protection from infection with the HIV virus will be achieved. The best approach to avoid contracting HIV is to heed the CDC’s recommendation of Standard Precautions by treating all persons as though...
they are HIV positive. The importance of this recommendation cannot be overemphasized. Additionally, when all persons are treated using Standard Precautions, there is no fear of discrimination on either the part of the healthcare worker or the patient.  

3. Review of Standard Precautions  
OSHA law, which protects healthcare workers, requires the practice of Universal Precautions which states that human blood and other potentially infectious material must be treated as if known to be infectious. The CDC has broadened these requirements by recommending that Standard Precautions be used for all patients in any healthcare setting regardless of their confirmed infection status. Standard Precautions apply to 1) blood, 2) all body fluids, secretions, and excretions except sweat regardless of whether or not they contain visible blood, 3) non-intact skin and 4) mucous membranes. Although it has not been specifically implicated in the transmission of HIV or other bloodborne diseases, saliva has not been removed from the list of body fluids that require caregivers to exercise Standard Precautions. In all clinical settings, the CDC and the American Dental Association’s Council on Dental Therapeutics suggest assuming that saliva can be contaminated with blood and can therefore potentially carry HIV and other diseases.  

Standard Precautions describe specific infection control practices including hand hygiene and safe injection practices, as well as the use of PPE that includes gowns, gloves, masks, eye protection, and face shields.

Personal Protective Equipment (PPE). Gloves must be used for any contact with blood, body fluids, secretions, excretions, mucous membranes, non-intact skin, and any potentially contaminated items. Gowns must be worn during any procedure or patient care activity where skin or clothing might come into contact with blood, body fluids, secretions, excretions, or potentially contaminated items. Masks, face shields, and eye protection must be worn during any patient care activity that could generate blood sprays or splashes of body fluids, secretions, and excretions, and during procedures such as suctioning or intubation. For all patient resuscitation, mouthpieces, ventilation bags or other ventilation devices must be used to prevent contact with the patient’s mouth and saliva.

Needles and Sharps. There is the potential for exposure to bloodborne pathogens any time a puncture wound occurs from a contaminated needle, lancet, or surgical instrument. Special care should be taken when using, caring for, disinfecting, or cleaning these items. Needles should NEVER be recapped with both hands, purposely bent, broken, manipulated, or removed from disposable syringes by hand.  

After use, disposable syringes and needles, scalpel blades, and all other sharps that are to be disposed should be placed in a puncture-resistant container that is placed as close as possible to the area where used. Large bore reusable needles should be placed in a puncture-resistant container and then transported to the nearest reprocessing area.

Housekeeping. Routine cleaning and disinfection of surfaces, instruments, and patient care equipment should be practiced. Laundry and other contaminated items must be properly handled. Disposable equipment should never be reused. All biohazardous materials must be properly labeled and disinfected. All specimens should be placed in leak-proof containers or bags with a biohazard warning label.

Patient Placement and Transportation of Infected Patients. Patients who have illnesses with the potential for increased risk of disease transmission should be given priority for placement in single patient rooms. A private room is important to prevent direct or indirect contact transmission when the source patient has poor hygienic habits, is likely to contaminate the environment, or cannot be expected to assist in maintaining infection control precautions to limit the transmission of organisms. When a private room is not available, an infected patient is placed with an appropriate roommate. A private room with appropriate air handling and ventilation is important for reducing the risk of transmission of organisms from a source patient and other persons in the hospital when the organism is spread by airborne transmission. Limiting the movement and transportation of patients infected or colonized with virulent or epidemiologically important organisms reduces opportunities for transmission of organisms. Such patients should be transported only when essential for care.

Respiratory Hygiene and Cough Etiquette. Patients with any symptoms of respiratory infection should be instructed to cover their mouth and nose with a tissue when coughing or sneezing. When a tissue is not available, patients should cough or sneeze into their elbow or sleeve and not into their hands. Used tissues should be disposed of in hands-free waste containers. Hands should be washed with soap and water for at least 20 seconds or with alcohol-based hand gel if soap and water are unavailable. If possible, patients should wear surgical masks (N95 respirators are not necessary) or be separated from well individuals by a distance greater than 3 feet.

4. Review of the Bloodborne Pathogens Standard  
The U.S. Department of Labor division of the Occupational Safety and Health Administration (OSHA) issued the Bloodborne Pathogens Standard in 1991 to protect healthcare workers from HIV/AIDS and other bloodborne pathogens. It has been revised over the years and now addresses issues pertaining to needlestick safety and prevention. For a more complete review of this Standard, please see NCCE’s Course entitled Science of Infection Control Principles, or see the entire Standard available at www.osha.gov.  

Major components of the Standard include:

a. Training. All employees who are exposed to blood or other potentially infectious material (OPIM) must receive proper training at the time of initial work assignment. Training must include procedures to be followed should an exposure occur, and what is necessary for post-exposure follow-up.

b. An Exposure Control Plan. Any employer with employees who may potentially encounter blood or OPIM must have a written plan to eliminate or minimize exposure.

c. Engineering Controls. Engineering controls refer to methods of isolating or removing a bloodborne pathogen from the workplace. These include sharps disposal containers, needleless systems, and other mechanical devices to reduce the handling of contaminated needles.

d. Work Practice Controls. These are techniques that reduce the likelihood of exposure by changing the way a task is performed. For example, employers must provide areas for handwashing. Other examples include never recapping needles with two hands, and not eating or drinking in areas of potential exposure.

e. Personal Protective Clothing and Equipment. All PPE must be provided at the employer’s expense. Examples include gloves, gowns, lab coats, face shields, masks, eye protection, etc. Employer enforced use of PPE is an OSHA mandate.

f. Labels and Signs. The OSHA biohazard warning label must be placed on all items containing blood or OPIM.

h. Recordkeeping. Employers must maintain
accurate and updated records for each employee who has had an occupational exposure. Employers must also maintain employee training records.

**i. Hepatitis B Vaccination**. Employers must offer the hepatitis B vaccine at no cost to all employees who may be potentially exposed to blood or OPIM.

**j. Post-exposure Follow-up**. Systems should be in place for the timely evaluation and management of exposed healthcare workers and for consultation with experts in the treatment of HIV should post-exposure follow-up be necessary.

**Disinfection and Sterilization of HIV in the Environment**

**General Disinfection**

Although HIV has been kept alive under certain laboratory conditions, medical authorities agree that the virus does not survive well in the environment. To put things into perspective, a 1 milliliter (ml) sample of blood from a person infected with hepatitis B virus may contain more than 100 million infectious viral particles. In a dried state, hepatitis B virus (HBV) can remain viable on surfaces for up to one week, or possibly longer. In contrast, the concentrations of HIV in the blood of infected persons are much lower. Neither HBV nor HIV is able to reproduce without a host cell, unlike bacteria or fungi which can reproduce without a host under suitable conditions.

Standard procedures currently recommended for disinfection and sterilization are adequate to control HIV. HIV has not posed any special requirements or procedures for the caregiver in order to achieve proper sterilization or disinfection within the healthcare environment.

**OSHA Recommended Disinfectants**

The Environmental Protection Agency (EPA) oversees the registration of antimicrobial products and determines which disinfectants are appropriate or approved. For antimicrobial disinfection, OSHA recommends cleaning with “an appropriate disinfectant” which includes:

1. a diluted sodium hypochlorite (bleach) solution (usually 1:10) made every 24 hours with a contact time generally considered to be the time it takes for the bleach solution to dry
2. an EPA registered anti-microbial product

including

a. sterilants (from List A*)
b. Tuberculocides (from List B*)
c. Products registered against HIV/HBV (from List E*) provided the surface has not been contaminated with agent(s) or volumes of or concentrations of agent(s) for which higher level disinfection is recommended. It must be noted here that certain products registered as HIV effective may not be effective against tuberculosis or HBV.
d. Sterilants/High Level disinfectants+ for equipment sterilization

*For specific chemicals in EPA List A, B, and E, see EPA website at www.epa.gov.

**Requirements for EPA-approved Products**

Products with an EPA-approved label section titled “Special Instructions for Cleaning and Decontamination Against HIV-1 and HBV of Surfaces/Objects Soiled with Blood/Body Fluids” require the following:

1. That PPE is worn by the worker
2. That all blood and organic material must be thoroughly cleaned before applying the disinfectant to ensure proper decontamination by the product
3. That disposal of the infected waste is in accordance with federal, state or local regulations
4. That the surface being decontaminated is left wet with the disinfectant for 30 seconds for HIV-1, and 10 minutes for HBV
5. That all disinfectants be used in accordance with EPA-approved label instructions.

When bloodborne pathogens other than HBV or HIV are of concern, OSHA continues to require use of EPA-registered tuberculocidal disinfectants or a sodium hypochlorite (bleach) solution diluted 1:10 with water.

**Medical Devices**

Certain commercial antimicrobials may be more compatible with particular medical devices or instruments to ensure they do not become corroded or damaged by extended use of 1:10 bleach solutions.

When preparing medical devices or instruments requiring disinfection or sterilization, they should be thoroughly cleaned first, and then exposed to antimicrobials as per manufacturer’s instructions. Care should be taken to adhere to the manufacturer’s special instructions as they apply to the compatibility of various devices or instruments with a particular antimicrobial cleaning agent. Healthcare workers should check with their individual facility policy for specific instruction on cleaning of routine and high level critical patient care devices and instruments. For more information on disinfection in healthcare institutions, please see the CDC’s publication Guidelines for Disinfection and Sterilization in Healthcare Facilities, 2008, available at www.cdc.org.

General guidelines for disinfection and sterilization of medical devices include emphasis on the following:

1. Sterilization of all equipment and/or devices that enter a patient’s vascular system or any other normally sterile area.
2. Sterilization whenever possible of all devices and equipment that contact mucous membranes but do not penetrate a patient’s body. If equipment cannot be sterilized before being used for each patient, it should undergo high level disinfection.
3. Cleaning with a detergent as recommended by the manufacturer for equipment or devices that do not contact a patient’s skin, or contact only intact skin.

**Blood Spills and Body Fluids**

In patient care areas where visible blood or body fluids are present, or spills of blood or body fluids have occurred, these should first be thoroughly cleaned, and then the area should be decontaminated with a disinfectant that is EPA approved as tuberculocidal. In instances where there are large spills of cultured or concentrated infectious materials, as may occur in a laboratory, the area should first be flooded with an EPA approved disinfectant and then decontaminated with additional fresh disinfectant solution. Gloves and PPE should always be worn during any cleaning and decontaminating procedures.

Usual recommendations for routine housekeeping are also applicable for HIV. Environmental surfaces such as walls, floors and similar surfaces are not associated with the transmission of infections. HIV is a fragile virus and has been shown to be easily killed by routine disinfecting techniques, so the frequency and duration of normally scheduled cleanings does not need to be altered to be effective against HIV.

**Laundry and Soiled Linen**

Although soiled linen has been shown to be a source of large concentrations of certain
pathogenic organisms, studies by the CDC have reported the risk of actual transmission of HIV from soiled linen to be negligible. In fact, the CDC has suggested that the use of hygiene principles coupled with common sense to be the guidelines for handling soiled linen. Those recommendations include:

1. Always wear gloves when handling soiled linen.
2. Always bag soiled linen on location. Do not sort or rinse soiled linen in patient care areas.
3. Always place linen that is soiled with blood or body fluids into bags that prevent leakage if it is to be transported.
4. Wash soiled linen in 71°C (160°F) water for 25 minutes using a suitable detergent.

**Infective Waste**

Hospital waste, which requires special precautions regarding disposal in all cases, includes microbiology laboratory waste, pathology waste and blood specimens or blood products. Generally, infective waste should either be incinerated or be autoclaved before it is disposed into a sanitary landfill. Bulk blood, suctioned fluid, and secretions may be carefully poured down a drain connected to a sanitary sewer. The sanitary sewer can also be used to dispose of other infectious wastes if they are capable of being ground and flushed into the sewer.

**Post-Exposure Prophylaxis**

**Statistics for Occupational Exposure**

The National Institute for Occupational Safety and Health (NIOSH) estimates that there are between 600,000 to 800,000 needlestick injuries each year, and that about half of these go unreported. Fortunately, the risk of HIV infection following needlestick is less than 1% (0.3% or 1 in 300 per CDC data), and the risk of infection from exposure in ways other than needlestick (such as a body fluid splash onto skin) is less than 0.1% (approximately 0.09% per CDC data). Nonetheless, seroconversion to HIV following occupational exposure is a possibility, and healthcare workers must protect themselves in all possible ways.

The CDC has determined that needle stick injury is most often the result of inadequate attention to detail by the healthcare worker. It is important to note that about one out of every four needle stick injuries involves IV therapy equipment. Many injuries result during disassembly, but they may also occur during any of the steps of the assembly/use/discard process, including insertion into drip chambers, injection ports, and IV bags. Healthcare workers should be aware that needles attached to discontinued IV lines are another potential hazard and should be handled with utmost care. Exposure risk is also increased by various factors such as deeper injuries, larger amounts of blood, hollow-bore needles, visible blood on a device, and needles used in patient arteries or veins. Occupational exposure should be considered as an urgent medical condition requiring immediate action.

**Steps to Take Following Occupational Exposure**

If exposure should occur:

1. The area should be immediately washed with soap and water. If a mucous membrane has been exposed, the area should be irrigated with copious amounts of water or saline. If a puncture or needlestick has occurred, bleeding should be induced by applying pressure to the area and it should be washed with soap and water. If eyes are affected, they should be irrigated with water, saline or sterile irrigants.
2. The name of the source patient, their HIV status and any information concerning their stage of disease, antiretroviral therapy, etc. should be obtained. If known, the source patient’s address and phone number, and the name of the source patient’s physician should all be obtained.
3. The exposure should be immediately reported to the department in charge of exposure management. Employers must then follow all state and federal reporting requirements, including those set forth by OSHA.
4. Immediate medical assessment should be obtained from a private physician or the emergency department so that, if indicated, antiretroviral medication may begin as soon as possible. Detailed questions concerning the exposure will be asked such as the cause of the wound, details of the procedure being performed, PPE worn, length of contact time, visible blood, etc.
5. A baseline blood sample should be obtained. If possible, a baseline blood sample should also be obtained from the source patient.

**Urgency of PEP**

Early post-exposure prophylaxis does work, and can reduce the risk of HIV infection tenfold. Should seroconversion occur despite prophylaxis, early suppression of the virus can lower the viral load and greatly slow the course of the disease. PEP should be initiated as soon as possible, preferably within hours of exposure. Data from the CDC has shown that the median time from exposure to initiation of PEP in healthcare workers has been 2 hours. Timely initiation of PEP should not be delayed by the need for expert consultation; rather the basic regimen should be started immediately and modified later if deemed necessary. Assistance in assessing HIV risk and management of PEP to HIV and other bloodborne pathogens can be obtained 24/7 from the National Clinician’s Post-Exposure Prophylaxis Hotline (PEPline) at 1-888-448-4911. The CDC advises that expert consultation be sought in the following cases:

1. Exposure report delayed greater than 24-36 hours
2. Exposure from an unknown source (example: needle in sharps container or laundry)
3. Known or suspected pregnancy in the exposed person
4. Breastfeeding in the exposed person
5. Resistance of the source person’s virus to antiretroviral agents
6. Toxicity of the initial PEP regimen

**Drugs Used for PEP**

Determining which drugs should be used for PEP is based on numerous factors including resistance (known or suspected) of the virus to antiretroviral drugs, drug toxicity profiles, and the frequency, severity, duration, and reversibility of drug side effects. A full four week (28 day) course of PEP is recommended. PEP may be a two-drug combination, or even a three to four-drug combination. Three and four drug regimens are considered when antiretroviral drug resistance is a factor. The CDC has stated that a two-drug regimen of PEP is a viable option primarily because the benefit of completing a full course of this regimen exceeds the benefit of adding a third or fourth drug and risking noncompletion of the regimen. For a list of side effects and toxicities associated with antiretroviral drugs used in PEP see Table 3.

**Complexity of HIV Care**

Many studies have shown that patients experience better outcomes when cared for by clinicians with HIV expertise. Because of the complexity of the HIV virus and its lengthy disease process, the HIV/AIDS patient should be under the care of an expert in...
HIV/AIDS is a multidimensional disease that present unique and challenging problems for both the caregiver and the patient. Persons infected with HIV will require physical care, as well as emotional support and counseling for a potentially fatal disease. Patient care will consist of medical, social, and psychiatric issues. Other potential issues may include substance abuse, high-risk behavior, social support, economic issues including insurance coverage, etc. Emotional responses and requirements will vary greatly from patient to patient, and will depend on factors such as patient attitude, inner strengths and beliefs, support from friends and family, and mental health status. The importance of sincere and dedicated support to HIV/AIDS patients cannot be over-emphasized.

Healthcare professionals will need to continually be aware of cultural issues that may affect a patient’s willingness to seek or continue with treatment and remain compliant with treatment plans. Awareness of potential prejudices toward certain behavioral practices will remain important. The healthcare worker must remember that it is not how a person became infected that is important, but rather that respect, hope, and compassion (instead of censure or condemnation) are the keys to the caring of the HIV/AIDS patient.

The healthcare requirements for the HIV/AIDS patient will vary as the disease progresses. Caregivers may be physicians, nurses, a home health aide, a family member, or even another person with HIV. Patients may go from feeling fine at times with no sign of outward illness to sudden hospitalization for an acute infection.

**Lab Tests for Assessment of HIV**

Medical care of the HIV/AIDS patient begins with a series of tests which will help with assessment of disease staging and choice of antiretroviral (ARV) drug therapy. Testing may include the following: HIV antibody testing; CD4 T-cell count; plasma HIV RNA (viral load); CBC; chemistry profile; transaminase; BUN and creatinine; UA; hepatitis A, B, and C testing; various STD testing; fasting blood glucose and serum lipids; and genotype resistance testing regardless of when ART will be initiated.

Two of the most important tests in evaluation of the HIV/AIDS patient are the CD4+ count and viral load test.

1. **CD4+ (T Cell) Count** is a primary indicator of immune function. It is done as an indirect cell count made by calculations based on total white blood cell count (WBC) and percentage of CD4+ T lymphocyte cells. Counts are reported as number of cells per mm$^3$. CD4 tests should be done at the same time of day and by the same laboratory each time. CD4 tests should not be done until several weeks after an infection or immunization.

2. **Viral Load tests** are a measure of the number of virus particles in the blood and are expressed as copies of RNA per milliliter of blood. Three types of tests are used to measure viral load: a) Polymerase Chain Reaction (PCR); b) branched DNA (bDNA); and c) Nucleic Acid Sequence Based Amplification (NASBA). Because different tests will yield different results...
class case, defer therapy based on clinical and/or psychosocial factors. The primary goal of ART is to reduce morbidity and mortality by restoring and preserving immunologic function. Other benefits of ART are suppression of viral load, reduction of HIV-associated inflammation, and reduction in HIV transmission.

### Classification and Efficacy of Antiretroviral Drugs

Antiretroviral drugs are classified based on the phase of viral replication inhibited by the drug. Categories include nucleoside and nucleotide reverse transcriptase inhibitors (NRTIs), non-nucleoside reverse transcriptase inhibitors (NNRTIs), protease inhibitors (PIs), fusion inhibitors (FIs), CCR5 antagonists, and integrase strand transfer inhibitors (INSTIs). Combination therapy of three to four antiretroviral drugs from different classifications is also known as highly active antiretroviral therapy (HAART). For a list of recommendations on specific combination drug regimens as well as side effects, see the HHS recommendations available at www.aidsinfo.nih.gov/guidelines/.

Efficacy of therapy depends on drug selection and many other factors including the patient's ability to adhere to strict regimens. Even the most compliant patients are challenged by the large pill burden, multiple daily doses, drug side effects, and lifelong commitment to treatment. Failure to adhere to strict regimens can result in viral drug resistance and treatment failure. Under the Investigational New Drug (IND) treatment program, the FDA has made additional clinical trial drugs available to patients with serious or life-threatening conditions for which no treatment is available.

### Hospital Care of the AIDS Patient

The AIDS patient who is admitted to the hospital will often be acutely ill, physically debilitated, and apprehensive. One of the most important roles of a caregiver at this time is to provide support and reassurance.

In the hospital setting, the CDC recommends isolation for the AIDS patient only when conditions such as infectious diarrhea, tuberculosis, or other communicable diseases are present.

Hospital care of the AIDS patient is planned on the basis of assessment in the same manner as with all other patients. Care will focus on the most critical problems, usually opportunistic infections and malfunctioning organs or organ systems. Treatment objectives include:

1. Identification and treatment of infections
2. Symptomatic relief
3. Identification and prevention of treatment complications
4. Compassion and emotional support

### Support for Individuals Infected With HIV

#### The Ryan White Programs

Ryan White, a 13-year-old from Indiana, contracted HIV following a blood transfusion used to treat his hemophilia. He was expelled by his Indiana middle school as a result. Ryan then became one of the youngest and most passionate advocates for people with HIV/AIDS and worked to promote public education, research, and funding until his death in 1990 at age 18. The Ryan White Care Act was passed by Congress shortly after his death, and has been reauthorized several times. It is now known as the Ryan White HIV/AIDS Program. Today, the Ryan White Programs are the largest service providers to people with HIV/AIDS. For more information on these programs, please see the U.S. HHS Health Resources and Services Administration website available at: http://hab.hrsa.gov/index.html.

#### The HOPWA Program

The Housing Opportunities for Persons with HIV/AIDS (HOPWA) Program is managed by the U.S. Department of Housing and Urban Development (HUD) and was created to meet the housing needs of persons who have AIDS (along with their families) and have limited income. Qualifying agencies funded by HOPWA can help eligible persons locate, acquire, and finance housing. Many other supportive services are included under HOPWA such as locating care providers, nutritional services, adult and child day care, drug and alcohol abuse treatment and counseling, daily living assistance, etc. For more information see the U.S. Housing and Urban Development website located at: http://portal.hud.gov/hudportal/HUD.

#### Other Programs

Medicare and Medicaid are two government-funded programs that provide health insurance coverage to people with HIV. The Supplemental Security Income (SSI) and the Social Security Disability Insurance (SSDI) programs are two other important sources of support. Additional information can be found...
End-of-Life Care

Terminal or palliative care for the AIDS patient is a process aimed at relief of suffering and improvement of quality of life for both the patient and their loved ones. Over the years, this care has shifted from the hospital environment to the home and hospice settings. End-of-Life care involves the following:
1. Pain and symptom management
2. Communication about illness and prognosis
3. Psychosocial and spiritual support
4. Coordination of patient care

For more information on palliative care, please see our listings of courses entitled “End-of-Life Care”.

Challenges in HIV Care

HIV/AIDS is a disease that has presented unique social challenges compared to other diseases. Patients infected with HIV are generally younger, and are possibly members of minority groups or groups that have at times been ostracized or disregarded. They are likely to have loved ones who are also infected with HIV, and they may have previously experienced the death of a loved one or close friend who has died from HIV. HIV/AIDS patients face the overwhelming fact that they have a chronic, incurable disease with a long and unpredictable course.

Some healthcare providers have been reluctant to care for and have even refused to treat patients with HIV/AIDS. Conversely, seropositive healthcare providers have also been targets of much discrimination, resulting in both personal and professional losses.

Patient access to ART and comprehensive care are other challenges faced by providers in settings that are resource limited. Patients may also have limited access to many other necessary drugs, such as opioids for pain management.

Anyone caring for the HIV/AIDS patient will face significant challenges regardless of their area of practice. Through education, awareness, and funding of this complex disease, attitudes and behaviors can be changed so that caregivers will be able to help patients reach a successful level of well-being.

HIV and the Law

Protection of Persons with HIV/AIDS

Individuals with HIV/AIDS are protected from discrimination on the basis of their disability by section 504 of the Rehabilitation Act of 1973, and by Title II of the Americans with Disability Act of 1990 (ADA). These laws are enforced by the Office of Civil Rights (OCR) of the United States HHS. Section 504 prohibits discrimination by healthcare and human service providers who receive federal funding such as Medicare, or other types of federal assistance. In 1998, the U.S. Supreme Court ruled that HIV-infected people are protected by the federal ban on discrimination against the disabled even if they suffer no symptoms of HIV. The ruling went against a Maine dentist who told an HIV-infected patient that he would fill her cavity in a hospital, but not in his office. In this landmark case, the woman sued her dentist under the ADA and won. Under ADA law, discrimination may occur if providers exclude a person with HIV from participating in a service, if providers deny benefits or medical treatment, or if providers delay treatment or services solely because a person has HIV/AIDS.

Variation of State Laws

Because state laws concerning HIV vary greatly, healthcare providers must be informed of their individual state laws and any changes that are made. The National HIV/AIDS Clinicians’ Consultation Center provides a compendium of state HIV testing laws that is updated periodically, and is available at http://www.nccc.ucsf.edu/.

Informed Consent

When an individual is tested in any way for HIV, whether it is to determine status or to monitor the progress of active infection, he has the right to informed consent. Individuals must give their express consent to be tested and must be informed of the reason for testing. If requested, complete results and an explanation of the testing must also be given. Individuals must also consent to be treated for HIV. Patients in hospitals cannot be tested without consent unless the patient needs emergency treatment. When a hospitalized patient is mentally ill, consent for testing must be given by a family member.

Compulsory Testing of HIV

Mandatory HIV testing is required for the following:
1. all blood and organ donors
2. all active duty military personnel
3. certain federal or state prisoners, such as those convicted of sex crimes
4. In certain states, newborns born to mothers of unknown HIV status

Criminal Transmission of HIV

In the United States, and many other countries, it is a crime to intentionally infect another person with the HIV virus. Failure to disclose a positive HIV status to one’s partner when engaging in sexual intercourse is considered a criminal offense, and can result in successfully prosecuted charges of attempted manslaughter or manslaughter. In certain states, spitting at another person or the transmission of HIV through infected body fluids, especially when the target person is a prison official, is also a criminal offense. The donation of HIV infected blood, tissues, or an organ is also grounds for criminal prosecution when a person is aware of their positive status.

Preventing Improper Disclosure/Confidentiality

Individuals diagnosed with HIV/AIDS will, at some point, face issues regarding public knowledge of their HIV status. HIV positive persons are not required by law to reveal their status to employers, co-workers, friends, or family. The only exceptions are spouses and sexual partners, who must be informed of an individual’s positive HIV status. Although no laws require HIV status to be revealed to medical providers, it is important to both the individual and the provider for infected individuals to reveal their positive status so optimal medical care can be given and the provider can be diligent about safety precautions.

Because HIV infection is a public health concern, providers who diagnose HIV and AIDS must report all diagnosed cases to their local health department for surveillance purposes. All reports are held confidential.

Stringent confidentiality laws have been enacted requiring medical personnel to keep an individual’s HIV status in the strictest confidence. These laws were passed to protect HIV positive persons from stigma, discrimination, persecution, and unfair treatment. Information about a person’s HIV status can only be disclosed with permission of the patient or with permission of the parent if the patient is a minor. In the case of a deceased patient, permission must be obtained from the
patient’s next of kin. Disclosure of a person’s status without express consent could result in civil liability and employer disciplinary action. Confidentiality applies to all patient medical records, and all diagnostic procedures and lab results as well.

When consent is needed to disclose health information, it must be in writing and must specifically state what information will be released, to whom it will be released, and the length of time the consent is valid. When HIV-related data is released, a statement prohibiting the receiving party from further disclosing the information without the patient’s consent should be included.

Final Considerations

Treatment of patients when personal health is a risk factor has been a topic of much debate over the years. In their Position Statements, Risk and Responsibility, the American Nurses Association (ANA) has stated that “Nurses are challenged to thoughtfully analyze the balance of professional responsibility and risk...” The ANA further states, “In some situations, the nurse may identify a degree of personal risk in caring for a patient and must differentiate between caring for the patient as a moral obligation or as a moral option.” Additionally, in the Code of Ethics for Nurses with Interpretive Statements, Provision 8.1, the ANA has stated specifically, “The nursing profession is committed to promoting the health, welfare, and safety of all people.”

When care of the HIV patient is the chosen path, the bottom line for consideration becomes education and preparedness. If providers in healthcare facilities and individual caregivers are educated and equipped to handle patients with infectious disease, a level of confidence is obtained in caring for these patients. It is the duty of the healthcare professional to provide treatment for any patient in need. Armed with the confidence afforded by education and preparedness, caregivers will be able to help patients with HIV/AIDS lead successful lives in spite of such a potentially devastating disease.

References


Additional References available upon request.
Florida’s Omnibus AIDS Act is vital for healthcare professionals to understand. This legislation corresponds closely with federal guidelines and accepted medical practice. The Omnibus AIDS Act has undergone several significant changes since its passage in 1988, requiring HIV infection reporting, “streamlining” HIV testing by eliminating mandatory counseling in most settings, providing for “rapid” HIV tests, and requiring “opt out” testing for pregnant women. For the most part, however, these changes have “fine-tuned” the Act, leaving its basic structure intact.

Violations are heavily penalized, and good-faith efforts at compliance do not ensure anyone against legal difficulties. The principal methods for dealing with the HIV/AIDS epidemic as specified in the Florida Omnibus AIDS Act are education and testing that is informed, voluntary, and confidential. Florida legislation stipulates four reasons for deviation from traditional educational and testing methods:

- It is assumed that involuntary and non-confidential testing may drive HIV-infected individuals underground.
- The government cannot constitutionally investigate or regulate much of the private behavior that permits the transmission of HIV.
- Because there is no effective cure for AIDS, there is less incentive to enforce mandatory testing and notification of individuals who have been exposed.
- The excessively anxious and sometimes intensely hostile public reaction.

More changes to Florida’s HIV/AIDS laws will occur as scientific knowledge, medical diagnosis and treatment, and public perceptions develop. Over time, compliance with the Omnibus AIDS Act, now in existence for more than two decades, increasingly has become a routine part of meeting the public’s health needs.

For more information on the Omnibus AIDS Act visit: http://www.doh.state.fl.us/diseaseCtrl/aids/legal/Omnibus_2010.pdf

Resources in Florida
Florida Department of Health, Bureau of HIV/AIDS
(850) 245-4334 http://www.floridaisds.org/
Florida HIV/AIDS Hotlines English: 800-FLA-AIDS (800-352-2437)
       Spanish: 800-545-SIDA (800-545-7432)
       Creole: 800-AUDS, 101 (800-243-7101)
       TDD/TTY: 888-503-7118

Kentucky HIV Law

Section 7. Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) Surveillance.

(1) Physicians and Medical Laboratories shall report:
   (a) 1. A Positive test result for HIV infection including a result from:
        a. Elisa;
        b. Western Blot;
        c. PCR;
        d. HIV antigen; or
e. HIV culture;
   2. CD4+ assay including absolute CD4+ cell counts and CD4+%;
   3. HIV detectable Viral Load Assay; and
   4. A positive serologic test result for HIV infection; or
   (b) A diagnosis of AIDS that meets the definitions of AIDS established within the Centers for Disease Control and Prevention (CDC) guidelines and reported in the:

- 1. “Adult HIV/AIDS Confidential Case Report Form”; or
- 2. “Pediatric HIV/AIDS Confidential Case Report Form”.

(2) An HIV infection or AIDS diagnosis shall be reported within five (5) business days and, if possible, the Adult HIV/AIDS Confidential Case Report Form or the Pediatric HIV/AIDS Confidential Case Report Form.
   (a) A report for a resident of Jefferson, Henry, Oldham, Bullitt, Shelby, Spencer, and Trimble Counties shall be submitted to the HIV/AIDS Surveillance Program of the Louisville-Metro Health Department.
   (b) A report for a resident of the remaining Kentucky counties shall be submitted to the HIV/AIDS Surveillance Program of the Kentucky Department for Public Health, or as directed by the HIV/AIDS project coordinator.
   (3) A report for a person with HIV infection without a diagnosis of AIDS shall include the following information:
      (a) The patient’s full name;
      (b) Date of birth, using the format MMDDYY; and
      (c) Gender;
      (d) Race;
      (e) Risk factor, as identified by CDC;

(f) County of residence;
(g) Name of facility submitting report;
(h) Date/type of HIV test performed;
(i) Results of CD4+ cell counts and CD4+%;
(j) Results of viral load testing;
(k) PCR, HIV culture, HIV antigen, if performed;
(l) Results of TB testing, if available; and
(m) HIV status of the person’s partner, spouse or children.

(4) Reports of AIDS cases shall include the information in subsections (1) - (3) of this section; and
   (a) The patient’s complete address;
   (b) Opportunistic infections diagnosed; and
   (c) Date of onset of illness.

(5) (a) Reports of AIDS shall be made whether or not the patient has been previously reported as having HIV infection.
   (b) If the patient has not been previously reported as having HIV infection, the AIDS report shall also serve as the report of HIV infection.

For more information visit http://lddha.org/Handouts.pdf
HIV/AIDS: Three Decades of an Epidemic