



HIV / AIDS

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When the first case of AIDS was reported in the USA in 1981, no one could have foreseen the impact of the HIV epidemic throughout the world. The prevalence of HIV/AIDS in homeless populations is unknown. Various studies have shown an incidence of HIV/AIDS to be from 3-20%. Homelessness itself is not a risk factor for HIV infection, although many homeless individuals are at risk because survival on the streets can include unprotected sex and injection drug use.

HIV stands for the Human Immunodeficiency Virus. This virus severely damages a person's immune system and impedes the body's ability to fight certain infections, cancers, and other diseases. When this virus progresses and causes enough damage, the person develops AIDS, or Acquired Immune Deficiency Syndrome. At this stage the immune system has been compromised and can no longer fight off life-threatening infections and cancers.

As the HIV/AIDS epidemic spreads throughout the USA and the world, the number of homeless persons diagnosed with HIV continues to grow. More than 790,000 cases of AIDS have been reported in the USA since 1981, and as many as 900,000 Americans may be infected with the virus. The epidemic is growing fastest among minority populations and is the leading cause of death among African-American men aged 25-44.

Although many advances have been made in treatment, HIV/AIDS remains a serious illness that presents difficult challenges to persons infected,

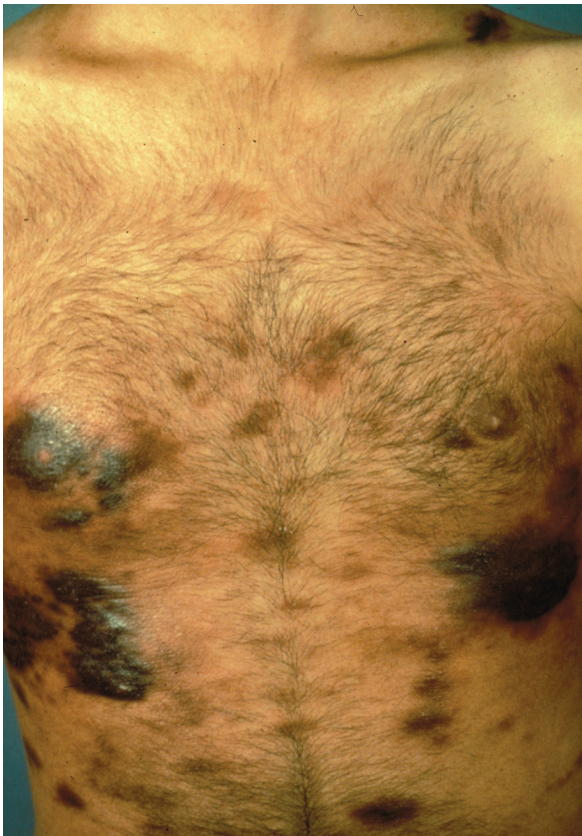
especially to those without safe and stable homes. The medications available for treatment are complicated and have many side effects. Shelter personnel have an important role in providing medical and social support to people infected with the virus. Understanding, patience, and compassion from the shelter staff are absolutely essential.

In addition to dealing with often overwhelming medical complications, a person infected with HIV must live with the stigma of the disease while coping with other psycho-social issues, such as child custody, partners who may or may not be infected, substance use, mental illness, and keeping a roof over their heads. Confidentiality, which is never easy in a shelter setting, is particularly important around this diagnosis.

Transmission

HIV is transmitted through person-to-person contact with blood or other body fluids such as semen, vaginal secretions, and breast milk. Common ways to transmit the virus include: sexual

Seborrheic Dermatitis in HIV/AIDS. This woman presented to a shelter clinic with weight loss and this flare of seborrheic dermatitis. Subsequent studies showed her to be HIV positive with a CD4 count of 25. Photo by Jon Fuller MD



(top)
Kaposi's Sarcoma.
This man presented with lymphadenopathy, fatigue, and these raised, violaceous skin nodules. The initial flat macules soon developed into elevated papules and coalesced into these nodules.
Photo by Irwin Freedberg MD

(bottom)
Kaposi's Sarcoma of the Ear.
Clinicians should be careful to examine all areas of the skin for unusual presentations of Kaposi's sarcoma. This man had a growth in his ear, and biopsy showed the characteristic changes of Kaposi's.
Photo by Jon Fuller MD

contact; sharing needles or other drug paraphernalia; and mother to child during pregnancy, birth, or breast-feeding. Before donated blood was tested and treated, many people (especially individuals with hemophilia) contracted HIV from blood transfusions.

Unsafe sexual practices allow for transmission of the virus through the lining of the vagina, vulva, penis, rectum, or mouth during sex. HIV can be spread to a sexual partner whether the partner is of the same sex or opposite sex. HIV medications do not eliminate the transmission of the virus from one person to another. Even if a person has a low level of virus in the blood stream, there can be a high level in other parts of the body and therefore the virus can still be spread through sexual contact and through sharing needles.

In the USA all blood products are treated and screened so that the risk of transmission is extremely low. In other countries, where the blood may not be screened as carefully, HIV can still be spread through blood transfusions

Injection drug users can transmit HIV through needles or syringes that have been used by someone who has the virus. Cocaine users who share contaminated drug paraphernalia can transmit the virus through the breakdown in the lining of the nose.

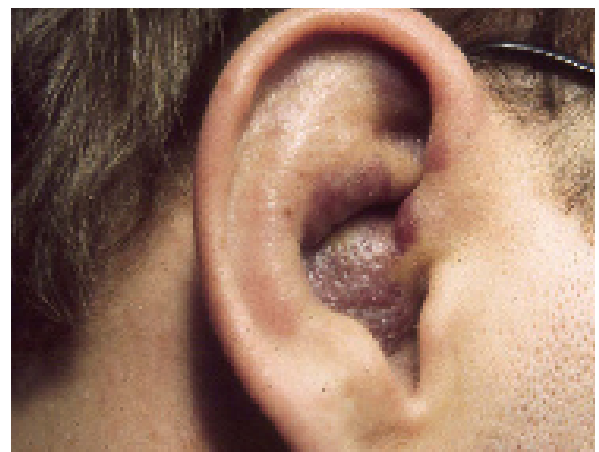
Women who are HIV infected can transmit the virus to the baby, both during the pregnancy and during delivery. HIV can also be transmitted to the baby through breast-feeding. In the USA, pregnant women with HIV infection are now treated with medications during pregnancy, and the babies are treated after delivery. The babies of women who take HIV medications during pregnancy have much less risk of getting infected, but the risk is still present.

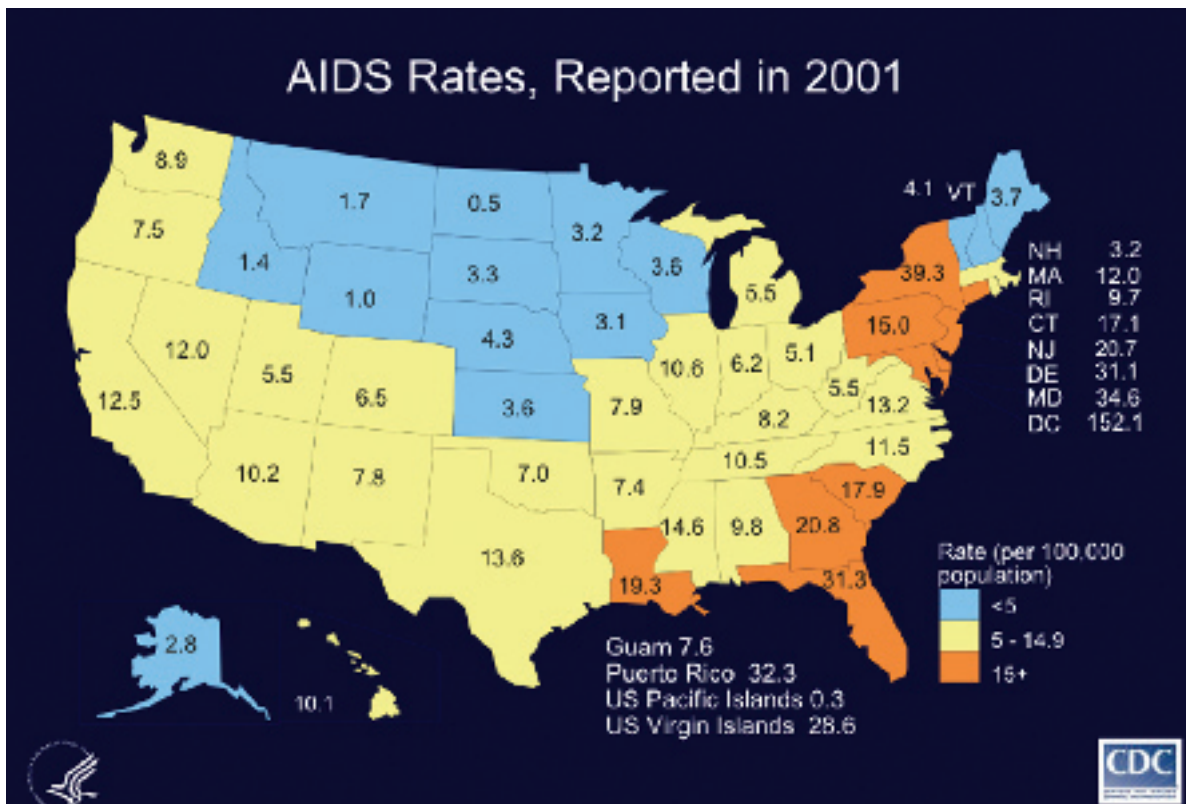
HIV is not transmitted through casual or household contact. Neither is HIV transmitted through sweat, tears, urine, or feces. While HIV can be found in saliva, scientists have found no evidence of transmission through saliva. There should be no risk to shelter workers or guests if men or women with HIV live or eat at the shelters.

Prevention and Control

Prevention is the key to control of HIV/AIDS. Significant advances have been made over the past two decades in the prevention of the spread of this virus, but this momentum should not be lost.

The role of shelter staff in the prevention of HIV is critical and cannot be underestimated. Education and prevention materials are available to shelters through local agencies and some Internet sites, e.g. www.thebody.com and Project Inform (www.projectinform.org). These materials are useful tools to educate both shelter staff and guests about ways to prevent the spread of HIV and are usually available in both Spanish and English. Shelters should make these educational materials readily available along with easily accessible condoms, dental dams, and bleach kits. Educational materials should be provided in multiple languages and should be easily understood by those with limited literacy skills.





The AIDS Epidemic in the USA. AIDS cases per 100,000 persons in each state as of December, 2001. Courtesy of the CDC

Safer Sex

Abstinence is the only sure way to avoid passing HIV or other sexually transmitted diseases (STDs) to a partner. No sexual contact is completely safe even with the use of condoms and other barriers. Even oral sex has some risk of spreading the HIV virus. Condoms can break or fall off. For these reasons, HIV counselors use the term “safer sex” rather than “safe sex”.

In order to decrease the risk of passing HIV or other STDs to partners, everyone engaging in any sexual act is urged to use a barrier such as a condom, female condom, or dental dam. Condoms are placed over the penis during penetrating sex – oral, vaginal, or anal. A woman can use a female condom if her partner will not use a male condom. A dental dam is a piece of plastic used to prevent contact during oral sex performed on a woman. Any piece of plastic that is a barrier can be used. If a dental dam is not available, Saran Wrap™ or similar products can be used. Nonoxynol 9, a very commonly used spermicidal agent, is no longer recommended. Studies have shown that this agent irritates the lining of the vagina or anus and can lead to an increased risk of HIV transmission. Safer sex should be practiced whether or not a partner is known to have HIV. Unfortunately, many individuals are unaware of their HIV infection.

Safer Needle Use

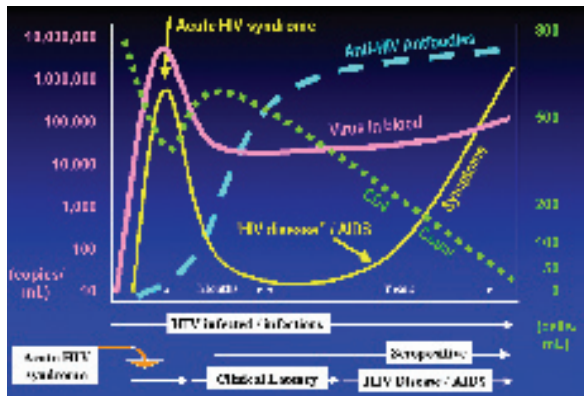
Sharing needles is a very common mode of transmission of this virus. Any individual who shares needles or other drug “works” with a person infected with HIV has a very high risk of HIV infection. While the best prevention is undoubtedly the treatment of addiction, the reality is that substance abuse is a chronic and relapsing illness and not all injection drug users will become drug free. Therefore, good public health practice should emphasize the education of injection drug users about needle exchange programs whenever available in the community. In more and more communities, programs have been developed that will exchange used syringes for clean ones in order to help reduce the spread of HIV and other diseases. A growing body of evidence has shown that such programs are very effective in reducing the transmission of HIV among injection drug users.

Use of Other Drugs

People who use cocaine must be aware that they can spread HIV by sharing straws or other tools with someone infected with the virus. Cocaine, alcohol, methamphetamines, and other drugs can affect a person’s ability to make clear decisions and easily lead to unsafe sex and sharing of drug works.

HIV/AIDS. This chart is complicated but helpful in understanding the natural course of this infection. Note the high level of virus in the blood and the absence of HIV antibodies during acute HIV syndrome.

Courtesy of Jon Fuller MD



Daily Activities

HIV is not spread by casual contact, including touching, hugging, and even sleeping in close quarters. People infected with HIV can share in all normal activities in a shelter without the risk of infecting staff or other guests. Shelter personnel should use universal precautions whenever cleaning spills of bodily fluids. Individuals should not share razors, toothbrushes, or any sharp object that could have come in contact with blood.

Diagnosis

Over the years, remarkable advances have been made in the technology involved in the testing for HIV. Prior to 1985, no blood test was available for HIV and the diagnosis of AIDS was a strictly clinical one. Otherwise “healthy” individuals who became ill with Kaposi’s sarcoma, *Pneumocystis carinii* pneumonia, or other illnesses that occurred only in severely immunocompromised patients, were said to have an “acquired immunodeficiency syndrome” or AIDS.

In addition to the routine blood tests for HIV that have been available since the mid-1980s, an individual’s saliva can now be checked for antibodies to the virus. Both of these tests can take up to 2 weeks for results to be returned. If the initial test is positive, the blood or saliva is sent to a reference lab for a confirmatory test. These laboratory tests indicate whether an individual has been exposed to HIV but cannot determine how sick an individual is or how advanced the HIV disease has become. Other tests, as well as a thorough history and complete physical examination, are necessary to determine the status of the HIV infection.

The Centers for Disease Control and Prevention have approved another test that can get results to the person as quickly as 20 minutes after testing. This finger stick requires a very small drop of blood for the test to be performed. This result is considered preliminary until a confirmatory test is done.

Counseling, both before testing and after giving the results, is critical and must be given the highest priority. Pre-test counseling helps to educate the person being tested about prevention of future infection, even if the test result is negative; post-test counseling offers needed support and education to individuals who test positive, as these individuals must cope with a chronic and often devastating illness.

Any person who tests positive for antibodies to HIV should be referred for accessible and available medical care in order to undergo more extensive evaluation, including tests and a physical examination.

Two blood tests are particularly important to assess the status of the person’s immune system:

- (1) CD4 T-lymphocyte cell count. These white blood cells are a subset of T lymphocytes and one of the body’s main immunologic tools to prevent certain types of infection and cancer. HIV targets these cells and gradually destroys them. By measuring the number of these cells in the blood, health care practitioners can tell how much damage has been done to the immune system;
- (2) HIV “viral load” directly measures the amount of virus circulating in the bloodstream. This test is utilized to measure the effectiveness of antiretroviral medications, and the goal is to reduce the viral load as much as possible.

Clinical Signs and Symptoms

“Acute HIV infection” is a syndrome that develops a few days to a few weeks after exposure to the virus. This non-specific syndrome is typically a “flu-like illness” accompanied by fevers, headache, sore throat, and enlarged lymph nodes. Any person with this syndrome who has a history of recent high-risk behavior, such as injection drug use or unsafe sex, should immediately receive a thorough medical evaluation. Important studies over the past few years have demonstrated that prompt treatment with antiretroviral medications may improve the ability of the body’s immune system to control HIV and favorably alter the course of the disease.

Persons with acute HIV syndrome are highly infectious and have a large burden of virus in the bloodstream. The HIV viral load is elevated, but the tests for HIV antibodies are usually negative at this early stage of infection when the body has not yet had time to generate an immune response and form these antibodies. The signs and symptoms of acute HIV infection usually disappear within a week to a month.

After the initial infection, the person with HIV may have no signs or symptoms of illness for months or years, sometimes as long as 10 years. Even though an individual does not feel sick, the virus continues to multiply and gradually kills certain T lymphocytes, known as CD4 cells, that are important to the body's immune system. Since these cells often decrease before any signs or symptoms are present, the measurement of the CD4 cell count has become a mainstay in monitoring and treating HIV disease. The normal CD4 count is greater than 500 cells/ml³ (per cubic milliliter of blood). Some early signs and symptoms may be present as HIV infection progresses, including: lack of energy; fevers and night sweats; weight loss; frequent yeast infections (oral or vaginal); flaky scaly skin; memory loss; and recurrent herpes virus infections of the mouth or genital or anal area. Shingles or herpes zoster virus can also be an early sign of HIV progression.

More serious infections can ensue as the CD4 count falls and the immune system becomes more compromised. These "opportunistic" infections (OIs) take advantage of the person's damaged immune system. Some examples include the following:

- *Pneumocystis carinii* pneumonia (PCP) is one of the most common and most dangerous of these OIs. *Pneumocystis carinii* can cause a very serious pneumonia when the CD4 cell count falls below 200 cells/ml³. The typical signs and symptoms of PCP include a cough accompanied by high fevers and shortness of breath;
- Toxoplasmosis is a single-celled parasite that can be found in cat feces (cat litter) or in partially cooked pork, lamb, or venison. In persons with poorly functioning immune systems, it can infect the brain and cause severe headaches, seizures, fevers, and stroke-like symptoms. People with HIV are at risk for this infection when their CD4 cell counts fall below 100;
- *Mycobacterium avium* complex (MAC) is due to a bacteria related to tuberculosis that causes weight loss, fevers, weakness, and gastrointestinal symptoms. It may infect persons with CD4 cell counts less than 50;
- *Mycobacterium tuberculosis* (TB), both pulmonary and extra-pulmonary, is more easily contracted by persons with HIV than those with normal immune systems.
- As HIV progresses, people can develop many infections caused by viruses, bacte-

ria, and parasites. They are also at greater risk of developing some cancers, such as lymphoma (cancer of the lymph nodes), Kaposi's sarcoma, and cervical and anal cancer.

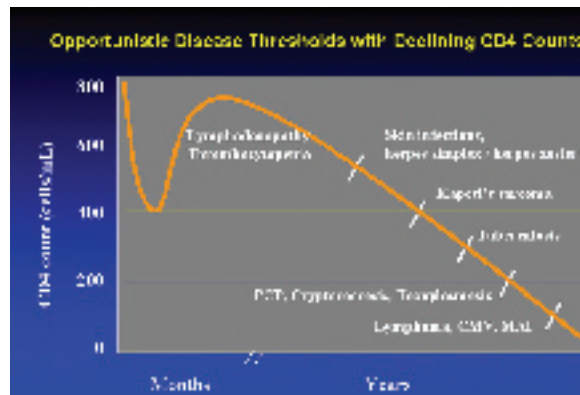
Diagnosis

The diagnosis of AIDS in a person with HIV infection is made when: (1) the CD4 cell count has dropped below 200; or (2) the individual has developed one of the many infections or cancers associated with HIV infection.

Treatment

The treatment of HIV disease involves education, prevention, and medications. The optimal treatment for HIV requires a multidisciplinary team approach in which doctors, nurse practitioners, physician assistants, mental health clinicians, nurses, substance abuse counselors, nutritionists, and case managers work together to care for each patient.

Infected individuals must be educated to avoid high-risk behaviors and prevent the spread of the virus to others. In addition, infected individuals who continue to engage in high-risk behaviors can receive repeated inoculums of virus and risk infection with another strain of HIV.



Opportunistic Disease Thresholds with Declining CD4 Counts. This chart shows the types of opportunistic infections that can occur as HIV destroys the immune system and the number of CD4 cells falls. Courtesy of Jon Fuller MD

Living with HIV without safe and stable housing creates an emotional roller coaster, especially for those persons also coping with substance abuse and mental illness. Virtually all individuals struggle with the stigma of HIV in our society and homeless persons already face a profound social isolation. Rejection by a partner often follows the diagnosis of HIV infection. Many persons infected with HIV have struggled with childhood and adult sexual and physical abuse, and coping with this infection often rekindles those memories. All persons with HIV infections should have ready access to sensitive mental health clinicians.

The relationship between the person infected with HIV and the health care clinician (or team) is paramount. This relationship must be based on mutual respect and trust, and the treatment plan must be mutually agreed upon and reflect the individual's social, cultural, racial, economic, and spiritual background.

Medications for the Treatment of HIV/AIDS

The advances in the treatment of HIV/AIDS have been dramatic, although we still have no cure for this virus. The advent of highly active anti-retroviral therapy (HAART, or simply ART) in the mid-1990s has revolutionized the treatment of HIV/AIDS, but it is very expensive and requires each individual to take several medications (usually 3-4) from one to three times each day. These medications also have several potentially serious side effects. The other danger is that the virus can develop resistance to one or more of the HAART medications.

Each patient who begins ART must become thoroughly familiar with each of the prescribed medications, including the proper timing and frequency of administration, as well as the common side effects. Some important considerations are:

- social supports – does the person have a supportive family or friends? Does the person's spouse or partner know of the diagnosis? Is the partner able to help with the treatment?;
- commitment – does the person understand that taking medications for HIV/AIDS will probably be a lifelong commitment necessary for the control of this chronic disease?;
- “medical home” – does the person have a medical clinician, or health care team, skilled in the treatment of HIV/AIDS? Is there someone on the team with whom

the person feels comfortable and safe when talking about personal health and other issues?;

- safety and privacy – does the person have a safe place for the storage of medication? Is there sufficient privacy for taking the medications? Many homeless persons fear that just being seen with these medications allows others to know about their HIV infection.

These issues are all very important for clinicians to address with their homeless patients. ART therapy should be considered lifelong and requires many lifestyle changes that can be very challenging for those without homes. Proper administration of the medications is critical, as the virus can more easily develop resistance if doses are skipped or individuals take “drug holidays”. Once the virus develops resistance to a medication, the person may not be able to use that medication again. Whenever side effects appear, persons should notify the clinician immediately. The medications should not be discontinued unless instructed by the clinician. Fortunately, most side effects resolve over time. Thousands of people take the medications without developing side effects.

During the last ten years, researchers and scientists have developed many new medications to treat HIV infection. Used in combination, these medications are very potent and can lead to remarkable improvements in a person's immune function and overall health. Nucleoside reverse transcriptase inhibitors (NRTI's) prevent viral replication within the cell. Non-nucleoside reverse transcriptase inhibitors (NNRTI's) work in a similar way to the nucleoside inhibitors. A third class of medications prevent viral replication at a later stage and are called protease inhibitors (PI's). A recently approved class of drugs called fusion inhibitors keeps the HIV virus from entering the cell.

Some of the most frequently used HIV medications are listed in the table at the end of this chapter.

Combivir™ is a combination of zidovudine and lamivudine. Trizivir™ combines zidovudine, lamivudine and abacavir.

Doctors and medical providers should be aware of the patient's homelessness and prescribe drugs appropriate for those struggling to live in shelters or on the streets. For example, drugs that require refrigeration or require food for absorption should be avoided whenever possible. Regimens that involve several pills taken multiple times per day

Oral Hairy Leukoplakia. This lesion of the tongue is usually asymptomatic and indicates immunocompromise and a poor prognosis. The white, irregular lesions can appear as columns on the lateral surface of the tongue. Photo by Irwin Freedberg MD



are very difficult for homeless persons, and the goal should be to prescribe medications that involve few pills that can be taken once or twice a day. Newer medications have made this possible, and many regimens involve medications taken twice a day, while at least one ART therapy is taken once a day. Some communities offer directly observed therapy of HIV medications in drop-in centers, methadone clinics, or medical clinics.

When to Start Medications

Federal guidelines recommend offering medical treatment for HIV infection when the CD4 count is between 200 and 350. The goal is to control the replication of the virus and delay the onset of opportunistic infections.

Translating this recommendation into reality is often complicated, as each treatment plan must address the special needs of each individual. Is the person ready and able to take medications every day at scheduled times? Does the person suffer from an underlying mental illness or abuse substances that hinder the ability to take 3 or more different medications? Does the HIV infected person have access to clinicians and support staff who will be available in the event of side effects of medications? Does the person have a safe place to store medicines? The medical team and the person with HIV infection should carefully discuss all these issues and make a mutual and informed decision concerning the best time to start taking medications.

The importance of offering HIV medications to pregnant women cannot be overemphasized. This practice has significantly decreased the number of babies born with HIV infection.

Prevention of OIs and AIDS-Related Cancers

Individuals with CD4 counts below certain levels must take medications to prevent the most common opportunistic infections. For example:

- CD4 = 200 or less, individuals should take trimethoprim-sulfamethoxazole (Bactrim™, Septra™) or dapsone (Avlosulfon™), or atovaquone (Mepron™) to prevent *Pneumocystis carinii* pneumonia (PCP);
- CD4 = 100 or less, medication should be taken to prevent toxoplasmosis. The preferred medication is trimethoprim-sulfamethoxazole (Bactrim™, Septra™). If the person cannot tolerate that medication, then dapsone (Avlosulfon™) with pyrimethamine (Daraprim™) and folic



Molluscum Contagiosum. The papules are pearl-colored with central umbilications, and often involve the eyelids. This rash resolved three months after the initiation of ART.

acid (Leukovorin™), or atovaquone (Mepron™) with pyrimethamine (Daraprim™) and folic acid (Leukovorin™) can be used.

- CD4 = 50 or less, medication to prevent mycobacterium avium complex (MAC), a bacteria related to tuberculosis is added. The preferred medication is azithromycin (Zithromax™) once a week or clarithromycin (Biaxin™) daily.

The federal guidelines for treatment of HIV and opportunistic infections are available online at www.aidsinfo.nih.gov.

Summary

Human immunodeficiency virus is a retrovirus that infects humans through sexual contact, shared drug paraphernalia, mother-to-child transmission, and blood transfusions (primarily in less developed countries). The virus attacks the immune system, damaging cells that fight infections and cancers.

Blood tests are available to diagnose the presence of antibodies to the virus, and these tests indicate that a person is infected with the virus. Further tests can assess how advanced the disease is. These tests are called CD4 counts and HIV viral load measurements. These tests are critical because early involvement in medical care can lead to greatly improved outcomes.

Although HIV medications are difficult to take and can cause side effects, they can allow a person to live a much longer life. Much like diabetes or high blood pressure, HIV has become a chronic disease that, with diligence, can be managed. Homeless people have a particular challenge in managing this disease, but success is very possible with support from their health care providers and others. Everyone infected with this virus, regardless of income or housing status, deserves the best that medicine has to offer.

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Shelter personnel play an important role facilitating access to medical, psychosocial, and in providing counseling and support, as well as supportive care. ■

HIV Medication List		
Generic	Brand	Cost
NRTI's		
zidovudine	Retrovir, AZT	\$\$\$\$\$
stavudine	Zerit, d4T	\$\$\$\$\$
lamivudine	EpiVir, 3TC	\$\$\$\$\$
didanosine	Videx, ddI	\$\$\$\$\$
abacavir	Ziagen, ABC	\$\$\$\$\$
tenofovir	Viread, TDF	\$\$\$\$\$
abacavir+lamivudine+zidovudine	Trizivir	\$\$\$\$\$
emtricitabine	Emtriva, FTC	\$\$\$\$\$
lamivudine+zidovudine	Combivir	\$\$\$\$\$
zalcitabine	Hivid, ddC	\$\$\$\$\$
NNRTI's		
nevirapine	Viramune, NVP	\$\$\$\$\$
efavirenz	Sustiva, EFV	\$\$\$\$\$
delavirdine	Rescriptor	\$\$\$\$\$
Protease Inhibitors		
nelfinavir	Viracept, NFV	\$\$\$\$\$
saquinavir	Fortovase, InVivase, SQV	\$\$\$\$\$
indinavir	Crixivan, IDV	\$\$\$\$\$
ritonavir	Norvir, RTV	\$\$\$\$\$
amprenavir	Agenerase, APV	\$\$\$\$\$
lopinavir+ritonavir	Kaletra, (LPV/r)	\$\$\$\$\$
atazanavir	Reyataz	\$\$\$\$\$
fosamprenavir	Lexiva	\$\$\$\$\$
Fusion Inhibitors		
enfuvirtide	Fuzeon, T-20	\$\$\$\$\$

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For useful references, please refer to these CDC web sites:

<http://www.cdc.gov/hiv/prevtools.htm>

<http://www.cdc.gov/hiv/testing.htm>