The Columbia University Handbook on HIV and AIDS

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Acknowledgements

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Causes, Characteristics, and Transmission

Between 1981 and December 2001, 816,149 cases of AIDS were reported in the United States.\(^1\) It is estimated that 650,000 to 980,000 Americans are infected with HIV, the virus that causes AIDS.\(^2,3\)

During the past seven years, the nature of the epidemic in the US has changed dramatically. Effective new treatment against the virus (referred to as HAART, highly active antiretroviral treatment) can limit the progression of HIV disease, allowing many HIV-infected people to remain healthy and reducing deaths from AIDS. One AIDS expert summarizes large medication studies in the following way: "The result of these [studies] have been astonishingly consistent: When HAART is introduced, opportunistic infections and deaths drop."\(^4\) However, the drugs that are currently available have significant side effects, which can limit their effective use.

The situation is drastically different in the developing nations, where 95% of cases of AIDS now occur.\(^5\) As of 2002, there were an estimated 42 million people globally with AIDS and HIV. In 2002 alone, an estimated 3.1 million people died of AIDS. The numbers are steadily increasing and effective treatment is not available due to economic limitations in developing nations.

**WHAT IS "AIDS"**

AIDS is an illness that damages a person’s ability to fight off disease, leaving the body open to attack from ordinarily innocuous infections and some forms of cancers. “AIDS” stands for Acquired ImmunoDeficiency Syndrome. AIDS is caused by a virus called HIV, which stands for Human Immunodeficiency Virus. This virus infects certain types of white blood cells, principally CD4 cells (also called helper cells or T4-cells) and monocytes/macrophages. CD4 cells and macrophages both have important functions in the immune system. The disruption of the function of these cells lies at the heart of the immunodeficiency that characterizes AIDS.

HIV disrupts the functioning of the immune system. A weakened immune system allows the development of a number of different infections and cancers and it is these diseases which cause illness and death in people with AIDS. HIV also infects and causes direct damage to other types of cells: damage to the lining of the intestine\(^6\) can contribute to wasting (severe weight loss); damage to nerve cells\(^7,8\) can cause neurological problems.
Spectrum of HIV Infection

“AIDS” is a diagnostic category constructed by the Centers for Disease Control and Prevention (the CDC); AIDS can also be referred to as advanced HIV disease. The definition of AIDS has changed over time.

Since 1993, AIDS has been defined as:

- “HIV infection and a specific group of diseases or conditions which are indicative of severe immunosuppression related to infection with the human immunodeficiency virus (HIV)”

Or

- HIV infection in a person without symptoms but with a significant level of immune suppression (CD4 count below 200).

People who are HIV-infected do not meet the criteria for AIDS if they are symptom free or have symptoms that do not belong to the specified group of illnesses and have a CD4 count over 200.

We will use the term “HIV disease” or "HIV/AIDS" to mean the full spectrum of conditions caused by HIV infection, including asymptomatic HIV infection, symptomatic infection which do not meet the criteria of AIDS, and CDC-defined AIDS.

Progression of HIV Disease to AIDS

Without treatment, it appears that the majority of HIV-infected people will develop AIDS within ten to fifteen years after being infected, though some people who have been infected longer than this remain healthy even without treatment. Effective treatment slows or stops the progression of HIV disease to AIDS and, for many people seems likely to extend healthy life for many years.

OPPORTUNISTIC INFECTIONS AND CANCERS

If HIV infection progresses, it can cause serious damage to the immune system. As a result, certain cancers may appear and ordinarily harmless infections may be reactivated, causing serious illness. These infections are referred to as opportunistic, since, although latently present in most people, they only cause illness in people with immune impairment. Opportunistic infections and cancers are currently the cause of most of the deaths in AIDS patients.
### Organisms that cause opportunistic infections

<table>
<thead>
<tr>
<th>Type of organism</th>
<th>Organism</th>
<th>Diseases Caused</th>
</tr>
</thead>
</table>
| **Parasites**    | *Pneumocystis carinii* (may be a fungus)  
                  *Toxoplasma gondii*  
                  *Microsporidia, Cryptosporidia* | Pneumonia  
                      Disease of the central nervous system  
                      Diarrhea and wasting |
| **Bacteria**     | *Mycobacterium Tuberculosis*  
                  *Mycobacterium avium*  
                  *Shigella, Campylobacter, C. difficile, Salmonella*  
                  *Streptococcus, H. influenza, Staphylococcus, Pseudomonas* | Tuberculosis  
                      Disseminated disease  
                      Gastrointestinal disease (including diarrhea, colitis and wasting)  
                      Bacterial pneumonia, sinusitis, skin and bone infections |
| **Fungi**        | *Candida*  
                  *Cryptococcus*  
                  *Histoplasma* | Thrush, esophritis  
                      Meningitis  
                      Pulmonary, systemic infections |
| **Viruses**      | *Adenovirus*  
                  *JC virus*  
                  *Cytomegalovirus*  
                  *Herpes*  
                  *Human papilloma virus (HPV)* | Gastrointestinal disease  
                      PML (brain disease)  
                      Retinitis, colitis, encephalitis  
                      Herpes, shingles, chicken pox  
                      Cervical dysplasia, genital and anal warts  
                      Squamous cell carcinoma of the anus |

Treatment of most opportunistic infections has improved radically in the last ten years.

Additionally, rates of opportunistic infections have dropped because effective antiviral treatment protects the immune system from deteriorating.
Cancers associated with HIV disease

The most frequent cancers seen in HIV-infected people are Kaposi's sarcoma (KS) a cancer of the linings of blood vessel) and lymphoma (cancers of the lymph nodes). Although KS can be fatal, it has a relatively slow course, and most people with KS eventually develop other opportunistic diseases which are more life threatening. A recently discovered virus of the herpes family, HHV8, appears to cause KS in the setting of immune suppression.

HIV and the Brain

HIV can directly damage the central nervous system (CNS), including the brain. Some opportunistic infections, particularly cryptococcus, toxoplasmosis, and progressive multifocal leukoencephalopathy (PML) also cause diseases of the CNS. Problems range from very mild (for example, minor problems with memory) to very severe (for example, dementia or delirium). Studies show that in HIV disease, serious cognitive symptoms generally develop after physical symptoms and relatively late in the course of the disease.

TREATMENT HAS IMPROVED DRAMATICALLY

Combinations of antiviral medications that have been available since 1996 are slowing, stopping, and even reversing the progression of HIV disease. Clear data is not yet available as to how long current medications will remain effective for the individual user of them. Antiviral drugs are allowing many HIV-infected people (who otherwise would become ill) to live active healthy lives with few or no symptoms.

These drugs are not a cure for HIV; the medications now available must be continued indefinitely to prevent progression of the disease. Antiviral drugs often have significant side effects and it is not yet sufficiently known what additional long-term side effects might occur.

HIV mutates rapidly and thus can develop resistance to drugs. Using medication in combination can help prevent such resistance. A single antiviral medication alone should not be used; most people currently use a combination of three or more different antiviral medications. Some people who have already developed advanced HIV disease or used drugs singly in the past do not respond to currently available drugs or respond less well than those without prior use of these drugs.

Adequate antiviral medications are not available to the vast majority of HIV-infected people in the world who cannot afford the drugs or the close medical monitoring required for their use.

There is ongoing research on therapeutic vaccines (that is, to treat people already infected with HIV) and on restoring immune system functioning.

VACCINES

Development of a vaccine to protect those not yet infected poses formidable problems. The scientific challenge is enormous, and there are ethical problems associated with testing an unproven vaccine for a dangerous disease. These factors make it unlikely that any vaccine will be widely available in the near future.
TYPES AND STRAINS OF HIV

Two types of HIV are currently recognized: HIV-1 and HIV-2. The classification is based on differences in genetic structure. HIV-2 is the less common type and is found primarily in western Africa. Both types of virus are transmitted in the same way and cause the same illnesses. However, it appears that HIV-2 is more difficult to transmit and that time from infection to illness is longer.

In addition, a number of different sub-types or strains of HIV-1 have been classified. These sub-types (also known as "clades") are distinguished by smaller variations in their genetic composition. The sub-types are identified by letter. They are unevenly distributed geographically. Sub-type B is found mostly in the Americas, Japan, Australia, the Caribbean, and Europe. Sub-types A and D are most common in sub-Saharan Africa.

HIV INFECTION CAUSES AIDS

Early in the course of the AIDS epidemic, there was some controversy about whether HIV is the cause of AIDS. Now AIDS experts have demonstrated conclusively that HIV is the cause of AIDS. However, a handful of dissenters ("HIV denialists") continue to claim HIV is not the source of AIDS.

HIV denialists often argue that drug use and other sexually transmitted disease in people who are "promiscuous" are the cause of AIDS. A few of the arguments and the scientific refutations follow, drawn from reports of a scientific forum on the topic sponsored by the American Foundation for AIDS Research (AmFAR)

<table>
<thead>
<tr>
<th>Criticisms of HIV as the Cause of AIDS, with Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HIV Denialist Argument</strong></td>
</tr>
<tr>
<td>Not everyone with HIV develops the symptoms of AIDS.</td>
</tr>
<tr>
<td>Circulating particles of HIV cannot be found in all AIDS patients.</td>
</tr>
<tr>
<td>HIV does not infect enough of the white blood cells called T4 lymphocytes to be fatal.</td>
</tr>
</tbody>
</table>
Since the body develops a relatively high level of antibodies to HIV, HIV cannot cause serious disease.

A number of viruses provoke production of antibodies that do not neutralize virus inside cells. These viruses include herpes simplex, varicella zoster, hepatitis B, and a number of slow-activating animal viruses. In fact, a number of diseases caused by slow-activating animal viruses resemble HIV disease in their form: long latency, slow damage to the immune system, and killing of white blood cells in culture.

Additionally, we now have the most compelling evidence that HIV causes AIDS: reducing the amount of HIV in the body through antiviral treatment can prevent AIDS.

HIV TRANSMISSION

Only Three Routes of Transmission

HIV is known to be transmitted only through:
- Contact of infected blood, semen, or vaginal and cervical secretions with mucous membranes.
- Injection of infected blood or blood products.
- Vertical transmission (that is, from infected mother to fetus) and from mother to infant via breast milk

Contact of Sexual Fluids or Blood with Mucous Membranes

The virus cannot pass through undamaged skin. HIV can enter the body through the mucous membranes that line the vagina, rectum, urethra, and possibly the mouth, on rare occasions. Damage to a mucous membrane may increase the risk of transmission of HIV, but is not necessary. Almost all cases of sexually transmitted HIV have been caused by anal or vaginal intercourse without a condom.

HIV has consistently been isolated in varying concentrations from blood, semen, vaginal and cervical secretions, and breast milk. It has occasionally (and in low levels) been isolated from saliva, and tears. Antibodies to HIV have been detected in urine. Two studies have isolated HIV in pre-ejaculatory fluid. Epidemiological evidence implicates only blood, semen, vaginal and cervical secretions, and breast milk as agents of transmission. Infection through contact of semen, blood, or vaginal or cervical secretions with mucous membranes occurs during anal or vaginal intercourse and only rarely during oral-genital sex. A component of saliva helps inactivate HIV.

Injection of Infected Blood

HIV can be transmitted by infected blood getting directly into the bloodstream through intravenous, intramuscular, or subcutaneous injection. Blood-to-blood transmission occurs in the following ways:
- Sharing of unsterilized hypodermic needles and syringes.
- Transfusing of contaminated blood and blood products to hemophiliacs and other blood recipients. Since March 1985, the blood supply has been screened for contaminated blood. The risk of infection from transfusion is now extremely small.
Vertical transmission (Mother to Fetus)

HIV can be transmitted from an infected woman to her fetus during pregnancy and during delivery. This is referred to as vertical or perinatal transmission. Antiviral therapy used at the appropriate time in pregnancy significantly reduces the risk of transmission from mother to fetus. Additionally, using certain methods for delivery (such as caesarian section) also help reduce transmission. Since breast milk can transmit HIV, avoiding breast feeding further reduces vertical transmission.

No Transmission by Casual Contact

Every major scientific study has concluded that HIV infection cannot be transmitted by casual contact: “Ordinary standards of personal hygiene that currently prevail are more than adequate for preventing transmission of [HIV] even between persons living within a single household; transmission will not occur as long as one avoids the relatively short list of dangerous sexual and drug-use practices that have been identified.”

Materials that could theoretically carry the virus in small amounts, such as saliva sprayed in a cough or a sneeze or left on a drinking glass, tears, or urine have never been implicated as the cause of any case of HIV transmission.

The Public Health Service states “AIDS is a blood-borne, sexually-transmitted disease that is not spread by casual contact… No known risk of transmission to co-workers, clients, or consumers exists from [HIV] infected workers… in offices, schools, factories, or construction sites… Workers known to be infected with [HIV] should not be restricted from work solely based on this finding. Moreover they should not be restricted from using telephones, office equipment, toilets, showers, eating facilities, or water fountains.”

HIV Is Fragile

HIV is fragile, much more so than the viruses that cause colds or the flu. It is killed by heat, ordinary soap and water, household bleach solutions, alcohol, hydrogen peroxide, Lysol™ and the chlorine used in swimming pools. Bleach kills HIV on contact; soap and alcohol require exposure of twenty minutes.

Families of People with AIDS Remain Healthy despite Extensive Household Contact

Many studies have been done on transmission patterns within the families of those with HIV infection and AIDS. In these studies no family member or house mate has contracted HIV infection from a person with AIDS other than sexual partners, people who shared needles, and children born to infected mothers. These people lived together without special precautions, sharing beds, dishes, clothing, toilets, food, toothbrushes, toys, and baby bottles. Because there is a theoretical possibility of infection through contact with bloody objects, take routine procedures in case of accidents (avoid exposure to blood) and do not share toothbrushes and razor blades.

HIV Is Not Transmitted by Contact with Inanimate Objects

Some people worry that HIV can be transmitted by fluid left on inanimate objects. This is virtually impossible in everyday situations. In order to observe the survival of HIV on inanimate objects, laboratory studies have looked at how long artificially high concentrations of the virus remain alive. Drying of these HIV samples for several hours reduces the level of virus by 90 to 99%. Since the concentration in these samples is vastly greater than those found in blood or other body fluids, the risk of environmental transmission is essentially zero. HIV remains alive in the laboratory only under precisely controlled conditions.
Other Transmission Concerns

HIV Is Not Transmitted by Insects

The virus is not transmitted by the bites of insects such as ticks or mosquitoes.\textsuperscript{32, 33} When insects bite a person, they do not inject their own blood or the blood of the last person they bit. Rather they inject their own saliva. Some diseases, such as malaria and yellow fever, are transmitted through the saliva of a species of mosquitoes. HIV lives only a short time in the body of an insect, cannot reproduce there, and is not present in insect saliva. Even in areas where there are many people infected with HIV and a large population of mosquitoes, there have been no cases of transmission through insects.

Tattooing and Piercing

No cases of HIV transmission through tattooing or body piercing have ever been reported to the CDC. However, because these activities, especially piercing, do pose a theoretical risk for transmission, new or sterilized instruments should be used.

Biting

A handful of cases have been reported in medical literature of the transmission of HIV by biting. These cases involved extensive tissue tearing and the presence of blood. There are more cases of biting by HIV-infected individuals in which HIV was \textit{not} transmitted.

Sweat, saliva, tears

Sweat has not been found to contain HIV. Saliva and tears sometimes contain a low level of virus. No cases of transmission by sweat, saliva, or tears has ever been reported.
Observed Patterns of Illness

HIV/AIDS IN THE UNITED STATES

Scientists at the U.S. Centers for Disease Control (CDC) gather information about each case of AIDS reported and identify the probable route of transmission. This surveillance began in 1981. CDC statistics are the primary source for the facts reported below.34

Statistics about HIV/AIDS in the United States

- 816,149 cases of AIDS were reported from 1981 (the beginning of the epidemic) to December 2001.
- 31,994 new cases of AIDS were reported in 2001.
- 807,075 cases of AIDS occurred in adults.
- 9,074 cases of AIDS occurred in children.
- 83% of adult AIDS cases occurred in men.
- 17% of adult AIDS cases occurred in women.
- 467,910 people have died from AIDS in the United States.
- AIDS has been reported in all fifty states.
- 800,000 to 900,000 Americans are currently estimated to be infected with HIV, the virus that causes AIDS. This is equal 1 in 300 Americans.35
- 45,000 adults and children are estimated to have been newly infected with HIV in 2002.36

Beginning in 1996, the number of AIDS deaths and new AIDS cases began to decline and has continued to do so. This is largely due to the development and use of effective new antiviral treatments.37

Incidence and prevalence

In looking at statistics about HIV/AIDS, it is useful to understand the meaning of "incidence" and "prevalence". **Incidence** is the **number of new cases** of a disease in a population over a given period of time. **Prevalence** is the **total number of cases** of a disease in a population at a given point in time. Either can be expressed as a proportion of the total, often written as the number of cases per 100,000 of the total population. For example, the incidence of new AIDS cases in the US in 1999 was 46,137. The prevalence of HIV infection in the United States in 1999 was estimated to be 650,000 to 900,000.

Most CDC data concern people with AIDS rather than people with HIV infection. Since the median time from infection to AIDS even without treatment is ten years, AIDS rates do not accurately reflect current patterns of transmission, especially since effective treatment has slowed the progression of HIV to AIDS. Rates of HIV infection are a more accurate indicator of current trends in infection. However, the data about incidence and prevalence of HIV infection are still limited because this information was not collected until recently. Based on information from states that report HIV infection as well as AIDS, the incidence of new AIDS cases is declining but the rate of new HIV diagnoses is remaining stable.
## EXPOSURE CATEGORIES OF AIDS CASES

<table>
<thead>
<tr>
<th>Transmission category</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Men who have sex with men</td>
<td>46%</td>
</tr>
<tr>
<td></td>
<td>31%</td>
</tr>
<tr>
<td>• Heterosexual contact</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>16%</td>
</tr>
<tr>
<td>• Needle sharing by injecting drug users</td>
<td>31%</td>
</tr>
<tr>
<td></td>
<td>20%</td>
</tr>
<tr>
<td>• Transfusion of contaminated blood or blood products in the course of medical treatment (including treatment for hemophilia)</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td>1%</td>
</tr>
<tr>
<td>• Not yet assigned a precise mode of transmission.</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>31%</td>
</tr>
</tbody>
</table>

This percentage is much lower after further investigation.

Among children younger than 13, 91% of cases of AIDS have been caused by vertical transmission (from infected mother to infant during pregnancy, childbirth, or breast-feeding). Transfusion of blood or blood products caused 7% of infections and 2% were categorized as not yet reported or identified.

One expert source says "the AIDS epidemic will neither explode nor diminish as a public health problem in the United States".38
Sexual Transmission

Sexual transmission accounts for at least 57% of all adult/adolescent cases of AIDS. Of this group, the underlying HIV infection was transmitted as follows:

<table>
<thead>
<tr>
<th></th>
<th>Cumulative</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexual activity between men</td>
<td>46%</td>
<td>31%</td>
</tr>
<tr>
<td></td>
<td>(there is an additional 6% of men who had sex with other men and shared needles)</td>
<td>(there is an additional 3% of men who had sex with other men and shared needles)</td>
</tr>
<tr>
<td>Sexual activity between men and women</td>
<td>11f%</td>
<td>16%</td>
</tr>
</tbody>
</table>

Two cases of transmission from sexual contact between women have been reported in the medical literature. In both these cases, mucous membranes were exposed to blood as well as to vaginal and cervical secretions. As of 1998, the CDC had no confirmed cases of female to female transmission despite the high priority given to investigating cause of transmission in women who initially report their only risk as sex with another woman. This has been supported by a separate study of over one million female blood donors. No cases of HIV infection were reported in women whose only risk was sex with women.

Changing patterns of sexual transmission

The rate of transmission through heterosexual sex increased faster than any other mode of transmission from 1990 to 1995. It declined slowly from 1996 to 1998 but seems to have increase through 2001. So far in the United States, many more cases of AIDS have been caused by HIV infection sexually transmitted from men to women than from women to men. This imbalance reflects the fact that in this country there are currently more infected men than infected women; it also demonstrates that HIV is more easily transmitted from the insertive to the receptive partner in intercourse (as is the case with some other sexually transmitted diseases such as gonorrhea).

Sexually-Transmitted AIDS Among Non-Needle-Sharing Heterosexuals

By December 2001, an estimated 90,131 cases of AIDS were transmitted by sexual contact between men and women. AIDS transmitted by sexual contact between men and women is already epidemic among the sexual partners of needle-sharers. In some communities, heterosexual transmission is also widespread among people who do not share needles.

Non-Sexual Transmission

Transmission Through Needle-Sharing

Thirty-one percent of all people with AIDS were probably infected through needle sharing. Some of these people may actually have been infected through sexual transmission, particularly the 6% of infected needle-sharers who were men who also had had sexual contact with other men.

Injecting drug use has accounted for a steadily increasing proportion of Americans diagnosed with HIV, though this increase may be leveling off. Needle sharing is directly or indirectly responsible for the majority of AIDS among...
women and children. The prevalence of HIV infection among injecting drug users varies sharply by geographic region, with the highest prevalence in the metropolitan corridor stretching from Boston to Washington D.C., in Miami, and in San Juan, Puerto Rico. One expert epidemiologist estimated that 1.46 million Americans use injection drugs, that 204,000 are already HIV infected and that 19,000 become infected each year.

**Blood and Blood Product Recipients**

Transfusion of blood and blood products in the course of medical treatment was the route of transmission in 2% of cases of AIDS. However, it has been almost eliminated as a source of new infections, due to screening of the blood supply. Very rarely, contaminated blood can escape detection. This can occur when people donate blood in the first three months of a new infection. During this time, their blood may still test negative on the screening and they will not know they are infected. It is estimated that two or three HIV infections per year occur because of transfusion of unidentified infected blood.

Blood products that are known to have transmitted HIV are whole blood, blood cellular components, plasma, and clotting factors. Blood products that are not known to have ever transmitted HIV are immunoglobulin, albumin, plasma protein fraction, and hepatitis B vaccine. Since the early 1990's all Hepatitis B vaccines are no longer blood products but are genetically engineered material incapable of transmitting HIV.

**Vertical Transmission**

"Vertical transmission" is the term used to describe HIV transmission from mother to fetus or infant. It is also sometimes referred to as perinatal transmission. HIV infection can be transmitted from mother to fetus during pregnancy, to the infant during delivery, or through infected breast milk. The mother may not have any symptoms; she need only be HIV infected. Of the 9,074 children with AIDS, 91% have been infected by an HIV-infected mother. There has been a steep decline in vertical HIV transmission in the 1990s primarily because of the use of antiviral medication to reduce transmission. A small number of cases of transmission through HIV-infected human breast milk have been reported in the United States. It is recommended that HIV-infected women in the United States (and other areas where safe alternatives to breast-feeding exist) should not breast feed their infant.

Without treatment, the pregnancy of an infected woman has a significant chance of resulting in a baby born with HIV infection: studies quote probabilities from 15 to 40%. The appropriate use of antiviral medication probably reduces this risk by more than two-thirds. Between 1992 and 1998, AIDS acquired perinatal transmission declined 75% in the United States.

Fertility of women does not appear to be affected by HIV infection. There is currently no scientific agreement as to whether or not a pregnancy accelerates the course of HIV disease in an HIV-infected woman.

**Medical Personnel**

Tens of thousands of health care workers treat AIDS patients every day. Health care workers include doctors, nurses, surgeons, dentists, and others. Many health care workers have either accidentally stuck themselves with needles used to treat AIDS patients or have been splashed with blood or other body fluids of patients. The risk of becoming infected through a skin puncture with blood known to be infected is estimated at about 1 in 300. As of December 2001, there are documented reports of fifty-seven health care workers in the United States who had become infected through their work. Another 138 may possibly have been infected through occupational exposure.

Of the documented cases, 48 were infected through skin punctures, 5 from mucous membrane exposure, 2 from both puncture and mucous membrane exposure, and one unidentified. Nineteen laboratory assistants have been infected, 24 nurses, 6 physicians, 8 in other categories (embalmer, health aide, housekeeper, technician) and no surgeons or dentists. Health care workers can greatly reduce their risk of infection via exposure to blood by adhering strictly and uniformly to infection-control procedures recommended by the CDC.
There is only one instance reported of a health care worker transmitting the virus to patients. A dentist in Florida apparently infected six of his patients. The circumstances surrounding this are not entirely clear. This is, so far, a unique situation. The CDC has investigated 22,000 patients who had been treated by 63 HIV-infected dentists, surgeons, and physicians and no other cases of transmission from health care worker to patient have been discovered.

**Few With Undetermined Risk**

Nine percent of all cases of AIDS fall into a transmission category which the CDC labels as “other/risk not reported or identified.” As of June 2000, 67,387 cases were reported in this category. Most of these cases are still being investigated. Only 1,010 cases have been completely investigated and could not be re-classified into a known exposure category on the basis of elicited information.

**SOME DEMOGRAPHIC FACTS**

**Gay Men and AIDS**

In 1995 AIDS was the leading cause of death among men between 25 and 44 years of age. Unfortunately, HIV infection had already spread widely among gay men before AIDS was recognized and modes of transmission and prevention were understood. Men who have sex with men continue to account for the largest group of people living with HIV/AIDS. In 2000, 13,562 AIDS cases were reported among men who have sex with other men, compared with 8,531 among injecting drug users and 6,530 among men and women infected through heterosexual sex. Fortunately effective treatment has dramatically reduced the number of deaths in the last five years.

Risk reduction for HIV infection has been widely adopted in the gay community. The gay community’s extraordinary efforts in major urban centers towards risk-reduction, public health education, and the support and care of people with AIDS have set an example for community response to the epidemic. A study done in San Francisco among a cohort of gay men indicated that high-risk behavior among the gay men studied had decreased 90% between 1978 and 1985.

However, much remains to be done and recent information is more discouraging. In 2000, 59% of newly reported HIV infections among men aged 13 to 19 and 53% of infections among men ages 19 to 24 were attributed to male-to-male sexual contact. The CDC states that “studies of sexually transmitted diseases and sexual behaviors suggest a resurgent HIV epidemic among men who have sex with men.” In the gay community, HIV prevalence and risk behaviors continue to be high. The CDC conducted a study from 1998 to 2000 of gay men in six large cities (Baltimore, Dallas, Los Angeles, Miami, New York, and Seattle). 12.3% of men who had sex with men between the ages of 23 and 29 were infected with HIV. Further, this study found that 46% of the participants reported having unprotected anal intercourse in the last six months. A CDC study conducted from 1994 to 1998 found that 7% of 15 to 22-year-old men who had sex with men were HIV infected.

Rates of HIV transmission are alarmingly high among men of color. The CDC study cited above found that among young gay men, infection rates were 30% in black men, 15% in Hispanic men, 15% in non-Hispanic white men, and 3% in Asian-American men. The proportion of AIDS cases among white men who have sex with men has declined since 1989 while the rates for all racial/ethnic minorities, particularly black men have increased. These figures indicate that there is a pressing need for ongoing AIDS education in the gay community, especially among young people and people of color. New strategies must be developed that take into account the difficulty of maintaining risk-reduction over a long period of time and the psychological effects of the epidemic on non-HIV-infected gay men.

In locations outside of major urban areas, risk reduction education for gay men remains inadequate. Nationwide, societal hostility to gay men combines with disapproval of sexual activity to hinder safe sex educational efforts. Stigmatization deprives closeted men of the supportive consensus for risk reduction that has developed among openly gay Americans.
Women and AIDS

Women account for over 17% of all adult/adolescent cases of AIDS reported in this country so far. The proportion of cases among women has increased steadily and by 2001, 30% of newly reported HIV infections occurred among women. In the last several years, about forty per cent of women are infected by needle sharing and 60% infected through heterosexual contact.61

Improved treatment is reaching fewer HIV infected women than men. Between 1993 and 1996, the number of new AIDS cases fell 60% for men and only 36% for women.62 In the United States, women with AIDS have a higher rate of mortality than men with AIDS. This may reflect a difference in access to care and socioeconomic factors such as poverty, homelessness, substance abuse, and domestic violence rather than a biological difference. 63

HIV/AIDS disproportionately affects black women. In 1999, black women accounted for 63% of new cases of AIDS among women.

Young People and AIDS

Researchers have estimated that at least half of all new HIV infections in the United States occurred among people under the age of 25. The majority of these people are infected through sexual transmission.64 In 2000, 1,6888 people ages 13 to 24 were reported with AIDS. In this age group, 49% of men infected acquired HIV through sex with other men. Of the women in this group, 45% were infected through heterosexual sex. Additionally, data that estimate HIV infection show that even though new AIDS cases are declining among young people because of more effective treatment) there is no decline in newly diagnosed cases of HIV. African-American youth are the most heavily affected.

Children and AIDS

Children under 13 years of age have accounted for about 1.2% of all cases of AIDS in the United States. Ninety-one percent of these children were infected by their mothers before or at birth, and another 7% were infected through contaminated blood or blood products.

Hemophiliacs and AIDS

An estimated 15,000 to 20,000 Americans have either hemophilia A or hemophilia B. As of the end of 1999, over 5,000 hemophiliacs have been diagnosed with AIDS. The tragically high prevalence of infection among hemophiliacs is due to the fact that the clotting factor used to treat hemophiliacs is prepared from blood pooled from a very large number of donors. Before screening of donated blood was instituted in March 1985, clotting factor was very likely to be contaminated with HIV. Heat treatment of U.S.-manufactured clotting factor concentrates has eliminated this risk of infection for those hemophiliacs who remain uninfected and those born since 1985.65
### Race/Ethnicity and AIDS

<table>
<thead>
<tr>
<th>Race/ethnicity</th>
<th>Percentage of reported HIV infections by race 2001 (CDC)</th>
<th>Percentage of the total US population (Census Bureau year 2000 projections)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black, not Hispanic</td>
<td>50%</td>
<td>12.2%</td>
</tr>
<tr>
<td>White, not Hispanic</td>
<td>29%</td>
<td>71.5%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>19%</td>
<td>11.8%</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>less than 1%</td>
<td>3.8%</td>
</tr>
<tr>
<td>American Indian/Alaskan native</td>
<td>less that 1%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Race/ethnicity unknown</td>
<td>2%</td>
<td></td>
</tr>
</tbody>
</table>

This table demonstrates the extreme disproportion of AIDS cases among blacks and Hispanic and the terrible burden these communities bear.

African Americans have accounted for more than 38% of AIDS cases since the beginning of the epidemic in the United States. By the end of 2001, more than 168,000 African Americans had died of AIDS. Two-thirds of the AIDS cases among women and children have occurred in African Americans. In 1999, the rate of infection among African Americans was eight times greater than the rate for whites. Routes of transmission among African-Americans were sex between men (38%), needle sharing (35%), and heterosexual sex (7%).

Individuals are not at higher risk for AIDS because of their race or ethnicity. The primary disproportion of AIDS among African-American and Hispanic people occurs in cases that were transmitted by needle sharing or the infected sexual partners and children of needle sharers. The high incidence risk behavior, including needle-sharing, in some African-American and Hispanic communities is probably due to the combined impact of underlying social and economic factors including poverty, racism, homophobia, unequal schooling, and unequal opportunity for employment. Further, African-American and Hispanic communities are concentrated in the large urban areas, which have a high prevalence of HIV infection.

The spread of HIV infection among African-American and Hispanic needle-sharers has continued essentially unchecked: AIDS education has often been targeted toward a white middle-class population and has not adequately addressed the issues relevant to those needle-sharers who generally have more limited access to information and medical services. There is a severe shortage of treatment facilities for people who wish to stop using drugs.

White people with AIDS have a life expectancy from time of diagnosis that is two to three times longer than that for African-American people with AIDS. This is due to social factors (poor health care, drug-related problems, nutritional status) rather than to biological differences.
The toll of HIV disease worldwide is enormous. As of 2002, there are an estimated 42 million people worldwide living with HIV/AIDS and at least 21.8 million who have died of AIDS. Over 1% of the world’s population is now infected with HIV. There were 5 million new HIV infections in 2002 and 3.1 million people died of AIDS in this year. 67

About 95% of HIV infected people infected with HIV live in developing countries where the ravages of the disease are compounded by the effects of poverty. AIDS is the leading cause of death in Africa and the fourth leading cause of death worldwide.

Figures the number of people who are HIV-infected or have AIDS are estimates. Most countries lack the resources to gather accurate data. Epidemiologists use small studies and a variety of statistical models to make estimates.

Following are global AIDS estimates provided by the World Health Organization. 68, 69

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of people living with HIV/AIDS AS OF 2002</th>
<th>Adult prevalence rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Saharan Africa</td>
<td>29.4 million</td>
<td>8.8%</td>
</tr>
<tr>
<td>South and South-East Asia</td>
<td>6 million</td>
<td>0.6%</td>
</tr>
<tr>
<td>Latin America</td>
<td>1.5 million</td>
<td>0.6%</td>
</tr>
<tr>
<td>North America</td>
<td>-980,000</td>
<td>0.6%</td>
</tr>
<tr>
<td>Western Europe</td>
<td>570,000</td>
<td>0.3%</td>
</tr>
<tr>
<td>Eastern Europe and Central Asia</td>
<td>1.2 million</td>
<td>0.6%</td>
</tr>
<tr>
<td>Caribbean</td>
<td>440,000</td>
<td>2.4%</td>
</tr>
<tr>
<td>North Africa and the Middle East</td>
<td>550,000</td>
<td>0.3%</td>
</tr>
<tr>
<td>Australia and New Zealand</td>
<td>15,000</td>
<td>0.1%</td>
</tr>
</tbody>
</table>
Sub-Saharan Africa

The AIDS epidemic is most severe in sub-Saharan Africa. 29.4 million of the world’s 42 million people with HIV/AIDS live. The rates of HIV infection (number of infected people per 100) are worst in southern Africa:

- Botswana 38.8%
- Swaziland 33.4%
- Lesotho 31
- Zimbabwe 33.7
- Zambia 19.54%
- South Africa 19.94%
- Malawi 15.96%
- Mozambique 13.22%
- The Central African Republic, (central Africa), Burundi (eastern Africa), Cameroon and the Côte d'Ivoire (western Africa) all have infection rates between 9 and 13%. The infection rate in Nigeria is 5.8%.

In order to grasp the magnitude of the AIDS epidemic in sub-Saharan Africa, consider the following facts:

- AIDS is the leading cause of death in sub-Saharan Africa.
- Ten percent of the world's population lives in sub-Saharan Africa; 83% of all AIDS deaths so far have occurred in this region.
- In 1998, 200,000 people died from wars in sub-Saharan Africa and 2 million died of AIDS. In 2002, 2,400,000 people in sub-Saharan Africa died of AIDS.
- The average life expectancy in sub-Saharan Africa has dropped from 62 years to 47 years due to HIV. In Botswana the life expectancy has dropped to below 40 years.
- A 15-year old boy in Botswana has an 85% chance of dying of AIDS in his lifetime.

Countries in sub-Saharan Africa are affected by the AIDS epidemic in diverse ways. Economies and infrastructures are being undermined, agriculture devastated, family structures destroyed, and health and education systems ravaged. So far, AIDS in southern Africa has left 14 million orphans who have lost their mothers or both parents; these children are increasingly subject to illness, malnutrition, abuse, and sexual exploitation. In the future there will be a "missing generation" of adults capable of caring for children and old people and maintain the economy and the society.

Prevention programs are tragically limited and medical treatment that might reduce suffering and limit mother-infant transmission is usually not available. Dr. Peter Piot, Director of UNAIDS stated that sub-Saharan Africa alone needs a minimum of $3 billion a year to turn back the tide of the epidemic and only a tenth of that is available. African governments owe the US $15 billion per year in debt repayment; debt relief by the US could allow the governments of the worst hit countries to fund effective prevention programs.

In the recent XIII International AIDS conference, South African Acting Supreme Court Justice Edwin Cameron said "No more than Germans in the Nazi era, no more than white South Africans during apartheid, can we …say that we bear no responsibility for the 30 million people in resource poor countries who face death from AIDS unless medical care and treatment is made available to them". 

Both Uganda and Zambia have waged successful prevention campaigns and rates of infection in these countries, though still very high, are decreasing. South Africa has made recent changes in policy, which have already shown promising results in reducing perinatal transmission.
South and Southeast Asia

In South and Southeast Asia about 7.2 million people are currently living with HIV. One million people were estimated to have been newly infected in 2002, an increase of 10% since 2001.\(^1\) About a half a million people are believed to have died of AIDS in 2002. The rates of infection remain relatively low at the present time; only three countries, Cambodia, Thailand, and Myanmar have a prevalence rate above 1% among those 15 to 49. However, this statistic is misleading. The huge populations in several Asian countries mean that even with low prevalence rates, the number of people infected is enormous; China and India together account for 36% of the world's population. In India, where the infection rate is less than 1%, an estimated 3.97 million people were living with HIV in 2000, a number second only to South Africa. The official estimate is that one million people living in China are currently HIV-infected. Given poverty, lack of prevention measures, and limited medical care, this sets the stage in South and Southeast Asia and, perhaps China, for a repetition of the disaster occurring in Africa.\(^2\)

The Caribbean

The HIV epidemic is severe in several Caribbean Island nations where it is estimated that 440,000 people are living with HIV/AIDS. In Haiti 5 of every 100 adults are infected, in the Bahamas 4 in 100, in the Dominican Republic 2.5 in 100, and in Trinidad and Tobago at least 1 in 100. Sex between men and women was the primary source of transmission in most of these countries. Saint Lucia, the Cayman Islands, and the British Virgin Islands are relatively unaffected.

Latin America

In Latin America, there are an estimated 1.5 million HIV-infected people. The HIV epidemic in Latin America varies from country to country. Countries along the Caribbean coast (Guyana, Honduras, Guatemala, and Belize) have the highest prevalence rates. In these countries, most transmission occurs through heterosexual sex. The Andean countries currently have the lowest rate of HIV infection in Latin America.

In Mexico, Argentina, Colombia, Costa Rica transmission occurs primarily through needle sharing and sex between men. Brazil has an epidemic in both heterosexual transmission and transmission in men who have sex with men.

Eastern Europe and Central Asia

In 2002, the HIV epidemic grew fastest in Eastern Europe and Central Asia. There were 250,000 new cases of HIV in this area in 2002, bringing the total number of HIV-infected people to 1.2 million.

The Russian Federation reported 200,000 cases of HIV by the middle of 2002 – a huge increase from about 11,000 reported four years earlier. Ukraine was the country accounting for the largest number of cases.\(^3\), but the epidemic is growing in all the Central Asian republics as well as in Estonia, Latvia, and Lithuania.\(^4\)

Western Europe, Canada, Australia, and New Zealand

The pattern of the epidemic in Western Europe is similar to that of the US. In 2002, there were 570,000 people with HIV in Western Europe, and 15,000 in Australia and New Zealand. In these countries, the rate of infection has declined in the last five years. Most transmission has resulted from needle sharing and sex between men although, as in the US, the epidemic has become more heterosexual over time. Treatment is widely available in the economically developed countries of Western Europe.
The Middle East and North Africa

It is estimated that 550,000 people are living with HIV in this region. About 37,000 people died of AIDS in 2002 and 83,000 people became newly HIV-infected. However, it is extremely difficult to collect accurate data in this area of the world.
Prevention and Risk Reduction

Learning to distinguish situations in which there is a real possibility of HIV transmission from situations with little or no risk of transmission will reduce your risk of becoming infected. In common, everyday non-sexual activities, you do not need to take special precautions. In certain sexual activities and in use of needles for injecting drugs, you can to take steps to reduce the risk of transmission of HIV.

**NO DANGER FROM CASUAL CONTACT**

There is no danger of contracting HIV infection through casual contact. You should, however, observe routine and reasonable precautions against accidental contact with blood, semen, or vaginal secretions. Wash hands or skin with soap and water. Clean surfaces where blood or semen have been spilled with soap and water or a mild disinfectant solution such as 10% household bleach. Do not share toothbrushes, razors, tweezers, or other instruments which may carry fresh blood. These precautions also provide protection against many common illnesses.

**Service Occupations No Hazard**

The U.S. Public Health Service (PHS) has made a series of recommendations regarding HIV infection in the workplace. These recommendations explicitly say that transmission of HIV is unlikely even in work settings in which close non-sexual person-to-person contact occurs. These occupations include:

- Food service workers including cooks, waiters, bartenders, and airline attendants.
- Personal-service workers including hairdressers, barbers, cosmetologists, and manicurists.
- Health care workers including nurses, doctors, dentists, optometrists, lab technicians, and emergency medical technicians.

The PHS states: “All laboratory and epidemiological evidence indicates that blood-borne and sexually transmitted infections are not transmitted during the preparation or serving of food or beverages and no instances of [HIV] transmission have been documented in this setting.”

The PHS found no evidence of transmission of HIV from personal-service workers to clients or vice versa.

Health-care workers known to be infected with HIV need not be restricted from work. Since blood is often present during medical procedures and is a source of transmission of HIV, the PHS has outlined routine hygiene procedures to prevent the transmission of HIV in a health-care setting.
No Risk of Casual Transmission from Child to Child

Since the start of the AIDS epidemic, there has been public and media concern about the possibility that young children with AIDS might somehow infect their schoolmates in ordinary day-to-day interactions. In some cases, fearful parents have harassed sick children and attempted to have them removed from school. Such fear is not warranted by scientific evidence. No case of AIDS has been transmitted in a school or day-care setting.

Due to sexual activity and intravenous drug use, adolescents face a much greater risk for becoming HIV infected than younger children.

Blood Transfusion Much Safer Since 1985

The blood supply in the United States has been tested for HIV since 1985 and the risk of infection through blood transfusion is close to zero. People who were transfused with many units of blood in the few years prior to late spring 1985 - after HIV was present in the population and before testing of blood for HIV began - were at increased risk of being HIV infected, especially if these transfusions occurred in areas with a high incidence of HIV infection (New York, San Francisco, and Los Angeles).

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Giving Blood Has Always Been Safe

There is absolutely no risk of becoming infected with HIV from donating blood, and there never has been, since the needles used to draw blood are sterile-packaged and are never re-used. Currently, according to US Red Cross policy, any man who has had sex with another man since 1977 cannot donate blood. This policy is controversial and may be changed. Many feel that it is discriminatory and needlessly reduces blood available for transfusion, which is often in short supply. If you are at risk for being HIV-infected and you are pressured into participating in a blood donation drive, be sure to indicate on the form provided that you wish to donate your blood for research purposes only. This option is standard and is provided by blood banks to protect your privacy while helping you avoid any embarrassment associated with refusing to donate blood.

AVOID NEEDLE-SHARING

You face high risk for HIV infection if you share needles, whether to inject or “skin-pop” heroin, cocaine, speed, or any other drug. If you are already infected, drugs themselves may increase the chance that your infection will make you ill. HIV-infected injecting drug users who continue to shoot drugs have a worse course of illness than those who stop using drugs.

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Cleaning needles

If you continue to inject drugs, it is crucially important that you do not share IV drug equipment (“works,” “gimmicks,” “sets”), including syringes, rubber bulbs, needles (“points”), “cookers,” or cotton. If you buy new works, clean them before using them. If you share works, clean them before you or the next person uses them. Blood may be in your works even if you can’t see it. Clean your works either with rubbing alcohol (available in drug stores), a household bleach solution (3 tablespoons of bleach in a cup of water), or boiling water. To clean your works:

- Pour the alcohol, bleach solution, or boiling water into a clean glass.
- Pull liquid up into the syringe, shake well, then squirt the liquid out again. Repeat this several times.
- Take your works apart, separating the plunger and needle from the syringe.
- Let them soak in the alcohol, bleach solution, or boiling water for 10 to 15 minutes.
- Rinse the parts of your works well under running tap water.
- Put your works back together. Pull clean water up into the syringe, then squirt it out again. Repeat a few times.

If you cannot wait, use the bleach solution, skip the soaking step, and be sure to rinse thoroughly with water.

Remember: You face a high risk for HIV infection if you have shared needles, whether to inject or “skin-pop” heroin, cocaine, speed, or any other drug. And, no matter how you got infected, you can still pass it on through sex.

**Needle Cleaning (see text)**

1. **Pour**
   ![Pouring Image]

2. **Squirt**
   ![Squirt Image]

3. **Separate**
   ![Separate Image]

4. **Soak (then rinse)**
   ![Soak and Rinse Image]

Remember: no matter how you got infected, you can still pass it on through certain sexual activities.

**Social and political issues in needle-sharing transmission**

Drug users share needles primarily because they cannot gain access to or afford new needles and syringes. Most states have laws against possession of needles and syringes for “illicit” drugs. Injecting drug users often do not carry needles or syringes because of fear of police harassment or arrest. These practices increase the sharing of needles.

A law was passed in Connecticut in 1992 de-criminalizing the possession of needles and syringes and making them available in pharmacies without prescription. After this law took effect, there was a significant decrease in needle sharing. New York has also changed its laws to allow the purchase of clean needles and syringes to lessen the health risk of shared contaminated needles.
Many cities in the US and around the world have started needle exchange programs (NEPs). These programs distribute clean needles, dispose of used ones safely and provide HIV counseling and referrals to drug treatment programs. Eight federally funded reports have summarized extensive studies of these programs. Each report has concluded that needle exchange programs reduce HIV transmission significantly. 80

These studies demonstrate that needle exchange programs do not increase the use of drugs among injecting drug users or others. In fact, they probably encourage users to seek treatment for their drug problem.

Reduction in injecting drug use would certainly limit the transmission of HIV. However, getting off drugs is difficult and there is a great shortage of treatment programs to help users. In New York City, the average waiting period to get into a methadone maintenance program is one to three months. The waiting period to get into a drug-free program where addicts are helped to be free of all drugs is up to six months. 81 There is an urgent need for all states to decriminalize the possession of needles and syringes and increase the availability of needle exchange programs and drug treatment.

REDUCE SEXUAL RISK

It is never too late to begin protecting yourself against HIV. Even if you have reason to believe you have already been infected, it is always to your benefit to follow sexual risk reduction guidelines since repeat exposure to HIV or exposure to other sexually transmitted infections may help to trigger illness. Follow the risk reduction guidelines below in any future sexual encounter.

Sexual Risk-Reduction Guidelines

The most important part of sexual risk reduction can be summarized in one sentence:

USE A CONDOM FOR EVERY EPISODE OF INTERCOURSE, BOTH VAGINAL AND ANAL.

If you follow this one guideline and use condoms correctly, the likelihood of HIV transmission is extremely low even if your other sexual practices have some small risk of HIV transmission.

Understanding Sexual Transmission

HIV transmission can occur when infected fluid comes in contact with mucous membranes (the lining of the vagina, rectum, urethra, and, rarely, mouth). However, several variables must be considered in order to assess the possibility of transmission.

• Not all mucous membranes are equally susceptible to infection with HIV. The lining of the rectum, vagina, and urethra are more susceptible than the lining of the mouth because they are composed of different types of cells. 82 The lining of the rectum is more fragile than the lining of the vagina and therefore more susceptible to small cuts and tears which increase the risk of transmission.

• Not all body fluids contain equal amounts of HIV. Blood and semen generally contain the highest amount of HIV, cervical secretions contain less, and vaginal secretions still less. Pre-ejaculatory fluid contains a significantly lower level of virus. HIV can only rarely be isolated in saliva and then at low levels; an enzyme contained in saliva seems to partially inactivate the virus.

• The amount of body fluid present during a particular sexual act is a factor. For example, pre-ejaculatory fluids are usually produced in smaller amounts than semen (Pre-ejaculatory fluid is a viscous, clear fluid that is secreted from the penis some time prior to the ejaculation of semen itself).
The extent of mucous membrane exposed to infected fluid plays a role in the likelihood of transmission. During intercourse the lining of a man’s urethra comes in contact with less fluid than the vagina or rectum since fluid must reach the urethra through the hole at the tip of the penis.

**Practicing Sexual Risk Reduction**

*Receptive anal or vaginal intercourse*

The receptive partner in vaginal or anal intercourse without a condom is at highest risk of becoming infected with HIV if his or her partner is infected. Semen, a body fluid with a potentially high level of HIV, is in contact with the lining of the rectum or the vagina, a relatively large area of susceptible mucous membrane. The lining of the rectum is somewhat more fragile than the lining of the vagina and may more easily develop small tears or abrasions which increase the possibility of transmission.

Condoms can eliminate the risk of transmission because they prevent infected semen from coming in contact with the rectum or vagina. Use of a water soluble lubricant (like K-Y) reduces latex condom breakage. Never use an oil-based lubricant (like hand lotion or Vaseline) with latex condoms; they can be used with polyurethene condoms, including the female condom. If a condom breaks or leaks and ejaculation occurs and semen escapes, there is a risk of infection. You can further reduce the risk of infection if the penis is withdrawn before ejaculation.

*Insertive anal or vaginal intercourse*

The insertive partner in vaginal or anal intercourse is at risk of infection, though the risk is lower than that of the receptive partner. During vaginal intercourse, the lining of the man’s urethra (a relatively small area) comes in contact with vaginal and cervical secretions and possibly with blood. In anal intercourse the lining of the urethra may come in contact with blood which is often present in the rectum. Infection of the insertive partner in both anal and vaginal intercourse has occurred frequently, though less often than infection of the receptive partner. Condoms essentially eliminate this risk.

*Fellatio*

Fellatio (sucking, blow job) is stimulation of the penis with the mouth. It is an unclear area of HIV transmission. However, it is clear that the risk of transmission from fellatio is much lower than the risk of unprotected intercourse. There is controversy about the level of safety of fellatio to the receptive partner (the person in whose mouth the penis is placed). It is a reasonable conclusion, based on currently available information, that transmission to the receptive partner by fellatio can occur but is relatively rare.

There is only a theoretical risk to the insertive partner (the person putting his penis in the other person’s mouth). No cases of transmission to the insertive partner in fellatio have been reported.

**Reducing risk with fellatio**

- Avoid ejaculation in the mouth. Since semen may contain a relatively high concentration of virus, it is wisest to avoid contact of semen with the lining of the mouth. The risk of infection to the receptive partner is considerably lower, if the penis is withdrawn before ejaculation.

- Do not engage in receptive fellatio if you have cuts or sores in the mouth or tongue, have just been to the dentist for cleaning or a surgical procedure, or if you have a sore throat. Do not floss or brush your teeth immediately before performing fellatio. Cuts, sores, or irritation of the lining of the mouth make it easier for infected semen to enter the body. If you have an infection in your throat, white blood cells will be present and they are good “targets” for HIV.

- If you want to make fellatio essentially risk-free, cover the penis with a condom. Use of a condom during oral sex essentially eliminates risk.
Evidence about the possibility of transmission of HIV through fellatio

- Biological evidence

The mouth is not an efficient site for transmission, both because of the element in saliva that tends to inactivate HIV and the type of mucous membrane in the lining of the mouth.

Further, if fellatio is not continued to ejaculation, the mucous membranes of the mouth are not exposed to semen. This probably lowers the risk of infection significantly. Two small studies have shown that pre-ejaculatory fluid (“pre-cum”) sometimes contains virus but at much lower levels than semen. (Pre-ejaculatory fluid is a viscous, clear fluid that is secreted from the penis some time prior to the ejaculation of semen itself).

- Clinical evidence

Many reliable clinicians have reported cases of patients who became infected through fellatio. Although it is always possible to question the honesty of the patients’ reports, the physicians reporting these cases had thoroughly interviewed the patients and were themselves convinced of the accuracy of the report.

- Epidemiological studies

Several epidemiological studies have assessed the increased likelihood of infection of people who have unprotected fellatio. These studies are difficult to evaluate. Generally, if someone reports that s/he had intercourse without condoms and fellatio without condoms, the case is attributed to transmission through intercourse. It is possible that some of these cases actually were infection related to fellatio. This is referred to as the masking effect.

Studies attempting to assess the relative danger of oral sex for HIV transmission have had conflicting results. Increased concern has been voiced by some recently because a carefully done study showed that 8 men in a cohort of 102 men who have sex with men infected with HIV - that is, 7.8% - were apparently infected through fellatio. (The principal researcher of this study believes that this is a higher percentage than would normally occur because men who volunteered for the study were likely to already be very careful about using condoms for intercourse and thus have a comparatively low risk of infection by this route.) Three of the eight men reported oral problems including bleeding gums. Ejaculation in the mouth occurred in seven cases and the eight involved either a large quantity of pre-ejaculatory fluid or ejaculate.

Cunnilingus

Cunnilingus is stimulation of a woman’s genitals with the lips and tongue. Cunnilingus during menstruation may possibly be risky for the person performing cunnilingus because there may be a high concentration of virus in menstrual blood, though the mouth is not an efficient site for transmission. If menstruation is not occurring, the mucous membranes of the mouth are not exposed to blood. This lowers the risk of infection during cunnilingus considerably. However, vaginal and cervical secretions sometimes contain a low concentration of virus. A few cases of transmission by oral-vaginal contact have been reported, although only when blood was present. There appears to be virtually no risk to the person whose genitals are being stimulated.

The small risk associated with cunnilingus is further lowered if an effective barrier such as a square of latex or plastic wrap (called an “oral dam” or “dental dam”) is used to separate the genitals from the partner’s lips and tongue. Although plastic wrap has never been formally tested, it is theoretically thick enough to prevent transmission. An oral barrier can also be made from a condom: cut off the closed end of a condom, then cut from bottom to top vertically, and unroll the condom into a square piece of latex that can be used as a barrier.

Oral-anal contact

Oral-anal contact (rimming) is stimulation of the anus with the lips and tongue. The possible risk is for the partner performing the oral-anal contact. This is not a likely route of transmission of HIV although it is possible that blood present in the rectum may come in contact with the lining of the mouth. However, oral-anal contact is a likely way to transmit intestinal parasites, which can produce troublesome medical problems. The risk of transmitting parasites
associated with oral-anal contact is made much lower if an effective barrier is used to keep the lips and tongue from coming into contact with the partner’s anus. The person receiving stimulation to the anus is essentially at no risk.

**Deep Kissing (French Kissing, Tongue Kissing)**

Kissing is not risky because HIV is either not present or present at very low levels in saliva. There is no evidence that exchange of saliva transmits the virus, even in prolonged deep kissing. HIV does not usually enter the body through the mucous membranes of the mouth. The CDC has reported only one case of possible transmission by kissing. In this instance, the infected man had frequent bleeding of the gums and sores in his mouth. His partner had periodontal disease.

**Touching Genitals with Fingers**

Touching or rubbing a partner’s genitals with fingers or insertion of fingers in the vagina or anus (fingering) does not present a risk of transmission unless the fingers have deep open cuts or sores.

**Activities involving no contact with body fluid**

If there is no contact between one partner’s bodily fluids and the other partner’s mucous membranes, there is no risk of infection—transmission of HIV cannot occur. The cells of skin are different from the cells of mucous membranes. Contact of HIV infected fluid with intact skin does not transmit HIV. A large, recent open cut in contact with infected fluid is usually necessary for transmission to occur. Sexual activities, such as mutual masturbation, rubbing bodies, and kissing skin, are therefore completely safe even if one or both partners are infected.

**Probability of Sexual Transmission from a Single Contact**

With HIV, a single act of anal or vaginal intercourse in which semen is deposited in the body may be sufficient for transmission. In the vast majority of cases, however, it appears that repeated exposure to the virus through multiple acts of intercourse has been necessary for transmission to take place.

**Estimates of probability of infection when one partner is HIV-infected**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Range of Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single act of anal intercourse to the receptive partner</td>
<td>0.0005 to 0.032 (8 to 32 in 1,000)</td>
</tr>
<tr>
<td>Single act of vaginal intercourse to the woman</td>
<td>0.0003 to 0.002 (3 in 10,000 to 2 in 1,000)</td>
</tr>
<tr>
<td>Single act of vaginal intercourse to the man</td>
<td>0.0003 to 0.0041 (3 in 10,000 to 41 in 10,000)</td>
</tr>
</tbody>
</table>

**Non-behavioral factors that may affect transmission**

In studies of people whose only risk was repeated intercourse without condoms with HIV-infected partners of the opposite sex, the prevalence of HIV infection ranged from under 10% to as high as 60%. These studies raise the question of why some sexual partners of infected people become infected while others do not, even when the sexual behavior is the same. Several factors may affect this:

- Some people may be more resistant to the virus than others. This is probably based on the absence or reduced susceptibility of certain cells that are attractive targets for the virus in the mucous membranes of some people. It
is also possible that people may vary in the immune mechanisms that make them able to mount resistance to the virus.

- HIV is more easily transmissible when the level of virus in the body is higher. Viral level is high shortly after infection and in late stages of the disease as the immune system deteriorates. Consequently, infected people probably transmit the virus more easily at these times. Treatment with antivirals, which lower the level of virus in the body also, may decrease infectiousness; however, it is still possible to transmit HIV even with a very low level of virus.

- Genital ulcers caused by concurrent infection with another disease in either partner makes transmission of HIV more likely. Mucous membranes in the vagina, rectum, or urethra are more vulnerable to infection from infected fluids if sores or other lesions caused by other sexually transmitted diseases are present. Also, activation of the immune system by illness makes the body more susceptible. Studies have clearly demonstrated that people are 2 to 5 times more likely to become infected with HIV when other sexually transmitted diseases are present.

Condom Information

Condoms can prevent the transmission of HIV, and also provide protection against diseases such as gonorrhea, chlamydial infections, HPV (human papillomavirus), syphilis, and herpes. Other methods of birth control, such as using a diaphragm with spermicide, do not provide adequate protection against the transmission of HIV infection and other sexually transmitted infections. Condoms can be bought at drugstores (no prescription is needed). Some highly infectious organisms (such as chlamydia and HPV) are probably transmitted by the hands during foreplay.

Latex and polyurethane condoms have been shown in the laboratory to block transmission of HIV, as well as CMV, chlamydia, gonorrhea, and, in many instances, herpes. In a study of 245 heterosexual couples where one partner was infected, none of the 123 uninfected people in couples consistently using condoms became infected while 12 of the 122 partners who didn’t use condoms became infected.

Use Condoms Correctly

- Condoms are latex, polyurethane, or animal-membrane sheaths that fit over the erect penis and act as a barrier to prevent semen or pre-cum from escaping while the penis is inside the vagina or rectum. Use only latex or polyurethane condoms. Do not use animal membrane condoms: they contain pores through which HIV can pass. Polyurethane condoms became available in 1995. While there is less data regarding their safety in practice (reducing transmission of sexually transmitted infections and pregnancy), there is evidence that the material they are made of is even less porous than latex. Consequently, they should prove to be at least as safe as latex condoms. The advantage of polyurethane condoms is that they can be used with oil-based lubricants (such as Vaseline and baby oil), they are thinner than latex condoms, and transmit heat better. This means that polyurethane condoms will feel more “natural” to some people. The disadvantage of polyurethane condoms is that they are more expensive. They may be particularly useful to the small group of people who are allergic to latex.

- Do not use condoms that are ribbed or textured to increase stimulation since these condoms may cause damage to genital tissues that, while unnoticeable, may make infection more likely if breakage occurs.

- Store condoms in a cool, dry place, out of direct sunlight. Condoms kept in wallets may become damaged after a period of time. Condoms are considered to be good for two years after their date of manufacture, which is sometimes printed on the package.

- The condom should be put on the penis after it is erect, not before. Put on the condom before the penis comes in contact with the genitals or with the anus.
• Condoms come packaged either rolled-up (usually) or loose. If the condom is rolled-up, determine which side is the inside of the condom, place that side against the tip of the penis and roll the rest of the condom down to the base. The condom should fit snugly so that it does not slip off during intercourse. If the condom is packaged unrolled, draw it over the penis like a glove.

• When putting on a condom, pinch about one-half inch of the condom’s tip to leave a small air-free space — this will help keep semen from bursting the condom upon ejaculation. If the penis is uncircumcised, retract the foreskin before putting on the condom. Putting a small amount (one drop) of lubricant inside the condom may increase comfort.

• If intercourse is continued to ejaculation, the penis should be withdrawn promptly afterwards. Since condoms may break or leak, ejaculation inside the body presents an increased risk of infection.

• In any case, the condom-covered penis should be withdrawn from the vagina or rectum before the penis becomes soft. During withdrawal, hold the rim of the condom firmly against the penis so that the condom cannot slip off and no semen can escape.

• Do not re-use condoms.

In 1994, so-called “female condoms” became commercially available. Studies indicate that female condoms are effective in preventing transmission of HIV. The technical name of these devices is lubricated polyurethane bags. These are polyurethane devices that are inserted into the vagina or rectum in order to create a protective barrier and prevent contact of semen with the mucous membrane of the vagina or rectum. The advantages of these condoms are that the receptive partner has more control over their use and that these condoms can be inserted many hours before sex. Their disadvantage is that they are expensive and some people find them uncomfortable or aesthetically displeasing.

Lubricants Should Be Water-Based

Lubrication is important to avoid tearing the condom or abrading body tissue. With latex condoms always use water-based lubricants such as K-Y Jelly, Foreplay, Probe, and Wet. These lubricants contain either glycerin or silicone. Never use oil-based lubricants such as hand-lotion, Vaseline, Crisco, baby oil, vegetable oil, mineral oil, suntan lotion, Albolene, Elbow Grease, Lube, or Shaft, since these may damage the latex of the condom. Put a drop of lubricant inside the tip of the condom before it is put on the penis. Too much lubricant inside the condom may lead it to slip off during intercourse. Use a generous amount of lubricant on the outside of the condom. Oil-based lubricants can be used with polyurethane condoms.

Do not use condoms or lubricants containing Nonoxynol-9

A spermicide called nonoxynol-9 is found in some contraceptive jellies and creams as well as in many lubricants and on some condoms. For some time, it was believed that preparations that contain nonoxynol-9 provided extra protection when used with condoms since nonoxynol-9 has been shown to kill HIV. However, a large double blind placebo study of the effect of Nonoxynol-9 on HIV transmission was conducted by UNAIDS from 1996 to 2000. The study volunteers were female African commercial sex workers. The women using a nonoxynol-9 gel became infected with HIV at a 50% higher rate than women using a placebo gel. This may be due to the nonoxynol-9 gel irritating vaginal tissues and making them more susceptible to HIV.

At the present time, the CDC recommends against the use of nonoxynol-9. Some condoms are lubricated with a substance containing nonoxynol-9. It is preferable to use lubricated condoms without nonoxynol-9. However, nonoxynol-9 condoms contain a far lower concentration of nonoxynol-9 than the gel used in the study and it is safer to use these condoms than to use no condom.
Additional Guidelines

It is preferable not to share sex toys (dildos, vibrators, etc.). If shared, clean sex toys thoroughly with soap and water and/or cover with a condom.

Wash the genitals with soap and water after sex. Douching or enemas immediately before or after sex do not help protect you against infection and may even increase the risk of infection by damaging natural protective barriers of the vagina or rectum. Do not put chemicals not intended for internal use into your vagina or rectum.

If you have sores or abrasions on your genitals, anus, or mouth, avoid activity that brings these into contact with your sexual partners. Also, if you have another sexually transmitted disease, have only no-risk sex until you are healthy. The presence of any one of a variety of sexually transmitted infections increases the risk of transmission of HIV infection.

Adapting to Risk Reduction

Of course, the greater the chance that your partner is infected, the greater the risk of infection through sex. Men who have had unprotected sex with other men and people who have shared needles for injection drug use are statistically at greatest risk of being infected in the United States, but most sexually active people are at some risk for HIV infection. It is extremely difficult to assess accurately your partner(s) risk of being HIV-infected. Intuition is an unreliable guide. You cannot tell whether a sexual partner is infected from appearance or social behavior. If you do not know a partner well, then you cannot know the level of risk.

Simply limiting the number of your sexual partners is not sufficient precaution against HIV infection. Two related misconceptions date from the early stages of the epidemic in this country: first, that having had many sexual partners somehow in and of itself causes AIDS; and second, that if you have had a small number of sexual partners, you are not at risk for AIDS. A recent study of a cohort of men who have sex with men indicated that 46% of men younger than 33 were infected by a steady partner.

Even if you have only one sexual partner, that person may be infected. Repeated unsafe sexual contact with one infected partner presents a high risk of infection.

The more partners you have, the greater the odds are that at least one of your partners will be infected. However, if you consistently avoid all high-risk sexual activity with all your partners, the extra risk associated with multiple sexual partners becomes much less significant.

Strike A Balance

Some people become so afraid of HIV infection that they give up sex, or alternate abstinence with occasional impulsive episodes of high-risk sex. Others deny that the epidemic has any chance of affecting them and continue high-risk sexual behavior without an appropriate level of concern. Extremes of behavior (anxious and fragile abstinence, unconcerned high-risk sex) may lead to a very high risk of infection. A middle course usually represents a better strategy. You need not give up your sex life nor should you expose yourself to high-risk sexual activity.

Many people follow risk reduction guidelines and still enjoy sex that is both safe and satisfying. However, risk reduction usually requires some loss of pleasure or spontaneity and can be extremely hard to maintain over a long period of time. It is more productive to view your own or others’ lapses from risk reduction with sympathetic concern and understanding rather than with condemnation. If you consistently engage in sexual activity which you feel places you at an unacceptably high risk of transmission, seek help from an AIDS organization or a counselor who understands the psychological difficulty of risk reduction.
**Planning for Risk-Reduction**

Learn how to come to an agreement with your partner about the sexual activity you will have together. Think through the issues in advance. This will help you avoid impulsive decisions and give a clear and consistent message to your partner. Have condoms available if you plan to have intercourse. Women hesitant to purchase and carry condoms should be aware that women now buy half of all condoms sold. The use of alcohol or other recreational drugs often impairs judgment; do not make decisions about sexual activity while you are intoxicated.

Try to talk about risk-reduction with your partners before sexual excitement interferes. Many have found that prospective partners interpret raising the subject of risk-reduction well before sex as a sign of intelligence and prudence. Others prefer to wait until they are actually involved in explicit sexual activity; follow this course of action only if you can stick to your decisions about risk-reduction and if you know that your partner will respect your wishes.

Ask yourself the following questions:

- Have you been practicing risk-reduction consistently?
- If not, what issues or circumstances interfere?
- How can you resolve these issues or avoid these circumstances?

If you are having difficulty avoiding high-risk sex, get help and support from an AIDS organization in your community. Many such organizations run "safe sex workshops."

Men who have sex with both women and men face difficult issues regarding risk-reduction. Ideally, discuss your sexual history with all your partners, both male and female, so that they may make informed decisions about risk-reduction. Practice risk-reduction with both women and men to avoid infecting yourself or others.

Frank discussion of risk-reduction may be difficult for men who have not told their female partners about sexual relations with other men. If your sexual contact with men has never involved the exchange of bodily fluids, you pose no special risk to your female partners. However, if there is a chance that you may already be infected then you must practice risk-reduction with your female partners as well as your male partners, that is, use condoms. If there is a chance you may be infected and you cannot tell your female partners, seek counseling from an AIDS organization in your community.

If you have further specific questions about risk reduction, an excellent source is "Ask the Experts" at www.theBody.com.

**Post-exposure Prophylaxis**

It is possible that infection may be prevented after an extremely high-risk exposure through immediate use of a combination of antiviral medications. This is known as “post-exposure prophylaxis” or “PEP”. It appears that treatment must begin within 36 hours after the possible exposure; many scientists believe that in order to be effective it may need to start sooner, perhaps within 12 hours. The treatment is continued for one month.

There is no conclusive evidence that such treatment is effective. No studies on non-occupational exposure prophylaxis have been completed. Studies on occupational exposure prophylaxis are somewhat inconsistent. However, a major study done by the Centers for Disease Control (CDC) in 1997 found that AZT use in health care workers who had been exposed to HIV was associated with an 81% reduction in infection compared to non-treated health care workers. Additionally, there is a rational scientific basis for believing that such treatment may prevent infection in at least some individuals.
PEP may prevent infection with HIV but starting PEP is a serious decision. There are several difficulties with PEP.

- PEP may prove, in the long run, to be ineffective in preventing infection.
- PEP requires careful use of antiviral medications. Medications may have significant side effects including fatigue and general malaise, nausea, diarrhea, and headaches. More severe side-effects are possible but unusual and reversible.
- The medications are expensive and must be taken several times a day.
- Many patients find the regime psychologically taxing and stressful.

Only those people who have had unprotected receptive vaginal or anal intercourse or shared needles with someone known or believed to be HIV positive should seriously consider PEP. Timely action is essential.

If you think you need PEP and are part of the Columbia University community immediately contact Laura Pinsky at 854-2878 or call the GHAP office at 854-6655.
Testing for HIV

Medical opinion now strongly recommends that if you are at some risk of being HIV-infected, you should be tested so that if you are infected, you can benefit from recent dramatic advances in medical care. People infected with HIV can now get special medical care before the development of any noticeable symptoms—care that has been shown to delay AIDS and extend healthy life. Since HIV may be transmitted mother-to-fetus, you should also be tested if you are a thinking of having a child and if either you or your partner has any risk of infection (including having had multiple sexual partners).

DETECTING ANTIBODIES VERSUS DETECTING VIRUS

There are several possible ways to determine whether you are infected with HIV. With a few exceptions, the method commonly used is a test for the presence of antibodies to HIV, rather than a test for the virus itself. The antibody test is typically used because it is less expensive, technologically simpler to perform and interpret (and thereby more reliable), standardized, and widely available. Other tests detect the virus itself directly and may be useful in certain circumstances.

HIV ANTIBODY TESTING

The HIV antibody assay is a blood test that, if properly used, can tell you whether you have been infected with HIV. If proper testing procedure is followed, the test has an accuracy of greater than 99%. The test indicates whether your blood contains antibodies to HIV.

Antibodies are proteins manufactured by your immune system that signal the presence of unwanted foreign material such as bacteria or viruses that may have entered your body. Each antibody is specific to a particular kind of foreign material.

A “positive” HIV antibody test result means antibodies to this virus were detected. A “negative” result means antibodies to this virus were not detected. If the test detects antibodies to HIV, it means that you have at some point been infected by HIV, that appropriate medical intervention will be helpful, and that you must consider yourself capable of transmitting the virus if you engage in specific risky activities. In contrast to many other infections, the presence of antibodies to HIV does not mean that you have successfully fought off infection.

HIV antibody testing is often incorrectly referred to as the “AIDS” test. Having a positive antibody test result does not mean you currently have AIDS now; however, a positive result does mean that you face a significant chance of dangerous illness in the future if you do not receive treatment.
Preconditions for Safe and Meaningful Testing

Testing is only safe, meaningful, and productive if certain preconditions are fulfilled. Before being tested, you should thoroughly understand the facts of testing.

Delay of Months Before Antibodies May Be Detectable

The body does not manufacture HIV antibodies immediately after infection. Most people develop measurable levels of antibodies in the blood within a few weeks after infection with HIV; the average time is 25 days. Almost everyone becomes positive within three months of infection. Therefore, HIV antibody testing is only meaningful if three months have passed since the last possible exposure to the virus. If not enough time has passed, the antibody test result may be negative despite the fact that the virus itself is present.\textsuperscript{117,118}

In rare cases, people may take longer to develop antibodies in response to HIV infection. In order to leave a margin for error, the CDC now recommends that you interpret a negative antibody test result as indicating that you were uninfected as of six months prior to the time blood was drawn for testing. However, it is reasonable to be tested after three months and then be re-tested after six months if you have a negative result despite extremely high risk for HIV infection.

Accurate Testing Requires a Sequence of Tests on Every blood Sample

HIV antibody testing provides accurate information only if it is done properly. A single blood specimen is tested with a sequence of tests. A very sensitive test called the EIA or ELISA (enzyme immunosorbent assay) test is used first. This test will pick up any blood sample positive for HIV. It may produce false positives because it cannot tell the difference between HIV antibodies and certain other antibodies that might be present and thus can be positive in the absence of HIV infection.

The EIA is repeated twice if it is positive. (Some laboratories, including the New York City lab used by Columbia University, do the EIA twice even if negative). If the blood sample is negative on both duplicate EIA tests, then the laboratory will report a negative result. If two of the three EIA tests are positive, a separate confirmatory test (usually the Western blot analysis) is performed on the same blood specimen. The Western blot test will usually eliminate false positives. If the Western blot analysis is positive, the laboratory will report a positive result. An alternative confirmatory test is the immunofluorescent assay or IFA.

After the proper sequence of testing is performed, the chance of a false positive test is miniscule; for example, one study indicates a six in one million chance of a false positive.\textsuperscript{119} However, if you have extremely low risk of being infected and test positive you should be re-tested by an alternative method that tests for the virus itself rather than antibodies (see below).

On rare occasions a Western blot analysis results cannot be conclusively determined to be either positive or negative. Such results are reported by the laboratory as “inconclusive” or “indeterminate.” If your test is indeterminate, consult with your testing counselor. Direct tests for the virus can be done to determine whether you are positive or negative. If you are at low risk, the most likely cause of the indeterminate test is cross-reaction with another antibody or technical/clerical error. If you are at significant risk, an indeterminate test probably means that you have become HIV infected in the recent past. In either case, you should be re-tested by an alternative method that tests for virus rather than antibodies.
**Positive Result Indicates Opportunity for Treatment**

If you have a positive HIV antibody test result then you must assume you are infected and could possibly infect others through certain types of sexual contact, needle sharing, child-bearing or breast-feeding. A positive HIV antibody test result indicates infection with HIV but provides no information about the current degree of illness or risk for opportunistic infections. Without treatment, at least seventy-eight percent of HIV-infected people will develop AIDS within fifteen years of infection. Treatment will greatly improve the odds of staying healthy.

**Negative result does not indicate immunity**

If you have a negative HIV antibody test result and the test was performed at least six months after the last possible exposure to HIV, then your result indicates that you have not been infected with the virus, you cannot infect others, and you have no current risk of developing HIV illness. All people should be aware that a negative test result does not mean that you are immune to possible infection in the future.

**Other HIV antibody tests**

**Testing for HIV-2**

HIV-2 is a variant of HIV that is prevalent primarily in Africa, particularly western Africa. HIV-2 is transmitted through the same routes as HIV-1, and, like HIV-1, can cause AIDS. The HIV antibody test commonly available in the United States is a test for antibodies to HIV-1 and does not always detect infection with HIV-2. However, all U.S. blood banks as well as some labs (including, the New York City laboratory, used by the Columbia testing service) test all blood for both HIV-1 and HIV-2.

Between 1987 and 1998, 78 persons were diagnosed with HIV-2 in the United States. All identified HIV-2 infected U.S. residents have been immigrants from Western Africa or their sexual partners.

West Africa nations with a greater than 1% incidence of HIV-2 are: Gambia, Guinea Bissau, Cote d'Ivoire, Cape Verde Island, Mali, Mauritania, Nigeria and Sierra Leone. Other African countries with a greater than 1% incidence of HIV-2 are Angola and Mozambique.

**HIV antibody saliva test**

The US Food and Drug Administration (FDA) has approved an HIV antibody test which is generally referred to as the saliva test. Actually, this test uses tissue collected from the cheek and gum by placing a specially treated pad between the lower cheek and gum for two minutes. The sample collected is tested using the same EIA and Western blot testing strategy used on blood. The approved test is the Orasure System produced by Orasure Technologies, Inc. and is available only in doctor's office, clinics, and testing sites. Results are reliable.

**The rapid test**

The US Food and Drug Administration (FDA) has approved a rapid test that can be done in 10 to 15 minutes. This test is known as the SUDS, produced by Abbott. This test is equivalent to the EIA. That is, it will have some false positives and no false negatives. If you test positive, then you must have testing done by a confirmatory method, such as Western blot. This is not part of the rapid test.

There are some commercial labs in New York City that perform the rapid test for a fee. The problem with using these services is that if you get an initially positive EIA result, you will need to be re-tested and wait for confirming results. This is generally very anxiety provoking and usually this requires going to a different testing service or paying a high fee for the confirmatory test.
**Home testing**

Only one home test has been approved by the FDA: the Home Access HIV-1 Test System. (phone number 800-HIV-TEST). This test is considered reliable and can be bought at a number of pharmacies, including Rite-AID. To use this "home" test, you prick your finger with a lancet provided in the kit, place the blood on special paper and send it to a laboratory with an anonymous personal identification number. You then telephone to receive your results. Any counseling is done at this point by phone.

The laboratory uses a double EIA and if the result is positive, it is confirmed by an IFA (immunofluorescent assay). Results are reliable. Be sure to check the expiration date on the package; the Home Access Corp. says that some pharmacies are selling expired kits. Disadvantages are the cost and the lack of in-person counseling.

**Technical details of the EIA Test**

| HIV from a laboratory source is grown in human white blood cells in the test tube. The resultant virus is chemically disrupted and then used to coat a small container or well. Serum (the cell-free portion of blood) from the person being tested is added to the coated well. If antibody to HIV is present, it will bind with the viral fragments lining the well. The serum is then washed away, leaving only the attached antibody behind. Another preparation is then added to the well. This preparation contains antibodies to human antibodies. These antiantibodies have been chemically attached to an enzyme, and the antibody-enzyme complex binds to the HIV antibody left in the well from the subject’s serum. The well is then washed again to remove any material that has not bound to HIV antibody. Finally, a substance is added that produces a visible color change. This color change is then measured with a photometer (a device that measures the color of light reflected from the well). If the color change is over a preset threshold, the result is considered positive. |

**Technical details of the Western blot test**

The Western blot is performed by exposing a specially prepared paper test strip to the blood sample. This strip is made in the following way. A quantity of HIV is grown in test tube cultures of human cells. The virus is isolated from the growth medium and disrupted into its component pieces. Each of these components is a molecule with a characteristic molecular weight. These components are then sorted by weight through a process called gel electrophoresis. In this process, the solution of disrupted virus with the different component molecules mixed together is applied to one end of a sheet of polyacrylamide gel, a special porous material. An electric field is applied across the sheet, and this field accelerates molecules of different weights at different rates. At the end of a period of time, the mix of different components will separate into bands across the gel, with the lighter molecules at one end and the heavier molecules at the other. Each band contains molecules of a certain molecular weight—that is, each band contains only one kind of antigen. The gel is then blotted onto a sheet of paper, and this sheet is then cut into strips, each of which contains the full set of bands (complement of antigens). As with the EIA, the strip is exposed to the blood sample to allow any antibodies in the blood to react with the antigens in the strip. The strip is then washed so that any free unbound antibody is removed. Then the strip is exposed to a special antihuman globulin that binds to any human antibody. This antihuman globulin will combine with HIV antibodies that may have bound to bands in the test strip. The antihuman globulin is tagged with a normally colorless enzyme that reacts with a substrate to produce visibly colored bands wherever HIV antibody binds to the test strip. The intensity and location of these visible bands indicates the presence and relative proportion of the different antibodies that were present in the blood sample. The formal interpretation of the Western blot depends on which combinations of two or more bands are present in a particular sample.
Viral testing

Several tests are available that detect the presence or absence of HIV itself in the blood. They include a test that detects RNA, the genetic material in HIV. This lab test can detect even tiny amounts of viral material with a methodology known as polymerase chain reaction (PCR). The test can detect virus within two to four weeks, but should be confirmed by an antibody test. This test can be used to detect HIV before the antibody test is accurate and to resolve indeterminate antibody tests. HIV RNA tests are also used to measure the amount of virus in blood in of people who are HIV infected in order to assess the need to start or change medication. This test has not been approved by the U.S. Food and Drug Administration for diagnosis of infection and should be followed up by an HIV antibody test.

OTHER ADVICE ABOUT HIV TESTING

Prepare for Psychological Stress

A positive antibody test result will almost certainly cause you psychological distress. Living with this stress has been painful and damaging for many people, according to evidence gathered by psychologists. In some cases, this stress has led to serious psychological problems including severe anxiety and depression. It is best to discuss your situation with a trained HIV counselor both before you are tested and after you receive your result. Government sponsored anonymous test sites generally provide counseling. Counseling tends to be inadequate in private doctors’ offices. Since testing positive may lead to great psychological stress, you should get additional support after such a test result, either informally through friends, through HIV-support groups, or through professional counseling. It may be helpful to locate sources of such support before being tested.

Discrimination Related to Testing

The HIV antibody test sometimes has social and legal implications. Many states, including New York State, now require reporting of HIV positive people; all states require reporting of people with CDC-defined AIDS. You can be tested anonymously in New York only at specific government anonymous test sites.

The legitimate purpose of reporting names and identifying information of people with HIV or AIDS is two-fold: to gather information about the nature and spread of the epidemic and to allow for partner notification. Many experts believe that information could be gathered with equal accuracy anonymously using a system known as "unique identification."

If you are tested positive in New York State, you may be contacted by state health officials who will request information about who your partners are and how to speak to them. The state will then notify your partners without giving your name. You are legally entitled to refuse to give this information. However, if you have given partners' names to the physician, clinic, or other site where you were tested, that facility is legally required to give such information to the state government.

The state currently keeps these records carefully guarded. It is not allowed to give this information to any other governmental or non-governmental organization. There appear to have been a relatively few lapses in confidential treatment of data. Insurance companies do not have access to these records.

The Federal Government requires all applicants for immigration to the United States and all employees and applicants to certain programs to take the HIV antibody test. These programs include: the Peace Corps, the Foreign Service of the State Department, the Armed Forces, the state National Guard, and residential training programs of the Job Corps. Discrimination is practiced against those who test positive. Applicants for the Peace Corps and the Foreign Service who test positive are rejected. Current members of the foreign service who are positive or have spouses or dependent children who test positive are barred from most posts outside the United States. Consequently, you should be anonymously or confidentially tested before applying to join any such organization, and consider withdrawing your application if you are positive.
Large Scale Coercive Testing Programs Not Advisable

Many proposals for large-scale coercive HIV antibody testing programs have been suggested: few of these proposals have been supported by responsible epidemiologists and public health officials. The debate over coercive testing is often wrongly characterized as a conflict between the public health and the civil rights of HIV-infected people. This misconception rests on the false premise that coercive testing would prevent new infections. HIV can be transmitted by unsafe sexual activity and through needle-sharing. Since these are voluntary behaviors, new infections through these routes could be best be prevented by appropriate education and persuasion. Testing cannot stop new infections without the cooperation of the public. This cooperation can be attained through education and voluntary anonymous testing programs.

No Need for Testing in Work Settings

According to the U.S. Public Health Service, there is no reason anyone needs to be HIV antibody-tested to protect others at their place of employment, even if they work with children or in a health-care setting.
Treatment

EXPLANATION OF CHAPTER

This chapter provides a brief overview of the treatment of HIV disease. It summarizes the consensus of medical and scientific opinion in early 2001 and necessarily omits and oversimplifies some issues. Information about HIV treatment changes rapidly, and inevitably, some specific details will be out-dated by the time you read this. However, principles of treatment do not change quickly and this chapter will provide a basic model of effective medical care for HIV.

Sources of more complete information that are regularly updated are listed at the end of the chapter. We particularly recommend that you visit the following web sites:

- AIDSmeds web site (AIDSmeds.com) - accurate, easy to read, and contains the latest information.
- AmFar Treatment Guide (Amfar.org) - information from a leading national AIDS organization
- U.C.S.F. The AIDS Knowledge Base (www.hivinsite.ucsf.edu/InSite) - accurate, detailed medical information

CURRENT STATE OF TREATMENT

The good news about treatment of HIV disease is dramatic: medication is available that can prevent illness and death and extend the life of HIV-infected people to a significant degree. Further, such treatment can probably extend years of healthy life.

However, the treatment now available is not a cure. Ongoing medical monitoring and continued medications are necessary. Medications have both long term and short term side effects that may be severe. It is too early to make confident predictions about the long-term efficacy of treatment. Further, treatment requires money for medical expertise and medication, laboratory tests; it is not available to the vast majority of HIV-infected people worldwide.

The most significant advance has been achieved through the development of effective antiviral medications that are used together in combination. This treatment is referred to as HAART (highly active antiretroviral therapy). The drugs halt or slow the replication of the virus, limit damage to the immune system and frequently restore immune function to near normal and thus prevent opportunistic infections, which are the cause of illness and death in HIV disease.
Tests that allow more accurate tracking of the level of virus in the body and resistance of virus to medication allow for more effective use of drugs. A tremendous increase in knowledge about the virus is opening routes for the development of new categories of antivirals. Improved treatment and prevention of specific opportunistic infections has also helped lessen illness and death from HIV disease.

**Evidence that currently available medication works**

Deaths from AIDS in the US rose every year from 1981 to 1995, reaching a peak of 50,000 in 1995. HAART began to be used in 1996 and by the year 2000, AIDS deaths dropped to less than 17,000. Although some of this drop is due to other factors (such as changes in patterns of transmission), it is largely the result of improved treatment of HIV disease.

Several large studies have followed the course of people with HIV disease, both before and after the use of HAART. The Adult/Adolescent Spectrum of Disease Project looked at 49,000 HIV-infected people beginning in people began in 1990. People not taking drugs were six times more likely to die than comparable patients taking a three-drug HAART regime. Another study, The HIV Outpatient Cohort, followed 3500 patients beginning in 1992. People not on medications were 4.5 times more likely to die as those taking a drug combination that include a protease inhibitor.

The San Francisco Department of Health has tracked about 95% of city's HIV-infected patients. People taking a drug combination including a protease inhibitor were 57% less likely to die than people not taking drugs.

While the vast majority of news about treatment is positive, the potency of HAART treatments and the longer life expectancy have resulted in recognition of the side effects that may accompany therapy. This represents the typical evolution that one sees in the early successful treatment of any disease. Fortunately, better therapies which are as effective and which offer reduced side effects are in development.

**NEED FOR EXPERT DOCTOR**

It is important to see a physician who is expert in HIV disease and has treated many HIV-infected patients. HIV care has become a medical specialty of its own. Information is fast changing and complex. Physicians not experienced in treating HIV patients are usually not adequately informed even if they are otherwise excellent doctors.

A recent survey indicated that one-quarter of United States physicians have never treated an HIV patient and that most of the rest have treated only one HIV patient. Physicians with significant HIV practices are often part of an informal network and keep each other up-to-date on recent developments. They are more aware of experimental treatments. There are a number of factors that will play a part in your choice of doctor. HIV expertise is not the only variable, but it is a crucial one. If you cannot receive care from an HIV specialist because of geographic or financial factors, try to seek periodic consultation from an HIV specialist who can collaborate with your regular physician.

One of the important facts to remember when choosing a doctor and deciding upon treatment is that "one size does not fit all". A doctor who is an expert in HIV will be knowledgeable about treatment options and will be able to describe current recommendations guiding the timing and choice of therapy. You and your doctor will individualize the choices based upon many factors including specific laboratory tests, general physical condition, and the presence or absence of any symptoms. An assessment of your lifestyle, age, other health factors, and your readiness for treatment, are equally important in making a treatment recommendation.

**UNDERSTANDING HIV DISEASE**

In order to understand the use and benefits of antiviral medication, it is necessary to learn some basic facts about the course of HIV disease and the laboratory tests that are used to monitor it (CD4 cell and the viral load tests).
**T cell count**

A T cell count (also known as a T4 count or CD4 count) measures the presence in the blood of a certain kind of white blood cell, the CD4 lymphocyte or T4 cell. The chart below shows how CD4 cells fit in the structure of blood.

CD4 cells are critical in helping the body mount an effective immune response. They signal the immune system to "turn on" in order to fight infections. Paradoxically, CD4 cells are also the major targets of HIV.

A CD4 cell count measures the number of CD4 cells per cubic millimeter of blood (there are five cubic millimeters in a teaspoon). As HIV disease progresses, it destroys CD4 cells and thus eventually interferes with the functioning of the immune system. CD4 cell counts are used to measure how much damage (if any) has been caused to the immune system. A normal CD4 count is somewhere between 500 and 1500. When a CD4 cell count falls below 200, a person infected with HIV is susceptible to a variety of opportunistic infections and is considered to have AIDS, by the definition developed by the CDC.

The status of the immune system can also be measured by looking at the percentage of CD4 cells present in the total number of lymphocytes. A normal percentage is 32 to 68% Generally, the immune system is functioning adequately when the CD4 percentage is 21% or higher.

HIV can damage the immune system in several ways. The virus directly destroys CD4 cells. In addition, the infection of CD4 cells causes the immune system to go into "overdrive." As a result, T cells of all types produce chemicals that stress the immune system and further damage CD4 cells.

When HIV-infected people are successfully treated with antiviral medication, T cells gradually increase. This correlates with the improvement of immune system functioning as evidenced by a significant drop in HIV-related infections. Once the immune system has been adequately reconstituted, HIV-infected patients who previously had low CD4 cells can frequently discontinue preventive medication for many opportunistic infections (for example, PCP, MAC, and toxoplasmosis). This should be done only in consultation with a physician.
**Viral load**

A viral load count (also known as viral burden) measures the amount of HIV circulating in the blood; it counts the copies of the virus in a cubic millimeter of blood.

Viral load is a direct measurement of how active infection is and is a very good predictor of how fast HIV disease is likely to progress. A high viral load (above 100,000 copies) means that there is high level of virus in the blood and body, many T cells are being infected and destroyed, and the immune system is in danger of significant damage. A low viral load (less than 5,000) means there is a smaller amount of virus in the blood, fewer T cells are being destroyed, and much less damage is occurring to the immune system. Studies show that less than 5% of all AIDS-defining complications occur in people with a viral load less than 5,000.\textsuperscript{128,129}

Data from a large cohort of patients have been used to predict the likelihood of the development of an AIDS-defining opportunistic infection in the absence of treatment.\textsuperscript{130}

### CD4 count less than 350:

<table>
<thead>
<tr>
<th>VIRAL LOAD</th>
<th>NUMBER OF PATIENTS</th>
<th>3 YEARS</th>
<th>6 YEARS</th>
<th>9 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,500 to 7,000</td>
<td>30</td>
<td>0</td>
<td>18.8</td>
<td>30.6</td>
</tr>
<tr>
<td>7,000 to 20,000</td>
<td>51</td>
<td>8.0</td>
<td>42.2</td>
<td>65.6</td>
</tr>
<tr>
<td>20,000 to 55,000</td>
<td>73</td>
<td>72.9</td>
<td>92.7</td>
<td>95.6</td>
</tr>
<tr>
<td>Greater than 55,000</td>
<td>174</td>
<td>72.9</td>
<td>92.7</td>
<td>95.6</td>
</tr>
</tbody>
</table>

### CD4 count 350 to 500:

<table>
<thead>
<tr>
<th>VIRAL LOAD</th>
<th>NUMBER OF PATIENTS</th>
<th>3 YEARS</th>
<th>6 YEARS</th>
<th>9 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,500 to 7,000</td>
<td>47</td>
<td>4.4</td>
<td>22.1</td>
<td>46.9</td>
</tr>
<tr>
<td>7,000 to 20,000</td>
<td>105</td>
<td>5.9</td>
<td>39.8</td>
<td>60.7</td>
</tr>
<tr>
<td>20,000 to 55,000</td>
<td>121</td>
<td>15.1</td>
<td>57.2</td>
<td>78.6</td>
</tr>
<tr>
<td>Greater than 55,000</td>
<td>121</td>
<td>47.9</td>
<td>77.7</td>
<td>94.4</td>
</tr>
</tbody>
</table>
CD4 count greater than 500:

<table>
<thead>
<tr>
<th>VIRAL LOAD</th>
<th>NUMBER OF PATIENTS</th>
<th>3 YEARS</th>
<th>6 YEARS</th>
<th>9 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,500 to 7,000</td>
<td>180</td>
<td>2.3</td>
<td>14.9</td>
<td>33.2</td>
</tr>
<tr>
<td>7,000 to 20,000</td>
<td>237</td>
<td>7.2</td>
<td>25.9</td>
<td>50.3</td>
</tr>
<tr>
<td>20,000 to 55,000</td>
<td>202</td>
<td>14.6</td>
<td>47.7</td>
<td>70.6</td>
</tr>
<tr>
<td>Greater than 55,000</td>
<td>141</td>
<td>32.6</td>
<td>66.8</td>
<td>76.3</td>
</tr>
</tbody>
</table>

If the amount of virus present in the blood is too low to be measured, viral load is considered undetectable. This does not mean that there is no virus present in the body; less than 5% of HIV in a body is present in the blood.

There are two commonly used tests to measure viral load. One is referred to as branch DNA or bDNA; the other is referred to as reverse transcriptase polymerase chain reaction or RT-PCR. The tests use different laboratory techniques to measure the amount of virus in blood. PCR amounts are slightly more than double those of bDNA, e.g. a viral load of 55,000 copies on PCR is the equivalent of 30,000 copies on bDNA.

If you are HIV-infected, it is important to measure CD4 count and viral load to determine when to start or change medication in order to prevent progression of the disease. To speak metaphorically, CD4 count tells you how far away the danger zone is and viral load tells you how rapidly you are approaching this zone.

Course of disease without treatment

Following is a description of the course of HIV disease without treatment. This is the typical course of illness, the statistical norm. A small number of people who are HIV infected never progress to AIDS, while others become ill quickly.

Without treatment, the average time from seroconversion to symptoms severe enough to meet the definition of AIDS is ten to twelve years. Sex, race, and risk category do not affect rate of progression if data are adjusted for quality of care.

Here are the stages of HIV disease:

- **Viral transmission**

  The virus enters the body and fuses with CD4 cells.

- **Primary HIV infection**

  HIV is disseminated to the brain and central nervous system and lymphatic tissue (lymph nodes, spleen, tonsils, and adenoids). Lymphatic tissue is the major reservoir of HIV in the body.

  Five to thirty days later (median 2-4 weeks), about 80 to 90% of people develop what is called "acute retroviral syndrome" or "primary HIV infection." This is an illness that resembles the flu and usually lasts about two weeks. Symptoms include fever, swollen glands, sore throat, rash, sores on the mouth, weight loss, and muscle or joint pain. (See section on treatment during acute infection for further information).
During the first two to three months of HIV infection, viral load is high and the CD4 count drops below normal. After a few months, the CD4 count rises close to normal levels and viral load drops. Viral load stabilizes at about six months to what is known as a viral "set point". A higher viral set point and more severe acute retroviral syndrome symptoms are considered predictors of more rapid progression to AIDS. It is important that people who might have acute HIV infection seek medical attention because most experts recommend at least short-term treatment during this period.\textsuperscript{131, 132}

Most people become positive on antibody test at about three weeks.

- **Asymptomatic infection,**

  During the next two to six years, most people remain asymptomatic, although they may have chronic swollen glands (lymphadenopathy). Despite lack of symptoms, HIV disease is progressing. On average, CD4 cells decline at a rate of approximately sixty points per year while viral load gradually increases.

- **Symptomatic HIV infection**

  After some years, a variety of medical symptoms may develop, often involving skin and gastrointestinal disorders. Viral load continues to rise and the CD4 count shows a more accelerated decline about 1.5 to 2 years before development of AIDS-defining illness.

- **AIDS**

  CD4 cells drop below 200. Opportunistic infections develop.\textsuperscript{133}

  The clear categorization of HIV into stages has become blurred by the ability of HAART to restore immune function, elevate T cells and allow AIDS related infections and conditions to be cured, allowing the halting or even reversal of this course.

**Goal of treatment**

At some point in the future, there may be a cure for HIV disease, perhaps a way to eradicate the virus in the body. At the present time, the goal of treatment is to halt or at least significantly slow the process described above. If the virus can be controlled with HAART, the immune system can function competently and no opportunistic infections will develop. This is the purpose of antiviral treatment.

Most people who start HAART for the first time reach the goal of becoming undetectable on viral load tests. In studies of these regimens, up to 90% of people who take the medications as directed, every day, without fail, achieve an undetectable viral load. This typically takes about four to six months. You can remain healthy even if your viral load does not become undetectable. However, because reducing viral load to undetectable predicts a more durable response, this is generally the goal of first time treatment.

CD4 levels gradually rise as viral load drops. On the average, the CD4 count will rise 100 to 200 in the first year after the virus becomes undetectable. After one year, it continues to rise at a more gradual rate.

HAART involves treatment with multiple drugs, most typically a total of three drugs. Multiple drugs are necessary fully to suppress HIV replication and to prevent the virus from becoming resistant to the medication.
When to begin medication

The US Public Health Service (USPHS) recommends that you should begin medication if:

- your CD4 cells are lower than 350 regardless of viral load
  
  Or

- your viral count is greater than 55,000 on bDNA assay or 30,000 on RT-PCR assay, regardless of T cells
  
  Or

- you have any opportunistic infections or HIV related symptoms such as persistent fever or weight loss
  
  Or

- you have become infected within the last six months.\(^{134}\)

You can check on current treatment guidelines at [www.hivatis.org](http://www.hivatis.org).

Treatment during acute or early infection

Preliminary research indicates that starting HAART during the first six months of infection will allow the body to establish a lower viral "set point" (the level at which virus settles a few months after infection). This correlates with improved response to treatment. Treatment may be most effective if started during the first few weeks of infection and some preliminary studies have shown that people who start HAART during the first few weeks may be able later discontinue medication and still maintain a low viral load.

If you have had a high risk encounter for HIV infection, the following symptoms are indicative of acute HIV infection:\(^{135}\)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Percentage of patients who develop symptom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>96%</td>
</tr>
<tr>
<td>Sore throat (pharyngitis)</td>
<td>74%</td>
</tr>
<tr>
<td>Rash (Usually a raised red rash on trunk and face)</td>
<td>70%</td>
</tr>
<tr>
<td>Joint pain (myalgia)</td>
<td>54%</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>32%</td>
</tr>
<tr>
<td>Headache</td>
<td>32%</td>
</tr>
<tr>
<td>Nausea and vomiting</td>
<td>27%</td>
</tr>
<tr>
<td>Enlarged spleen (hepatosplenomegaly)</td>
<td>14%</td>
</tr>
<tr>
<td>Weight loss</td>
<td>13%</td>
</tr>
<tr>
<td>Thrush (a fungal infection of the mouth)</td>
<td>12%</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Neurological symptoms</td>
<td>12%</td>
</tr>
</tbody>
</table>

Remember that many of these symptoms are common in a variety of illnesses other than acute HIV infection.

**Starting medication**

It is difficult to start taking medication that may have serious side effects if you feel good and have no symptoms. Remember, however, that you can feel completely healthy and still have a high viral load and low CD4 cells and be in danger of developing a life-threatening opportunistic illness without warning. Also, the decision to start therapy and the type of therapy you select must be individualized.

The U.S. Public Health Guidelines were revised in 2001 and will certainly be revised again as new drugs and data are produced. Earlier guidelines had suggested starting at a higher level of CD4 count and a lower level of viral count. The changes were made to reflect growing concern about side effects from prolonged use of medication.

**Classes of drugs**

Various developmental steps in the course of the reproductive cycle of the virus provide opportunities for anti-HIV drug therapy. These steps include attachment, uncoating, reverse transcription, protein synthesis, particle assembly, and budding. Particular categories of antiviral drugs interfere differently with steps in the life cycle of the virus. As our understanding of HIV grows, additional categories of antiviral drugs are discovered. For example, we now recognize that the initial steps in infecting a cell with HIV involve attachment and binding through receptors and fusion. There are now antiviral drugs in various stages of development that may work at these newly discovered steps.

Two classes of currently available drugs work by inhibiting a viral enzyme (reverse transcriptase) that converts the RNA in HIV into DNA and allows it to reproduce. These drugs are called nucleoside reverse transcriptase inhibitors (NRTIs) and non-nucleoside reverse transcriptase inhibitors (NNRTIs). A third category, protease inhibitors (PIs) disable a chemical necessary for the effective organization of the structure of new copies of HIV.

**Hydroxyurea**

New categories of drugs that are being developed include:
- entry blockers and fusion inhibitors (such as CCRS and CXCR4 blockers or the fusion inhibitor T-20)
- integrase inhibitors
- nucleotide RT inhibitors (such as Tenofovir).

**The mechanics of HIV**

Viruses are protein-shelled particles containing genetic material (composed of nucleic acids). Viruses also sometimes contain enzymes, which are complex proteins that enable very specific chemical reactions, in effect acting as tiny machines that assemble and disassemble other molecules. Viruses sometimes have an enclosing fatty (lipid) membrane. Viruses have no ability to reproduce on their own and are completely reliant upon the host cell to make the proteins the virus needs for reproduction. Viruses hide their genetic material in the DNA of a cell. When infected cells make proteins, they make new viruses as well.

A particle of HIV is encapsulated with a sugar-protein-lipid (fatty) membrane studded with sugar-protein spikes. The viral membrane is derived, in part, from the membrane of the host cell. Proteins on the surface (envelope) of the virus are attracted to receptors on CD4 cells. When HIV binds with these receptors, it activates other proteins that allow HIV to fuse to the cell.
Inside the virus’s membrane is a spherical protein shell, called a capsid. Inside this shell is a tapered cylinder of protein that with its contents forms the core complex of the virus. The core complex contains both the genetic material of the virus (RNA sheathed in a protein coat) and the virus’s enzymes (reverse transcriptase/ribonuclease H, HIV integrase, and HIV protease). After the virus is attached to the cell, the capsid is released into the host cell.

HIV is a type of virus called a retrovirus, or “reverse virus.” The name stems from the fact that retroviruses reverse part of the usual path by which genes make proteins. Retroviruses use RNA as their genetic material, but use an enzyme called reverse transcriptase to reverse the usual DNA-to-RNA transcription process. Reverse transcriptase forces the cell to copy the virus’s RNA into DNA, the opposite of the usual flow of information in the cell. The part of an infected host’s DNA that encodes the retrovirus is called the provirus.

Newly made viral DNA migrates to the nucleus, where it is incorporated into the cell’s own native DNA using another viral enzyme called integrase. If the host cell divides, the provirus divides right along with rest of the host DNA, and the latent retroviral infection is passed along to the daughter cells.

Special enzymes create a strand of genetic material called messenger RNA (mRNA). These are the "instructions" for making new viral proteins. Each mRNA strand makes a string of proteins needed for a new virus. Finally, these strings of protein are cut up by an enzyme known as protease and reassemble as new viral particles. They bud off from the original cell and make new virus that can infect other cells. Each infected cell can make many copies of new virus.

The entire process takes only 8 to 12 hours. It is highly error-prone, making at least one mistake (mutation) in its gene structure every time it reproduces.

### Available antiviral medication

<table>
<thead>
<tr>
<th>GENERIC NAME</th>
<th>BRAND NAME</th>
<th>ABBREVIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zidovudine</td>
<td>Retrovir</td>
<td>AZT or ZDZ</td>
</tr>
<tr>
<td>Didanosine</td>
<td>Videx or Videx EC (time release)</td>
<td>ddI</td>
</tr>
<tr>
<td>Zalcitabine</td>
<td>HIVID</td>
<td>ddC</td>
</tr>
<tr>
<td>Stavudine</td>
<td>Zerit</td>
<td>d4T</td>
</tr>
<tr>
<td>Lamivudine</td>
<td>Epivir</td>
<td>3TC</td>
</tr>
<tr>
<td>zidovudine/lamivudine combination</td>
<td>Combivir</td>
<td>AZT/3TC combination</td>
</tr>
<tr>
<td>Abacavir</td>
<td>Ziagen</td>
<td>ABC</td>
</tr>
<tr>
<td>Zidovudine/lamivudine/abacavir combination</td>
<td>Trizivir</td>
<td></td>
</tr>
</tbody>
</table>
Non-nucleoside reverse transcriptase inhibitors (NNRTIs)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Trade Name</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nevirapine</td>
<td>Viramune</td>
<td>NVP</td>
</tr>
<tr>
<td>Delavirdine</td>
<td>Rescriptor</td>
<td>DLV</td>
</tr>
<tr>
<td>Efavirinz</td>
<td>Sustiva</td>
<td>EFV</td>
</tr>
</tbody>
</table>

Protease inhibitors (PIs)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Trade Name</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>saquinavir (soft gel cap)</td>
<td>Fortovase</td>
<td>SQV(sgc)</td>
</tr>
<tr>
<td>saquinavir (hard gel cap)</td>
<td>Invirase</td>
<td>SQV(hgc)</td>
</tr>
<tr>
<td>Indinavir</td>
<td>Crixivan</td>
<td>IDV</td>
</tr>
<tr>
<td>Ritonavir</td>
<td>Norvir</td>
<td>RTV</td>
</tr>
<tr>
<td>Nelfinavir</td>
<td>Viracept</td>
<td>NFV</td>
</tr>
<tr>
<td>Amprenavir</td>
<td>Agenerase</td>
<td>APV</td>
</tr>
<tr>
<td>Lopinavir and ritonavir</td>
<td>Kaletra</td>
<td>LPV/RTV</td>
</tr>
</tbody>
</table>

Cellular factor inhibitors

<table>
<thead>
<tr>
<th>Drug</th>
<th>Trade Name</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydroxyurea</td>
<td>Droxia</td>
<td>HU</td>
</tr>
</tbody>
</table>

**IMMUNE-BASED THERAPY**

Immune-based therapy is the term used to describe treatments that are not antiviral and are intended to improve the immune system as measured by your CD4 cell count. It includes such treatments as interleukins, interferons, and therapeutic inactivated vaccines. All are still experimental and in clinical trial; interleukins appear to be the most promising in that they may allow people infected with HIV to receive intermittent therapy.

**Viral resistance**

A major problem in the use of antiviral drugs has been the ability of the virus to become resistant to medication, rendering the drug ineffective. HIV is very active in the body even when no clinical problems exist. In fact, billions of new viral particles can be made and cleared from the body every day. This level of reproduction allows for rapid mutation of the virus. If you are taking medication but the reproduction of the virus is not completely blocked, the virus can become resistant to the medication you are taking. At the present time, no single drug is effective enough to lower reproduction of the virus to a level that will prevent resistance. This is the reason a combination of medication is used.

Nature makes frequent errors in transcribing the genetic code of HIV-enzymes. Some of these errors allow HIV to escape the effect of HIV therapy. Antiviral drugs prevent reproduction of virus that is susceptible. Over time, virus types that are resistant to medication become the predominant types in the body. This is known as selective pressure. Use of multiple drugs (usually at least three) reduces the ability of the virus to escape inhibition and mutate successfully. In addition, lowering replication of HIV through use of antivirals decreases the number of new viral
particles produced and thus the number of mutations. As viruses mutate they may also become less "fit," that is, less able to replicate.

The goal of HAART is to reduce the level of virus in the body as much as possible while preventing or reducing the production of mutations, which make the virus resistant to a drug. Resistance is caused primarily by not taking drugs properly, that is skipping too many doses or discontinuing one drug while continuing to take others. Resistance can also be caused by a combination of drugs that does not adequately limit reproduction, or low drug levels caused by poor absorption of medication.

Viruses may become resistant not only to an individual drug, but also to some or all of the drugs in its category. This is known as "cross resistance." Some medications such as 3TC and the NNRTIs develop cross-resistance easily and should only be used if you are sure you can always take the medication precisely as prescribed. Medication should be used in combinations that do not reduce future options by causing the virus to become resistant to entire categories.

In order to choose the best combination, the virus in your body should be tested for resistance to various drugs. Resistance testing is most often done for people who do not respond to treatment after a certain period of time. There are two types of resistance testing available, referred to as genotypic and phenotypic testing.

A phenotypic test measures the ability of the virus to reproduce in the test tube in the presence of anti-HIV drugs. It is reliable but expensive and takes some time to get back results. A genotypic test sequences the genes of the HIV in your body to show where mutations have occurred. It is quicker and less expensive than the phenotypic test but requires expert interpretation. A newly developed test, known as the virtual phenotype test, may combine the advantages of both tests.

Use of these tests will determine what drug(s) you should switch to if a change is necessary. In addition, now that transmission of multi-drug resistant virus is becoming more common, some physicians recommend resistance testing before first starting medication.

**HAART GUIDELINES**

**Starting medication**

Generally, if you have not been previously treated, your doctor will recommend that you start on a combination of three drugs:

- Two nucleoside reverse transcriptase inhibitors and one protease inhibitor (but never d4T and AZT together)

  *Or*

- Two nucleoside reverse transcriptase inhibitors and a non-nucleoside transcriptase inhibitor.

  *Or*

- Three nucleoside reverse transcriptase inhibitors.

If you have previously been treated with any antiviral drugs, your physician will perform resistance testing to determine what combination of medications will work best for you.
Monitoring medication

With current available medication, 95% of people on HAART need to continue taking medication indefinitely, according to studies so far conducted. In a study, patients who had maintained undetectable viral loads for two to three years returned to pre-treatment viral set point within twelve weeks after discontinuing medication. After viral load is undetectable, monitoring of viral level and CD4 cells should be done every three or four months. Some drugs require other lab tests in order to assess possible harmful side effects.

Discontinuing medication

Stopping medication should be planned with your physician. Stopping only one or two of three medications leads to an increased likelihood of developing resistance to medications. NNRTIs (Sustiva, Viramune, and Rescriptor) need to be stopped a few days earlier than other medication because they remain in the body longer.

Changing medication

Medication may need to be changed for two reasons. First, if side-effects make taking a particular combination of drugs unacceptable, you may be able to tolerate other drugs.

Second, you may need to change drug combination if the drugs are not working adequately. You will know medication is ineffective if:

- You are starting medication for the first time and your viral load does not decrease by 90% in eight weeks.

- Two successive viral load tests show a significant increase in viral load, as this means the drugs are no longer working. Some studies show that if you have been taking the drugs as prescribed, the most likely reason for this is that the virus has developed resistance to the drugs. Your doctor will perform resistance testing while you are still taking medication to determine which drugs are still likely to be effective (see below).

- Your T cells level drops steadily even if your viral load does not increase.

Some patients do not respond to typical HAART regimes. These are usually people with very low T cell counts (less than 50) and high viral loads (greater than 100,000) or people who have previously been treated with medication and become resistant may require more drugs.

These treatment regimens are referred to by a variety of names: "salvage therapy" or "rescue therapy," "mega-HAART" or "MDRT (multi-drug rescue therapy)." These treatment regimes involve the use of more than three antivirals, often five or six. Taking a large number of drugs often increases the level of side effects as well as requiring more attention to complicated schedule of drug taking.

If you have become resistant to several medications, you may want to investigate the possibility of entering a clinical trial. This is a way of obtaining new types of medication that may still be effective for you. It is also a way of obtaining medical care and medication free of financial cost.

Structured treatment interruption (STI)

Over the last two years, scientists have raised the question as to whether it might be possible safely to discontinue medication for some period of time, that is, to do so without a large increase in viral load or reduction in CD4 cell count. Such periods are referred to as "drug holidays" or STIs (structured treatment interruptions). It is crucial to understand that the benefits and risks of STIs are unknown and research is preliminary, that HIV experts do not currently recommend STIs, and that an HIV-infected person should not interrupt treatment without consultation with an experienced clinician.
There are four categories of reasons that STIs might be advantageous.

- An STI would temporarily relieve the acute side effects of antiviral medication and, most importantly, potentially help reduce long-term side effects of medication. STIs would allow an individual a break from the rigors of taking medication on a daily basis. This in turn might improve a person's ability to take the medication correctly and reduce the resistance that can develop when medication is taken irregularly.

- The effects of antiviral drugs on a developing fetus are still unknown. STIs would allow pregnant women to discontinue medication during the first three months of pregnancy, when drugs are most likely to cause harm to the fetus.

- STIs may allow a change in the virus to a strain that is more susceptible to medication. When an individual discontinues medication, the virus reverts to what is known as "wild type." Such virus may be more sensitive to previously used medication. This would be useful to HIV infected people who are resistant to a number of drugs.

- Some scientists theorize that STIs may be useful in causing changes to the individual's immune system that would help fight HIV. The hypothesis is that stopping medication may help the immune system fight HIV by increasing a type of T cells known as HIV-specific-CD4-cells and by improving an immune function known as CTL (cytotoxic T-lymphocyte) response. It is possible that the body no longer produces responses when viral load is below a certain level. Alternating periods of taking and stopping medication might allow the body to continue to produce helpful antibodies while keeping HIV in sufficient check to prevent damage to the immune system.

A number of studies are underway and no conclusive results are available. Some findings are hopeful, others are discouraging. The findings can be summarized as follows:

- There are no data on the effects of STIs on reducing long-term side effects of reducing potential damage to fetal development.

- Patients with chronic infection continue to have an increase in viral load (referred to as "viral load rebound") when they stop taking medication. A small number of patients have returned to a level lower than the one they had before starting medication, but most did not.

- Most patients who stopped medication and re-started were able to bring their viral load down to a detectable level. However, some patients were not.

- STIs look promising in people initially treated during acute HIV infection, that is people who were diagnosed and treated for HIV within a few weeks of becoming infected. Some patients were able to maintain a low, though not undetectable, level of virus in their body for a period of six months. It should be stressed that this study has looked at a very small number of subjects.

Preliminary studies show that some patients who have been treated with many drugs and have multiple drug resistances may benefit from a treatment interruption before starting multi-drug "salvage" therapy while others do not. The usefulness of STIs in such patients have neither been established nor ruled out. Some patients in this category have had a marked decrease in CD-4 cells during the STI and have developed opportunistic illnesses.

**Physical side effects**

HAART medications do have significant side effects. These side effects vary from medication to medication and from person to person. Some people find the short-term side effects mild and transient, others experience them more severely and persistently. Your goal should be to find a combination that is effective and allows you to have an acceptable quality of life.
**Short term side effects**

The most commonly experienced short-term side-effects to HAART are diarrhea, nausea, and other gastrointestinal symptoms, headache, rash, fatigue, and for some people (a difficult to describe) feeling of disorientation or "spaciness." Sustiva, a commonly used non-nucleoside reverse transcriptase inhibitor, frequently causes mental changes: nightmares, and/or symptoms of depression or anxiety.

Generally, side effects are worst in the first few weeks to months of taking medication. The anxiety related to starting medication might exacerbate symptoms. You should report side effects to your physician and feel free to ask questions about expectable severity and duration. Many physicians hesitate to describe side effects to patients fearing that this will increase their rate of occurrence. Decide for yourself how much information is best for you.

You may have short-term adverse responses to medication that will show up on lab tests or physical exam. It is important to see your doctor regularly and obtain suggested lab tests.

**Long-term side effects**

HAART has only been in use since 1996 years and even the oldest HIV drugs have been used for a limited time. Consequently, it is difficult to be certain what long-term side effects will result. Some have already appeared and can be quite significant. There is no point in minimizing the potential long-term risks of taking a combination of powerful drugs. Recent guidelines about when to begin medication were revised because of these risks. However, it is important to remember that you are accepting these risks because the alternative is a life-threatening illness. As experience with HAART grows, we should have better information about long-term side effects and, perhaps, how to manage or avoid them.

So far, the major long-term side effects of HAART include the following

- "Lipodystrophy"

This is a general and non-specific term used to describe a complex of problems related to the amount of lipid (fat) and its distribution within the body. They include fat loss and redistribution. Typically, face, limbs, and buttocks become leaner and additional fat is concentrated on the abdomen, breast (in women), and upper back.

Associated with lipodystrophy, although not proven to be directly linked are several other metabolic abnormalities that include:

- High cholesterol and triglyceride levels. These may increase the risk for cardiovascular events (heart problems)and stroke

- Diabetes. This may be very subtle and your doctor should regularly check your blood glucose while you are fasting

- Mitochondrial toxicity. This is possible irreversible damage to the energy producing machinery of certain cells and is mostly seen with NRTI medications. This type of side effect may lead to peripheral neuropathy (numbness or tingling in hands and feet), pancreatitis (an inflammation of the pancreas, an organ responsible in part for digestion) or rarely, lactic acidosis (accumulation of a cells waste products in the blood).

- Osteoporosis and osteopenia. These terms describe a loss of the calcium in bones that weakens them and may put you at risk for fractures.
Emotional reactions

Some people feel a sense of relief at starting medication because they are taking action against the virus. Some people feel upset because starting medication makes the illness seem more threatening to them, even if they have no symptoms. Most people have a complicated mixture of these and other reactions. If your mood or behavior changes at this time, it may be that you are reacting psychologically to the stress of beginning medication.

For some people, starting HAART feels like reaching a new stage in HIV disease. You may associate starting medication with the onset of disease. This association may make you feel as if you are sicker than you really are. Taking HAART may be your first significant protracted action to fight the virus. Some people feel that taking medication is a constant reminder of their HIV infection and, for a period of time, worry more about getting sick.

Many people find themselves feeling angry when they begin to take medication. It is burdensome to remember medication, to visit the doctor, to pay for pills, and to fill out insurance forms. You may feel it is very unfair that you have to worry and make sacrifices to protect your health when other people do not. Taking medication may also make you feel isolated or different from other people.

The negative psychological reaction to starting HAART often fades within a few weeks as taking medication becomes part of your daily routine and therefore less noticeable. It may be easier for you to manage the first few weeks if you remember that the physical and emotional reactions to taking medications will probably lessen.

Adherence

If you are on HAART, you will be usually be taking at least five pills per day though some new regimes are as few as two pills per day and some are many more than five. This is difficult for almost everyone. Some medications need to be taken with food and others without. This may require an inconvenient juggling of eating schedule and social inconvenience. Side effects make it hard to persevere. Taking more of a medication that makes you feel ill is the last thing anyone wants.

However, taking medication regularly and pretty much on time is crucial with HAART. The main reason for medication not working is failure to adhere to medication regime.

Taking medication regularly is partly a matter of habit; any chore like this needs to become part of your daily routine. Sometimes negative feelings about taking drugs may unconsciously lead you to forget. It is understandable that people push out of their mind reminders of a frightening situation. Some people prefer to use a watch beeper or a special pillbox with a beeper attached to help remind them to take medication. Others feel that this makes their use of drugs too noticeable to others.

The main predictors of non-adherence are the simplicity and tolerability of the regime, how comfortable you are with taking pills in front of others, and your psychological state when you begin therapy. Depression and substance use are often related to difficulty in adhering to medication.

Some people find that temporarily enlisting another person to help them remember and give them support is helpful. Many people are best helped by others in the same situation. Being part of a group when you first start medication may help you get through successfully. Sometimes friends, acquaintances, or health care providers act as if taking medication and tolerating side effects is a simple proposition. It isn't, for most people. You deserve whatever help and encouragement you need in using medication consistently.
PREVENTION OF OPPORTUNISTIC ILLNESS

Serious illness and death associated with HIV disease has decreased due not only to antiviral treatment but also through improvement of treatment to prevent and opportunistic illness. The word prophylaxis is used interchangeably with the word prevention; medications (or other methods) to prevent the development of an illness are referred to as prophylactic treatment.

Prophylaxis is better than waiting to treat acute disease: drugs are more effective when used earlier, side effects are less severe, and the immune system is spared the strain of active illness.

For example, Pneumocystis carinii pneumonia (PCP) has been the major cause of sickness and death in the AIDS epidemic in the United States. Although almost everyone is infected with Pneumocystis carinii early in life, the organism is harmless unless people become immune compromised. In immune-compromised people, the organism can cause a life-threatening pneumonia.

In the last few years, researchers have shown that PCP can in general be prevented. You can greatly reduce your chances of ever developing PCP if you receive the right kind of monitoring and treatment starting as soon as you know you are HIV infected. It is very important to prevent PCP: although treatment for episodes of active PCP has improved, 5% to 10% of people still die during their first episode.

Successful prophylaxis has two components: determining when particular opportunistic infections are likely to occur in an immune-suppressed person; and then using appropriate medication to block these infections.

Most opportunistic infections are the result of the growth and spread of microorganisms that have been in the body many years. Monitoring through the use of screening tests can sometimes indicate which people are infected with which organisms and therefore at risk for active infections.

The development of opportunistic infections is highly dependent on the degree of immune suppression. The most common measure used to monitor HIV-related immune deficiency is the CD4 lymphocyte count. Opportunistic infections are rare in people with CD4 cell count above 200. As the CD4 cell count declines below 200, infections become more frequent.

Some prophylaxis should be started in the absence of any symptoms:

- Prophylaxis for tuberculosis should be started for all HIV positive people with a positive tuberculin skin test (TST) or with close contact with a person with active TB regardless of the TST.
- Prophylaxis for PCP should be started when CD4 cells are below 200. It can be discontinued if, with antiviral treatment, CD4 cells rise above 200 for at least 3 months.
- Prophylaxis for MAC (mycobacterium avium complex) should be started if CD4 cells are below 50. It can be discontinued after 12 months of treatment if no symptoms are present and CD4 cells rise over 100 for at least 6 months.
- Prophylaxis for toxoplasmosis should be started if there is a positive antibody for toxoplasma and CD4 cells are below 100. It can be discontinued after initial therapy is completed, no symptoms are present, and CD4 cells are greater than 200 for at least 6 months.

Other diseases require prophylactic treatment if an initial episode has occurred. These include cryptococcosis, histoplasmosis, coccidioidomycosis, and cytomegalovirus retinitis. Discuss the criteria for stopping with your physician. Recommendations differ for children and adolescents.

The need for prophylaxis also depends on which opportunistic infections are common in the area in which the
patient lives. PCP is common in North America, Europe, and Australia. Tuberculosis is common in Africa, Asia, the Caribbean, and South America, as well as in poverty-stricken areas of the United States. Histoplasmosis is common in the Ohio-Mississippi river valley of North America, the Caribbean (including Puerto Rico), and in Central and South America. Coccidiomycosis is found in the southwest United States and in Los Angeles. It is therefore useful to give your doctor a history of where you have lived and traveled.

Prophylactic drugs should not produce dangerous or intolerably unpleasant short-term side effects. Specific side effects have to be balanced against the benefit of preventing particular opportunistic infections.

Long-term use of any drug may encourage the evolution of drug-resistant strains of microorganisms. Resistance is undesirable: it would reduce the effectiveness of both prophylactic and acute treatment. Long-term side effects and possible interactions with other drugs are also potential adverse consequences of prophylaxis.

**HIV TREATMENT ISSUES FOR WOMEN**

Generally, the differences in progression of disease in women versus men appear to be due to sociological rather than biological factors. Although studies demonstrate faster progression of illness and shorter survival time in women, this appears to be related to poor access to care because of gender issues, particularly the greater poverty of women and the burden of childcare.

No gender-specific recommendations exist for the screening of women for opportunistic infections. Kaposi's sarcoma is the only AIDS-defining condition found less frequently in women.

Women who are HIV-infected may be more prone to cervical disorders than uninfected women. Expert clinicians have recently recommended that an initial exam include *colposcopy* (magnified visual inspection of the cervix) and cervical cytology (PAP smear), followed by a PAP smear every six months. PAP smears appear to be sensitive in HIV-infected women.

Vaginal candidiasis, which occurs frequently among all women, may be particularly severe and likely to recur in HIV-infected women. Herpes simplex may also be more difficult to treat. No differences have been seen in menstrual disorders between HIV positive and HIV negative women.

There is a lack of direct data about the use of antivirals in HIV-infected women, although generally they appear to be as effective for women as for men. Further study is needed to determine if factors such as lower mean body weight and lower hemoglobin level in women may contribute to increased toxicity.

For information regarding issues of pregnancy and childbirth, consult The Medical Management of AIDS (www.hopkins-aids.edu/publications/book/book_toc.html) or The HIV Knowledge Base (www.hivinsite.ucsf.edu/InSite)
Further Information for HIV-infected People

The most significant factors in treatment of HIV disease are the prevention of opportunistic infections and the use of antiviral medication. However, other health care measures can make a significant difference in the course of illness and quality of life. This chapter will describe these steps: e.g., the importance of prompt and aggressive treatment of all symptoms; immunizations (including the crucial topic of immunization against hepatitis B); specialized gynecological care; and dental care. In addition, this chapter will provide information about condom use and needle cleaning; nutrition and food safety; the use of alcohol and other recreational drugs; and how to live safely with domestic animals.

**SEEK MEDICAL CARE PROMPTLY AND AGGRESSIVELY**

Most people who are HIV infected worry at some point about whether to contact their doctors if a new symptom appears. If you are generally healthy and your CD4 count is high, most symptoms do not constitute an immediate medical emergency; nothing terrible is going to happen to you in the next few days. However, it is always a good idea to let your doctor know about any new symptom that lasts more than forty-eight hours. If you find yourself debating whether to call your physician, go ahead and call. It is almost always better to err on the side of being too careful.

One highly respected HIV doctor in New York City put it this way: “Almost all disasters in HIV disease occur because people wait too long to call their doctor.” (Daniel William, M.D., private communication.) Many people put off calling their doctors because they worry about being “hypochondriacs” or bothering their doctors. Many HIV doctors on the other hand seem to report the opposite problem: their patients wait too long to call them with problems. Very few people call their doctors too often; if you are afraid you are doing this, speak about it directly with your physician. If you are becoming too worried about minor symptoms, the solution is not to ignore all symptoms but to get help with your anxiety.

Most people feel a strong impulse not to think about a new symptom. People feel that if something is wrong, even something minor, it could be the start of a larger problem. If you are asymptomatic, you are probably afraid of developing symptoms that could lead to a diagnosis of AIDS. It is tempting for most people to say, “If I just wait a few days this may go away and I won’t have to worry about it.”

Contacting your doctor to report a new problem takes work. Doctors are busy: you may have to make repeated calls and then wait for a return call. Not only is this inconvenient, but during this time your anxiety may increase. (Some doctors have assistants who can give preliminary advice on the phone; this is very helpful).

There are very strong reasons to try to overcome the understandable impulse to avoid calling your doctor if a new problem occurs. Most symptoms will be minor and getting this reassurance from your physician will make you feel better. If you have pushed a worry out of mind it can create anxiety even if you aren’t thinking about it consciously. If the symptom requires treatment, it is better to get treatment promptly. Your goal is to stay as healthy as possible; curing infections and other problems as fast as possible will help maintain the proper functioning of your immune system.

If the problem you are experiencing is a symptom of an opportunistic infection, it is crucial that you receive treatment as soon as possible. Opportunistic infections are likely to respond better to treatment when the treatment
occurs early in the course of the infection. Early treatment may help you avoid hospitalization; some problems can be treated on an outpatient basis if treatment begins early. More severe illness due to delayed treatment can lead to unnecessary suffering, weight loss, and multiple secondary medical problems. Sometimes early intervention in an opportunistic infection can be lifesaving.

This situation may be particularly difficult if you get your medical care through a clinic. Sometimes the only way to be evaluated between regular visits is to go to the emergency room, a time-consuming and often unpleasant activity. It may be difficult or impossible to get your clinic doctor on the telephone. It is extremely useful to establish contact with a nurse or other health care professional in the clinic in addition to your doctor. This person may be easier to reach and may advise you as to whether it is urgent that you see a doctor.

**SYMPTOMS THAT REQUIRE MEDICAL EVALUATION**

The symptoms of HIV disease are often the same as the symptoms of common illnesses. HIV-infected people need some way to distinguish run-of-the-mill colds and flus from more serious illness. The following section lists symptoms severe enough that you should call your physician.

Many of these symptoms can occur as a result of depression or anxiety: headache, diarrhea, shortness of breath, confusion, memory loss, nausea, pain, and weakness. If you are feeling very depressed or anxious, your symptoms may be related to these emotional states. However, there is no way to determine if this is the case except by careful medical evaluation of the symptoms. You may be undergoing severe stress and still have physical symptoms that require independent treatment. As doctors say, you must “rule out” physical causes rather than “rule in” psychological causes.
### SOME SYMPTOMS THAT MAY REQUIRE MEDICAL EVALUATION

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Contact your doctor if…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>Temperature is above 100°F for 48 hours or longer. Fever indicates underlying illness. Fever is not dangerous in itself unless it is very high. Fever can be lowered with the use of drugs.</td>
</tr>
<tr>
<td>Weight loss</td>
<td>Unexplained loss of greater than 10% of your body weight. “Unexplained” means that there is no change of behavior that would logically have caused the weight loss such as dieting, exercising a lot, or not eating because you are depressed or anxious or in love.</td>
</tr>
<tr>
<td>Headache</td>
<td>Headache is unusually severe (“worst headache ever”). Headache lasts much longer than past headaches.</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>3 or 4 liquid bowel movements per day. Diarrhea is combined with increased frequency of defecation, stomach cramping, or loss of control of your bowels. Symptoms persist for more than a few days.</td>
</tr>
<tr>
<td>Change in stool</td>
<td>Blood or mucus is found in your stool.</td>
</tr>
<tr>
<td>Vaginal bleeding</td>
<td>If not during menstruation.</td>
</tr>
<tr>
<td>Nausea, vomiting, marked loss</td>
<td>Nausea or vomiting lasts for more than 1 day. Noticeable but unexplained loss of appetite.</td>
</tr>
<tr>
<td>Pain on swallowing</td>
<td>Pain lasts more than a few days. Pain may appear in middle of chest under breastbone (mediastinal pain).</td>
</tr>
<tr>
<td>Breathing (respiratory)</td>
<td>Shortness of breath goes on for more than a few days. Look out for unusual shortness of breath on exertion. If normally you can climb flights of stairs and you now notice that you must rest between flights, call your doctor.</td>
</tr>
<tr>
<td>Coughing</td>
<td>Dry, non-productive (no mucus) cough goes on for more than a few days.</td>
</tr>
<tr>
<td>Severe abdominal pain</td>
<td>Abdominal pain is accompanied by fever, particularly if you have a history of pelvic infection.</td>
</tr>
<tr>
<td>Persistent colds or sore throats</td>
<td>Cold or sore throat goes on for 3 weeks or more.</td>
</tr>
<tr>
<td>Night sweats</td>
<td>More than 1 episode of night sweats (pajamas and/or sheets drenched). A sweaty neck or scalp is not a night sweat.</td>
</tr>
<tr>
<td>Mental changes</td>
<td>Recent onset of confusion or loss of memory.</td>
</tr>
<tr>
<td>Rashes</td>
<td>Rash over entire body. Localized rash lasts more than 2 days.</td>
</tr>
<tr>
<td>Muscle weakness</td>
<td>Muscle weakness or loss of functioning on one side of your body.</td>
</tr>
<tr>
<td>Change in vision</td>
<td>Blurred vision, blind spots, or increased floaters.</td>
</tr>
<tr>
<td>Fatigue</td>
<td>Unusual and unexplained fatigue for more than 3 weeks.</td>
</tr>
<tr>
<td>Vaginal itching or discharge</td>
<td>Symptoms are persistent or unresponsive to self-treatment.</td>
</tr>
<tr>
<td>White patches or sores in your mouth</td>
<td>These symptoms can often be treated easily, but may be a sign of decrease in your immune function.</td>
</tr>
<tr>
<td>Swollen lymph nodes</td>
<td>Nodes swell very rapidly, particularly if swelling occurs on only one side of the body.</td>
</tr>
<tr>
<td>Purplish or discolored area on the skin</td>
<td>Skin discolorations get darker rather than fading, get hard, or do not blanch when pressed.</td>
</tr>
</tbody>
</table>

### IMMUNIZATIONS

In developed countries almost everyone receives vaccinations (injections designed to stimulate a protective immune response). Most vaccinations are given to infants or children. Some familiar childhood vaccines are those used to prevent polio, measles, mumps, rubella, whooping cough, and *Hemophilus influenza* type B (HIB). Other vaccines are usually given later in life to travelers who are going to countries in which a particular infectious disease is common. Examples of this are vaccines against cholera and yellow fever. Some injections that are given to children need to be repeated periodically for adults who are at risk. Examples of this are injections against typhoid, diphtheria, and tetanus.
There are several questions to be answered about immunization for people who are HIV infected. Which vaccines are safe for people who are immune suppressed? Which are unsafe? What vaccines should HIV-infected people get that non-infected people do not routinely get?

HIV-infected people are at increased risk of several diseases for which vaccines are useful. HIV-infected people should be vaccinated against pneumococcal (bacterial) pneumonia at least once and should receive yearly influenza vaccinations (before the flu season in the fall). Vaccination against bacterial pneumonia and influenza are usually given only to those with increased vulnerability, such as older people or those with chronic illness. These vaccinations are safe and recommended for all people with HIV infection.

There has been concern that since vaccines stimulate the immune system they might therefore provoke T4 cells to divide, making HIV infection worse. However, **no persistent increase of viral activity has been correlated with vaccination of HIV-infected people** in studies of use of vaccines so far and in observation of HIV-infected children who have received the measles, mumps, and rubella vaccines. The side effects of vaccines are largely limited to a sore arm at the site of the injection and sometimes transient fevers.

Immune responses to antigens (substances that provoke immune responses in the body) are not as good in immunocompromised people as in others. However, in limited studies and in clinical practice, **HIV-infected patients generally do respond with protective antibodies to most vaccines**. The ability to respond depends on the degree of immunosuppression. Asymptomatic HIV-infected people are more likely to have a protective response to vaccines than are symptomatic people. It seems possible that vaccines offering long-term protection should be given early in the course of HIV disease. Higher doses and more frequent boosters may be needed.

Hepatitis B vaccination is somewhat less effective in HIV-infected people. However, it is recommended for all HIV-infected people. Antibody response to influenza vaccine in HIV-infected people may be low and may not be improved by a booster.

Some vaccines are made from microorganisms that have been disrupted to the point that they cannot reproduce. Since they cannot reproduce, they cannot cause disease. Such vaccines are known as an **inactivated vaccines** or **killed vaccines**. Killed-virus vaccines are safe for HIV-infected people.

An **attenuated live vaccine** is made from a microorganism that can reproduce but that has been weakened (or attenuated) so that it cannot cause serious disease. Sometimes, attenuated live vaccine are contraindicated in HIV-infected people.

Antibodies (immunoglobulins) can be concentrated from donated blood and injected into those who need protection against certain infectious illnesses. This **passive immunization** provides quick but temporary protection. Once the injected antibodies are gone, there is no native immune response to make more (no activated T cells and no memory B cells for the appropriate antigens. The immunoglobulins used may contain many different antibodies (as in the familiar **gamma globulin** shots) or they may contain specific antibodies for specific purposes. For instance, specific passive immunization is given to people who have been exposed to the hepatitis A virus in order to help prevent or limit the development of the disease.

General vaccination tips:

- Do not get vaccinated if you have a moderate to high fever; it is safe to be vaccinated if you have a cold or a low-grade fever.

- Keep track of your record of vaccinations; write down what vaccination you got and on what date. Try to get a record of vaccinations you received as a child. Your mother or other family member or your former pediatrician may have such records.

- Vaccine should be administered by the recommended route (oral, intramuscular, subcutaneous) to increase efficacy and reduce side effects.
• If you wait longer than recommended to complete a series of immunizations and your immune system remains intact, it does not reduce final protective results and you do not need to start over or get extra doses. However, if you are HIV infected it is good to get protection as soon as possible. Your immune system may be declining so it is best to finish a series of vaccinations in the recommended time. You cannot get doses closer together than recommended or it will reduce antibody response.

• Do not get immunized during first three months of pregnancy. Avoid conceiving until at least three months after immunization.

As was mentioned earlier, it is recommended that all HIV-infected people be vaccinated against hepatitis B virus, against bacterial pneumonia, and also be vaccinated each year in November against influenza. HIV infected gay men should receive the hepatitis A vaccine.

The following chart summarizes information about immunizations given to HIV-infected adults.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Recommendation</th>
<th>Safety, Efficacy, Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>Recommended for all HIV-infected people born after 1956</td>
<td>Vaccination is important: measles can cause severe illness in HIV-infected people</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Probably safe: no adverse reactions reported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subcutaneous</td>
</tr>
<tr>
<td>Tetanus, diphtheria</td>
<td>Recommended for adults</td>
<td>Booster shot needed every 10 yrs.; pain, swelling may occur</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intramuscular</td>
</tr>
<tr>
<td>Hepatitis B (Heptavax, Recombavax, Engerix)</td>
<td>Recommended for adults</td>
<td>Safe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>75% response rate in HIV-infected adults</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intramuscular</td>
</tr>
<tr>
<td>Pneumococcal vaccine (Pneumovax)</td>
<td>Recommended for adults</td>
<td>Safe: pain or swelling at injection site</td>
</tr>
<tr>
<td></td>
<td></td>
<td>88% response rate in asymptomatic pts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intramuscular</td>
</tr>
<tr>
<td>Influenza vaccine</td>
<td>Recommended for adults once every year in November</td>
<td>52%–89% response rate in asymptomatic pts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intramuscular</td>
</tr>
<tr>
<td>Haemophilus influenza b polysaccharide vaccine (HbCV)</td>
<td>Recommended for adults</td>
<td>Possibly useful for those not vaccinated in childhood</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intramuscular</td>
</tr>
<tr>
<td>Hepatitis A vaccine</td>
<td>Recommended for adults</td>
<td>Safe</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A immune globulin</td>
<td>Recommended as post-exposure prophylaxis for asymptomatic and symptomatic HIV-infected who have not received Hepatitis A vaccine</td>
<td>Safe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Must be used within 2 wks. after exposure</td>
</tr>
<tr>
<td>Varicella zoster immune globulin (VZIG)</td>
<td>Recommended as post-exposure prophylaxis for chicken pox</td>
<td>Safe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Must be used within 96 hrs. after exposure</td>
</tr>
</tbody>
</table>
ROUTINE IMMUNOLOGIC INTERVENTIONS FOR HIV-INFECTED CHILDREN

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>Recommended for asymptomatic children; probably indicated for all HIV-infected children.</td>
</tr>
<tr>
<td>Intramuscular immune globulin</td>
<td>Recommended after exposure to measles</td>
</tr>
<tr>
<td>Serum intravenous immune globulin (IVIG)</td>
<td>Recommended after exposure to measles if child does not have adequate level of protection from measles vaccination (as measured by poor specific antibody response) or has had a significant recent decline in immune functioning. Needs to be given within 6 days of exposure. Also recommended on a regular basis if child has recurrent life-threatening infections.</td>
</tr>
<tr>
<td>Inactivated polio vaccine (IPV)</td>
<td>Recommended for all children; use instead of oral polio vaccine</td>
</tr>
<tr>
<td>Influenza vaccine</td>
<td>Recommended for all HIV-infected children once each year in November</td>
</tr>
<tr>
<td>Haemophilus influenzae b vaccine (HbCV)</td>
<td>Recommended for all HIV-infected children 6 months or older except those with allergies to eggs</td>
</tr>
<tr>
<td>Pneumococcal polysaccharide vaccine</td>
<td>Recommended for HIV-infected children at 2 years or older</td>
</tr>
<tr>
<td>Varicella zoster (chicken pox) immune globulin (VZIG)</td>
<td>Recommended for children exposed to varicella zoster (chicken pox)</td>
</tr>
</tbody>
</table>

HEPATITIS B VACCINATION

Hepatitis B is a viral disease that can cause serious and even fatal damage to the liver. Vaccination is now available that can prevent infection with hepatitis B. People who are HIV-infected should be screened to see if they are hepatitis B-infected: if infected, they should be monitored (and possibly treated) for chronic infection; if uninfected, they should be vaccinated against future infection. Hepatitis B screening and vaccination is recommended for:

- Men who have sex with other men
- Health care workers
- Those who share needles for drug use

People from China, Southeast Asia, tropical Africa, most Pacific islands, parts of the Middle East, and the Amazon basin. Hepatitis B is endemic in these areas, where it is often transmitted at birth.

The vaccine is administered in a series of three injections in the arm. You will get an initial vaccination, one a month later, and one six months later. The timing does not have to be exact. There are few side effects—you may have a sore arm for a day. This vaccine provides an effective level of immunity in 90 percent of cases.

Before you are vaccinated, your blood must be tested to see if you have ever had hepatitis B in the past (remember—you may have had hepatitis B without noticing it). If you have ever had hepatitis B, you have developed natural immunity, cannot be reinfected, and will not need the vaccine. The blood test determines if you’ve ever been infected by looking for evidence of your immune system’s response to the hepatitis B virus (specifically, for antibodies to hepatitis B).

These blood tests also tell you if you are a chronic carrier or have chronic hepatitis. The presence of viral fragments (hepatitis B antigen) for more than six months indicates that you are a chronic carrier and are capable of transmitting the virus to others. Further testing can be done to determine your level of infectivity (how likely you are to infect others).
If you are infected with HIV, it is important to get vaccinated against hepatitis B, because acute hepatitis B often produces severe symptoms in those who are HIV infected. Also, developing chronic hepatitis B is a higher risk if you are HIV infected. HIV-infected persons who develop hepatitis B are at a 19 percent to 37 percent risk of becoming chronic hepatitis B carriers. The vaccine is somewhat less likely to “take”—that is, to provide an effective level of immunity—in those who are HIV infected, but it is effective in the majority of cases. One study indicated that at least 75 percent of asymptomatic patients developed a protective response against hepatitis B.

Hepatitis B vaccine does not transmit HIV, so there is no reason for people to avoid hepatitis B vaccine out of fear of HIV infection or reinfection. There are two kinds of hepatitis B vaccine:

- **Heptavax** is made from human blood and is heat-treated to kill HIV

- **Recombivax** and **Engerex** are synthesized using recombinant DNA technology. Since they are not made from human blood there is no danger of contamination with HIV. **Twinrex** is a combination of Hepatitis A and B vaccine that is also manufactured using recombinant DNA technology.

**DENTAL CARE**

Because people with HIV disease have an increased incidence of problems with gums, it is important to take particularly good care of your teeth and gums. This means following routine dental hygiene (tooth brushing and flossing) and seeing your dentist regularly, at least once a year.

Unfortunately, this is not as easy as it sounds. Many people are limited in their ability to get adequate care because dental care is very expensive and is not covered under many insurance policies. If dental insurance is available to you through your job and you can afford it, it usually turns out to be a good bargain. If you do not have insurance and cannot pay for dental care out-of-pocket, check on what clinic resources are available to you at a medical center near you that has a dental school affiliated with it. Registering at a dental clinic can involve time and red tape. It is better not to wait until an emergency to become a registered patient at a dental clinic.

If you are in bad pain from a dental problem, cannot afford a private dentist, and are not a clinic patient, you can always go to an emergency room for dental care, although this is likely to be time-consuming and not very pleasant. Call the hospital before you go and make sure that it has a dental department.

An additional problem with dental care is that many people have faced discrimination. Some dentists overtly refuse to treat HIV-infected patients. If this happens to you, consider calling your local AIDS organization for information about legal recourse. Dentists or technicians may also subtly discriminate, for instance in attitude. It is important to counter discrimination but it is also important to get your health care (including dental care) in as comfortable a setting as possible. Few people feel comfortable confronting their dentists about a troubling attitude. The realistic option may be to switch to a dentist who is better informed about HIV disease.

Many people worry about whether to tell their dentists that they are HIV infected. There is no need for you to do so in order to protect your dentist. Your dentist should be following routine infection-control measures such as wearing gloves and mask and sterilizing instruments. This protects both dentist and patient. If your dentist is not following these procedures you should find a new dentist.

On the other hand, there are some reasons to tell your dentist about your HIV infection. Many people feel uncomfortable keeping a part of their medical condition hidden from a provider. If you have not told your dentist, you have no way of predicting her or his reaction if you develop symptoms. Also, HIV-related problems are often manifested first in the mouth. A dentist who is aware of your HIV infection and knowledgeable about oral symptoms in HIV disease can be helpful to you.
In some big cities there are dental practices that welcome HIV-infected people and specialize in their care. Call your local AIDS organization or ask friends to get information about such dental practices.

**NUTRITION AND FOOD SAFETY**

Issues regarding nutrition vary widely in HIV-infected people depending on their state of health. The same “well balanced” diet is recommended to asymptomatic HIV-infected people as to anyone else. People with more advanced HIV disease may need a special diet, often to control weight loss (and the various factors that lead to it).

Good nutrition should maintain lean body mass (muscle as opposed to fat) and should provide adequate vitamins and minerals. Malnutrition complicates the course of HIV disease. Therefore, early intervention to prevent malnutrition is important.

Some drugs used in the treatment of HIV disease may interact with certain nutrients. Whenever you start a new medication, ask your physician about any diet modifications that might be useful.

**Learn about nutrition.** There are a number of pamphlets available to the public that provide up-to-date information specially tailored to people with HIV disease. You can get these pamphlets by calling the National AIDS Information Clearinghouse (phone 800-458-5231). The Cutting Edge, P.O. Box 392, Fremont, California, 94537 (phone 415-797-9768), can provide referrals to HIV-knowledgeable nutritionists and a database of available articles and pamphlets on nutrition and food safety in HIV disease.

A balanced diet consists of varied foods with adequate calories, protein, vitamins, minerals, and fluids. It is possible to get good nutrition from either a vegetarian diet or one that contains meat. If you are HIV infected, it is a good idea to learn the basics of good nutrition and try to modify your diet to conform.

Some people who have HIV disease believe that a special diet or dietary supplements may help maintain health. Use your judgment carefully when changing your diet. Any diet that limits the variety of foods eaten may make it harder to get complete nutrition. In addition, limited diets may contain some substances in harmful amounts.

Some of the special diets that have been tried seem to be harmful rather than helpful. A macrobiotic diet must be monitored very carefully to assure sufficient calories and protein. A very-high-fiber diet may lead to diarrhea. A yeast-free diet has shown no evidence of effectiveness and is very restrictive.

If you feel that a special diet may help you, you must approach this with the same rigor as any other experimental program. That is, you have to be sure you understand the pros and cons of the diet you are trying.

Unfortunately, most physicians are not knowledgeable about nutrition. Consulting with a registered nutritionist may be a better idea. However, many nutritionists do not know much about HIV disease. The ideal consultant is a nutritionist who has specialized in counseling patients with HIV disease. You can ask your doctor or nearby AIDS organization for referrals. If you are hospitalized, you may be able to get a nutritional consultation at no extra fee.

Taking a daily vitamin pill is a good idea to make sure you are getting 100 percent of the Recommended Dietary Allowances (RDA) of vitamins and minerals as set by the Food and Nutrition Board of the National Academy of Sciences. It is safe to take up to two or three times more than the RDA of vitamins and minerals. Amounts higher than these may cause problems, particularly with vitamins A, D, E, and K. There is no information for or against taking moderate extra amounts of vitamin B₁₂; however very large doses of fat-soluble vitamins (such as vitamin A) may cause inflammation of the liver. There is no evidence that use of very large amounts of vitamin or mineral supplements (“megadoses”) is helpful in HIV disease. It is safe to take up to 200 grams per day of vitamin C (ascorbic acid). Higher doses of vitamin C may lead to gastrointestinal symptoms such as diarrhea.

Trace minerals in high dosage can also be toxic. For example, zinc used ten times more than the RDA can lead to diarrhea, vomiting, reduced serum copper levels, and anemia. High levels of selenium can also cause cardiac problems.
Food safety is an important issue. HIV-infected people are particularly susceptible to infections from microorganisms in food. Infectious organisms include salmonella, campylobacter, shigella, *Clostridium perfringens*, *Staphylococcus aureus*, and *Clostridium botulinum* (which causes botulism), as well as others. These infections occur more frequently and tend to be more severe and more long-lasting in people who are HIV infected. For this reason, food safety precautions that help prevent infection are important for those with HIV disease.

Following are some essential food safety precautions:

- Do not eat raw meat, chicken, shellfish, or eggs. Examples are steak tartare, uncooked oysters or clams, and homemade mayonnaise or other dishes made with uncooked eggs. These foods are more likely to contain infectious organisms. There has been debate about the safety of raw fish such as sushi. Avoid undercooked meat, chicken, poultry, fish and shellfish, and eggs. The temperature of any meat, poultry, or fish should reach 165 to 212 degrees F.

- Be careful in food preparation not to contaminate cooked foods with raw meat, fish, or poultry. For example, do not cut cooked meat on a cutting board that you have used for raw meat. (Plastic cutting boards are easier to clean. After using a cutting board for preparing raw meat, clean it with diluted bleach.) If you are using a marinade in which meat has been placed raw, you can use the marinade as part of the finished product, but only if the marinade is also cooked.

- Thaw frozen meat in the refrigerator. Do not stuff chicken in advance.

- Fruits and vegetables are much less of a problem than meat, poultry, or fish. However, fruits and vegetables can contain bacteria. Wash all fruits and vegetables thoroughly. Buy fruits and vegetables with unbroken skins.

- Wash hands frequently when cooking and always after handling raw meat, chicken, or fish. Keep all utensils in contact with food clean.

- Keep hot foods hot (above 140 degrees F). Keep cold foods cold (below 40 degrees F). Reheat leftovers.

- Use packaged luncheon meats within three to five days after opening.

- All milk and milk products should be pasteurized. Make sure frozen foods you buy are frozen solid. Make sure refrigerated foods are cold.

- Do not keep leftovers too long. If you are in doubt, discard it.

- Be careful with food that may have been outside for a long time or carelessly prepared. This includes foods brought on picnics or purchased from street vendors.

**SAFER SEX AND CONDOM USE GUIDELINES**

It is never too late to begin protecting yourself against HIV. Even if you have already been infected, it is always to your benefit to follow sexual risk-reduction guidelines since repeat exposure to HIV (possibly to a more virulent strain of the virus) or exposure to other sexually transmitted infections may help to trigger illness. Follow the risk-reduction guidelines below in any future sexual encounter.

Safer sex in one sentence: use a condom for every episode of intercourse, from start to finish, whether vaginal or rectal.
Adapting to Risk Reduction

If you are HIV infected, the primary way to protect sexual partners from infection is to use condoms and withdrawal carefully every time you have intercourse. Limiting the number of your sexual partners is not precaution against infecting others with HIV or becoming reinfected yourself. Only safe sex prevents transmission.

Even if you have only one sexual partner, you can infect that person if you have unprotected intercourse. Repeated unprotected intercourse with one infected partner exposes you to a high risk of being reinfected yourself or developing other sexually transmitted diseases.

The issue of talking about safer sex with a partner is a difficult one for people who are HIV infected. When will you tell your prospective partner that you are HIV infected? For most individuals, this raises both an ethical and an emotional problem.

Some people feel that it is their partner’s right to know about their HIV status prior to any sexual activity, no matter how safe. Others feel that if they are practicing safer sex, they have no particular need to disclose their HIV status. Still others feel that the need to disclose depends on the degree of risk in the activity they are practicing. It is important for you to think out in advance what you believe is right and wrong. Impulsivity followed by guilt is an uncomfortable choice.

You need to think also about how your disclosure will affect your relationship with the prospective sexual partner. It is true that you may be rejected by a partner if you disclose that you are HIV-positive, either because of fear of infection or fear of a relationship with an HIV-infected person. On the other hand, your partner may feel angry or misled if you do not disclose your status prior to the first contact. In addition, you are likely to become anxious about this issue if the relationship progresses and you have not told your partner of your status.

Strike a balance in your sexual behavior. Some HIV-infected people are so afraid of infecting others or of others’ reaction to hearing they are HIV-infected that they give up sex, or alternate abstinence with occasional impulsive episodes of high-risk sex. An extreme of behavior (anxious and fragile abstinence) may lead to a very high risk of infection. You need not give up your sex life, nor should you expose partners or yourself to high-risk sexual activity. Many people have been practicing risk reduction for several years now. They report that although it was sometimes difficult at the beginning, they are now able to enjoy sex that is both safe and satisfying.

Plan for risk reduction. Learn how to come to an agreement with your partner about the sexual activity you will have together. Think through the issues in advance. This will help you avoid impulsive decisions and give a clear and consistent message to your partner. Have condoms available if you plan to have intercourse. Women hesitant to purchase and carry condoms should be aware that women now buy half of all condoms sold. The use of alcohol or other recreational drugs often impairs judgment; do not make decisions about sexual activity while you are intoxicated.

Try to talk about risk reduction with your partners before sexual excitement interferes. Many have found that prospective partners interpret raising the subject of risk reduction well before sex as a sign of intelligence and prudence. Others prefer to wait until they are actually involved in explicit sexual activity; follow this course of action only if you can stick to your decisions about risk reduction and if you know that your partner will respect your wishes.

Ask yourself the following questions:

- Have I been practicing risk reduction consistently?
- If not, what issues or circumstances interfere?
- How can I resolve these issues or avoid these circumstances?
If you are having difficulty avoiding high-risk sex, get help and support from an AIDS organization in your
community. Many such organizations run “safe-sex workshops” designed to help with this problem.

Men who have sex with both women and men face difficult issues regarding risk reduction. Ideally, discuss your
sexual history with all your partners, both male and female, so that they may make informed decisions about risk
reduction. Practice risk reduction with both women and men to avoid infecting yourself or others.

Frank discussion of risk reduction may be difficult for men who have not told their female partners about their
sexual relations with other men. If your sexual contact with men has never involved the exchange of bodily fluids,
you pose no special risk to your female partners. However, if you are infected you must practice risk reduction with
your female as well as your male partners: at a minimum, use condoms. If you feel you cannot tell your female
partners, seek counseling from an AIDS organization in your community.

**TRAVEL**

**Plan for emergency and routine health care.** You are unlikely to need these arrangements, but it can be reassuring
to know they are in place. Work out in advance a plan for return home if it should be necessary. For continuity of
care and for psychological and financial reasons you may prefer to return home to get any major medical care
(including hospitalization) even if such care is available in another location. Make sure that you bring enough
money to purchase a flight or other rapid transportation home if this should be needed.

If you will be away from home for more than three months or if you currently have major medical Generally
speaking, there are few purely medical reasons that restrict the travel of HIV-infected people both within the United
States and internationally. However, travel may take extra planning, depending on the state of your health, the
location to which you are traveling, and the length of time you will be away.

Most people who are HIV infected are asymptomatic. They have normal energy and stamina and have to make only
minor provisions for their special health needs when traveling. Developed countries pose no greater risk of
infectious disease than is found in the United States. Special planning needs to be done in advance for travel to
developing countries where certain infectious diseases may be more common. Obviously, a very long trip requires
making arrangements for routine health care and medication.

Certain countries have regulations that allow them to restrict the entry of HIV-infected travelers. Ironically, the
United States—with more AIDS cases reported than any other country—is the only major developed country to
have such laws on the books. Check on the rules that apply to the country to which you are traveling. You can do so
by calling the Washington, D.C., embassy or local consulate of the country to which you intend to travel.

If you are asymptomatic (or have only minor symptoms) and your trip is of less than three months duration, you are
very unlikely to need medical care while away from home. In most developed countries, you can obtain adequate
emergency care. Most geographical locations are easy to return from if you develop more serious medical problems.

problems, ask your doctor for the name of an HIV-expert physician in the area to which you are traveling. If your
doctor cannot help you with this, call a local AIDS organization in the area to which you are going. If this is not
possible, find out what the nearest major medical center is. If you think you might require major medical care, it is
obviously best to travel only to areas where such care for HIV-infected people is available.

**HIV-infected people face special risks of infectious disease when traveling to some countries.** The presence or
increased incidence of infectious disease in these countries may be due to tropical climate or to inadequate health
care and poor sanitation secondary to poverty. Generally the risk is greater in Latin America, Africa, parts of the
Middle East, the Indian subcontinent, parts of Asia, and Southeast Asia. However, travel to western Europe,

Australia, Japan, and Canada present no additional risk to United States travelers. Epidemics of infectious diseases
come and go in different areas. In order to find out about risk of infectious disease in a particular geographical area
you need up-to-date information. Your best bet: check with the CDC International Travelers Hotline at (404) 332-4555. Contact the Centers for Disease Control (CDC) International Traveler’s Hotline at www.cdc.gov/travel or 404-332-4555 for up-to-date health information for travelers, including current areas of infectious disease and current vaccination requirements. Some countries require submission of the International Certificates of Vaccination. Since areas of possible exposure to disease and legal requirements change, they are not listed in the chart below. Almost all of the vaccines are necessary only when traveling to certain geographical areas including the so-called developing countries in Asia, the Middle East, Africa, and Latin America. The following chart summarizes information about travel vaccines.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Recommendation</th>
<th>Safety, Efficacy, Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>For travel to developing countries unless already immune</td>
<td>Probably safe: no adverse reactions reported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subcutaneous</td>
</tr>
<tr>
<td>Hepatitis A immune globulin</td>
<td>For travel to developing countries unless already immune</td>
<td>Get 3 mos. before or 2 wks. after any live vaccines to avoid interference</td>
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<tr>
<td></td>
<td></td>
<td>Effective for 3 to 5 mos. depending on dose</td>
</tr>
<tr>
<td>Typhoid (inactivated parenteral vaccine)</td>
<td>For travel to developing countries</td>
<td>Possible redness or soreness at injection site, fever, headaches</td>
</tr>
<tr>
<td></td>
<td>Do not use live oral typhoid vaccine</td>
<td>Two injections at least 4 wks. apart; boost every 3 yrs. if continued exposure</td>
</tr>
<tr>
<td>Inactivated polio vaccine (IPV)</td>
<td>Full series for immunization</td>
<td>Subcutaneous</td>
</tr>
<tr>
<td></td>
<td>Single booster for travel to developing countries</td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria</td>
<td>Boofer for travel to developing countries</td>
<td>Booster shot needed every 10 yrs.</td>
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<tr>
<td></td>
<td></td>
<td>Intramuscular</td>
</tr>
<tr>
<td>Meningococcal vaccine</td>
<td>For travel to only certain countries</td>
<td>Boost at 3-yr. intervals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subcutaneous</td>
</tr>
<tr>
<td>Plague vaccine</td>
<td>For travel to only certain countries</td>
<td>Redness, soreness, fever</td>
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<tr>
<td></td>
<td></td>
<td>Booster interval varies by antibody level</td>
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<tr>
<td></td>
<td></td>
<td>Intramuscular</td>
</tr>
<tr>
<td>Rabies vaccine</td>
<td>For travel to only certain countries</td>
<td>Booster interval varies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Confirm with tests for antibody response</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intramuscular</td>
</tr>
<tr>
<td>Japanese encephalitis vaccine</td>
<td>Required only for certain countries, primarily rural area of China, Korea,</td>
<td>Booster interval varies</td>
</tr>
<tr>
<td></td>
<td>Indian subcontinent, Southeast Asia</td>
<td>Confirm with tests for antibody response</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow fever</td>
<td>Not recommended; preferably avoid travel to endemic areas: jungle areas of</td>
<td>Theoretical risk of encephalitis; no adverse effects reported in practice</td>
</tr>
<tr>
<td></td>
<td>South America (especially Bolivia, Brazil, Columbia, Peru) and Africa (especially West Africa)</td>
<td>Conim with tests for antibody response</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subcutaneous</td>
</tr>
<tr>
<td>Cholera vaccine</td>
<td>Use only if travel to country at risk (Indian subcontinent; parts of Africa)</td>
<td>Redness and soreness at injection site, fever</td>
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<tr>
<td></td>
<td>Current (1991) epidemic in Peru, Ecuador, Columbia</td>
<td>50% efficacy, lasts for only 3–6 mos.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Boost at 6-mo. intervals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subcutaneous or intradermal</td>
</tr>
<tr>
<td>Bacille Calmette-Guerin (BCG)</td>
<td>AVOID</td>
<td>Severe complications seen in immune-suppressed adults</td>
</tr>
<tr>
<td></td>
<td>Exception: recommended for asymptomatic HIV-infected children in areas of high risk of tuberculosis</td>
<td></td>
</tr>
<tr>
<td>Live oral typhoid vaccine (Ty21a)</td>
<td>AVOID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use inactivated parenteral typhoid vaccine instead</td>
<td></td>
</tr>
<tr>
<td>Smallpox vaccine</td>
<td>AVOID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vaccination is unnecessary, as smallpox has been eradicated worldwide</td>
<td></td>
</tr>
<tr>
<td>Oral polio vaccine (OPV)</td>
<td>AVOID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use inactivated polio vaccine (IPV) instead</td>
<td></td>
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</tbody>
</table>
The most common diseases in travelers are caused by microorganisms in food and water contaminated with infected feces. Diseases caused by microorganisms that enter via the gastrointestinal tract are known as enteric infections. It is estimated that at least forty percent of travelers to developing countries suffer from enteric infections. In many of these developing countries the indigenous population suffers chronically from these infections and lacks adequate resources for prevention and treatment such as an uncontaminated water supply, sanitation facilities, refrigeration, medications, etc.

The most common symptom of these diseases is diarrhea, often referred to as “traveler’s diarrhea.” The symptoms of traveler’s diarrhea are increased volume of unformed bowel movements, urgency, cramps, fever, malaise, and nausea. Traveler’s diarrhea often has an abrupt onset and usually lasts for three to seven days, although it can be longer.

People with HIV disease are particularly vulnerable to many enteric infections and have an increased risk of developing severe forms of the illness. The most common enteric infections are *E. coli* diarrhea, salmonellosis, campylobacteriosis, cryptosporidiosis, hepatitis A, and shigellosis. People with HIV disease have increased risk of developing serious symptoms with all these diseases, particularly campylobacteriosis, shigellosis, and salmonellosis. There are a number of other diseases caused by contaminated food and water including poliomyelitis, cholera, and typhoid fever.

There are several strategies to control enteric infections. They include sanitary measures to avoid exposure to the infectious organisms, immunization, and prevention of illness through the use of antibiotics, antimicrobials, or immune globulins. Medications exist to prevent the development of some infections, but not others.

Prevention is the best way to deal with the possibility of developing an infection while traveling. Caution about food and water is the main method of prevention. In poor, developing countries where sanitation and refrigeration is likely to be inadequate, follow the suggestions below.

- Do not drink tap water or use ice. Drink bottled water and use it for brushing your teeth. Soda, beer, wine, and hot tea or coffee made from boiled water are safe to drink. It is better to drink from a can or bottle than from a container that might have been washed with contaminated water. Wipe the outside of the bottle or can.

- If bottled water is not available, you can treat water. The best method is to boil it vigorously, then allow to cool. Do not use ice to cool boiled water. Chemical disinfection is also possible with either iodine or chlorine, preferably iodine. Tincture of iodine or iodine tablets are available from sporting-goods stores and pharmacies. If the water remains cloudy after treatment, strain it through a clean cloth and use double the number of disinfectant tablets. Mechanical filters have not proven to be reliable.

- If you eat raw fruit or vegetables, eat only those that you have peeled yourself. Eat only thoroughly cooked eggs, meat, and fish. Food that is steaming hot will be safe. Do not eat unpasteurized milk or dairy products. Do not eat prepared food from street vendors. Restaurant food that is cooked and still hot is generally safe.

If you are HIV-infected and traveling to a developing country where enteric infection is likely, discuss medication with your doctor. Taking preventive medications such as ciprofloxacin may reduce the risk of enteric infections. You should get careful directions from your doctor on what to do if you develop diarrhea.

If you develop traveler’s diarrhea, it is important to avoid further infection. Be even more careful about food and water precautions. It is also important to avoid dehydration by drinking plenty of fluids. Fruit juices and caffeine-free soda are ideal. Eat salted crackers to help you retain fluids. You should seek medical help if you have a fever over 102 degrees F, bloody diarrhea, dehydration, shaking, or any symptoms of long duration. Lomotil or Imodium can be used to control symptoms—but do not use them if you have a high fever or blood in your stools.

**Hepatitis A** is another disease transmitted by the fecal-oral route and is common in certain developing countries. HIV-infected people are no more susceptible to Hepatitis A than are other people. Nevertheless, HIV-infected
travelers can benefit from an injection with hepatitis A immune globulin (passive immunization). Passive immunization against hepatitis A is effective, has few side effects, and can prevent an uncomfortable illness that lasts several weeks. If you have not previously received Hepatitis A vaccine, you should consider vaccination against hepatitis A if you are travelling to developing. The complete series is given as two shots six months apart. Completion of the two vaccinations confers long lasting immunity against hepatitis A.

Other health measures for travelers:

- If you take a long trip on an airline you may develop respiratory problems due either to recirculation of air in the cabin or to the very dry atmosphere on board. Ear infections or sinus problems may get worse due to changes in airplane cabin pressure that take place at take-off and landing. It may help to use a decongestant or nasal spray.

- While on long airplane trips, get up and walk around if possible. This will help reduce blood clots that can form in the legs following long periods of inactivity.

- The flu season may be different in another geographical area. Check to see when you should get your influenza vaccination, if it is available.

- HIV-infected persons do not seem to develop particular problems with malaria, but any traveler who is going to an area where malaria is a danger should take medication to prevent the disease and take precautions against mosquitoes that spread the disease. Several drugs are used (for example, mefloquine, doxycycline, chloroquine). Your doctor or you should check on what type of medication is best to use. This depends on your destination since resistance to antimalarial drugs differs geographically. You can get this information by calling the Centers for Disease Control International Travelers Hotline: (404) 332-4555.

- Use of condoms for intercourse is crucial in all countries. Bring an adequate supply of condoms and lubricant, no matter where your destination. Condoms may be in short supply or of inferior quality.

ALCOHOL

Many people who are HIV infected use alcohol. Does this damage the immune system? Is it correlated with faster progression to AIDS? No studies answer these questions definitively. Consumption of large amounts of alcohol damages the body (including psychological damage). This has been proven in countless studies of non-HIV-infected people. Therefore, if you are HIV infected and fighting to maintain the best health possible, you may impair your health further by drinking too much.

People with chronic active hepatitis should not drink alcohol at all. People taking ddI should drink alcohol only in limited quantities because alcohol increases the risk of pancreatitis.

Alcohol dependence and abuse is extremely common in the United States; estimates are that 13 percent of the population are alcohol abusers or dependent. What is excessive use of alcohol? This is a difficult question to answer. It cannot be simply quantified by amount. For some people even a relatively small amount of alcohol can cause adverse effects both physically and psychologically.

Here are some questions to ask yourself to help you figure out if you are using alcohol in a way that is harmful to you.

- Have you ever had a blackout? (A blackout is a period of time when you were intoxicated and cannot remember what happened.)

- Have you ever been arrested for drunken driving or any other crime while under the influence of alcohol?
• Have you done anything you seriously regret when you were drinking?

• Have you ever been involved in violence while drunk?

• Have you had unsafe sex while drunk?

• Do you frequently fail to take prescribed medication when you have been drinking?

• Are you frequently hungover?

• Have you missed multiple days of work or school due to aftereffects of alcohol?

• Have you ever lost a job due to alcohol use?

• Have you ever lost a friend or lover due to alcohol use?

• Do you spend so much time drinking or recovering from being drunk that you have given up previously important social and recreational activities?

• Do you have any alcohol-related medical problems?

• Has use of alcohol caused you financial problems?

• Have you made unsuccessful efforts to cut back or eliminate alcohol use?

• Do you drink every time you feel anxious or depressed?

• Have other people complained about your drinking or told you that you drink too much?

If you answer yes to one or more of the above questions, seek further help in assessing a possible problem with alcohol. There is one important resource for alcohol problems that is available almost everywhere throughout the United States and in many other countries. That is Alcoholics Anonymous (AA). Even if you are not sure if you have a problem with alcohol, you can go to an AA meeting and learn more about the problem from people who are expert in alcohol problems—recovering alcoholics.

AA is a self-help group. It is free and anonymous. Although some people feel uncomfortable with certain aspects of the AA program, the fact remains that AA has been the single most successful program in helping people deal with alcohol problems. Almost every town has an AA chapter. If you live in a big city you will have a choice of multiple AA groups. For example, many cities have several gay AA groups. In addition, in New York, San Francisco, and Los Angeles you can go to an AA meeting specifically intended for HIV-infected people. Call your local AIDS organization for information about these meetings. Some contact numbers for Alcoholics Anonymous Intergroup include: (212) 683-3900 in New York; (415) 661-1828 in San Francisco; and (213) 387-8316 in Los Angeles.

In addition to AA, there are a number of professional resources available to help individuals evaluate or treat alcohol problems. You can get information about these from calling either a local AIDS organization that maintains a resource directory, a local AA information number, or the psychiatry department of a local hospital, or possibly from your doctor.

OTHER RECREATIONAL DRUGS

Many other recreational drugs are used by people who are HIV infected: cocaine, heroin, so-called designer drugs such as Ecstasy or Special K (ketamine), marijuana, tranquilizers (such as Valium and Librium), sedatives such as
Quaaludes or drugs intended for sleep, and amphetamines (speed), to name only a few. It is beyond the scope of this discussion concerned that you may have a problem with a recreational drug.

Ask yourself the questions listed in the alcohol section, substituting the drug with which you are concerned.

In addition, ask the following questions.

- Am I sharing needles for drug use? Like intercourse without condoms, this puts you at risk of re-infection with new, perhaps more dangerous, strains of HIV as well as other blood-borne diseases.

- Am I injecting drugs? Even when needles are not shared this is probably a poor idea because of the possibility of infection and because injection of drugs may activate the immune system, possibly promoting the progression of HIV disease.

- Am I facing the possibility of legal trouble because of the use of illegal substances?

It is a tragedy of American society that despite the loud talk of the dangers of drug abuse, there is a disturbing lack of services to help people stop using drugs. Nonetheless, you should try to get help if you feel you have a drug problem. Some insurance policies pay for in-patient and/or outpatient treatment of drug abuse. There are some free drug programs sponsored by government and by private philanthropies. These may have waiting lists. Many people who use drugs are able to get help from going to AA meetings, even when their problem is a drug other than alcohol. Some communities have Narcotics Anonymous (NA) groups modeled on AA. For specific information, see what referral resources are available near you. Possibilities are an AIDS organization, a drug hotline, a state or locally run information service, the psychiatry department of a local hospital, or your doctor.

**SMOKING TOBACCO**

There is no definitive information available about the effect of smoking tobacco on HIV disease. Studies done so far on the effect of smoking on CD4 cell levels have produced contradictory results. However, tobacco has a multitude of bad effects on health. Many of the opportunistic infections in HIV disease affect the lungs. Your lungs will be in better shape and better able to resist damage caused by disease if you do not smoke. If you are HIV infected and trying to take the best possible care of your body, you may want to consider stopping smoking.

**PETS**

Some animals harbor organisms that are transmissible and may cause harm to people with HIV disease. For example, cat feces may contain *Toxoplasma gondii*. Other animals that may spread harmful organisms are birds, turtles, and tropical fish.

This does not necessarily mean you have to give up your pet. Your veterinarian can determine whether your cat carries the toxoplasma parasite. Cats that have never been outdoors are less likely to be infected with toxoplasma. If you want to keep a toxoplasma-infected cat, have someone else clean out the litter box or wear gloves and a mask when you clean it. Wear gloves when cleaning a fish tank or handling fish, birds, or turtles.
Notes

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