5

HIV, AIDS, and Reproductive Health

Theresa was 17 years old when she married. She had a baby right away, and another one 3 years later. The second one was sickly and died before his first birthday. Soon after, her husband became ill with tuberculosis. He went to the doctor for medicines, which he took for 6 months. After he had been well for nearly a year, he began having diarrhea and weight loss. Theresa again became pregnant, but her husband died before the baby was born.

When she found out that her husband had died of AIDS, she asked the doctor many questions about the illness and how it was spread. It surprised her that people could have a silent virus that could make them sick after many years. She realized her husband may have become infected before they were married. She had never had sex except with her husband, nor had she ever received a blood transfusion, so she knew that she could not have given the infection to her husband. She wondered if he gave ***her*** *the virus, and if that was why their second baby died.*

Theresa and her child went back to her village to live with her mother. She was afraid for the baby she was carrying, but he was born healthy and grew strong.

Acquired immune deficiency syndrome (AIDS) is a fatal disease that has no cure and no vaccine to prevent it. The disease is caused by the human immunodeficiency virus (HIV), a retrovirus transmitted from an infected person through unprotected sexual intercourse (vaginal, oral, or anal), by exchange of body fluids such as blood, or from a mother to her infant during pregnancy, childbirth, or breastfeeding.

Some people mistakenly think that HIV can be transmitted through insect bites, dirty water, handshakes, coughing, sneezing, shared food, bad air, or witchcraft. It cannot be transmitted in these ways. Some people mistakenly believe that HIV can be cured or that a vaccine exists to prevent it.[1,5,34,44,52,59] Still others mistakenly believe that they can tell who is infected with HIV simply by looking at them or wrongly think that young people cannot be infected.

Most people who are HIV-infected do not feel sick and do not know they are infected until years later, when the symptoms of AIDS finally appear. Because people with AIDS usually lose weight, it is sometimes called the "slim disease" or "body shrinker."[6] Two types of HIV can cause AIDS, HIV-1 and HIV-2. HIV-1 is far more common.

GLOBAL HISTORY OF HIV-1

AIDS was first described in the early 1980s, and HIV was identified as the cause a few years later. The infection has become a worldwide epidemic. In some areas, men who have sex with men have the highest rate of infection. In other communities, people who share bloody injection equipment (needles or syringes) have the highest HIV prevalence. In still other areas, heterosexual transmission is the most common route of infection.

In most places, HIV is spread by *more than one* transmission route. For example, a man who became infected by re-using contaminated injection syringes may pass the infection to his wife by having sex with her. If his wife is pregnant or becomes pregnant later, she may then pass the infection to her baby. The routes of transmission are the same around the world, but differing patterns of human behavior allow the virus to travel faster in certain social networks. People who

frequently have unprotected sex (sex without a condom) or share injection equipment are most likely to become infected. They can then expose others to their virus. In general, the more sexual partners a person has had, the higher that person's risk of becoming infected with HIV and of infecting others. However, it does not take multiple partners to become infected; a person with just one HIV-infected partner is at extremely high risk.

TRANSMISSION TRENDS OF HIV-1 IN AFRICAN NATIONS

Africa is the continent most severely affected by HIV infection. In sub-Saharan Africa in 1997, an estimated 4.0 million people were newly infected with HIV, 530,000 of whom were children. This amounts to 11,000 new infections per day. As of late 1997, an estimated 20.8 million people were living with HIV in sub-Saharan Africa.[6] It is not possible to test entire populations for HIV, so the exact numbers of HIV-infected people are not known. The general prevalence of HIV infections is extrapolated from studies of specific groups who can be routinely tested for HIV (such as military personnel, pregnant women, or people with sexually transmitted infections [STIs]). See Figures 5:1 and 5:2.

In addition, most of the available statistics describe the final stage, AIDS, and not HIV infection. Therefore, when reading about AIDS cases, keep in mind that these statistics do not include most people infected with HIV, who are not yet sick. AIDS statistics also can be misleadingly low because of the difficulties with diagnosis and delayed reporting.

In African countries, heterosexual contact accounts for more than 80% of HIV transmission.[46] In some areas, men and women are infected at equal rates. In other areas, women are more likely to be infected.[53] Women are often infected at younger ages than men. HIV prevalence is highest in women aged 15 to 25 years; it peaks in men 5 to 10 years later. The number of reported AIDS cases among women aged 15 to 19 is twice that of men of the same age.[4,53]

Figure 5:1 HIV-1 prevalence in high-risk populations, which include commercial sex workers, their clients, and sexually transmitted disease patients

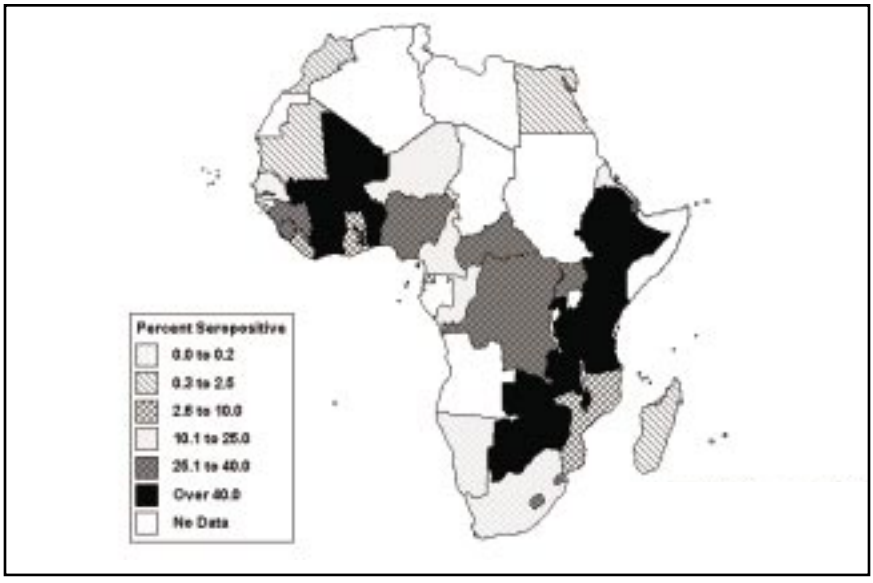
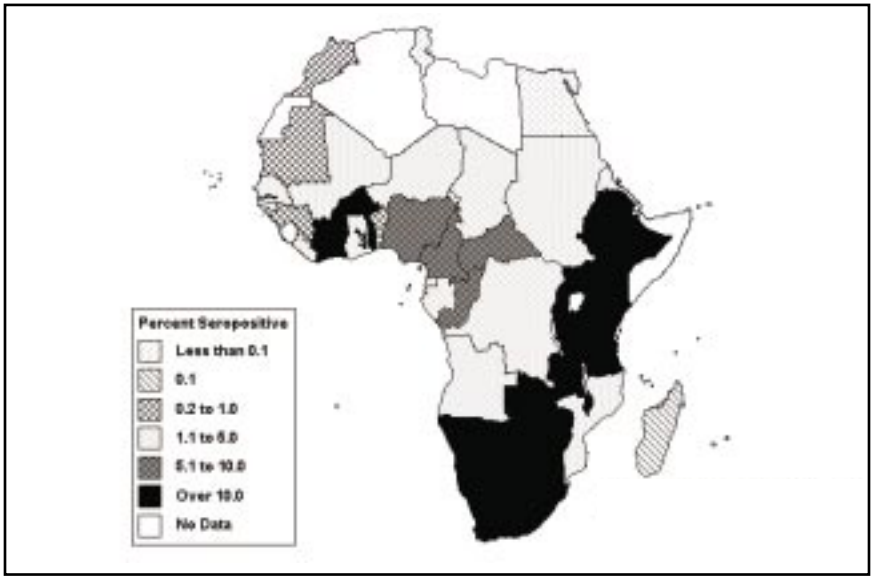


Figure 5:2 HIV-1 prevalence in low-risk groups, which include pregnant women and the general population



Source for Figures 5:1 and 5:2: U.S. Bureau of the Census, Population Division, International Programs Center, HIV/AIDS Surveillance Database, January 1998.

The next most common route of HIV infection in Africa is from an infected mother to her newborn. This vertical transmission can occur either during pregnancy, delivery, or breastfeeding and is associated with more advanced disease in the mother, severe prematurity, and other factors.

The most efficient route of HIV transmission is through blood transfusion from infected donors. From 4% to 10% of HIV cases are transmitted this way.[36,62] This route affects primarily women and children, because transfusions are most often given to infants with malaria or sickle cell anemia and women with obstetrical complications. In Africa, injection drug use and other means of HIV transmission account for less than 1% of HIV cases.[36]

Between the early 1980s and the 1990s, HIV seroprevalence rates increased dramatically in many groups:

- Men attending STI clinics in Nairobi, Kenya: 3% were HIV-infected in 1981; 23% were in 1990.
- Adults in Abidjan, Cote d'Ivoire: about 1% were HIV-infected in 1987; more than 7% were in 1991.
- Pregnant women in Nairobi, Kenya: 2% were HIV-infected in 1985; 13% were in 1991.
- Blood donors in Nigeria: none were HIV-infected in 1987; 1.5% were in 1990.[36,46]
- Pregnant women in Free State, South Africa: 4.3% were HIV-infected in 1993; 11% were in 1995.
- Pregnant women in Kwazulu/Natal, South Africa: 9.6% were HIV-infected in 1993; 18% were in 1995.[3]

Although some countries have been able to slow the incidence of new infections with aggressive prevention programs, infection rates are still increasing in many regions.

Other groups, such as commercial sex workers, men who have sex with commercial sex workers, military personnel, truck drivers, and people with other STIs have higher than average rates of HIV infection, above 85% in certain instances.[46] These individuals are also more likely to be infected with HIV and other STIs and are often referred to as high-frequency transmitters or "core groups."

In general, the rural epidemic is several years behind the urban epidemic. HIV is expanding into rural areas, however, and rural rates are climbing.

PREVALENCE OF HIV-2

HIV-2, a retrovirus similar to HIV-1, causes a similar illness, but the symptoms progress more slowly. HIV-2 is transmitted by the same routes as HIV-1, but it is less easily transmitted by the perinatal route. Mothers infected with HIV-2 pass the infection to their infants in up to 8% of births. Some authorities believe HIV-2 is also less easily transmitted by the sexual route.[29] Among individuals with HIV-2, however, 40% of their sexual partners also had the infection.[46] HIV-2 can be transmitted by blood transfusions. A Cote d'Ivoire study showed that 7.4% of blood donors were infected with HIV-2 in 1986-1987. The same study showed that 15% of children who had received multiple blood transfusions had HIV-2, and that none of the children who had never been transfused had HIV-2. The children who had received blood transfusions were also much more likely to have HIV-1, which was slightly less prevalent than HIV-2 in donors tested at that time.[48] See Figures 5:3 and 5:4.

PROGRESSION OF HIV INFECTION TO AIDS

After becoming infected with HIV, most people will not immediately notice any illness. After a few weeks, some infected people become ill with fever, sore throat, enlarged lymph nodes, rash, and general fatigue or malaise. This is called the acute retroviral illness, or *primary HIV infection*, and the symptoms disappear within a few weeks. By the time the newly infected persons would test positive for HIV, about 6 weeks to 6 months after becoming infected, they feel healthy again. (See Table 5:1 on the Spectrum of HIV infection.)

Figure 5:3 HIV-2 prevalence by country for high-risk urban populations: commercial sex workers, their clients, and sexually transmitted disease patients

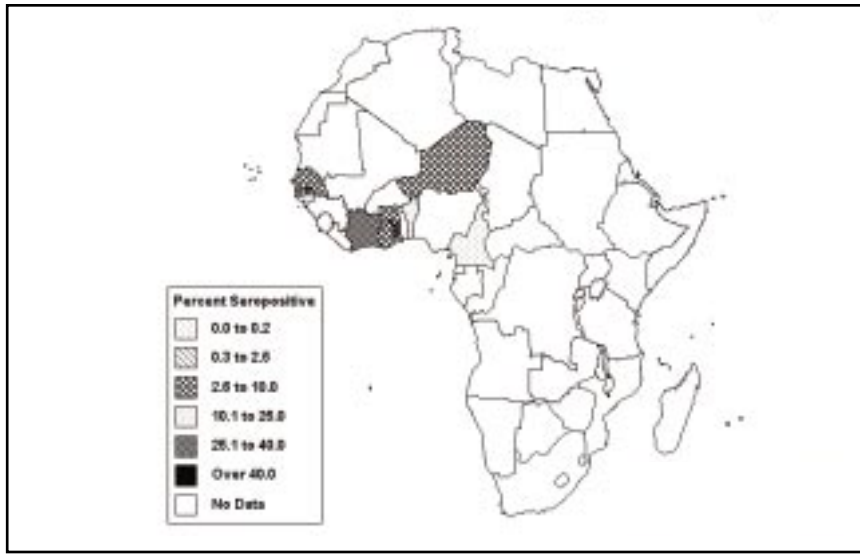
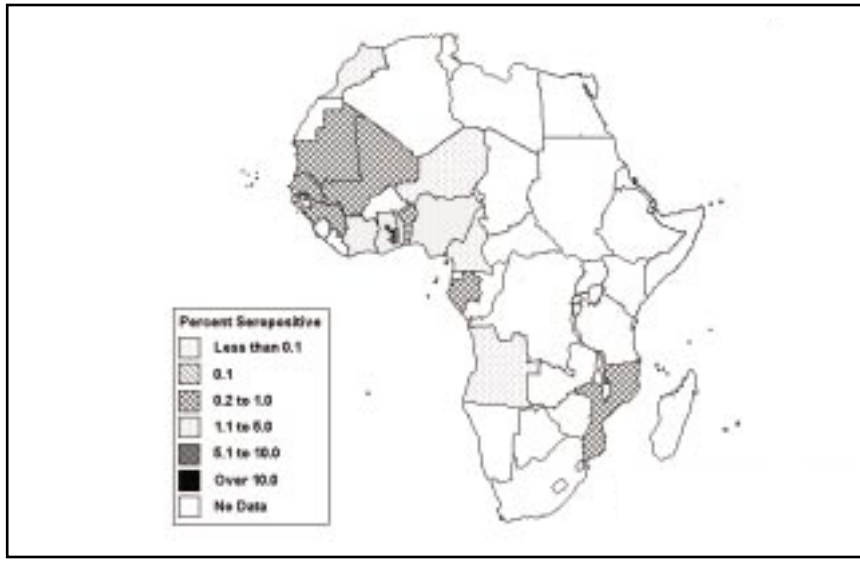


Figure 5:4 HIV-2 prevalence by country for low-risk urban populations: pregnant women and the general population



Source for Figures 5:3 and 5:4: U.S. Bureau of the Census, Population Division, International Programs Center, HIV/AIDS Surveillance Database, January 1998.

Table 5:1 Spectrum of HIV infection

	Primary Infection	Asymptomatic Period	AIDS	Endstage
Symptoms	Acute retroviral illness: sore throat, fever, swollen nodes, rash, resolves spontaneously	No disabling symptoms; swollen lymph nodes, increased skin rashes, herpes zoster, pulmonary TB, dry skin, diarrhea	Disseminated or pulmonary TB, prolonged diarrhea, fevers, weight loss, bacterial pneumonias, invasive cancers, debilitating fatigue late in stage	Severe weight loss, chronic fever, simultaneous and recurrent infections, unable to care for self
Duration	2-4 weeks	<1 to >10 years	Usually <1 year	Weeks to months
HIV antibody test	Negative	Positive	Positive	Positive

Note: Not all symptoms are experienced by everyone with HIV or AIDS.

The duration of apparent wellness that follows can last for years. This is called the *asymptomatic period*, and it may extend from less than 6 months to more than 10 years. The infected person looks and feels fine and is able to work or care for the family without impairment. However, the immune system gradually loses its ability to fight infections.

People who discover their infection during this phase sometimes have trouble believing they are actually infected. The health care worker may suggest that the infected person bring his or her sex partner for counseling and assessment. HIV-infected people may be fearful that others will find out about their HIV status and stigmatize, blame, or avoid them. They may fear being abandoned by their spouses. Married couples may need help in dealing with the fear and mistrust that may ensue. Peer support groups for HIV-infected people, available in some areas, may provide a safe place for discussion of how to handle these challenges.

Before developing the symptoms of full-blown AIDS, the infected person may begin to notice some unusual symptoms such as candidiasis (a fungal infection) in the mouth or vagina, worsening of skin rashes, and fatigue. Once referred to as AIDS-related complex (ARC), this set of symptoms is now considered part of the *early symptomatic period*.

Once HIV has weakened the immune system, bacterial infections become more severe, last longer, and are harder to treat with antibiotics. Tuberculosis, bronchitis, and pneumonia are more common and severe in patients with AIDS. Fungal and protozoal infections often will not go away, even with treatment, and may cause death in a short time. Viral infections can become chronic, with persistent or worsening symptoms. These infections are called *opportunistic* infections, because they take advantage of the opportunity of an impaired immune system to cause major, life-threatening illnesses. When opportunistic infections or certain rapidly growing cancers occur, the illness is classified as *AIDS*. Cryptococcal meningitis, esophageal candidiasis, cerebral toxoplasmosis, and invasive Kaposi's sarcoma are examples of such diseases. Other symptoms during this phase include severe weight loss, anemia, prolonged diarrhea, extreme fatigue, dry skin, rashes, and thin or wispy hair. HIV can directly interfere with normal functioning of the brain, the gastrointestinal tract, and other body systems (see Table 5:2).

Survival after progression to AIDS is usually short. In African nations, death usually occurs within 6 months after AIDS is diagnosed,[64] but individual survival varies widely. Even in areas with extensive diagnostic and medical resources, a person with AIDS may live only a few years. Death is generally a result of opportunistic infections, severe weight loss, or any of the cancers commonly seen with AIDS.

Aggressive treatment for HIV infection, available in settings with extensive medical resources, involves the use of 2 or more antiretroviral drugs to reduce the actual number of HIV (viral load) in the body. These drugs must be taken several times a day for life, because they only help while they are in the patients' body. The person can still infect others, but the decrease in viral load helps preserve the immune

system. Because of the expense of such treatment, it has been unavailable to most people with HIV in 1998. Medical treatment also seeks early diagnosis and rapid treatment of opportunistic infections. The type of opportunistic disease seen in AIDS varies from region to region, depending on what bacteria, fungi, viruses, and parasites are common to the area (air, water, and people). In some locations, a particular opportunistic infection may be so common and so lethal that HIV-infected persons are given a specific drug to prevent such an infection, rather than wait for the infection to occur and then treat it. For example, in a group of Abidjan patients who were treated for tuberculosis, daily co-trimoxazole (trimethoprim 160 mg. and 800 mg. sulfameth-oxazole) prolonged survival and greatly reduced hospitalizations due to enteritis and bacterial infections.[67] Whether this will hold true for people without TB or people in other regions remains to be seen. With aggressive treatment, a patient's life may be extended a year or more.

Table 5:2 WHO case definition for AIDS surveillance in adults and adolescents

For the purposes of AIDS surveillance, an adult or adolescent (>12 years of age) is considered to have AIDS if at least two or more of the following major signs are present in combination with at least one of the minor signs listed below and if these signs are not known to be due to a condition unrelated to HIV infection.

Major signs
Weight loss greater than or equal to 10% of body weight
Chronic diarrhea for more than 1 month
Prolonged fever for more than 1 month (intermittent or constant)

Minor signs
Persistent cough for more than 1 month*
Generalized pruritic dermatitis
History of herpes zoster
Oropharyngeal candidiasis
Chronic progressive or desseminated herpes simplex infection
Generalized lymphadenopathy

The presence of either generalized Kaposi's sarcoma or cryptococcal meningitis is sufficient for the diagnosis of AIDS for surveillance purposes.

*For patients with tuberculosis, persistent cough for more than 1 month should not be considered a minor sign.

From: World Health Organization (1994)

HIV TRANSMISSION AND CONTRACEPTION

Several contraceptive methods reduce the risk of HIV and other STIs, although a few may actually increase risk of these infections (see Table 5:3). No matter what other methods of contraception a person is using, if he or she is at any risk because a sex partner is HIV-infected or because the partner's HIV status is not known, advise him or her to use condoms with every sexual act. No other contraceptive method besides abstinence provides this degree of protection.

Studies of contraceptive use and HIV transmission are particularly complex because both the choice of contraceptive method and the risk of HIV transmission are related to sexual behaviors. For example, women who use hormonal contraceptives may engage in sexual behaviors that place them at increased risk of HIV—such as reduced use of condoms. Further studies are needed to clarify the true risk associated with the hormonal methods themselves. *Until then, women using oral, implantable or injectable contraceptives should be advised to use condoms with every sexual act if their partners' HIV status is unknown.*

CONDOMS

Because a women's HIV status does not seem to affect fertility, it is important to provide contraceptive counseling and contraception to women with HIV. Women known to have HIV infection should be counseled that they can infect their partners, and that among contraceptive methods, only condoms can reliably reduce HIV risk to uninfected partners. Again, this requries that condoms be used in addition to other types of contraception, and that they be used consistently and correctly for every sexual act.

Condom use reduces the risk of HIV and other STIs effectively, but condoms work only if used correctly all the time.[16] In several studies of heterosexual couples, consistent and correct use of condoms reduced by 90% to 100% the risk of HIV transmission from the infected man to the uninfected woman.[16] Consistent condom use is also highly effective in preventing HIV transmission from an infected woman to an uninfected man.[27]

Table 5:3 Contraceptive effects on sexual transmission of HIV

Method used	HIV Transmission Risk		Comments
	Male-to-female	Female-to-male	
Hormonal:			
Pills	Conflicting data: several studies seem to show higher risk with pill use; many show no increase	No clinical studies; increased HIV shedding on hormonal contraception in one study	May vary depending on composition of pill and other factors
Injections	Studies in monkeys showed increased risk with progesterone; most studies in humans show no increase in risk	No clinical data	
Implants	No data	No data	
Condoms: male or female, latex or synthetic	Offers excellent protection from virus when correctly and consistently used	Offers excellent protection from virus when correctly and consistently used	May be used in combination with other contraceptive to reduce HIV risk
Vaginal spermicides: sponges, foam, films, suppositories, and jellies (nonoxynol-9)	Conflicting data: daily sponge users had higher HIV risk; non-sponge spermicides have shown some protective effect against HIV in one study	No clinical studies; spermicides inactivate HIV upon contact	Frequent use of nonoxynol-9 may cause vaginal or vulvar irritation; some STI reduction with spermicide use
Intrauterine devices (IUDs)	Most studies show no increased susceptibility to HIV	No clinical observations, but some IUDs increase amount and duration of menses: sex during menses poses higher risk	Not considered safe for women at risk of STIs. HIV-infected IUD users must have continued access to medical care
Coitus interruptus (withdrawal before ejaculation)	Reduction in risk when practiced consistently with stable partner; Some transmission still occurs	Males are still exposed to female vaginal and cervical secretions, although duration of exposure may be shorter	
Surgical sterilization (vasectomy, tubal ligation, hysterectomy)	No clinical studies on HIV; unlikely to reduce risk	No clinical studies on HIV; unlikely to reduce risk	Semen and vaginal secretions still contain HIV; absence of cervix not protective
Diaphragm or cervical cap	No clinical studies on HIV	No clinical studies on HIV	Risk of other STIs is less, but HIV can invade through vaginal wall (unlike STIs requiring cervical exposure)

Although some studies have suggested that condoms are not very effective in preventing HIV transmission, those studies usually did not ask how frequently condoms were used. In those studies, people who used condoms rarely or occasionally may have been misclassified as condom users. (See Chapter 16 on Condoms.)

Intrauterine Devices

Two cross-sectional studies, one in Italy and one in Tanzania, have shown that women with a history of intrauterine device (IUD) use are more likely to be HIV infected than those without a history of IUD use.[30] In a recent Italian study, women who used an IUD during a stable relationship with an HIV-infected male partner appeared to have only a slightly higher risk of HIV infection than women who did not.[43] However, women who had an IUD inserted or removed during the relationship had a significantly increased rate of HIV infection.[41] The association may be related to inflammatory changes in the uterine mucosa that increase the number of HIV target cells available to become infected. [41]

In cross-sectional studies, IUD users were no more likely to be infected with HIV.[19] More recently, a prospective study of women attending a family planning clinic in Tanzania showed that women using IUDs were not at increased risk for HIV seroconversion.[30] Thus, the risk for HIV infection associated with IUD is uncertain. IUDs have been associated with pelvic inflammatory disease (PID), but most IUD-associated PID is thought to be attributable to STIs. For this reason, IUDs are not generally recommended for women at risk for STIs, including HIV. Women known to be infected with HIV may safely use IUDs if they have continued access to medical care, and a stable, mutually monogamous relationship.[68]

Hormonal Methods: Oral Contraceptives, Implants, and Injectables

Whether oral contraceptive (the "pill") use has any effect on HIV transmission is controversial. In Nairobi, women who had taken oral contraceptives were more likely to be HIV-infected than were those who had not.[51] Commercial sex workers and women attending STI clinics also showed an increased risk for HIV if they used oral contraceptives.[47] In contrast, an Italian study suggested that women who had taken oral contraceptives were slightly less likely to be HIV-infected.[43] Other studies conducted among commercial sex workers or women in stable relationships have not found a significant increase in HIV risk among oral contraceptive users.[16,30] In these studies, it is almost impossible to rule out the possibility that other factors accounted for the difference in HIV risk. Thus, it is difficult to tell whether an increased risk of HIV is attributable to oral contraceptive use or to other characteristics.

Of 10 published studies with data on Depo-Provera use, only one reported an increased risk of HIV among women using Depo-Provera.[17]

Vaginal Spermicides

The role of vaginal spermicides (sponges, foams, suppositories, films, and gels) in reducing the risk of HIV infection is controversial. Alone, they are not currently recommended for preventing HIV infection in women. Although spermicidal ingredients (nonoxynol-9, octoxynol, benzylkonium chloride, and menfegol) kill HIV under laboratory conditions, their usefulness in preventing HIV transmission during sex is less certain.[23,27,32]

Nonoxynol-9 can be irritating. Four groups of women were given intravaginal doses of nonoxynol-9 on different schedules: every other day, daily, twice a day, or four times a day. The women who received the spermicide more often than every other day had vaginal irritation.[49] Women who used menfegol spermicidal foaming tablets more

than once per day had more genital lesions, even though they did not report problems.[23] Frequent use of higher doses of spermicides may cause genital irritation that could actually increase the woman's HIV risk. Whether vaginal spermicides affect HIV transmission from an infected woman to an uninfected man has not been fully investigated.

Although observational studies have suggested that prostitutes using nonoxynol-containing spermicides were less likely to have HIV infection, randomized trials have not shown that these spermicides protect against HIV. A Nairobi study found a higher rate of HIV conversion in commercial sex workers using the vaginal sponge, which contained high doses (1 gram) of nonoxynol-9, than in commercial sex workers using inert suppositories.[31] The increased risk may have been due to chemical or mechanical irritation from daily, near-continuous sponge use, and may not hold true for women who use sponges infrequently, or women who use nonoxynol-9 creams or suppositories.

Coitus Interruptus

Stable couples in which the man was HIV-infected and the woman was not demonstrated that coitus interruptus (withdrawal of the penis before ejaculation) was somewhat better than unprotected intercourse with ejaculation at keeping the woman from becoming infected. This method cut the HIV sero-conversion rate of women by half in one study[41] and by a larger percentage in another.[16] These studies examined only stable, heterosexual couples. The findings may not hold true for women with several HIV-infected partners. Coitus interruptus has not been studied as a way to reduce HIV transmission from an infected woman to an uninfected man.

Coitus interruptus probably decreases a woman's HIV exposure by reducing the amount of semen that enters her vagina. However, the seminal fluid that emerges from the penis before ejaculation may contain some HIV.[27] Although coitus interruptus may be better than intercourse with ejaculation at preventing HIV transmission, a number of women have become infected while their partners reported consistently practicing withdrawal.

Diaphragms and Cervical Caps

No information is available regarding the usefulness of the diaphragm or cervical cap in preventing HIV transmission. Case reports have shown that vaginal contact with HIV-containing semen is enough to infect a woman. Any barrier that covers only the cervix or the cervix and part of the vaginal wall does not adequately protect the user from HIV transmission.[27]

Voluntary Sterilization

Voluntary sterilization (tubal ligation, hysterectomy, or vasectomy) has not been clinically studied to find out if it alters the rate of HIV transmission. Because all the elements for HIV transmission remain in place after such surgery, sterilization would not be expected to increase or decrease this risk.[27]

Fertility Awareness

Fertility awareness methods have no known impact on HIV or STI transmission. They may have some use in risk reduction when an HIV-infected man and his uninfected wife want to have a child. Some couples in these circumstances do not wish to adopt a child or use semen from an uninfected donor to impregnate the woman. Fertility awareness methods can be used to time the unprotected sex act to the woman's days of maximum fertility, so the woman's exposures to HIV is minimized. (See Chapter 18 on Fertility Awareness.) There is no guarantee the woman will escape HIV infection or the risk of passing it on to their baby. Be sure the couple understands the need to use condoms for all other sexual intercourse. If a couple is determined to pursue this option, they should be fully informed of the risks to the mother's and the fetus' health. If the woman is fearful of risking infection or shows signs that she feels coerced, her wishes must be respected.

FACTORS FACILITATING SEXUAL HIV TRANSMISSION

The chance of getting HIV when having sex with an infected partner varies considerably for each person. Some individuals had sex with an infected person one time and contracted HIV. Other individuals had sex with an infected person many times and did not contract the infection, but many such persons did eventually contract HIV.

Certain factors increase the danger of getting HIV when having unprotected sex (sex without a condom) with an infected person:[19,30,40,41,43]

- Gender (most studies suggest HIV is two to three times more easily transmitted from an infected man to a female partner than from an infected woman to a male partner)
- Anal intercourse (more risk to receptive partner)
- Advanced HIV disease
- Any STI, especially genital ulcers, in either the HIV-infected or uninfected partner
- Frequent intercourse (>2 times a week)
- Sex during menses (if the female is infected)
- Uncircumcised male partner (increases the risk for uninfected men of getting HIV)
- Use of vaginal drying agents

SEXUALLY TRANSMITTED INFECTIONS

Almost any STI increases the chance of HIV transmission, particularly those that cause genital sores or ulcers.[60] In a Malawi study of HIV-infected men, those without urethritis had about 17,000 HIV copies/ml of semen, but those with urethritis had about 125,000 HIV copies/ml.[26] Only two weeks after urethritis treatment, the viral count dropped to 37,000 HIV copies per ml. In women, a similar correlation was seen between a current STI and detectable numbers of HIV in cervical and vaginal secretions.[22]

Rapid, effective treatment of STIs curbs the spread of HIV. A study in Tanzania found a dramatic reduction in new cases of HIV among men and women who received improved STI treatment services.[24] Sometimes infected partners may provide the only route for finding and treating women, because women often have no symptoms of their STI.[60] For example, in a group of rural Ugandan women, 65% had reproductive tract infections, but only 8% reported a vaginal discharge.[45] Women with untreated STIs are not only more likely to become HIV-infected and pass on their HIV infection to others, but they are also more likely to experience infertility, chronic pain, and perinatal complications, as well as neonatal blindness, disfigurement, and death. (See Chapter 6 on Sexually Transmitted Infections.)

Bleeding, Abrasions, and Vaginal Drying Agents

Any sexual or hygiene practice that causes friction, abrasion, or irritation may lead to small breaks or tears in the woman's genital mucosa. Thus, almost any intravaginal product such as douches, tampons, or substances to dry or tighten the vagina will increase the risk of HIV infection among women having sex with HIV-infected men.[37] "Dry sex" (removal of vaginal secretions before intercourse) and use of intravaginal herbs, leaves, or powders are likely to increase the transmission of HIV infection during sexual intercourse.[28] Any sexual practice associated with bleeding in either partner would also be likely to increase HIV transmission. Breaking the hymen, if traumatic or associated with bleeding, is thought to magnify the risk of HIV transmission from an infected man.[10] Finally, if an HIV-infected woman has sex during her menstrual period, she is more likely to transmit the virus to her partner.[46]

Female Genital Infibulation

The effect of female genital infibulation (circumcision) on HIV transmission has not been studied. The woman's husband or partner is expected to separate (defibulate) this tissue during her first sexual intercourse. Because defibulation routinely tears tissue, the opened

wound comes in direct contact with semen. This wound provides HIV a direct portal of entry into the bloodstream of the woman. Scarring that may occur as the defibulated area heals may lead to repeated episodes of intercourse-related tissue trauma and bleeding.

HIV IN PREGNANCY, CHILDBIRTH, AND BREASTFEEDING

HIV Transmission During Pregnancy and Childbirth

HIV can be passed on from an infected mother to her child before birth, during delivery, or while breastfeeding. Studies to date have shown that between 23% and 42% of babies born to African mothers infected with HIV-1 will become infected via one of these routes. The risk may be higher if the mother acquires the HIV infection during the pregnancy or if she has symptomatic or advanced disease during the pregnancy.[33] Other factors associated with increased HIV transmission from mother to infant are premature rupture of the membranes, preterm delivery, invasive procedures performed during pregnancy (particularly amniocentesis and amnioscopy), chorioamnionitis (infection of the placenta), STIs during pregnancy, hemorrhage during labor, and bloody amniotic fluid.[35] Some of these conditions can be prevented by good prenatal care and careful intrapartum management. In particular, screening for and treating STIs (both symptomatic and asymptomatic infections) before pregnancy or as early as possible during pregnancy can help reduce HIV transmission. If the woman has an STI, her partner(s) will need treatment in order to prevent reinfection.

In a multicenter study, HIV-infected pregnant women were given the antiretroviral drug zidovudine (also called ZDV, AZT, or Retrovir) several times a day during the second and third trimester of pregnancy and intravenously during labor and delivery. The newborns were given ZDV syrup for the first 6 weeks of life. Infants whose mothers were treated with zidovudine had an 8.3% chance of infection versus 25.5% in the untreated group.[56] These infants also had a temporary drop in their hemoglobin level (about 1 gram), with spon-

taneous resolution after the ZDV was completed. A shorter course of zidovudine was tested on pregnant women in Thailand between 1996 and 1998, in which the HIV-infected women took 300 mg. of zidovudine twice a day starting at 36 weeks. During labor, they took 300 mg. every three hours by mouth until delivery. In that study, the HIV transmission rate was 50% less for infants whose mothers took zidovudine (9.2%), versus infants of those who had not received the drug (18.6%). This study greatly simplified the previous regimen, and even though the reduction in HIV was somewhat less, the much lower cost may make it feasible for countries with limited resources. No intravenous drug was used, and the infants were not treated after birth. None of the infants were breastfed, however. In areas where artificial feedings are not feasible, this regimen is not likely to be as effective in reducing perinatal HIV transmission.[66]

Zidovudine has not been widely tested in adults in African nations and will require careful monitoring during initial use in African populations. We do not know if some other drug regimen or type of treatments may be more useful to reduce mother-to-child HIV transmission. One treatment recently tested in Malawi was vaginal cleansing with a 0.25% chlorhexidine solution every 4 hours during labor and delivery.[9] The entire birth canal and external genitalia were wiped with a cotton swab soaked in the solution. The infants were cleansed in the same manner immediately after delivery. This regimen did not reduce HIV transmission from mother to newborn, except in a subgroup of women whose membranes had been ruptured for longer than 4 hours. In these women, transmission rates were 25% in the vaginal cleansing group versus 39% in the control group. Whether this finding was due to the intervention has not been ascertained, but there were no ill effects reported from the cleansing. In fact, the same study suggested that the chlorhexidine cleansing reduced neonatal and maternal infections in the early portpartum period. Infant mortality from sepsis also was reduced.[69] Additional studies are needed to answer some of the remaining questions as well as produce an effective, less expensive, and more practical methodology for women in countries with fewer resources.[14]

HIV Transmission During Breastfeeding

Infants who escape HIV infection during pregnancy and delivery may still become infected by breastfeeding from an infected mother. If the mother was not infected with HIV previously but became infected during the breastfeeding period, the infant's risk of seroconversion is around 29%.[18] If the mother was infected with HIV before the pregnancy, the infant's additional risk of contracting HIV from breastfeeding is estimated at 14%.[18]

Breastfeeding provides optimal nutrition, protects infants from many life-threatening infectious diseases, and provides some natural contraceptive benefit (see Chapter 12 on Postpartum Contraception and Lactation). For these reasons, continue to promote breastfeeding among HIV-negative women and women of unknown HIV status. A woman known to have HIV infection should be informed about the risk of HIV transmission through breastfeeding and about other possible feeding options, so that she can make her own decision about whether to breastfeed. HIV-infected women may consider using commercial infant formula only if the family has reliable access to sufficient formula for at least 6 months and has the resources—clean water, fuel, utensils, skill, and time—to prepare it accurately and hygienically.[64] (See Chapter 12 on Lactation and Postpartum Contraception.) If a woman chooses to use artificial feedings, teach her how to prepare the feedings and how to feed the infant from a cup. Then ask the mother to demonstrate the preparation and feeding so you can be sure she is able to do it safely and correctly.

Some mothers may be stigmatized for using artificial feedings, and some families cannot afford the additional costs for fuel, equipment, and supplies. HIV-infected women who breastfeed must be treated promptly for breast infections and cracked or bleeding nipples because these might increase the baby's risk of acquiring HIV infection. For the same reason, quickly treat an infant that has thrush, ulcerations, or other problems of the mouth.[64] An HIV-infected woman who breastfeeds may possibly reduce the child's risk of HIV by stopping breastfeeding when the infant is a few months old.[15]

Infant Outcomes

Most HIV-infected babies become ill within the first year of life.[50] Others will not show symptoms for a year or more. The baby with HIV may not gain weight normally or may have repeated bouts of pneumonia, bacterial infections, diarrhea, severe oral candidiasis, and other illnesses. In African countries, the death rate is 21% to 37% for infants born to HIV-infected mothers versus 2% to 4% for infants born to uninfected mothers.[33] Infected infants who survive their first year are likely to die at a young age and rarely live to age 12.

The HIV-infected woman considering pregnancy will need to choose another guardian for the child when she becomes too ill to care for it. The World Health Organization (WHO) estimates that, since the beginning of the epidemic, nine million children under age 15 have lost their mothers to AIDS. Of these maternal orphans, 90% have been in sub-Saharan Africa.[63]

HIV Prevention Education

Reproductive health care workers are critical agents for HIV prevention, especially where the prevalence of HIV infection is high. Your patients may not be aware of the routes of transmission of HIV or how they can protect themselves. Every patient should have some skill-building on HIV prevention. Ask each patient, "What do you do to protect yourself from AIDS?"[25] Your female patients must understand that protecting themselves is the only way to protect their unborn children.

Many reproductive health care patients are already infected with HIV, and most of them are not aware of their infection. These clients need to know how to protect uninfected partners and children. Individual and collective human behavior are the key to HIV containment, and information is the first step to behavior change.

HIV Prevention and Sex

The only way to prevent death from AIDS is to avoid contracting HIV infection. Although vaccines against HIV are being developed, as of the late 1990s, none have been proven effective in humans. Prevention of sexual transmission of HIV is difficult, complex, and requires accurate information, decisions by the patient and partner, and many changes in behavior that may not be easy to master or maintain. Prevention messages to the client should remind her or him: "If you are not infected now, you may still become infected." The following measures will reduce a person's risk of HIV infection (see Table 5:4):

- Mutual monogamy with an uninfected partner
- Abstinence from sex
- Avoidance of alcohol or drug use in situations where they will make a person more likely to have unprotected sex
- Correct use of condoms and water-based lubricants during sex (anal, oral, or vaginal) with anyone who has HIV or whose HIV status is unknown

Even though STIs and HIV have been associated with having multiple sex partners, advice to limit the number of partners becomes less important as the prevalence of HIV climbs. For example, in Kigali, Rwanda, the HIV prevalence among women who had only one lifetime sex partner was more than 20%.[2] Their male partners had become infected during previous or extramarital sexual relationships, and the women's risk was directly related to their partners' sexual behavior rather than to their own behavior. It does not take many sexual partners to be exposed to HIV when the overall prevalence is greater than 30%, as it was in Kigali.

In the Kigali study,[2] some individuals were fearful of condoms because they mistakenly believed that condoms could cause sterility or illness in women. This study also found that condom use among couples increased when the male partner came in for HIV testing and counseling. Male partners who refused HIV testing were least likely

to use condoms, and the rate of HIV seroconversion among their female partners was twice that of the group in which the men were tested and counseled. Thus, men should be targeted for education to reduce HIV infection in their wives, sex partners, and children.[2]

Table 5:4 Safer sex options for physical intimacy

Safe
Massage
Hug
Body rub
Dry kiss
Masturbation
Hand-to-genital masturbation or mutual masturbation
All sexual activities, when both partners are monogamous and known, by testing, to be uninfected with HIV
Possibly safe
Wet kiss with no broken skin, cracked lips, or damaged mouth tissue
Vaginal or rectal intercourse with latex or synthetic condom used correctly
Oral sex on a man using a latex or synthetic condom
Oral sex on a woman using a latex or synthetic barrier such as flexible plastic wrap or a modified male condom (cut open and spread over vulva), especially if she is not menstruating or having a vaginal infection with discharge
All sexual activities, when both partners are in a long-term, monogamous relationship and trust each other
Unsafe in the absence of HIV testing and mutual monogamy
Any vaginal or rectal intercourse without a latex or synthetic condom
Oral sex on a man without a latex or synthetic condom
Oral sex on a woman without a barrier, especially if she is menstruating or has vaginal infection or discharge
Semen in the mouth
Oral-anal contact
Blood contact of any kind, including menstrual blood, or sex that causes tissue damage or bleeding

Adapted from Hatcher, et al. (1994)

An uninfected woman considering sex with a man of unknown HIV status must consider the possibility that he is HIV-infected and realize that she can choose safer activities to reduce risk to her and her future children. These alternatives must be discussed before they prepare for sexual activity. Likewise, an HIV-infected woman considering sex with a man of unknown HIV status must consider that he may be uninfected and talk with him about measures they can take to protect him from infection. To protect their wives and future children, men who know that they are uninfected need to take steps to stay that way. Men who are already infected with HIV must act to keep uninfected sexual partners from contracting the virus.

Women who are interested in protecting themselves from HIV are often doubtful that their sex partners will agree to safer sex measures. Women often say that their main reason for not using condoms is that the man refuses or does not like them. Because women are frequently economically dependent upon their partners, they feel that if they become demanding about such a difficult subject, the man may retaliate or leave. The health care worker may suggest that a woman in such a position come in with her partner for HIV prevention counseling or even HIV testing. Remind your patient that a man who refuses to use condoms with her may be more likely to refuse to use them with his other partners as well, thereby posing a higher risk to all his partners.

Women who are least able to negotiate with their partners for safer sex tend to be younger and disadvantaged by poverty, war, lack of education, and poor job opportunity. Young girls are sometimes forcibly seduced by older men, or men who may give them gifts or money.[4] Unmarried or divorced women may set up arrangements with one or more men to provide sexual services in exchange for material support. These partnerships may not be stable, and the man often has other sexual partners as well. Women who are unable to find work sometimes sell sexual encounters to feed themselves and their children. Some of these situations are not considered prostitution, but they are still very risky for the women.[7] Keep in mind too that women and girls are sometimes raped, a practice that may dramatically increase during war and civil unrest.

The vulnerability that stems from poverty and limited job opportunities often means that women do things that they would rather not. A few organizations help women gain property rights, improve their education, receive job training, or get business loans. Learn if any such organizations are in your area so that you can refer women in need of such assistance. Encourage your patients who want out of a risky situation to create a workable plan to do so. Most important, respect a patient's autonomy, even if you do not personally agree with her choices.

Teaching your client the facts about HIV is an essential step, but knowledge alone will not reduce risk. Most people do not absorb this information and translate it into action after hearing it only once. It takes many small steps to action. When a client returns after an educational or counseling visit:

- Applaud any behavior steps in the direction of safety.
- Be sure that you teach in a way the patient can understand.
- Listen and try to understand the client's questions and concerns.
- Allow the client to determine what steps to take toward reducing HIV risk and protecting her or his family.
- Offer to teach or refer the client's partner, if the partner is unwilling to accept information from your client.

If your client does bring in a sex partner, either or both of them may want an HIV test. They may choose to take other types of precautions, such as using condoms. He may elect to cease extramarital relationships or use of commercial sex workers. *Each step toward safer living must be supported.*

Prevention and Blood Transfusions

Blood donors have differing HIV prevalence rates, depending on their country and region. Volunteer donors are less likely to be infected than paid donors.[8] In Uganda, donors recruited by family members were more than twice as likely to test HIV-positive than vol-

unteer donors recruited by the national blood center.[61] All donated units should be tested by a sensitive HIV screening test and positive units discarded. If confirmatory testing is available, the donor should be counseled about his or her HIV-positive status and advised never to donate blood, semen, or tissue. (See the section on HIV test counseling, this chapter.) One blood collection center in Zimbabwe defers all donors with a history of genital ulcer or STI. This step reduces the number of HIV-infected blood units which must be discarded, thereby saving money,[39] and lessens the chance that the collected blood will test negative for HIV during the "window period" (described below), even though the infection can be passed on to the recipient.

THE HIV TEST

TEST METHODOLOGY

Standard HIV testing does not detect HIV directly. Instead, it detects the *antibody* to HIV produced by the infected person's immune system. It is like seeing an elephant's footprints—even though you don't see the elephant, you can see that he's been there. This antibody can be detected in blood, or with some of the newer tests, in saliva or urine.

Because a delay occurs between infection and antibody production, the HIV test is not helpful immediately after exposure to the virus. Most people take *6 weeks to 6 months* to show a positive test after HIV infection has taken place. During this window period, the HIV antibody test will be negative, even if the person is infected and is capable of infecting others. After an infected person has produced enough antibody to be detected on the HIV test, future HIV tests will be positive.

If the HIV screening test is negative, the person is considered uninfected, assuming that the window period has already passed. A negative confirmatory test is not needed. A positive screening test is generally confirmed with a more specific test, however, because of the high rate of false-positive screening tests. Some fairly simple confirmatory tests are available.[11] Different combinations of rapid screening

and confirmatory tests are being used for areas with limited resources, which helps to reduce costs and technical demands. All HIV testing is subject to error, and laboratory workers with less experience have higher rates of false results. Be familiar with the testing procedure and speak with the laboratory personnel who perform the test to understand the screening accuracy in your area.

Screening Test Limitations

If the only available test on-site is a single screening test, advise your client that a negative result can be relied on unless he or she is in the window period. If the screening test is negative, the post-test counseling for negative tests should be used. If the screening test is positive, the patient must be advised that the first part of the HIV test was positive, then referred to a location that can perform a confirmatory test. Because this patient is likely to be infected, advise safer sex precautions until the confirmatory test is completed. If the confirmatory test is negative, the post-test counseling for a negative test is used at this time. If the confirmatory test is positive, the post-test counseling for positive results is used.

Testing Infants

Up to the age of about 15 months, the infant carries the mother's HIV antibody. Therefore, testing a newborn with the standard HIV antibody test will actually test the mother. After the age of 15 months, the maternal antibodies are cleared from the child's blood, and the child can be tested to determine its HIV status.[33] It is very important that HIV-infected infants and children, who are especially vulnerable to infection, receive immunizations (see Table 5:5).

In some research centers, tests that directly detect HIV can be performed on infants as young as 6 months. Because it is possible that an uninfected baby will become infected later through breastfeeding, such tests are more useful in situations where artificial feedings can be safely used. The tests are also relatively expensive and technologically impractical for widespread use at this time.

Table 5:5 Immunizations recommended for children with HIV infection

Vaccine	Recommendation
Measles vaccine	Children with known or suspected HIV should receive measles vaccine at 6 and 9 months, because of their risk of severe measles.
Diphtheria-tetanus-pertussis vaccine	Administer the same dose and schedule as for immunocompetent children.
BCG	BCG is not recommended for children with symptomatic HIV. In regions where the risk of TB infection is high, it should be given to asymptomatic children. BCG is not recommended for adults.
Oral polio vaccine (OPV)* Enhanced inactivated polio vaccine (IPV)	Children with AIDS should receive IPV. Asymptomatic children may be given OPV on the usual schedule.
Yellow fever	May be given to asymptomatic children, but not to those with symptoms.
Pneumococcal vaccine	Administer to HIV-infected children at 2 years of age.
Hepatititis B vaccine	Administer the same dosage and schedule as for immunocompetent children.
Live vaccines (e.g., typhoid, varicella zoster, and vaccinia)	Live vaccines are not generally recommended for people with HIV.

NOTE: In urban areas, children may also be given Pneumococcal vaccine at age 2, and an annual influenza vaccine each year starting at age 6 months. Adults with HIV also may benefit from these immunizations if they are available.

*If OPV is given to a person, close contact between the OPV recipient and the immunocompromised infant should be avoided for approximately 1 month after the vaccination. OPV has not been harmful when administered to asymptomatic HIV-infected children, but some immunocompromised children may be unable to limit the vaccine virus' replication, which can result in severe, progressive neurologic involvement.

Source: WHO (1998) and Scarlatti (1996)

HIV COUNSELING

HIV counseling is a unique opportunity to learn about the patients' needs, risks, and understanding about HIV and AIDS. The counselor can correct misinformation and help the patient reduce the risk of getting HIV if the client is HIV-negative, or the risk of giving it to others if the client is HIV-positive. Your patient may have received inaccurate or incomplete information from friends and family. He or she may have heard about HIV and AIDS from other sources, such as pamphlets, posters, and mass media campaigns, but may not have changed his or her behavior. Sometimes a person will mistakenly change behavior in ways that do not actually reduce risk, for example, by taking only younger sexual partners, or by selecting partners who "look healthy."

The health care worker can use this time to emphasize facts and to teach patients how to effectively reduce the risk of HIV and AIDS for themselves and their families. The two-way conversation with the health care worker not only helps to highlight actual risks for that patient, but also gives the client a chance to ask those questions that are personally important to him or her. Counseling may include referring the patient to support groups, post-test clubs, and other services that improve the patient's and family's well-being.

PRE-TEST COUNSELING

Counseling before the HIV test must be a complete and thorough review of facts. The client cannot be expected to absorb much information at the post-test counseling session because of emotional reactions to the test results. All important information must be given before HIV testing, and 15 to 30 minutes should be allotted for this session. It is usually impractical for the primary care provider to spend this much time with a patient; other workers—counselors, assistants, or even volunteers—can be taught to perform this important task.

The first component of pre-test counseling is a basic explanation of what the HIV test is, including test limitations. For example, if the

patient is in an ongoing sexual relationship with someone suspected to have HIV, the test will need to be repeated 6 months after the last unprotected sexual contact with that person. If the patient was recently transfused, it is best to wait 6 months before HIV testing to avoid the window period, when the test may be negative despite actual infection. Pre-test counseling also is used to ascertain that the client's consent to be HIV-tested is an informed and voluntary one.

The client must understand that the test detects antibody to HIV, the virus that causes AIDS. Even if the HIV test is positive, the client may be healthy for months or years. The health care worker should advise on the possibility of a false positive or false negative test. This possibility depends on the types of HIV tests available and the expertise of the laboratory personnel performing them.

Pre-test Discussion Outline

1. Explain that the virus is in the semen, vaginal, and cervical secretions, and blood of infected people. Review the routes of HIV transmission:
   - Having sex (use language that the patient understands)
   - Receiving an infected blood transfusion
   - Giving birth (the infant is at risk)
   - Breastfeeding (the infant is at risk)
   - Re-using blood-contaminated injection equipment
2. Your client also must understand ways the virus is *not* transmitted:
   - Living in the same house
   - Working together
   - Insect bites
   - Sharing bathrooms
   - Hugging
   - Food preparation
   - Sharing dishes or eating together

3. Discuss measures that the client can take to avoid exposing sex partner(s) to HIV, in case she or he is infected:
   - Devise a plan for informing partner(s) that she or he is taking the test and why they will be using condoms or other precautions
   - Rehearse what the client will say to the partner
   - Allow the client to bring in the partner so that the client can talk to the partner in the presence of the counselor and questions can be answered
   - Set up a time to counsel and offer to test the partner for HIV, if that is desired by the client
4. Review confidentiality of the test with the client:
   - Who will receive the lab result
   - Whether the result will be reported to the local health authority or the government
   - Where the test result will be stored, and who will have access to it
   - How and when the client will receive the result (if a couple wants to receive their results together, they should consent separately to do so)
5. Legal ramifications of the test vary from country to country, and sometimes from state to state. The counselor must know the local regulations that apply to HIV test results and people with HIV infection and be able to discuss them with clients.
6. Set up an appointment for the client to return for test results:
   - Allow enough time for both the screening and confirmatory tests to be completed before the return date.
   - Help the client cope with anxiety while waiting for the test results.
   - Assist in developing specific plans about who the clients can talk with, post-test clubs that may be available to them, and any local resources, including the possibility of a return visit to the counselor.

Often, the client may not be entirely comfortable with a frank discussion of sexual practices. Health care workers, too, must work to

overcome their own discomfort with discussing sexual matters openly, because understanding is essential for preventing transmission of this deadly virus. HIV is commonly a topic of much misunderstanding and unfounded fears. Occasionally, people are more afraid that they will get HIV from sharing a meal than from sexual activity. Pre-test counseling is an excellent time to dispel such mistaken notions.

Post-Test Counseling

Positive HIV Test Result

Greet the client and seat him or her in a quiet, private place. Be sure you have adequate time to deal with the emotional reactions that may occur. Gently explain that the results were positive, meaning that he or she is HIV-infected, but may not develop AIDS for some time (if the patient has not already developed AIDS). Allow the client to react and ask questions, keeping in mind that a wide range of expressions may be considered normal upon learning this news:

- Anger
- Denial
- Numbness
- Sadness
- Fear
- Anxiety

Often, people ask for specific predictions about their survival and how long they can expect to be healthy. Help your patient understand that the future is dependent on many factors, most of which are unknown at this time.

- You can transmit HIV to others through unprotected sex or by donating blood to them. Women can pass it on to unborn children or through breastfeeding infants.
- You may have contracted the virus from a current or a past sex partner or through receiving a blood transfusion. You may or may not already have transmitted it to a more recent partner.

- Stay as healthy as possible to try and slow the onset of symptoms and progression of disease:
  - Avoid unprotected sex to prevent STIs.
  - Get a tuberculosis skin test and follow recommendations for prevention.
  - Eat nutritious foods.
  - Get adequate exercise.
  - Get enough rest and sleep.
  - Try to stop smoking.
  - Obtain recommended immunizations (see Table 5:5).
  - Reduce or stop alcohol and other drug use.
- If area support groups exist, give them a try.
- Be sure you have adequate condom supplies if you have a sex partner or partners.
- Know how to use condoms and use them correctly, *every time*.
- It may make it easier to practice safer sex in your relationship if your partner comes in for testing and counseling as well.
- Remember that drinking alcohol or using mood-altering drugs may cloud judgment, and increase likelihood of unsafe sexual behavior.
- Learn sources of good treatment. Unscrupulous people in every country prey on the hopes and fears of people with HIV and AIDS, promising miracle cures in exchange for large sums of money. Such predators can bankrupt entire families with their lies.

Negative HIV Test Result

Greet the client and seat her or him in a quiet location. Explain that the results were negative, which could mean several things:

- The client may not have been exposed to HIV.
- The client may not have been infected when he or she was exposed to the virus. This may not be the case next time the client is exposed.

- The client may have become infected very recently. If he or she was infected less than six months ago, the test may not yet show the infection.

Discuss with the client how to avoid HIV infection in the future (see Table 5:4):

- Abstinence
- Mutually monogamous sex with an uninfected partner
- Use of condoms and water-based lubricant during sex (anal, oral, or vaginal) with anyone of unknown HIV status
- Avoid alcohol or drug use, especially in situations that may make you more likely to have unprotected sex

SAFETY FOR THE HEALTH CARE WORKER

In many medical settings, a small risk of HIV transmission from a patient to a health care worker exists because of invasive examinations and procedures. These procedures may bring the health care worker into contact with infectious materials such as blood or amniotic fluid, which may then be accidentally introduced into the body of the health care worker. *Blood is the single most important source of HIV in health care settings.* Blood or bloody fluid has been implicated in every documented transmission of HIV to health care workers in clinical settings to date. Other body fluids have been found to contain HIV, but so far have not been implicated in work-related HIV infections (see Table 5-6).

Because of the seriousness of HIV and other blood-borne infections, precautions must be taken to decrease the health care worker's chances of exposure. All patients must be treated cautiously, as if any one of them may have potentially serious infections. The practice of treating all patients as potentially infectious is known as *universal precautions*, and includes:

- Wearing waterproof gloves (rubber, latex, or vinyl) to clean infectious spills
- Using disinfectant solutions to clean infectious spills
- Handling sharp instruments carefully until they have been sterilized

- Using waterproof gloves for pelvic and genital exams
- Using gloves for any procedures that may involve contact with or potential spilling or splashing of potentially infectious bodily fluids
- Educating health care workers about the risk of HIV and hepatitis B, how they are transmitted, and how to avoid them in the health care setting

Table 5:6 Potentially HIV-infectious versus non-HIV-infectious bodily fluids in medical settings

Infectious	Non-infectious*
Blood	Nasal mucus
Amniotic fluid	Sputum
Cerebrospinal fluid	Saliva
Synovial fluid	Tears
Pericardial fluid	Sweat
Peritoneal fluid	Earwax
Semen	Feces
Vaginal/cervical secretions	Urine
Any secretion visibly contaminated with blood	Vomit
	Breast milk†

*Unless visibly contaminated with blood.
†Because HIV has been found in small quantities in some breast milk and is implicated as a route for transmission to nursing infants, gloves may be worn by workers in situations with exposure to large volumes of breast milk.

Source: Centers for Disease Control (1988)

Accidental HIV exposures most often occur when blood-contaminated sharp instruments, such as needles or scalpels, break the skin of the health care worker. Rarely, infectious materials enter the body of the health care worker through open lesions, broken skin, or mucous membranes (eyes, mouth, nose). Because there is no easy way to tell who is HIV-infected and who is not, it is important to guard against injury with contaminated instruments or splashes by infectious body fluids with *all* patients. Analyze each work setting and each procedure for specific potential risks, and take action to reduce those risks.

The risk of contracting HIV, even with injury, is extremely small. U.S. data show that, after a puncture wound with a hollow-bore injection needle or sharp instrument which was contaminated with blood from an HIV-infected patient, the HIV seroconversion rate averages 0.3%.[21] The risk appears to be smaller for splashes on mucous membranes or broken skin.

A 1995 case-control study of European and U.S. workers showed variable levels of HIV risk from different kinds of workplace exposures.[57] Groups of health care workers who had become infected with HIV from exposures at work were compared to those who had reported work-related exposure to HIV but had not become infected. The researchers sought to determine which factors were associated with increased risk of work-related HIV infection. All of the workers who acquired HIV infection had been exposed to the blood of an HIV-infected person. Almost all (94%) had a needlestick injury with a hollow-bore (injection) needle previously used on an HIV-infected patient; the rest had sustained punctures or lacerations with other sharp objects such as lancets or scalpels. Many more workers with deep punctures or wounds were in the group who actually contracted HIV infection. Other high-risk conditions were terminal illness (end-stage AIDS) in the source patient, puncture with a visibly bloody device, or injury with a needle that had been placed directly in the vein or artery of the source patient.

This same study showed that workers who did not seroconvert were more likely to have taken zidovudine after the exposure. In 1996, because of this apparently protective effect, the U.S. Public Health Service recommended that workers reporting a parenteral exposure to HIV-contaminated blood be offered a 4-week course of antiretroviral medications, called post-exposure prophylaxis, in an attempt to abort HIV infection.[58] These recommendations were based on a small study, however, and not everyone who took antiretroviral drugs avoided HIV infection. Potential candidates for this prophylaxis must be apprised of this and the potential for side effects and toxicity of the drug(s) to be used.

Post-exposure prophylaxis, if used, is best started within 1 to 2 hours of the HIV exposure, but no later than 72 hours after exposure.

Even without antiretrovirals, 99.7% of workers exposed to HIV-contaminated needlesticks would be expected to remain uninfected.[21] Toxicity, expense, refusal by the health care worker, low risk of seroconversion, and lack of drug availability are common reasons for not using post-exposure prophylaxis.

If a health care worker has an HIV exposure by injury with a contaminated needle or instrument or by contact of potentially infectious fluid (see Table 5:6) with broken skin or mucous membranes, the following steps must be taken as soon as possible:

- Immediately wash the area thoroughly with plenty of soap and water. In the case of eye or mucous membrane splashes, rinse with large amounts of water.
- Apply disinfectant to broken skin after cleansing.
- Report the injury to a supervisor.
- If the source patient is known, see if it is possible to find out if the patient has HIV.
- If the source patient is unknown or is known to be HIV-infected, proceed with HIV testing of the health care worker.
- Request an HIV test on the health care worker as soon as possible, preferably within 24 hours, but certainly within 1 or 2 weeks.
- Repeat HIV testing 6 months and 12 months after the injury to determine if HIV seroconversion took place. If the worker has used safer sex measures and had no blood transfusion during the year and still seroconverted to a positive HIV test, it is assumed that he or she contracted HIV from the workplace exposure.

The initial HIV test is a baseline test, which takes advantage of the delay between exposure and conversion, or the window period. Its purpose is to determine if the worker already was HIV-infected at the time of the exposure. If the worker is positive at this time, the HIV infection is not related to the proximate injury. The employee must also be counseled pre- and post-test, much as a patient would be. (See the sections on Pre- and Post-Test Counseling, this chapter.) Advise

the worker to use barriers and practice safer sex with partner(s) until he or she completes the follow-up HIV tests.

These guidelines will help prevent many occurrences of occupational (work-related) HIV transmission and track those that occur. It is easy for health care workers to over-estimate their risk of becoming infected with HIV at work while downplaying risk from off-the-job activities. Most health care workers contract HIV by the same routes others do.[12] It is important for those in health care to be aware of all risks and to make adjustments to reduce them if possible.

Theresa and her two children lived quietly with her mother, helping with the house and farm. She was afraid to tell her family what had killed her husband, and every day she wondered if she was infected. She refused all offers of courtship, because she knew that if she carried HIV, she could give it to the man she loved. After nearly a year, she found out that a clinic where her aunt lived could test for the virus. She left her children with her mother and took a little money she had saved, saying only that she was going to visit her aunt. She had to wait several days for the test, and more for the result, but she felt very lucky when she found she was not infected. She went back to her mother's village and decided that, before she considered remarrying, she would find a way to avoid exposing herself, and her future children, to such a risk again.

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