6

The spread of HIV by ways other than sex

Clarence's story

Clarence is a "train doctor" in Ghana. He makes the trip from Accra to Kumasi almost every day. The people on the train rarely get to see a doctor and they ask Clarence about all kinds of health problems. He gives advice and sells soaps, vitamins, and injections to treat fevers. Many of the people riding the train have asked him if he has a cure for AIDS. He believes that one of his injections of vitamins and penicillin prevents AIDS. Clarence has heard about dirty needles spreading HIV and cleans his needles with coconut juice. He also uses a different needle for each train car. Clarence tries to buy clean needles once a month, but they are expensive and sometimes hard to get. When

he hears that you are teaching people about AIDS, he asks, "Can you help me sell my AIDS medicine? Can I catch AIDS from people on the train? Does coconut juice kill AIDS?"

How HIV is spread

In most cases, people have become infected with HIV by having sex. However, there are other ways that HIV can be spread: by dirty needles and instruments, by transfusions of HIV-infected blood, and from a mother to her baby. In this chapter we discuss these other ways that HIV is spread.

HIV, alcohol, and drug use

Alcohol and drug use make it more likely that a person will get or spread HIV. This is not because HIV is in alcohol or drugs—it is not—but because people taking drugs or drinking alcohol do not think clearly and are more likely to do things that put them at risk for getting HIV. The most common way is by having unsafe sex.

Many people drink alcohol. Some people drink so much alcohol that it harms them. They are called "alcoholics." Drinking alcohol damages their bodies; it also changes the way they act, which can damage their relationships with other people and their ability to work. Other people almost never drink alcohol. When it comes to getting or spreading HIV, what matters is that

CAGE questions

Some people do not know that they have a problem with alcohol. If you ask someone whether she is an alcoholic, you may not hear the truth. Here are some other questions you can ask instead. These are known as the CAGE questions. If someone answers "yes" to two or more of these questions, she probably has a problem with alcohol.

- C Have you ever tried to Cut down (lower) the amount of alcohol that you drink?
- A Do you get Annoyed when people talk to you about your drinking?
- G Have you ever felt Guilty about your drinking?
- E Have you ever needed an "Eye-opener" (a drink) when you woke up in the morning to steady your nerves or prevent a headache?

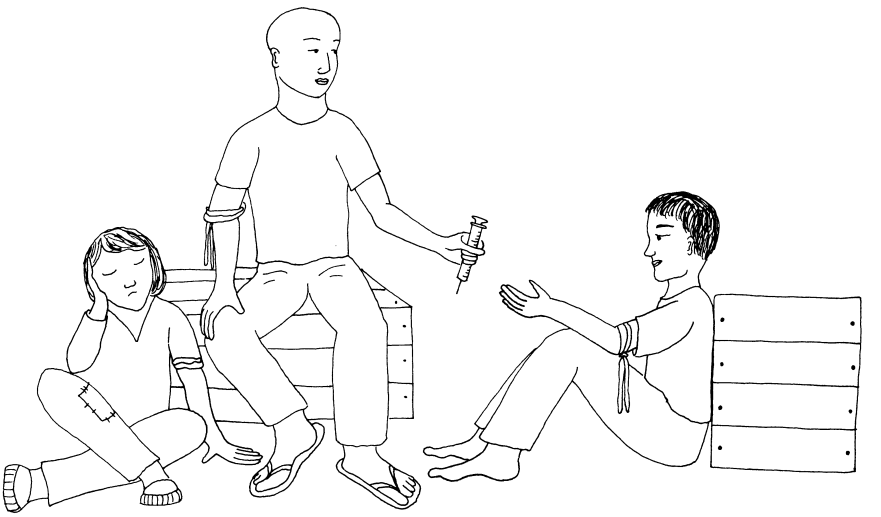
drinking alcohol causes people to make bad decisions. For example, going to a bar to drink may lead a man to spend his money on alcohol when his children are hungry at home. After having a few drinks, he may decide to visit a sex worker—even if he knows she might have HIV.

Just like people who drink alcohol, people who use drugs are also at risk of getting HIV. People who use drugs may trade sex for drugs or money. They may want drugs so badly they have unsafe sex. Drug use is also dangerous because HIV can be spread by needles that have been used by someone else to inject drugs. A person using a dirty needle puts a little of someone else's blood into herself. If HIV is in the blood, she could get infected.

In some countries, it is against the law for people to have needles or syringes unless a doctor has prescribed them. People who use drugs like

Millions of people use drugs worldwide

Between 5 and 10% of the people in the world have alcohol-related disease. Two million people die each year from alcohol use. About 144 million people, almost 2.5% of the world's population, smoke marijuana or hashish. About 14 million people use cocaine, 9 million use heroin, and 29 million take amphetamine-like drugs ("speed").



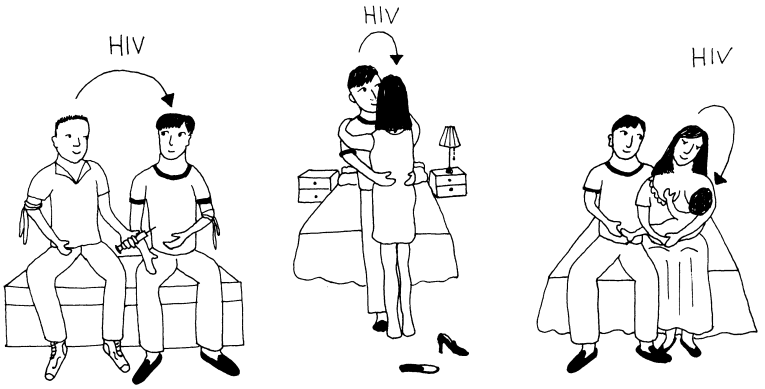
Sharing needles spreads HIV.

Drug injection and HIV

Intravenous (IV) needles are used to draw blood and to give fluids and medicines. Injectionists, traditional healers, doctors, and nurses all use intravenous needles.

These needles can also be used to inject illegal drugs. People who give themselves drugs in this way are called drug injectors, injection drug users (IDU), or intravenous drug users (IVDU). HIV is spread by drug use all over the world. In some places 50% or more of all people who inject drugs have HIV.

Drug injectors can give HIV not only to other drug users, but also to their sexual partners. If a woman becomes pregnant she may give HIV to her baby. The spread of HIV among people who share needles is a problem for the drug injector, her or his sexual partner, and their children.



A person who has shared needles can spread HIV to his partner and their baby.

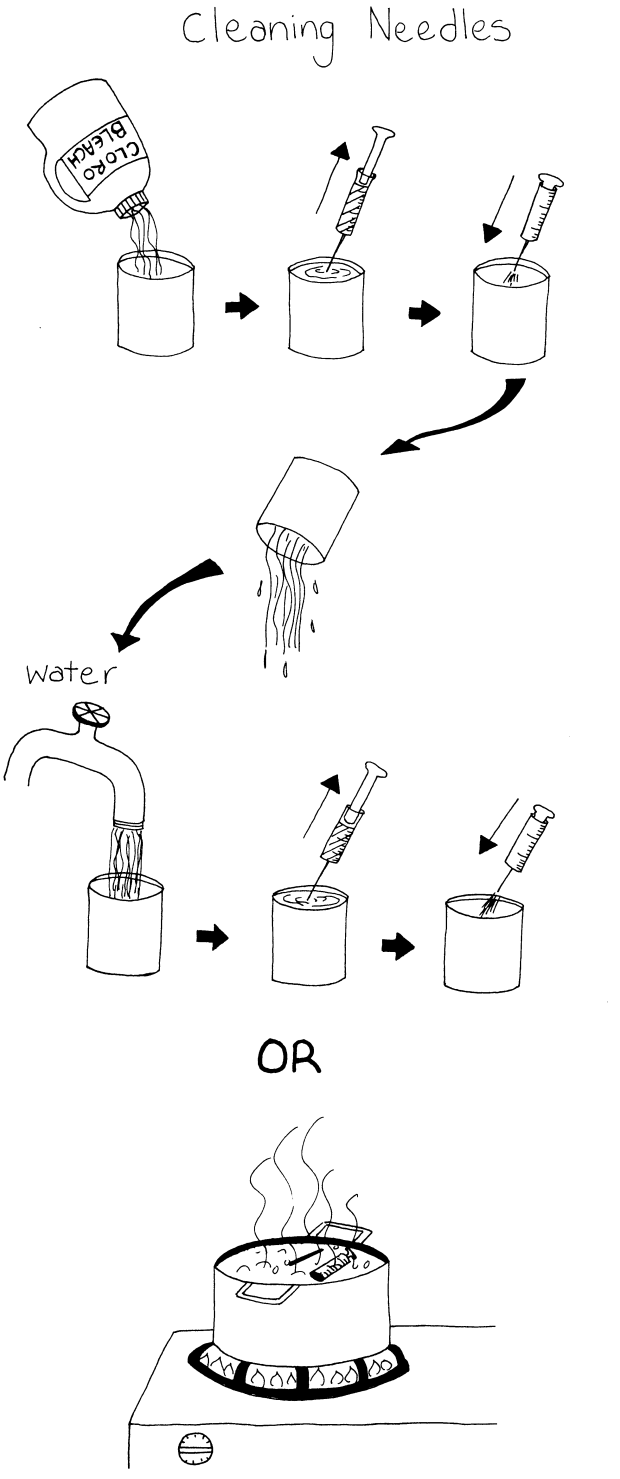
heroin or amphetamines often buy needles illegally or rent them from someone else. In New York City in the United States, people inject drugs in "shooting galleries," where people rent used needles. These needles have been used by many different people. The more people share needles, the more likely it is they will become infected with HIV.

How can drug injectors avoid HIV?

Injecting drugs does not directly cause AIDS; sharing needles with other people is what causes the spread of HIV from person to person. This is why people should avoid sharing needles, cookers (equipment used to prepare

drugs for injection), cotton, or anything used to inject drugs. Drug injectors can lower their risk of getting HIV in three ways:

1. *Stop injecting drugs.* It is often hard to stop using drugs because they are addictive. People who are addicted will become sick if they do not have drugs. Although it is very difficult for drug injectors to quit using drugs, it is not impossible. You can help them. Find out if programs are available in your community for people who want to stop using drugs. Learn how people can join these programs. Get to know the people who work in the programs. There may be clinics that give methadone to drug injectors. Methadone is a drug like morphine and heroin, but it is taken by mouth and therefore does not spread HIV. Methadone gives people less of a "high" than heroin, but it lasts for 24 hours. This means people do not need a new "fix" every few hours. Since methadone is legal, they do not need to steal or have sex in order to pay for drugs.
2. *Use new needles.* If a drug user is unable to quit using drugs, he can avoid HIV by using only clean, new ones. Teach drug users that dirty needles spread HIV. If your community has a needle-exchange program, tell drug users that they can get clean needles for free by bringing in old ones. You might think that such a program would increase the number of people who use drugs. But in communities that have needle-exchange programs, the number of people who inject drugs has not increased—and the number of drug injectors who get HIV has decreased. (Also, people who use new, clean needles get fewer skin infections.)
3. *Use clean needles.* Sometimes getting new needles is difficult or expensive. In these situations, people can learn how to clean their needles. Everyone who shares needles should clean them between users. The most common way to clean needles is with bleach (Cloro, Clorox, etc.). Bleach kills HIV, but do not drink it or inject it, because it can hurt or kill people when inside the body. Because of this, after cleaning the needles with bleach, use clean water to wash away the bleach. People can also clean needles by boiling them in water for 30 minutes. (Also see the box on "How to clean needles and other instruments" later in this chapter.)


Cleaning Needles
CLOROX Bleach
water
OR
Boil in water for thirty minutes

HIV and blood transfusions

Blood or blood products (such as serum or plasma) can save a person's life. However, they can also be dangerous. If blood and blood products have not been carefully "screened," or tested, a person could get several diseases, including AIDS, from them. The chances of getting HIV from blood that has not been tested depend on how many blood donors—people who give blood—have HIV. For example, in a city where 25% of the donors have HIV and screening is not available, HIV is in one of every four units of blood. HIV has been found in all parts of blood. This means that packed red blood cells, serum, plasma, and clotting factors can all contain HIV. Even in places where blood is screened carefully, there is still a very small chance that it contains HIV, viruses that cause hepatitis or malaria, or other organisms.

Many countries in the world are taking special care to keep their blood supply free of HIV. They do this first by screening donors and second by testing blood. Blood banks collect and store blood for later use. To reduce the chance that the blood contains HIV or other organisms, blood banks screen donors by asking people about their sexual and drug-use practices. People with a high risk of having HIV are then asked not to give blood. This lowers the chance that the blood supply will have HIV. Unfortunately, in areas where many people have HIV it is difficult to find donors.

Sample blood bank questionnaire

These are some questions that blood banks, clinics, and hospitals can use to screen their donors and find out who has a high risk of having HIV. A "yes" answer to even one of the questions means that the blood should not be used.

- Do you have AIDS or have you had a positive test for HIV (the AIDS virus)?
- Have you had sex with someone who has AIDS or who has had a positive HIV test?
- Have you ever received money or drugs in exchange for sex?
- Have you had sex with a sex worker?
- Have you ever injected illegal drugs like heroin or speed?
- Have you had sex with someone who has injected illegal drugs?
- Have you ever received a blood transfusion?
- Are you a man who has had sex with another man?
- Do you feel ill today?

People who are paid to give blood are more likely to have HIV than people who give blood for free. This is because people who want money for donating blood may not tell the truth about their risk of having HIV. They may also be more likely to have used drugs, to have exchanged sex for money, or to have had sex with someone who had HIV. People should never be paid for donating blood.

In addition to questioning donors, blood banks should test donated blood for HIV. Blood that has HIV should be thrown away. The HIV test is very accurate except during the few weeks between when people get the virus and when their bodies begin to produce antibodies. During this time, a person can test negative even though she has the virus. (For more about HIV testing, see Chapters 7 and 8.) In areas where donors are screened and blood is tested, the number of people who get HIV from blood transfusions has gone down.

The risks and benefits of giving a patient a blood transfusion should be carefully weighed. "Topping off," or giving a person extra blood to make him feel better, is a bad idea. No matter how well the blood is screened, there is still a very small chance of getting HIV. Before giving a transfusion, doctors should think very carefully about whether the person truly needs blood. Most hospitals now give blood to people less often than they did ten years ago. Sometimes a transfusion is needed to save a person's life, and in that case the benefits of receiving blood outweigh the risks of getting HIV. Learn how blood is screened in your area and ask what the chance is that a unit of blood has HIV.

Of course, there is no risk of getting HIV from *giving* blood as long as clean needles are used. You can encourage people who do not have HIV to donate blood. This adds to the blood supply and prevents the spread of HIV.

The blood supply in India

In India, most blood banks were not testing blood for HIV or other viruses. Then it was found that many blood donors had HIV. In 1996, the Indian government wrote new laws to try to make the blood supply safer. The new laws said that blood banks had to have licenses and had to test donated blood. The new laws also said that blood banks could not pay donors for their blood, so that people at high risk for infections would not give blood to get money.

There are ways to reduce the risks of getting HIV from a transfusion. One way is to have a person give her own blood a few weeks before an operation. Then her blood will be available if a transfusion is needed. This is the safest way to get a transfusion. But often there is not enough time or space in the blood bank for a pre-donation.

How to reduce the risk of spreading HIV through blood transfusions

Choosing donors

- Teach health care workers about the risk of spreading HIV through blood transfusions.
- Use a questionnaire to screen out high-risk donors.
- Use blood from donors who give it for free, not from donors who are paid.
- Use a person's own blood when possible.
- Use donors with a low risk of having HIV.

Screening donated blood

- Test all blood donations for HIV.
- If all blood cannot be tested, other screening options can be used. For example, samples from ten donations can be pooled (combined) and tested. If the test is positive, the ten donations can then be individually tested, or all ten can be thrown away. A negative test means that all ten are safe.

Medical practices

- Do not give transfusions unless absolutely necessary.
- When possible, use blood expanders such as saline instead of blood.
- Heat-treat blood products like plasma and clotting factors in order to kill HIV.

People often believe that getting blood from a family member is safer than getting blood from an unknown (anonymous) donor. However, this is usually *not* true, because family members may be more likely to cover up that they are at a high risk of having HIV. For example, a woman may be embarrassed to tell her family that she had sex with someone outside of her marriage.

HIV in the clinic

HIV can be spread in the clinic by needles and instruments (scalpels, forceps, scissors, specula, etc.) that have been used to give people medicine, draw blood, perform an examination, or perform surgery. Especially in an area where many people have HIV, the virus can

How to clean needles and other instruments

Heat methods	Time needed
Boiling	30 minutes
Steam	30 minutes
Dry-heat oven, 77°C or 170°F	30 minutes

The following chemicals can be used to clean needles and other instruments. The instruments should be rinsed with water and then soaked for at least 30 minutes in one of these solutions. Instruments should be placed in a clean area and allowed to dry before use.

Chemicals that inactivate HIV	Concentration
Sodium hypochloride (bleach)	0.5%
Sodium hydroxide	30 mM
Glutaraldehyde	2%
Formalin	4%
Paraformaldehyde	1%
Hydrogen peroxide	6%
Ethyl peroxide	1%
Lysol (household cleaner)	1%
NP-40 detergent	1%
Chlorhexidine gluconate/ethanol	4/25%
Ammonia	1:1 (ammonia to water)
Isopropyl alcohol	50%
Chloramine	2%
Ethanol	70%
Polyvidone iodine	2.5%

None of these works inside a person's body!

spread quickly if needles and instruments are used on more than one patient. However, most health workers know that HIV can be spread in this way, so they either do not use needles a second time or they clean all needles and instruments before using them on another patient. If simple measures are taken, spread of HIV in hospitals and clinics should be rare.

Avoiding HIV in the clinic

When people ask your advice about how to avoid getting HIV when they visit the doctor or other health care worker, you can tell them to:

Ask for new or sterilized instruments.

Go to health care workers who clean needles using the methods described in this chapter (not, for example, with coconut juice).

Ask the doctor or health care worker if it is possible to take pills instead of injections.

Use sterilized instruments if you are piercing your ears or getting a tattoo.

Ask health care workers to use new, clean gloves when doing procedures that may spill body fluids.

How can health workers avoid getting or spreading HIV on the job?

People who take care of people with HIV often worry about getting the virus from patients. Procedures such as giving injections, drawing blood, doing pelvic examinations (examining a woman's vagina and cervix), and performing surgery usually involve some contact with body fluids. However, if normal safety measures are followed, there should be very little risk of getting HIV for the health care worker or the patient. (The box called "Are you at risk" gives some questions that can help health care workers find out their risk of getting or spreading HIV in the clinic.)

Are you at risk for getting HIV at work?

How much contact do you have with body fluids?

What are you doing now to prevent contact with body fluids?

Do you protect yourself all the time or only sometimes?

How do you clean instruments? Do you sterilize them?

Do you reuse syringes or do you throw them away?

Do you have a safe place to put sharp, dirty instruments?

Are clean gloves available?

If the workplace is unsafe, how can you make it safer?

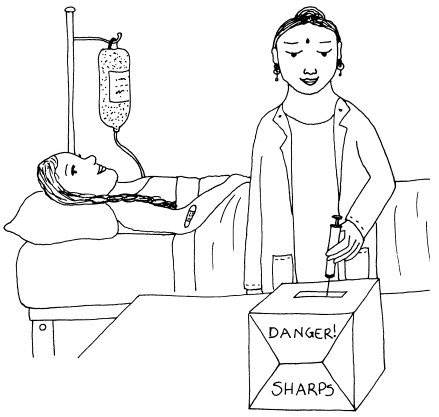
A pelvic examination with a dirty instrument can give a woman HIV. Clean instruments and gloves should be used by people at all times when in contact with body fluid (during pelvic examinations, when using a needle to draw blood, and during surgery). It is best if gloves are used once and then thrown out. Some rubber gloves are made to be reused; these gloves should be steril-

Chances of getting HIV after being injured by a needle

It is very rare to get HIV after being stuck by a needle—about 1 in 300 people who are stuck by a needle that has been used on a person with HIV will become infected. There are some things that increase the chance that a person will get HIV from a needle injury:

- if the injury is deep and in a muscle
- if there was patient's blood in the needle
- if the patient has AIDS (this may mean there is more virus in the patient's blood than if she just had HIV)

ized after each use in one of the solutions listed in the box "How to kill HIV." If no gloves are available, then health workers should carefully wash their hands immediately after contact with each patient. They should also keep their fingernails short and cover any open sores on their hands with waterproof plaster, tape, or bandages. Tables and floors should be washed with a bleach solution every day *and* after each examination or procedure. People doing this job should wear gloves, because they may touch body fluids. If you only have dirty instruments, think about whether the risk of spreading HIV is greater than the benefit of the examination or procedure. It may be better not to treat the patient.



Needles that are thrown away with paper waste or linens can cause injuries. Needles and other sharp instruments should be thrown away in a special box called a "sharps box" or "sharps container." The box should be made of a material that is thick and strong enough that the needles and other instruments cannot pierce it. You can buy sharps containers that are made of plastic, or you can use a strong cardboard box with a small hole in the top. Label all sharps containers so people do not open them by mistake and hurt themselves. Whoever uses a needle should drop it in the sharps container immediately after using it. Needles should not be left lying around—needles and other sharp instruments that are hidden on trays cluttered with cotton swabs and papers can be deadly. And do not put the cap back on a needle; many injuries have happened this way.

How to prevent injuries when using needles, scalpels, and other sharp instruments

In the clinic

Do not

- put caps back on needles
- bend or break needles

Do

- remove used needles from your work area
- put needles and other sharp instruments in "sharps boxes" after using them
- keep sharps boxes near where work is being done
- wear gloves when using a needle to draw blood (if you stick yourself after drawing blood from a patient, the glove will clean some of the patient's blood off the needle before the needle punctures your skin)
- use protective barriers such as gloves, gowns, masks, and eyewear (glasses or safety glasses) when a lot of contact with body fluids is expected
- wash hands immediately if they have body fluid on them, and also wash them after seeing each patient

In surgery

- Pass sharp instruments back into a tray and not into an open hand
- Always say "needle back" or "sharps back" when passing these instruments back
- Bandage all cuts and nicks on hands before putting on gloves
- Wear a double pair of gloves
- If blood or other body fluid gets under a glove, take off gloves immediately, scrub hands, and put on new, clean gloves
- Think safety!

If someone is cut with a dirty instrument or needle, she should clean the wound immediately with soap and water. If a person is stuck by a needle that has HIV-infected blood on it, her chance of becoming infected with HIV is about 1 in 300. This is high enough to mean that everyone should take precautions very seriously, but low enough that spread of HIV in the health care setting remains rare.

HIV outside the clinic

People use needles for injecting medicines outside of the clinic or hospital. For example, people with diabetes inject medicine at home. In Ivory Coast,

Tattooing, body piercing, scarification, and circumcision

All over the world people get tattoos and scars. If the needles, razor blades, or knives used to make the marks are not clean, HIV can be spread from one person to another. In some parts of the world people pierce parts of their bodies and put in pieces of jewelry. HIV can spread if the piercing instruments used are not cleaned properly. HIV can also be spread through the use of acupuncture needles if they are not sterilized before reuse.

In some parts of the world, people circumcise boys and girls before they reach adulthood. Circumcision for a boy means that the foreskin is cut off of the tip of the penis. "Circumcision" or "genital mutilation" for a girl means that the clitoris and/or vaginal lips are cut off. Sometimes the vagina is sewn up. Circumcisions are performed either in the hospital or clinic, or in the community. If instruments are not cleaned, HIV can be spread.

people travel from village to village selling injections and medicines. In Mexico, some people have small stores where they inject vitamins and antibiotics and other medicines. These people are known as "injectionists." You can talk with injectionists and see what they know about HIV and the problems with using dirty needles. Talk with them about ways to clean needles.

Mothers, babies, and HIV

HIV can pass from a mother to her baby during pregnancy, birth, or breastfeeding. Without antiretroviral medicines or other prevention, about one of every three babies born to women with HIV is infected with the virus during the pregnancy or birth. The chance of a mother passing the virus on to her baby can be reduced greatly if she takes antiretroviral medicines throughout the last 3 months of her pregnancy or during birth. See the section "Medicines for HIV" in the appendix to learn how to give these medicines.

The best way to prevent the spread of HIV to children is to protect mothers from getting HIV in the first place. See Chapter 5 and Chapter 12 for how to help women and their partners prevent the spread of HIV.

If a woman already has HIV and does not want to become pregnant or risk giving birth to a child with HIV, she can use contraceptives (birth control) to prevent pregnancy. Some common contraceptives are condoms, contraceptive pills, injections (Depo-Provera), diaphragms, intrauterine devices (IUDs), and implants. Condoms are the only of these methods that can prevent the spread of HIV too. Some couples have sex only around the time of the

woman's period because she is much less likely to get pregnant at that time. This does not work well unless the couple keeps very careful track of which days the woman can become pregnant. Couples can also avoid pregnancy by having oral sex or by touching each other in sexual ways instead of having sexual intercourse.

If a woman with HIV does become pregnant, she may think about having an abortion. Performed correctly, abortions are safe procedures. However, in some communities abortion is illegal and some communities do not have the means to do safe abortions. Having children may be so important to the woman or her family that she may choose to have children even though there is a risk of passing HIV. This is a complicated decision and many people including the woman's family and community will have opinions about what she should do.

When a woman with HIV gives birth, it is difficult to know whether the baby has HIV. All babies born to mothers with HIV have HIV antibodies in their blood because these antibodies are transmitted from the mother to the baby during pregnancy. HIV tests check for HIV antibodies, so all babies of HIV positive mothers test positive. This does not mean that all the babies have HIV. After 15–18 months, the mother's antibodies will all have left the baby's body and the baby's HIV test will be accurate. Many babies that have HIV will become sick in the first year or two of life. Some, however, grow to be children, living many years with HIV.

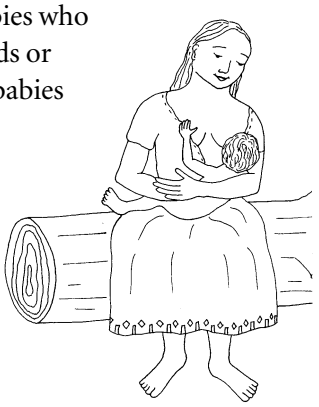
Breastfeeding and HIV

Breast milk is the best food for young babies. It is more nutritious, safer, and cheaper than bottled milk or baby formula. Breast milk also protects the baby against disease. Babies who are breastfed have a better chance of staying healthy and living longer.

Unfortunately, mothers with HIV can pass the infection to their babies through breast milk. No one knows why HIV is passed to some babies and not others, but HIV probably passes more easily during breastfeeding when:

- the mother recently became infected with HIV.
- the mother is very sick with AIDS.
- the mother gives formula, teas, or other fluids along with breast milk.
- the mother has cracked nipples or a breast infection.
- the baby has thrush in her mouth.

For most mothers, even mothers with HIV, breastfeeding is the safest way to feed their babies. That is because in most places formula and other milks cause many babies to get sick or die from diarrhea or hunger. Many more babies die from taking formula than get sick or die from HIV passed through breastfeeding. If a mother with HIV chooses to breastfeed, here are some things that may make it safer:



- Give only breast milk for the first 6 months. Babies who have breast milk and formula, teas, or other foods or drinks are more likely to become infected than babies who drink only breast milk. Any other foods or liquids will irritate the baby's intestines.
- Stop breastfeeding completely after 6 months.
- Position the baby correctly to avoid cracked nipples.
- Treat thrush, cracked nipples, and breast infections right away.
- Do not feed the baby from a breast that has mastitis or an abscess—instead, remove the milk and throw it away.

A woman who is being treated with medicines for HIV is less likely to pass the disease while breastfeeding.

A baby that is fed only formula has no chance of getting HIV from breast milk. So if formula can be given safely, it is the best option. But it is only safe when the family has enough money to afford enough formula, clean water to mix the formula with, and fuel to boil and sterilize bottles.

Families who give formula must follow the directions on the package — exactly. Do not thin the formula by adding extra water or by using less milk or powder. Dirty bottles and nipples or watered-down formula can kill a baby.

Misunderstandings about HIV

Many people worry about getting HIV. For example, in one town in the United States, parents banded together to stop a nine-year-old child with HIV from going to school because they thought their children could get HIV in school. We know there is no risk to children who go to school with another child who has HIV; but whenever a new disease is found, fear and a lack of information will cause some people to have false ideas about the disease.

People who are ill should be cared for with kindness. This is true whether someone has cancer, diabetes, or AIDS. In the past, people with cancer were sometimes treated unfairly. Even though cancer is not spread from person to person, some people lost their jobs and their friends when it was known that they had cancer. People with cancer had these difficulties for social reasons, not biological ones. This is also the case with HIV. Even though it is an infectious disease, HIV can spread from person to person in only a few ways. We must all take care not to let fear of HIV and AIDS make us treat people unfairly.

Answering Clarence's questions

"Can you help me sell my AIDS medicine? Can I catch AIDS from people on the train? Does coconut juice kill AIDS?"

Clarence has some important questions about AIDS. He knows a little about AIDS , but he also has some false information. Because he treats so many people on the train, it is important for him to understand how HIV is spread. He needs to understand that HIV can be spread from person to person through dirty needles. Clarence thinks that he can stop people from getting AIDS with an injection of penicillin and vitamins. This is a dangerous idea. If people believe Clarence, they will think they can have unsafe sex or share needles with someone with HIV and still not get the virus. There is no injection that will stop someone from getting HIV. You might try talking about this with Clarence. Over time, he could help you teach people on the train about HIV.

Cleaning needles with coconut juice does not get rid of HIV. It is best to use a new needle for each injection. However, using bleach to carefully clean needles and syringes will also work. If there is no bleach, needles and syringes should be cleaned with alcohol after each *person*, not each train car.

The only way Clarence could get HIV from someone on the train is if he sticks himself with a dirty needle. You can explain to him that using gloves, not putting caps back on needles, and putting dirty needles in a sharps container will help protect him from HIV.

7

HIV testing

Jean-Patrice's story

Jean-Patrice is nineteen years old and lives in Cayenne, the capital of French Guiana. He moved to Cayenne six months ago from his village in the southern rainforest, where he was a farmer. Now he works in a hotel near the center of Cayenne. He enjoys living in the city and has had several girlfriends, but he wants to earn enough money to go back to his village and start a family. Jean-Patrice has not visited his village since he moved to Cayenne. Next weekend he will return there to bring medicines to his sick mother. He is looking forward to spending time with Michelle, his girlfriend in the village, but he is worried: his doctor warned him that he may have gotten something from his last girlfriend. A friend of his has AIDS and is now very sick. Jean-Patrice comes to your clinic and asks, "Can I get tested for AIDS? How good is the test? If I am negative, does that mean I am immune?"

The HIV test

The HIV test will tell if the HIV virus is in a person's body. It does not tell that a person has AIDS. It is important to know if a person is infected with HIV so:

1. People who know they are infected can begin to take more care with nutrition, clean water, and other ways of staying healthy right away. They may also start taking certain medicines. These steps will keep people with HIV healthier for longer.
2. People who know they are infected can access care and support services available to people with HIV.
3. People who are infected can protect others and avoid passing the virus.
4. People who are infected can protect themselves so they do not get re-infected in the future.

People who wait until they are sick to get tested will have more difficulty treating their sicknesses and living healthy and positive lives.

Types of HIV tests

When a virus, bacteria, or parasite enters a person's body, the immune system begins to make antibodies that try to fight off the virus or other invader. The most common HIV tests—the rapid test, the ELISA (enzyme-linked immunosorbent assay) and the Western Blot—work by looking for antibodies to HIV.

The tests are used millions of times each year. Each has its benefits and drawbacks; because of this, the tests may be used together.

Not all tests look for antibodies. Some tests look for the virus itself. For example, one type of test involves trying to grow HIV in the laboratory from a sample of a person's blood. If the virus grows from the blood, it means the person has HIV. This type of test is difficult and expensive, and it does not always find the virus in people who are infected. Other tests, such as the nucleic acid test and the polymerase chain reaction (PCR), which look for HIV RNA or DNA, are also expensive and are rarely used.

The **CD4 T-cell count** is not an HIV test. It does not check for HIV. This test counts the number of CD4 T-cells in one microliter of blood. The CD4 cells are white blood cells that are part of the immune system. These cells help the body find and fight bacteria and viruses. When the immune system has many CD4 cells it is more able to fight off infection. CD4 cells are also

Antibodies and vaccines

Vaccines use antibodies to prevent illness. They help a person make antibodies to fight diseases that she may come into contact with later. For example, the injected polio vaccine is made of pieces of the polio virus. These pieces are not harmful to people because they are not the whole virus. When given this vaccine, a person's body makes antibodies to the virus. If the person is infected later with the real polio virus, the antibodies will attach themselves to the virus and make it easier for the body to get rid of it. Unfortunately, there is no vaccine for HIV.

attacked and destroyed by HIV. When the number of CD4 cells in the body decreases, the immune system is less able to fight infections. The CD4 count measures how strong the immune system is.

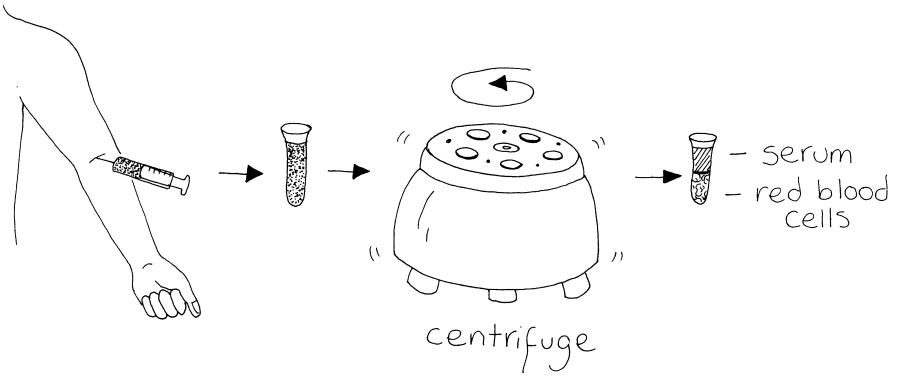
How HIV tests work

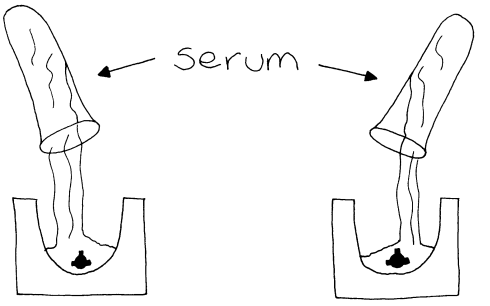
For a rapid test, a little blood is mixed with a chemical solution. A test stick is dipped into the mixture. If the blood contains HIV antibodies, a mark on the stick will indicate that the person has HIV. This test is simple and inexpensive. They are quite accurate and the results are usually available within an hour.

There are several different types of ELISA tests. We will discuss an ELISA test that uses beads. Laboratories in your country may use a slightly different test. However, all ELISA tests are based on the same idea; they look for antibodies, and if you understand how one works you can understand the others.

A small sample of blood is separated into serum (yellow liquid) and red blood cells. Antibodies are found in the serum.

Serum is placed in a container with a round bead that has bits of HIV attached to it. If there are antibodies to HIV in the serum, they will recognize





Serum is placed in the container with a round bead that has pieces of the virus attached to it

The beads are washed
If there are antibodies to HIV in the serum they will recognize the HIV and attach themselves to the bead

Goat antibodies are added; they will only stick if antibodies to HIV are present

A chemical is added and color appears if goat and HIV antibodies are present

the test is positive

the test is negative

the HIV and attach themselves to the bead. Then the bead is washed. After washing, only antibodies to HIV will stick to the bead; antibodies to other viruses will be washed away.

Special antibodies taken from goat blood are then added. These antibodies attach themselves to any human antibodies that are on the virus-coated bead. The bead is washed again, and a chemical is added that brings out color in any goat antibodies that are still attached to the bead. If color appears, it means there were HIV antibodies in the person's serum. This is a positive test. If a person does not have HIV, there would be no human antibodies for the goat antibodies to attach themselves to. The goat antibodies would have been washed away and there would be no color. This is a negative test.

ELISA tests are excellent at finding antibodies against HIV. This ability to detect antibodies is called "sensitivity"; it is a basic quality of any medical test. The ELISA test for HIV is not too expensive compared to other medical tests (each test costs US$5–10). Clinics and blood banks usually use the ELISA test as a first round for testing blood.

Fingerstick and oral swab tests

The most common way to test for HIV is to examine a person's blood. People do not like to give blood, however, and collecting it can be expensive. Because of this there are now accurate tests that use a finger stick to get a little blood. Also, there is an HIV test has been made that uses a small sample from the inside of the mouth. This test is painless and is safer than a blood test because no needles are used. Unfortunately, the test is expensive and may not be available in your area.

The problem with rapid and ELISA tests is that they can make mistakes. Because they are so sensitive, they can give a positive result for blood that does not actually have HIV. This is known as a "false positive." To avoid this, most clinics and blood banks run a second test on blood that is positive on rapid and ELISA tests. They use another ELISA test or a test like the Western blot. The Western blot also looks for antibodies to HIV; it is not as sensitive, but it is able to look more closely at *what kind of* antibodies are present. It will almost never show a blood sample to be positive if it does not contain antibodies to HIV. Thus, when a Western blot is positive, a person almost always has HIV. This ability to be right when a test is positive is called "specificity," because the test is finding antibodies to a specific disease. The problem with the Western blot is that it is expensive (each test costs US$25–50). In summary, the rapid and ELISA tests have excellent sensitivity but not very good specificity, whereas the Western blot has excellent specificity but not very good sensitivity.

When to test and when not to test

When people come to you for testing, it is important to talk to them first about their individual situations. In some areas of the world, HIV infection is so common there are very few false positives. In these areas, the test is useful for most people who want to be tested. In other areas, HIV infection is rare, and it is important to ask a few questions about risk factors before testing people. If a person is at very low risk for having HIV, it might be better not to test her. There are several reasons for this. First, it may be better to use money and other resources to test people who are at high risk, not low risk. Second, if a person is at very low risk, a positive test is likely to be a false positive. To find out for sure if he has HIV, you will need to test the person a second time, with a more expensive test. Finally, getting a positive test result can make a person frightened and upset; if the result is a false positive, the person will have been frightened and upset for no reason.

What does a test result mean?

Because the body takes a couple of weeks to produce antibodies to HIV, an HIV test may be negative for up to 3 weeks after a person becomes infected. So a negative result from an ELISA test means that a person does not have HIV—*if*, in the several weeks before testing, he did not do anything that would put him at risk (for example, he did not have unsafe sex or share needles). A negative test does *not* mean that a person cannot get HIV in the future. A positive result from *both* a rapid or ELISA *and* Western blot means that a person most likely has HIV.

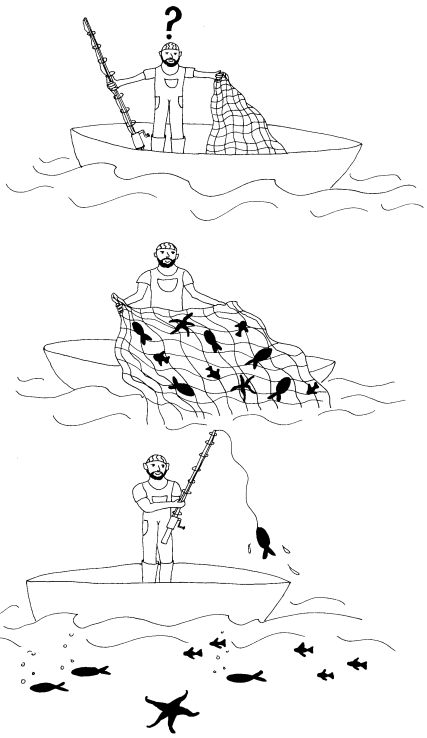
Sometimes the Western blot gives an answer that is not positive or negative but "indeterminate" (unclear or uncertain). Someone with an indeterminate Western blot is more likely to have HIV than someone with a negative Western blot, but less likely to have HIV than someone with a positive Western blot. Sometimes a Western blot is indeterminate because a person has only just begun to produce antibodies to HIV. But the Western blot can also be indeterminate for people who are not infected with HIV, especially if they have certain other diseases. The sensitivity and specificity of a Western blot also depend on the skills of the people performing the test. People with indeterminate tests should take another test in one month to determine if they have HIV.

Why there are different types of HIV tests

A fisherman in a boat on a small lake is trying to catch tilapia. He can use either a net or a fishing pole. What he catches will depend on which tool he uses.

The net would catch all the tilapia, but it would also catch many other fish that the fisherman does not want. The net has high sensitivity because it catches all the tilapia. The net, however, has low specificity because the fisherman catches many fish in the net that are not tilapia.

The same fisherman may choose to use a fishing pole to catch tilapia. With a pole he can use bait that is only eaten by tilapia. The pole has high specificity because it only catches the kind of fish the fisherman wants. Unfortunately, the fishing pole has low sensitivity; it cannot catch all the tilapia in the lake.



The HIV test is trying to "catch" antibodies to identify if a person has the HIV virus.

Like the net, rapid serological tests and the ELISA test for HIV have high sensitivity. They identify almost everyone who has antibodies to HIV. But these tests have low specificity which means sometimes results are positive for people who do not have HIV antibodies. If a person has a positive rapid or ELISA test but does not truly have HIV, the test is called a false positive.

Like the fishing pole, the Western blot test has high specificity because almost everyone it identifies really has antibodies to HIV. With good specificity, there are few false positives. Tests with good specificity usually have low sensitivity. They do not catch everyone who has HIV. If a person has a negative test but really does have HIV, the test is called a false negative.

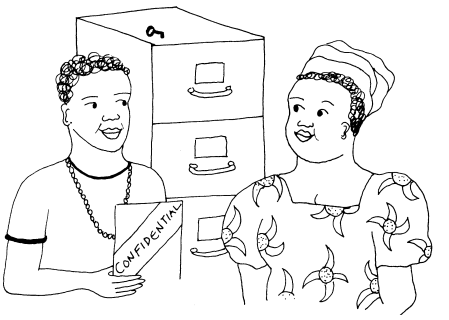
It is best to have a test with both high sensitivity and high specificity, but this is not always possible. This trade-off between sensitivity and specificity in a medical test is common. Rapid serological tests and ELISA tests have good sensitivity and are used as a first test to identify all the people who have HIV antibodies-along with a few who do not. Blood samples with positive ELISA results can then be tested with a Western blot, which has good specificity. The Western blot screens out the false positives — those that are not truly infected with HIV.

The HIV test and babies

The ELISA and Western blot tests do not work for babies younger than fifteen months. This is because antibodies against HIV pass from the mother to the baby and stay in the baby's blood for about fifteen months. This means a baby can have antibodies to HIV even if she does not have the virus. If a baby being tested is at least fifteen months old, then a positive HIV test is likely to be a true positive. By the time the baby is this age, any antibodies in her blood are her own, not her mother's. For babies less than 15 months old a negative HIV test is accurate. To be sure that a positive test is correct, a test called a polymerase chain reaction (PCR) must be used.

Confidential and anonymous testing

Most people want the results of their HIV tests to be private. Telling supportive people that you have HIV can be very helpful. The right people can offer support, love, or vital services. But if a person's HIV results are shared without her consent or knowledge, this information can be used to harm her. A woman may be beaten or kicked out of her home. She may be fired from her job or shunned by her community.



To protect a person's privacy, HIV tests should be anonymous or confidential. The test is the same for a confidential or anonymous test. The only difference is in the records kept about the results.

Confidential testing is done by a health worker who knows the name of the person being tested and the test results. The health worker keeps both private, so that other people do not know the results. Records are kept of the results and may be shared with other health workers who are involved with the person's health care.

Anonymous testing is when a health worker does not know the name of the person being tested. A number or a fake name is given to the person being tested, and the same number or name is attached to the blood sample. The person then gives their number or fake name to get the results.

Confidential testing helps limit the number of people who know about a test result. One good thing about confidential testing is that because the

HIV, blood, and pregnancy

Before a baby is born, the baby shares the mother's blood. Before the mother's blood passes to the baby, it is filtered (cleaned) by the placenta. The placenta is sometimes able to filter out HIV. This is why some babies born to mothers with HIV do not have the virus. However, the placenta is not able to filter out antibodies. This means that if a pregnant woman has HIV, she will pass her HIV antibodies to her baby. This will not hurt the baby, but it will make it difficult to test the baby for HIV infection. Over time, the antibodies in the baby fade away. If a baby still has HIV antibodies after fifteen months of age, then he is probably truly infected.

name of the person is known, a health worker can contact a person who is positive and offer further advice and treatment, even if the person does not come for a return appointment.

One problem with confidential testing is that it does not always keep information from being shared. This is why anonymous testing is sometimes used instead. If no one knows the person being tested, then it is impossible for anyone except that person to find out the results.

Mandatory testing

In some countries all people, or certain groups of people, are forced to be tested for HIV. This is called mandatory testing. Groups of people sometimes tested without their consent include factory workers, workers in the tourism industry, soldiers, sex workers, prisoners, immigrants, and pregnant women.

Mandatory HIV testing violates a person's right to privacy and the right to make her own decisions about her medical care. Mandatory testing often means the government or an employer unfairly controls what happens to the person after the testing. People may lose their jobs or their family support or suffer from other discrimination. People afraid of mandatory testing may avoid seeking needed health care.

There are ways to make testing both voluntary and more routine, such as offering testing in more places — hospitals, primary care clinics and people's homes, for example.

Mandatory screening

Many countries use HIV tests to screen donated blood, blood products, and organs for transplants. This is one kind of mandatory testing that is important, because it helps make sure that blood transfusions and transplants will not spread HIV.

Behavior change

There are many reasons why people think they might have HIV. These can range from knowing for sure that they are at risk because a sexual partner has AIDS to thinking they got the virus from a public toilet. When people are concerned enough to ask to be tested for HIV, they are usually eager to learn more about the virus.

The decision to be tested for HIV is often difficult (for more about counseling people who are being tested, see Chapter 8). People may be afraid of the test result, worried about who might find out the result, and concerned about how the result might change their life. The time spent waiting for test results can cause anxiety. People may think seriously about changing their behavior in order to avoid HIV. A good counseling session before the test can give a person important knowledge and tools that he will need to be safe. For example, if someone drinks alcohol, gets drunk, and then has unsafe sex with different partners, you can help her understand the link between alcohol and

unsafe sex. The pre-test session is very important; some people will not come back for their test result, and this may be your only chance to talk with them.

If an HIV test is positive, then the person must face new decisions. You can help people tell their sexual partners and their family, and you can help them get health care. When people find out that they have HIV, they will probably want to know about the symptoms of AIDS (see Chapter 2). Some people whose tests are positive may be so shocked that they do not hear or understand what you say. Ask them to come back later to continue talking.

What it means to have HIV

If a person has HIV, it means

1. HIV is in her body, even though she may not be sick or have AIDS.
2. She may pass the virus to others, including babies she may have in the future.
3. She should never donate blood.
4. She may stay healthy for a long time, especially if she takes good care of herself.
5. She needs advice and follow-up counseling.

If an HIV test is negative, it is still important to counsel the person after the test. A negative test does not mean that a person is immune to HIV; the person can still get it later. Talk to the person about the effectiveness of the test and how to prevent HIV infection in the future. A negative test result can give a person hope and a new view of life; if a person took risks in the past, it can help change that behavior.

HIV testing and pregnancy

If a man and woman are thinking of having a child, they should talk with each other about the risks of giving HIV to their baby. A man with HIV can pass the virus to his partner, who can in turn pass it to their baby. Pregnant women with HIV should know that pregnancy can make HIV disease worse.

Many times a woman will already be pregnant when she finds out she has HIV.

In some places, drugs that prevent the spread of HIV from mothers to babies will be available (see "Medicines that work against HIV" on page 185). The laws and feelings in her community about abortion and HIV may also play a part in her decision about her pregnancy. Some people feel that having an abortion is not ethical. Families may pressure women to have children at any cost. Other people feel that having children when you have HIV is not moral or responsible. Issues surrounding HIV and women are complex, and people being tested will need support (see Chapter 8).

Answering Jean-Patrice's questions

"Can I get tested for AIDS? How good is the test? If I am negative, does that mean I am immune?"

Jean-Patrice is worried about whether he has AIDS. He is also worried about giving HIV to his girlfriend in his home village. He has other girlfriends in Cayenne and does not know if they have the virus. You can explain to him that he can be tested for HIV. Most people who have AIDS are very ill; usually a test is not necessary to know that they have the disease. The HIV test can be useful, however, for finding out if someone who does not seem ill has HIV.

The HIV test looks for HIV antibodies. Sometimes it takes up to three months for a person's body to make HIV antibodies. If Jean-Patrice has a negative HIV test, there is a small chance that he may still have the virus; he should get tested again in three months. A negative test does not mean that Jean-Patrice is immune to HIV. He can still get the virus from one of his girlfriends if she has HIV. Jean-Patrice should protect himself and his girlfriends by having safe sex.