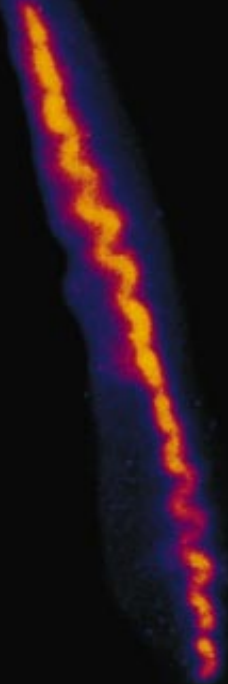
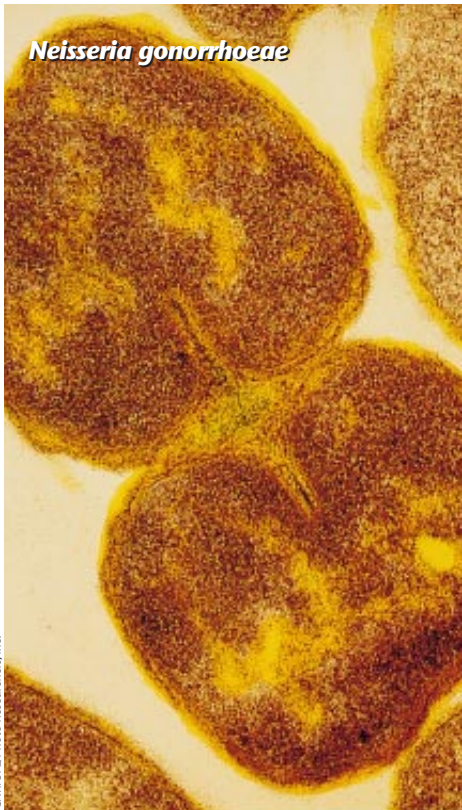


Treponema pallidum
(cause of syphilis)



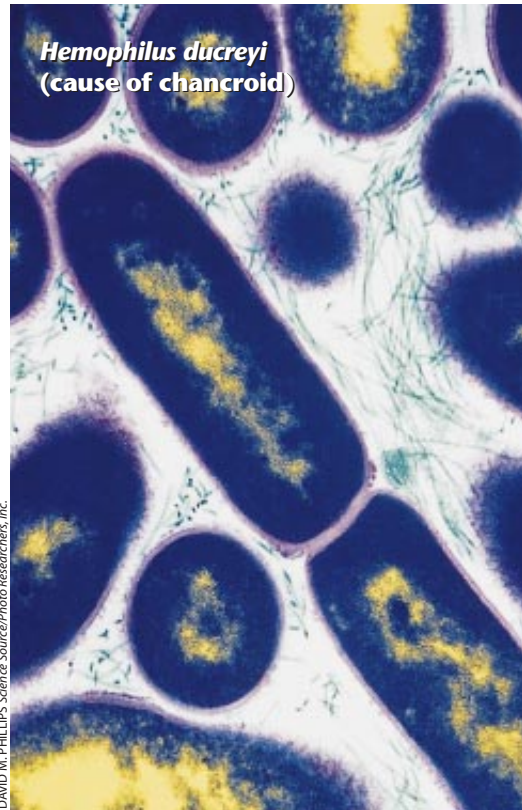
BIOPHOTO ASSOCIATES Science Source/Photo Researchers, Inc.

Neisseria gonorrhoeae



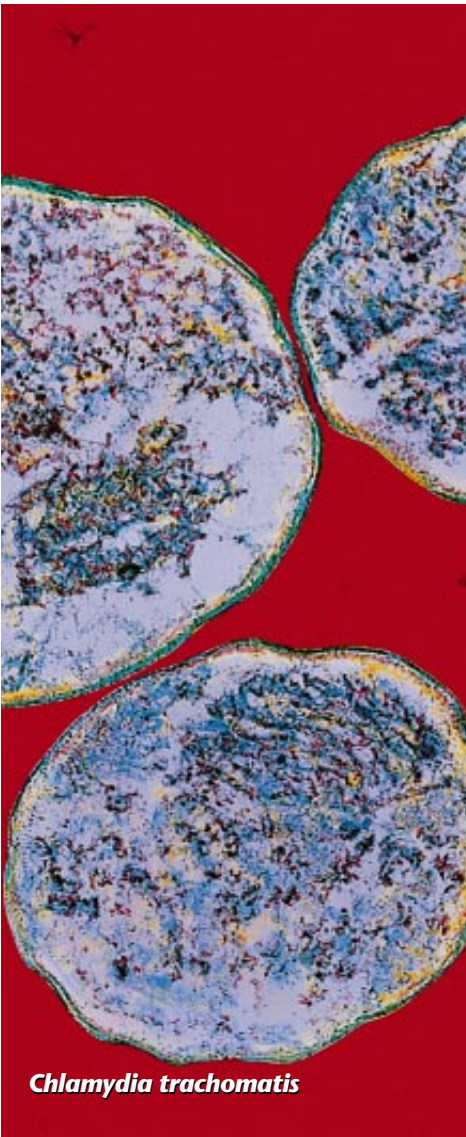
CHRIS SPL/Photo Researchers, Inc.

Hemophilus ducreyi
(cause of chancroid)



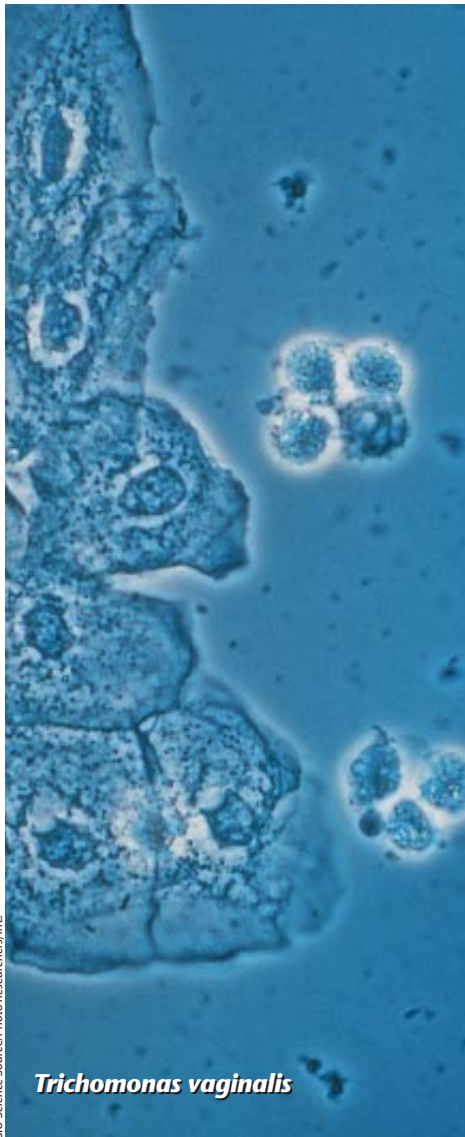
DAVID M. PHILLIPS Science Source/Photo Researchers, Inc.

Chlamydia trachomatis



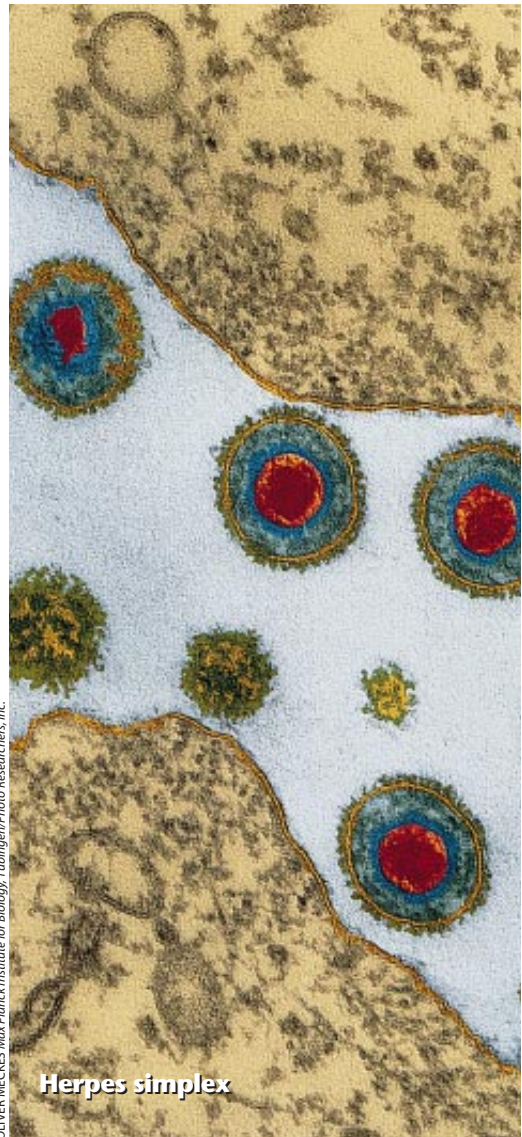
KARI LOUNATMAA SPL/Photo Researchers, Inc.

Trichomonas vaginalis



SILV Science Source/Photo Researchers, Inc.

Herpes simplex



OLIVER WECKES Max Planck Institute for Biology, Tubingen/Photo Researchers, Inc.

What Women Need to Know about Sexually Transmitted Diseases

Left undiagnosed, STDs can be deadly. Fortunately, many people can be helped

by Laura A. Koutsky, Ph.D.
University of Washington

Half of all women will acquire one or more sexually transmitted infections

during their reproductive years. Despite this dramatic statistic, most people think sexually transmitted diseases, or STDs, are rare. This misperception arises, in part, from the fact that people are often embarrassed to talk about sex, sexuality and genitalia.

But frank discussion is needed. Every year 12 million or so new cases of STDs are reported in the U.S. The most common are chlamydia, gonorrhea and syphilis, which are caused by bacteria. The most widespread viral STDs are human papillomavirus (HPV), genital herpes, hepatitis B and human immunodeficiency virus, or HIV (the virus that causes AIDS). Among the consequences of these myriad STDs are ectopic pregnancy, infertility, preterm delivery, neurological disorders, arthritis, cardiovascular problems, cancer and even death.

This hidden epidemic primarily afflicts young people. Two thirds of STDs in the U.S. take place among people under the age of 25. This finding is not surprising: more than 60 percent of high school seniors report having had sexual intercourse, and 27 percent say they have had at least four partners. In 1971, 39 percent of young women between the ages of 15 and 19 reported having had more than one sex partner; in 1988 that figure reached 62 percent. There is no indication that this trend will reverse soon. Although our society does not condone adolescent sexual activity, the fact remains that teenagers are sexually active and that they are acquiring STDs with some painful consequences.

Rogue's gallery of microbes causes a variety of sexually transmitted diseases in millions of people every year.

This situation is especially disturbing because in many cases it is preventable. Although incidences of incurable viral STDs, such as HPV, appear to be similar everywhere, the incidence of curable bacterial STDs among U.S. teenagers and adults is higher than it is in other industrial countries. Syphilis, for example, afflicts 4.3 out of every 100,000 Americans annually—nearly three times the rate for Germans and almost 11 times the rate for Canadians. This discrepancy is caused in part by cultural differences in sexual behavior and by economic differences, but it also results from the fact that Americans have less access to diagnosis and treatment than do people in Germany or Canada—countries that provide universal health care. Indeed, one quarter of American adolescents and young adults do not have health insurance.

In developing countries, where health care resources are extremely limited, the situation is more dire. STDs, including syphilis, chlamydial infection, gonorrhea and pelvic inflammatory disease—an upper reproductive tract infection that can result from various STDs—constitute the second leading cause of healthy life lost for women between the ages of 15 and 44. Cervical cancer caused by genital HPV is the most common cancer and the principal cause of cancer-related deaths among women in these resource-poor countries,

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where Pap tests are not widely available.

Although they affect both men and women, STDs are disproportionately damaging in women and adolescent girls. The biology of the female genital tract lends itself to asymptomatic infections. Unlike the male urethra, which often becomes painful within days of exposure to gonorrhea or chlamydia, the cervix (which is particularly susceptible to infection in younger women) may be infected for long periods without causing any discomfort. At least 25 percent of women with gonorrhea experience no symptoms, for instance, as opposed to less than 10 percent of men. Many women, unaware of the presence of an STD, do not seek medical attention—a delay that can have serious consequences. Untreated cervical gonorrhea and chlamydial infections can ascend into the uterus and fallopian tubes, causing pelvic inflammatory disease and setting the stage for ectopic pregnancies and infertility.

Some STDs are largely asymptomatic in both sexes—most men and women with HPV or herpes infections never become aware of them. Even so, women often suffer more damage to their health from these STDs: HPV infection, for instance, is more likely to cause cancer in women than in men [see box below].

Routes of Transmission

For many STDs, particularly the bacterial ones, people who repeatedly acquire and transmit infection play an important role in establishing and sustaining the prevalence of disease. Such people are

considered to be high-frequency transmitters—in epidemiological terms, they are called a core group. This group typically includes people who are commercial sex workers, their clients and their partners, as well as men and women who have unprotected intercourse with multiple partners.

The impact of people in a core group appears to vary for different diseases. Syphilis requires the participation of a great many transmitters to achieve an annual incidence rate of 1 percent. HPV, however, can have an annual incidence rate of more than 5 percent in populations that include a tiny core group or even no core group at all. This difference may be explained by several factors. First, HPV appears to be more easily transmitted than *Treponema pallidum*, the bacterium that causes syphilis. Second, asymptomatic diseases are harder to control: more than 90 percent of genital HPV infections are asymptomatic; only about 50 percent of syphilis cases are. And, finally, current therapies usually do not rid the body of HPV infection, but penicillin can cure syphilis.

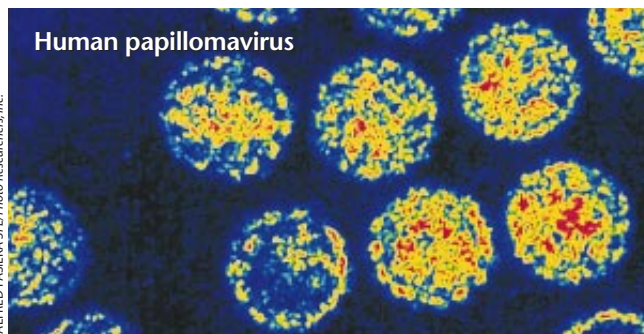
Whether STDs originate with a member of a core group or not, they are generally more efficiently passed during vaginal and anal intercourse than they are during oral intercourse. (In rare situations, an STD may be transmitted from a mother to her infant during pregnancy or delivery.) Furthermore, some STDs appear to be more easily transmitted from a man to a woman than from a woman to a man. For example, between 60 and

90 percent of women engaging in unprotected intercourse with men who have gonorrhea will become infected, whereas only 20 to 30 percent of men who have unprotected sex with infected women will contract the disease.

In the case of HIV, more data are needed to determine whether infection moves as readily from women to men as it does from men to women. It is clear, however, that HIV is somewhat more difficult to transmit during sexual intercourse than other STDs. The presence of syphilis, chlamydia, gonorrhea or chancroid may facilitate transmission of HIV. Rates of HIV infection are increasing faster among 15- to 44-year-old women than they are among any other group in the U.S.

The Challenge of Prevention

Women are at a distinct disadvantage with regard to protecting themselves against STDs. Synthetic condoms, which are the only available reliable barriers to infection, are generally in the control of the man. (The female condom does not seem to have become wildly popular; see box on page 26.) Nevertheless, sexually active women can reduce their chances of suffering the consequences of STDs. To do so, they should use a condom during intercourse with a new partner or with a regular partner who is unwilling to be monogamous. Sexually active women should undergo annual pelvic examinations and Pap tests, as well as screening for gonorrhea, chlamydia and HIV, if recommended by their health care provider.



ALFRED PASIEKA, SZ/Photo Researchers, Inc.

The American Social Health Association (ASHA) is a non-profit organization that provides information on HPV and other STDs. ASHA also sponsors the National STD Hotline (800-227-8922) and offers pamphlets and educational materials on STD-related topics. For more information, visit the organization's World Wide Web site at <http://www.ashastd.org> or write to the American Social Health Association/HPV, P. O. Box 13827, Research Triangle Park, NC 27709-3827.

Genital Human Papillomavirus

Human papillomavirus, or HPV, is a particularly insidious sexually transmitted disease (STD) because it is largely asymptomatic, can cause cancer and is virtually ubiquitous. More than 50 percent of sexually active adults have been infected with HPV—and less than 10 percent of them develop the warts that can help people identify an infection. As with other STDs, the incidence of HPV is highest among 18- to 28-year-olds. Most disturbing, perhaps, is the fact that condoms have not been shown to prevent transmission effectively, because HPV can occur in areas not covered by a condom—such as the base of the penis, the scrotum and the labia.

Of the more than 100 types of HPV, at least 35 infect the skin or mucosal surfaces of the genitalia (other types cause plantar warts and common skin warts). Although two types of HPV—HPV-6 and HPV-11—are most frequently detected in genital warts, these types are rarely found in invasive cancers of the cervix, vagina, vulva, penis and anus. Most such cancers seem instead to originate with infection by HPV-16, HPV-18, HPV-31 or HPV-45.

Genital HPV infections are primarily acquired through sexual intercourse. Unlike other viruses such as HIV and hepatitis B, HPV is not transmitted through blood and bodily fluids but rather by

Sexually Transmitted Disease	Percent of Women Who Show No Symptoms	Possible Long-Term Complications in Women	Effective Treatment or Vaccine Available?
Chlamydia	More than 75	Pelvic inflammatory disease, infertility, ectopic pregnancy, chronic pelvic pain	Antibiotics available; no vaccine
Gonorrhea	25–75	Pelvic inflammatory disease, infertility, ectopic pregnancy, chronic pelvic pain	Antibiotics available (although antibiotic-resistant strains exist); no vaccine
Syphilis	25–75	Cardiovascular problems, neurological disorders, damage to other organ systems	Antibiotics available; no vaccine
Chancroid	25–75	Unknown	Antibiotics available; no vaccine
Genital human papillomavirus	More than 90	Cervical, vulvar, vaginal and anal cancers	No*
Genital herpes	More than 50	Unknown	No*
Hepatitis B	25–75	Chronic liver disease, cirrhosis, liver cancer	No*; vaccine available
Human immunodeficiency virus	25–75	AIDS	No*
Trichomoniasis	25–75	Unknown	Antibiotics available

* Available treatments can reduce symptoms and complications but do not clear virus from the body. SOURCE: Laura A. Koutsky and the Institute of Medicine

Relying on over-the-counter products is no substitute for seeing a physician or nurse practitioner. Although douching is popular among some women, there appear to be few situations where it is medically required. Women with gonorrhea or chlamydia may actually increase their chances of developing pelvic inflammatory disease by douching. Women should also be aware that vaginal discharge does not always mean a yeast infection—rather it can be the sign of a more dangerous infection. Public health officials have recently become concerned that over-the-counter yeast infection treatments are encouraging women to diagnose and treat themselves, thereby delaying a trip to the doctor for a more serious problem, such as gonorrhea.

Despite this dismal state of affairs, there is hope. Researchers are working to develop vaccines for viral STDs, including HIV and HPV. A vaccine for hepatitis B is already available. And targeted behavioral intervention programs have proved successful in other countries. For instance, in Thailand, a government-sponsored and widely advertised effort to promote condoms among the general population and to enforce the universal use of condoms among sex workers has contributed to a dramatic decline in the incidence of STDs there.

There is growing awareness in the U.S. that the medical and public health community has not been effective in warning people about the rise in incidence of STDs or the possibilities for prevention

and treatment. This ineffectiveness is clearly reflected in a 1993 survey, which found that 84 percent of women felt they were at no risk of contracting an STD. As many public health experts and a recent Institute of Medicine report note, the secrecy and uneasiness surrounding discussions of sex in the U.S. undermine this country's ability to address STDs. Without open discussion, education, outreach and intervention, the threats to young people will only continue with tragic consequences. ^{5A}

LAURA A. KOUTSKY, associate professor of epidemiology at the University of Washington, has studied the epidemiology of STDs for more than 10 years. Her research concerns genital human papillomavirus infection.

direct skin-to-skin contact. Although it is uncommon, warts on the fingers can carry genital HPV-6 or HPV-16, and in some cases, warts can develop in and around the mouth. All sexually active people—whether heterosexual or homosexual—are at risk of genital HPV infection with each new sex partner. Indeed, genital forms of the virus are not uncommon among lesbians.

Most newly acquired genital HPV infections do not announce themselves, and often people with genital HPV infection never become aware of its presence. HPV infection can be detected through certain tests for HPV DNA. Because of the high prevalence of this STD, any kind of general screening test for HPV would reveal infection in a huge proportion of sexually active adults. But the clinical importance of detecting asymptomatic infection in areas other than the cervix is not yet clear; penile cancer, for instance, is extremely rare.

The significance of genital HPV infection of the cervix, however, is quite certain. Precancerous lesions can form within a year of initial infection. Because early detection of cervical cancer is crucial for prevention and treatment, women should have regular Pap tests, which can detect HPV-related precancer, early invasive cancer and cancer of the cervix. Women should know that Pap

readings are most accurate if they are done midway between menstrual periods. Gynecologists also recommend that women avoid vaginal creams, foams or suppositories the week before the exam and that they do not douche, have sex or use tampons the day before.

Women with abnormal Pap test results are referred for colposcopy. During this procedure, the cervix is treated with a mild vinegar solution and then examined for flat, whitish lesions. If these lesions prove to be precancerous or cancerous, they must be removed.

Genital warts in men and women can be surgically excised, frozen off or topically treated with medication, but the virus probably remains present in the body: it cannot be eradicated. For this reason, treatment of asymptomatic infection is not recommended.

In the near future, vaccines may be able to prevent HPV transmission. Our research group is testing an HPV vaccine that consists of the outer protein shell, or capsid, of the virus, which should stimulate the body's immune response, thereby preventing infection or disease. Similar vaccines have been effective in animals. If all goes well, an HPV vaccine may become available in the next decade. —L.K.

The female condom's manufacturer, the Female Health Company, reports that the plastic vaginal sheath is 79 to 95 percent effective as a contraceptive and can reduce the risk of contracting HIV by 97 percent.

SCOTT CAMAZINE AND SUE TRAINOR/Photo Researchers, Inc.



Arm Yourself against STDs

Humanity's battle against sexually transmitted diseases (STDs) is limited by the weapons at our disposal. The bacteria and viruses that cause STDs are spreading faster than modern technology and education can sequester their populations. Although there are effective methods available for preventing infection, it is estimated that at least 300 million people are infected every year throughout the world with the most common STDs—gonorrhea, chlamydia, syphilis and trichomoniasis.

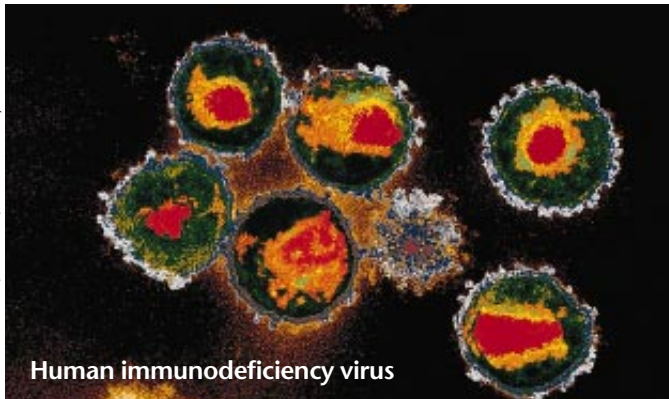
In addition to abstinence, there are three principal approaches to blocking the transmission of STDs: physical barriers, chemical barriers and vaccines. These techniques are in different stages of development and have various degrees of reliability.

Physical barriers

Physical barriers, such as synthetic condoms, prevent the organisms that cause disease from entering the body. Condoms are the only method of birth control on the market today that has proved effective in fighting most STDs. (They have not been shown, however, to block the transmission of human papillomavirus, or HPV.)

In addition to the male condom, there is a female condom available—sold under the brand name Reality. A package of three female condoms costs about \$9, roughly the cost of 12 male condoms. But current studies by Family Health International are evaluating whether female condoms could be reused, notes Nancy Alexander, an expert on contraception at the National Institutes of Health. According to the manufacturer, The Female Health Com-

OLIVER MECKES E.O.S./Gedderblom/Photo Researchers, Inc.



Human immunodeficiency virus

It's All Connected: The Importance of Addressing Young Men's Health

The waiting room is almost full, and it is only 4:30 P.M. Still half an hour to go before the clinic opens. The young men started arriving at 3:00, a few accompanied by their girlfriends, and they sit in rows facing a screen, watching a sexy music video. That is, until their viewing pleasure is interrupted by a slide show that opens with a graphic portrayal of the difference between an uncircumcised and a circumcised penis. The uncomfortable silence does not faze the social worker. "Any opinions on why they are different?" she asks. And the evening at the Young Men's Clinic at the Columbia University School of Public Health's Center for Population and Family Health in New York City is off and running.

For the next several hours, men and boys from the primarily Dominican, largely poor neighborhood of Washington Heights meet with doctors and nurse practitioners—as well as medical students from the New York and Presbyterian Hospital—to have HIV tests, physicals and exams for genital warts, herpes and other sexually transmitted diseases (STDs). "We use the slide show not to scare them but to open

up discussion. We are trying to get them to challenge their beliefs," says Bruce Armstrong, associate professor of public health and co-founder of the clinic. About 80 percent of the young men who come in are sexually active, 40 percent have made a partner pregnant, and 17 percent have an STD; almost none of them receive health care anywhere else.

"It's teaching without preaching," adds Tschaka Tonge, one of the physician's assistants. "We talk to them about lifestyle. I ask the young gentlemen, 'Do you really need another girlfriend? Can you afford this?' We try to get them to rethink their choices."

In a small examining room, Tonge talks with a young man from Nigeria who says he needs a physical for college. Tonge knows some Yoruba and tries to get his patient to talk about his health and sexual activity: Has he been tested for tuberculosis? Where'd he lose his two front teeth? When did he become sexually active? Does he use birth control and, if so, which kind? Sabitu Ladejobi, who says he found out about the clinic from a flyer, is terse at first but slowly warms to his purple-shirted,

dreadlock-sporting, hip-looking P.A.

The night of Ladejobi's visit is a particularly busy one. Not only is the free clinic—which is open only on Friday afternoons and Monday nights—filled to capacity as usual, but a group of Latin American public health experts are visiting. As one of a handful of places worldwide that offers preventive care for young men and that does not ignore their role in family planning, the Young Men's Clinic is increasingly being looked to as a model program.

Men have traditionally been left out of family-planning initiatives. Some of this bias has been purely practical: women have the babies, and most forms of birth control have been designed for them. Other aspects of the discrepancy have been incidental. "Put yourself in the mind-set of a young man who comes into a clinic and sees 50 women and a video on 'Your First Pelvic Exam' in the waiting room," Armstrong explains. "From the young fellow's point of view, the family-planning clinic is perceived as being for young women—even though that is not the policy."

New data on STDs and male sexual behavior, however, are beginning to inform family-planning strategies. In the late 1980s the first National Survey of Adolescent Males provided some of the only information on the attitudes and sexual behavior of 15- to 19-year-olds. The survey

pany, the female condom has proved effective in preventing the transmission of gonorrhea, chlamydia, syphilis and trichomoniasis—and if correctly used can reduce one's risk of getting HIV by as much as 97 percent. Alexander says that an independent study of the female condom's effectiveness in this regard has not yet been conclusive and is currently under way at the University of Alabama.

Because of its large size, the female condom has been somewhat unpopular since it went on the market in the U.S. in 1993, but the company says that sales are up and that the idea is catching on. The female condom consists of two rings connected by a polyurethane sheath. The small, inner ring covers the cervix, stretching the sheath to line the walls of the vagina. The larger ring at the other end of the sheath remains outside the woman, protecting the vaginal lips from contact with skin or bodily fluids.

Other barrier devices for women that rely on a combination of physical and chemical methods to block STDs are not as effective against infection, because they do not prevent fluids from entering the body. These methods include diaphragms and cervical caps.

Chemical barriers

Chemical barriers, such as spermicides, do not block the exchange of bodily fluids at all—but actively kill the viruses and bacteria that can cause disease on contact. Spermicides are not proved to be effective in preventing most STDs, however—not because they cannot kill the organisms but because they cannot kill all of them.

To be effective, a chemical barrier must be applied to cover every place that bodily fluids might travel during sex, a task that is

nearly impossible. Yet there is some evidence suggesting that spermicides are an effective defense against chlamydia and gonorrhea, Alexander says. And although some researchers are developing spermicides that will be able to target specific viruses or bacteria, any chemical barrier will still be limited by its inability to protect all sexually exposed areas.

Vaccines

Perhaps the greatest hope for defense against STDs lies in vaccines, which activate the body's immune system to attack the organisms that can cause disease. The only STD vaccine available is for the viral infection hepatitis B. The Centers for Disease Control and Prevention and the American Academy of Pediatrics recommend the vaccine for all newborns, children and sexually active people.

Several vaccines are being tested to fight HIV, but so far none has been effective. The search for a vaccine is hampered by the fact that investigators do not yet understand how—or even whether—the human body can resist the ravages of HIV.

The quest for a vaccine for HPV—the virus associated with 90 percent of cases of cervical cancer—has just begun. Still, researchers are hopeful because animal vaccines against analogous infections, such as bovine papillomavirus in cows, have been effective.

Despite the promise of STD vaccines, Alexander predicts that they will not be available for another 20 years. The process is slow because vaccines have to be tested on humans—and precautions must be taken to prevent the spread of disease while testing the effectiveness of the treatment.—*Krista McKinsey, special correspondent*

recently found that between 1988 and 1995 the use of contraceptives during first intercourse increased from 62 to 73 percent; condom usage, in particular, rose significantly.

The survey's authors also found that, contrary to stereotype, 90 percent of men believe they should talk to their partner about contraception before intercourse, protect against pregnancy and take responsibility if they do father a child. These findings, as well as a review of male-oriented programs, were recently published in an Urban Institute report, "Involving Males in Preventing Teen Pregnancy."

Public health experts say the shift to include men is part of a larger social transformation catalyzed by the current fatherhood movement, the 1988 Family Support Act—which requires noncustodial parents to be financially responsible for their progeny—and the 1995 Clinton administration effort to design federal programs that include and promote the involvement of fathers. Developing "the role of men as being nurturing, caring and responsible in reproductive health matters has taken a while in many ways," Armstrong remarks. "It was just a short time ago that fathers were not allowed into the delivery room."

But perhaps most responsible for the changing approach is the alarming prevalence of STDs. According to the Alan Guttmacher Institute, 12 million such infections occur annually in the U.S.—among the highest numbers in the industrial world—and teenagers account for 25 percent of all cases. Judith N. Wasserheit, director of the Division of STD/HIV Prevention at the Centers for Disease Control and Prevention, notes that men have been the focus of STD programs in the past, largely because most STDs are more symptomatic in men. But in the past decade or so, more data have made clear the long-term consequences of asymptomatic STD infection in women—including infertility, cervical

cancer, miscarriage, stillbirth, premature delivery, and mental retardation and blindness in newborns. Now, Wasserheit says, "there is a very interesting confluence with the family-planning community's saying we need to do more for men, and the STD community's saying we need to do more for women."

"Although you are talking about women's health, men are very much interwoven," concurs Anidolee Chester, education coordinator at Planned Parenthood in Providence, R.I. "If you get them to have some sense of responsibility, you will see improvements in women's health." Chester and her colleagues recently started a program for men, modeled after the Young Men's Clinic.

Armstrong and his colleagues say the clinic's success comes from their efforts to make every moment a "teachable" one and to listen without judging. "There is a stereotype that young men are healthy, not concerned about health, and hard to engage and maintain as patients," says Alwyn T. Cohall, medical director at the clinic and director of the Harlem Center for Health Promotion and Disease Prevention. "We have debunked all of these myths." —*Marguerite Holloway, contributing editor*



Discussions at the Young Men's Clinic in New York City emphasize men's roles in family planning.

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