

Herpes, HIV and the High Risk of Sex

Heterosexual men and women whose sex partners carry the virus for genital herpes run a "substantial" risk of catching the virus, even when the infected partners show no signs of the disease, scientists report in the Feb. 1 *ANNALS OF INTERNAL MEDICINE*.

For sexually active heterosexuals there's more bad news: A statistical analysis indicates that people with genital herpes have an increased chance of infection with the human immunodeficiency virus (HIV), which causes AIDS.

Taken together, the two new reports suggest that sex is riskier than ever.

First, consider genital herpes, which is caused mainly by Type II herpesvirus. Approximately 20 to 40 million people in the United States carry the virus. In the 1980s, preliminary studies hinted at the risk of spreading genital herpes to an uninfected sexual partner even when no symptoms are present (SN: 6/28/86, p.410). Now, scientists have confirmed those suspicions and have compiled data that quantify the risk of sex with a herpes-infected partner.

The researchers, led by infectious-disease specialist Gregory J. Mertz of the University of New Mexico in Albuquerque, studied a total of 144 men and women who experienced recurrent outbreaks of genital herpes, as well as their regular sexual partners, who showed no sign of infection before entering the study. Each couple was asked to keep a detailed diary of sexual activity and any herpes symptoms, such as genital ulcers, throughout the yearlong study.

The researchers advised all participants to avoid sexual contact when genital ulcers flared. Despite a warning about possible virus spread during asymptomatic periods, only 21 of the 144 couples used condoms routinely, the team found.

By the end of the year, 14 (nearly 10 percent) of the initially healthy partners had developed signs of genital herpes, Mertz and his colleagues report. In nine of these cases, the investigators concluded that transmission occurred during a period of asymptomatic viral shedding. In one case, infection apparently took place at a time when the infected partner experienced mild itching symptoms, which can precede an ulcer outbreak. In three cases, the previously infected partner reported no symptoms at the time of intercourse but noticed lesions several hours later.

Women's risk of catching the virus proved much greater than men's, perhaps because the virus finds it easier to penetrate the membranes of the female genital tract, Mertz says. Uninfected women had

a 33 percent chance of contracting the disease if the male partner did not use condoms during the study period. Uninfected men, in contrast, had a 5 percent chance of catching the virus if they didn't use condoms.

Although condoms clearly help, says Mertz, they may not provide absolute protection: One of the 21 couples who said they consistently used condoms reported herpes transmission.

In the February *JOURNAL OF INFECTIOUS DISEASES*, a separate team presents the results of a study designed to show whether genital herpes can boost the risk of HIV infection among sexually active heterosexuals.

Led by Thomas C. Quinn of the National Institute of Allergy and Infectious Diseases (NIAID) in Bethesda, Md., the researchers examined blood serum ob-

tained from a total of 471 heterosexual men and women who were examined at a sexually transmitted disease clinic in 1987. After controlling for factors known to influence the risk of HIV infection, such as the number of sexual partners, the team's statistical analysis revealed that men and women with genital herpes face double the HIV risk of people who do not have genital herpes.

This study, as well as previous research, suggests that HIV may find its way through the genital skin blisters caused by Type II herpesvirus and several other sexually transmitted microbes, comments NIAID Director Anthony S. Fauci.

For heterosexuals concerned about herpes, HIV and other sexually transmitted diseases, Fauci advises: "You shouldn't have unprotected sex, period."

— K.A. Fackelmann

Stringing together a conducting window

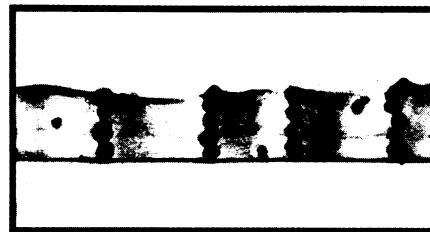
Chains of iron filings hanging from the ends of a magnet furnish a revealing snapshot of the way a magnetic field aligns ferromagnetic particles. Researchers have now applied this same principle to create a novel transparent material that also conducts electricity.

The researchers achieve this effect by using a magnetic field to string tiny, metallic beads into narrow strands embedded in a polymer. Because thin films of this flexible, composite material remain clear enough to permit easy viewing of underlying words or graphic images, they show potential as pressure sensors and touch-sensitive coatings for computer display screens.

Sungho Jin and his co-workers at AT&T Bell Laboratories in Murray Hill, N.J., describe these optically transparent, electrically conducting films in the Jan. 24 *SCIENCE*.

Most transparent materials, including a wide variety of glasses and polymers, conduct electricity poorly. Moreover, the handful of transparent semiconductors presently available tend to carry electrical current along a layer's surface rather than across its thickness. In contrast, the material developed at Bell Labs combines transparency with high electrical conductivity through its thickness.

The researchers prepare the material by mixing gold- or silver-plated nickel spheres, about 20 microns in diameter, with uncured, liquid silicone, then spreading the mixture into a thin layer on a flat plate. A vertical magnetic field aligns the randomly dispersed spheres,



Cross-section showing isolated chains of electrically conducting spheres extending from surface to surface across a silicone film about 0.3 millimeter thick.

which act like little magnets, into a set of isolated, parallel chains of touching spheres, which extend from one surface of the silicone film through to the other. Curing the silicone locks these columns into place. The gold or silver coatings on the spheres protect their surfaces from corrosion and improve conductivity.

By keeping the proportion of nickel spheres in the material to less than 2 percent by volume, the researchers say they can achieve high transparency in the direction along the electrically conducting chains. In addition, by spraying a thin layer of silicone over the cured, composite material, they can make it pressure-sensitive. That extra layer serves as an insulating barrier when the applied pressure is low, but allows the passage of electric current when the pressure, exerted by a finger or a pen, exceeds a certain threshold.

"We've demonstrated the principle," Jin says. "But for practical applications, there are a lot of engineering questions, including reliability." — I. Peterson