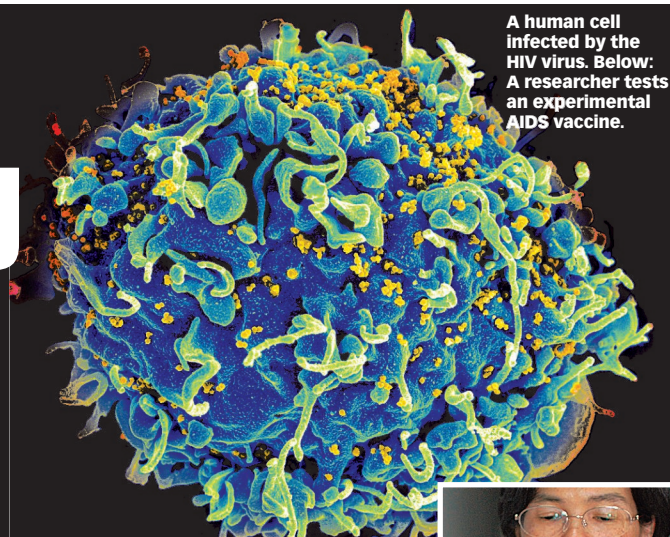


AIDS in 2010 How We're Living With HIV

by Drs. Francis S. Collins and Anthony S. Fauci



A human cell infected by the HIV virus. Below: A researcher tests an experimental AIDS vaccine.

F SOMEONE LIKE 23-YEAR-OLD Erik H. had walked through the doors of the National Institutes of Health (NIH) Clinical Center in the 1980s and asked how long he had to live, the answer would have been grim. We'd have told the recent college graduate that he probably had less than a year.

Today, the future is far brighter for Erik and millions of others infected with the human immunodeficiency virus, or HIV—the retrovirus that causes acquired immunodeficiency syndrome, or AIDS. Because of the development of truly transformative drugs by researchers in government, at universities and hospitals, and in the biotech and pharmaceutical industries, HIV-positive people can now look forward to decades of life. Someone like Erik can expect to survive until age 70 or even beyond.

In 2009, Erik became extremely ill with severe weight loss and chronic diarrhea. After tests revealed that the Maryland resident was HIV-positive, a hospital social worker steered him into NIH's Partnership for Access to Clinical Trials (PACT) program, which brings together community-based health-care providers, patients, and NIH research clinicians.

"If it wasn't for the people at PACT, I'd probably have died," says Erik, who takes a combination of three antiretroviral drugs every morning. He now leads an active, healthy life that includes playing tennis and is planning a future in hotel management.

The United Nations estimates that more than 33 million people globally—including about 2 million children and 15 million women—are currently infected with HIV. If untreated, HIV destroys the immune system, rendering the body vulnerable to

life-threatening infections and cancer.

More than two dozen drugs to suppress HIV infection are now available, usually used in combinations known as HAART (Highly Active Antiretroviral Therapy), or more commonly as AIDS "cocktails." Because HIV mutates rapidly and because some people can't tolerate certain drugs, doctors sometimes need to switch patients to different combinations of drugs over time to keep their infections under control.

NIH supported much of the research to develop these drugs and is helping to determine the best way to use them in different populations. This information will be key in implementing the President's Emergency Plan for AIDS Relief and other programs that provide greater global access to HIV therapies. More than 4 million people in the developing world now get antiretroviral drugs thanks to this outreach.

BUT MUCH MORE REMAINS TO BE done. Each year, about 2 million people worldwide die of AIDS. An additional 2.7 million—56,000 in the U.S.—become newly infected with HIV. Unless we stop these new infections, it will be extremely difficult, perhaps impossible, to provide appropriate therapy for all HIV-positive people.

Prevention is the key to defeating this terrible disease. And that is where medical research's biggest challenges lie as we prepare to enter the fourth decade of the AIDS pandemic.

HIV can be transmitted by sex, sharing needles and



PHOTOS COURTESY OF NIAID, NIH (CELL), U.S. MILITARY HIV RESEARCH PROGRAM (RESEARCHER), AND GEORGE MELTON (MELTON)

PARADE Survivors 22 Years Later

In 1988, PARADE began following 16 Americans living with AIDS. All had been leading active lives for three years or more, which classified them as long-term survivors. At that time, the probability of surviving the disease for even one year was 50-50. Today, people



George M

who get effective treatment can live healthy, normal lives.

At 57, George Melton is the last known survivor in the group that was diagnosed with AIDS. Retired, healthy, and living in Palm Springs with his partner of 19 years, Melton has just finished his third book, an account of an 18-month cross-country trip he and his then-partner, Wil Garcia—who was also HIV-positive—made in 1988 in a 27-foot Winnebago. They set

out to talk about the disease at every church, AIDS organization, and broadcast station they could find. Garcia died in 1989.

"AIDS was a wake-up call for me," Melton says. "It was live or die. It was going to be the agent of my enlightenment or my destruction." He laughs, adding, "My enlightenment has been a long process."

Melton didn't require drugs until 1995. He now takes two, with moderate side effects. "I was lucky," he says. "By the time I needed them, the drugs had gotten better." —Christine Wicker

syringes, and from mother to child at birth or through breast milk. HIV also can be spread by blood. However, since 1985, all donated blood in the U.S. is tested for HIV, making transmission through transfusion extremely unlikely.

A major obstacle to reducing HIV transmission is that many people—one in five in the U.S. alone—don't know they're infected and may inadvertently be spreading the virus. The U.S. Centers for Disease Control and Prevention recommends that everyone between ages 13 and 64 be tested for HIV. The benefits of more frequent testing, perhaps every year, for high-risk groups such as those who have unprotected sex with multiple partners or use injected drugs, are also being studied. Earlier detection would not only curb HIV transmission but might help those already infected, since there's evidence that patients who get early treatment tend to live longer than those treated later on.

An effective vaccine remains the ultimate goal in defeating AIDS.

Another new preventive approach, pre-exposure prophylaxis, involves encouraging uninfected people who continue high-risk activities to take antiviral drugs in advance. The idea is that the drugs might lower the odds of an HIV infection taking hold if the person were exposed.

No current drug or combination of drugs can currently cure HIV infection—that is, totally eradicate the virus from an HIV-positive person's body. Some researchers are pursuing that goal. Others are aiming for a “functional cure,” in which antiretroviral drugs would

continued

AIDS in 2010 | continued

so lower levels of HIV that the patient's own immune system would keep the virus in check once drugs were discontinued.

Some rare individuals have a genetic variation that almost always protects them from HIV infection, even if they are repeatedly exposed to the virus. By studying their genetic makeup, researchers hope to design new therapies that confer the same resistance to those who didn't win the genetic lottery. Other individuals have immune systems that control the virus exceptionally well after infection. Studying these "elite controllers" may help create an HIV vaccine.

An effective vaccine remains the ultimate goal in HIV prevention. After more than 20 years of research, there is finally a glimmer of hope. A large study in Thailand recently provided the first signs that a vaccine could actually prevent HIV infection, albeit in a relatively small percentage of those vaccinated. Much more research is needed to understand how this vaccine regimen works and how its efficacy might be increased.

Until an effective vaccine is available, the best defense against HIV is to avoid injection-drug use and needle-sharing and not engage in unprotected sex in a relationship in which there's any doubt about a partner's HIV status.

Erik encourages others, particularly other young people, to take these preventive messages to heart. "You can live a normal life and be happy if you are HIV-positive," he says. "But it's better not to be infected at all." 

Dr. Francis S. Collins is director of the National Institutes of Health. Dr. Anthony S. Fauci is director of the National Institute of Allergy and Infectious Diseases.