



PREVENTIVE HIV VACCINES

WHAT IS A VACCINE?

The body's immune system normally reacts to anything it recognizes as foreign and tries to eliminate it. A vaccine is a substance that helps the immune system respond to a specific germ or virus. A vaccine can prevent an infection. No vaccine is 100% effective.

Vaccines can protect people against a disease (preventive vaccines) or help them fight a disease they have acquired (therapeutic vaccines). They can also lower the overall infection rate within a community and help stop the spread of a disease. People living with HIV need to consider special issues when getting vaccinated against common diseases (see Fact Sheet 207).

At this time there is no vaccine against HIV. This fact sheet explains research into a preventive vaccine to keep people from acquiring HIV.

HOW DOES A VACCINE WORK?

A healthy immune system fights anything it thinks does not belong in the body. It produces proteins called antibodies. These antibodies lock onto the invading germs or virus and prevent them from infecting cells or multiplying. Once the threat of infection is over, the immune system produces special memory cells that remember how to fight that specific germ or virus.

Some vaccines are made from weakened germs or viruses. They are called "live vaccines." One such vaccine is the MMR shot (measles, mumps and rubella). Other vaccines are made of inactivated ("killed") virus. This type includes the influenza (flu) shot.

Vaccines can have side effects. With live vaccines, you might get a mild case of the disease that is being prevented. With inactivated vaccines, you could have a reaction where you got the shot. You might also briefly feel weakness, fatigue, or nausea.

WHAT'S DIFFERENT ABOUT HIV VACCINES?

All proposed HIV vaccines use copies of parts of HIV to produce an immune reaction. You cannot acquire HIV from them. These vaccines in development are neither live nor inactivated vaccines. They are "engineered" vaccines.

Participants in HIV vaccine trials will likely develop antibodies to HIV. HIV tests check for these antibodies.

People who take part in a study of an experimental HIV vaccine therefore may test positive for HIV, even if they have not acquired the virus itself. If you participate in such a study, you should only get an HIV test at the clinical trial site.

HOW ARE HIV VACCINES TESTED?

As with medications, a vaccine concept is first tested in the laboratory. If laboratory ("in vitro") studies are successful, the potential vaccine is tested in animals. If it is successful in these early studies, a vaccine "candidate" can then be tested in humans ("in vivo"). There are three phases to clinical trials in humans:

Phase 1: Is it safe?

Phase 2: Does it produce an immune response (a body's defensive reaction against the invading virus)?

Phase 3: Is it effective in preventing HIV acquisition?

Vaccine development takes many years. For example, it took more than 100 years to develop a vaccine against typhoid fever, and almost 50 years for the polio vaccine.

HOW CLOSE ARE WE TO A VACCINE THAT PREVENTS HIV?

There is currently no effective vaccine to prevent HIV. Several clinical trials, including a large trial in Thailand, have shown little or only a modest effect. Currently, a modified version of an earlier vaccine candidate is being tested in South Africa.

Developing an HIV vaccine is extremely difficult. Similar to combination antiretroviral therapy, a combination of vaccines may be necessary to achieve protection against the virus. An initial vaccine would get a person's immune system ready ("prime" it), and additional shots would prompt the person's immune system to make antibodies ("boost" it).

WHAT OTHER FORMS OF HIV PREVENTION ARE BEING STUDIED?

A medication to prevent acquisition of HIV has been approved in the US and other countries. That form of prevention is called pre-exposure prophylaxis (see Fact Sheet 160). Unlike a vaccine, however, it must be taken regularly in order to work.

Microbicides might be another way to prevent HIV infection (see Fact Sheet 157). These are substances that are applied as a cream or gel by women and men to prevent HIV acquisition during vaginal or anal sex.

NEXT STEPS

Experts agree that a safe and effective HIV vaccine could be a good way to deal with the global epidemic. It would work alongside effective antiretroviral drugs that help people already living with HIV control the virus.

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