

HIV Testing

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Testing for HIV

- When the virus enters the body, it is recognized as a foreign invader, and antibodies are produced in response
- Testing for HIV tests the blood serum for antibodies to the virus
- If antibodies specific to HIV are found, the body has produced antibodies, and the person is positive for the virus
- Video on Testing for HIV:
 - http://aids_org.healthology.com/webcast_transcript.asp?f=hiv&c=hiv_testingadvances&b=aids_org

When Should One Be Tested?

- The body may take 3 months or more to produce antibodies to the virus (seroconversion)
- The test should not be administered earlier than 3 months after a sexual encounter
- After 6 months, any infected individual should have produced antibodies

Antibody Test

- Blood serum is tested for the presence of antibodies to the virus
- ELISA Test
 - An ELISA plate is coated with HIV antigens, which will bind to HIV antibodies in an infected individual's blood serum
 - Blood serum is added to the ELISA plate
 - A second antibody, called anti-human immunoglobulin (AHI), which is joined to an enzyme, is added to the plate.
 - If HIV antibodies have bound the antigens on the plate, the second antibody will bind the HIV antibody.
 - Chromogen is then added, which changes color when cleaved by the enzyme joined to AHI.
 - If there is a color change on the plate, HIV antibodies are present, and the individual has tested positive for the virus.
 - This test should always be repeated if the individual tests positive.
- A Western blot should also be done to confirm presence of protein.

ELISA Animation

ELISA animation

“Rapid HIV Test”

- Particle Agglutination
 - HIV antibodies in individual's blood serum mix with HIV antigens and visibly agglutinate
- Immunoconcentration
 - Sample is run through a membrane containing HIV antigens
 - A visible dot or line shows when antibodies are present and the sample is developed with a signal reagent
- Immunochromatographic Test
 - HIV antigen and signal reagent are built in to a strip
 - A sample is exposed to the strip, and, if antibodies are present, a visible line or dot shows
- Tests take less than an hour
- Can use blood from a finger prick or saliva to test for antibodies

Viral Load Test and Nucleic Acid Test

- Test for HIV RNA
- Method 1:
 - Use PCR to encourage RNA replication and use what is known about HIV RNA to determine the number of particles in the blood.
- Method 2:
 - bDNA is used to start a chemical reaction with HIV RNA in a sample so that it gives off light and can be detected and measured.
- Results given in HIV RNA copies per milliliter
- Also a good test of disease progression.

Where Can One Be Tested?

- Wake County Human Services

10 Sunnybrook Road

Raleigh, NC 27620

Main: (919) 250-3950

- Planned Parenthood Chapel Hill

1765 Dobbins Dr

Chapel Hill, NC 27515

Main: (919) 942-7762

National HIV/STD Hotline: 1-800-342-AIDS

Stigmas and Misconceptions Associated with Being Tested

- Worry about social stigmas associated with HIV/AIDS
 - Kaiser Family Foundation survey: Three in 10 participants said they would be very (17 percent) or somewhat (14 percent) concerned that people would think less of them if they found out they had been tested for HIV.
- Worry about testing positive.
- Think that HIV testing is a part of normal physical examinations.

Pros and Cons to Home Testing

Pros:

- Can test without anyone knowing
- Can be purchased at stores or ordered online for people without transportation
- FDA-approved tests are as accurate as antibody tests

Cons:

- Home test kits can cost up to \$50.
- Confidentiality
 - If purchased in a store, others will see the purchase
 - When ordering by phone or internet, personal information must be provided
 - Anyone with a test ID number can get the associated test results over the phone
- Getting results over the phone could be difficult (especially if the test is positive)
- Partner notification not a part of at-home testing services

Problems with Reliability

■ False positives

- The ELISA test may produce false positives if there is an antibody present in the individual's blood serum that will also bind to the antigen on the plate.
- The "rapid tests" may also produce false positives for the reason.

■ False Negatives

- If an individual is tested before seroconversion, the test results may be negative when the individual is HIV positive.

Testing the Blood Supply

- In 1985, the United States began testing the blood supply for HIV using the Antibody test
- Nucleic acid testing is now also used
- Screening processes aid in making the blood supply safer (i.e. questions for each donor)
- The greatest risk to recipients of blood is blood donated by infected individuals who have not seroconverted
 - Assessment questions provide information about donors that may not know they have been infected
 - Risk formula:
$$\text{RISK} = \frac{\text{incidence} \times \text{window period in days}}{365}$$
- HIV risk per unit--> 1 / 1.25 million (calculated in 1997)

Answers to Quiz

- 1) True
- 2) False
- 3) False
- 4) False
- 5) True
- 6) False
- 7) True
- 8) True

References

- <http://www.thebody.com/nmai/testing.html>
- http://www.labtestsonline.org/understanding/analytes/hiv_antibody/test.html
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- www.thebody.com/sowadsky/homehiv.html
- www.hivtest.org