

Group: Group VI (ssRNA-RT)

Order: Unassigned

Family: Retroviridae

Subfamily: Orthoretrovirinae

Genus: Lentivirus HIV

The human immunodeficiency virus (HIV) is a lentivirus (a subgroup of retrovirus) that causes HIV infection and over time acquired immunodeficiency syndrome (AIDS). AIDS is a condition in humans in which progressive failure of the immune system allows life-threatening opportunistic infections and cancers to thrive. Without treatment, average survival time after infection with HIV is estimated to be 9 to 11 years, depending on the HIV subtype. Infection with HIV occurs by the transfer of blood, semen, vaginal fluid, pre-ejaculate, or breast milk. Within these bodily fluids, HIV is present as both free virus particles and virus within infected immune cells .

HIV infects vital cells in the human immune system such as helper T cells (specifically CD4+ T cells), macrophages, and dendritic cells ,direct viral killing of infected cells, and killing of infected CD4+ T cells by CD8 cytotoxic lymphocytes that recognize infected cells. When CD4+ T cell numbers decline below a critical level, cell-mediated immunity is lost, and the body becomes progressively more susceptible to opportunistic infections .

Sample :

blood, semen, vaginal fluid, pre-ejaculate, or breast milk , oral fluid .

HIV EIA

EIA is commonly used as a screening assay for many infectious diseases, including HIV. These assays are used because they are highly sensitive and generally amenable to automation, facilitating high-volume testing .

Western blot

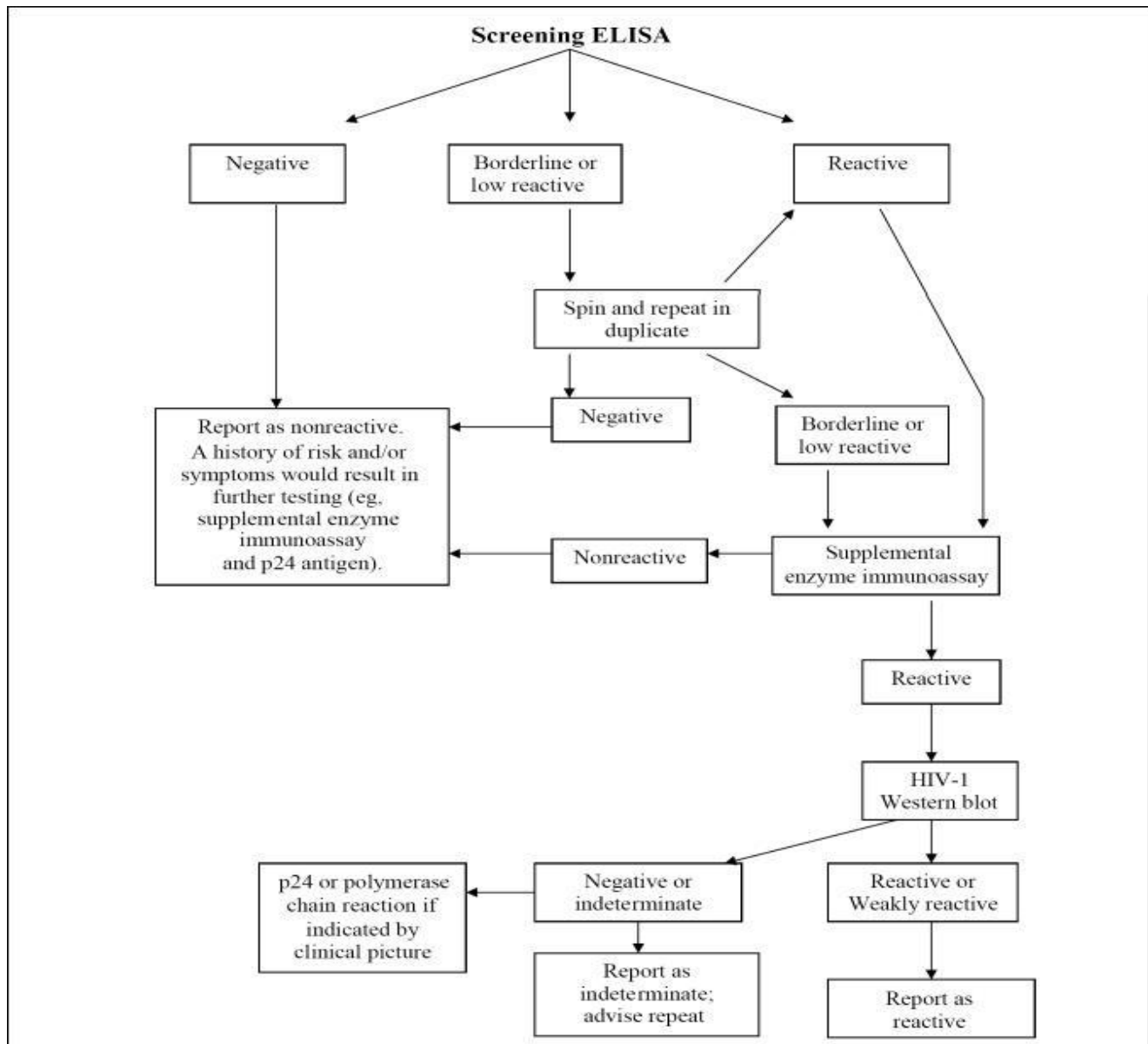
The Western blot is an immunoblot that allows for the characterization of antibodies to each viral protein. Patient serum is reacted with a nitrocellulose strip containing all of the constitutive HIV virus proteins (core and envelope), arranged by molecular weight after polyacrylamide gel electrophoresis .

enzyme-linked immunosorbent assay (ELISA)

to detect antibodies to HIV-1. Specimens with a nonreactive result from the initial ELISA are considered HIV-negative unless new exposure to an infected partner or partner of unknown HIV status has occurred. Specimens with a reactive ELISA result are retested in duplicate .

Quantitative RNA PCR and genotyping

Quantitative RNA PCR must only be used to monitor HIV-positive individuals before or during antiretroviral therapy. It is used in conjunction with CD4 counts and general clinical assessments to ascertain when therapy should be started. It is also used to help determine the patient's response to therapy .



Group: Group VI (ssDNA-RT)

Family: Hepadnaviridae

Genus: Hepatitis B HBS

Hepatitis B is an infectious disease caused by the hepatitis B virus (HBV) which affects the liver. It can cause both acute and chronic infections. Many people have no symptoms during the initial infection. Some develop a rapid onset of sickness with vomiting, yellowish skin, tiredness, dark urine and abdominal pain. Often these symptoms last a few weeks and rarely does the initial infection result in death. It may take 30 to 180 days for symptoms to begin. Most of those with chronic disease have no symptoms; however, cirrhosis and liver cancer may eventually develop. These complications result in the death of 15 to 25% of those with chronic disease .

Specimen Choice, Collection

The specimen of choice for the diagnosis of HBV infection is blood. Serological tests for viral antigens and antibodies are typically used for diagnostic screening and can be performed on either serum or plasma .

Total antibody to hepatitis B core protein

If negative, past infection with HBV is typically ruled out .

If positive, the patient has been infected with HBV. Infection may be resolved (HBsAg-negative) or ongoing (HBsAg-positive). If the infection is resolved, the person is considered naturally immune to HBV infection .

Antibody to hepatitis B surface protein

If negative, the patient has no apparent immunity to HBV .

If positive, the patient is considered immune to HBV (either because of resolved infection or as the result of prior vaccination). Very rarely (less than 1%) can chronic carriers be positive for HBsAg and antibody to hepatitis B surface protein (anti-HBs) at the same time . In such cases, the patient is considered infectious .

Serum transaminases

Once an individual has been diagnosed with chronic HBV infection, follow-up testing must be performed for alanine aminotransferase (ALT), a marker of liver cell inflammation.

PCR tests have been developed to detect and measure the amount of HBV DNA, called the viral load, in clinical specimens. These tests are used to assess a person's infection status and to monitor treatment .